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EDITORIAL

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Telegraph-Signal Pole Lines

With the installation of automatic block signals in prospect on several roads the question whether a separate pole line should be installed to carry the line circuits deserves serious consideration. For alternating current signaling using approximately 4,400-volt feeding circuits a separate pole line is essential, but with low-voltage direct current circuits another cross-arm has simply been added to the existing telegraph lead in the majority of installations made in the past. Serious accidents are said to have been caused by crosses between telegraph and signal wires carried on the same pole line. Again, in case the pole lines are damaged by wind or sleet storms, considerable confusion and delay often result because of a lack of co-operation between employees maintaining the separate signal and telegraph lines. Also adding another cross-arm for signal wires to an already overloaded telegraph lead is poor economy, as has been found by some roads in the past. A study of these factors on several roads has resulted in the decision to build a separate pole line. The local conditions in each case should be carefully studied before determining the practice to be followed.

Electric Rivet Cutting

Cutting out rivets with the gas flame is a practice quite common in railroad shops. The practice of using the electric arc for this purpose is comparatively new. Numerous objections have been raised from time to time to the use of the electric arc for this purpose, but, one by one they have been disposed of and there are now several railroads using the process. Damage to the plate is offered as an objection but anyone who has watched the work has noticed that the arc sticks to the rivet after it is started and does not wander around on the plate as might be expected even though the rivet is burned completely out of the hole. Mechanical and inductive "kick" have been practically eliminated by improvements of welding equipment. Comparatively large amounts of power are, of course, required which in turn means heavy welding leads and bulky cutting electrodes. On the Chesapeake & Ohio the welding machine is connected to a bus to which are connected in turn a number of welding leads. The cutting electrode only is carried about and the dragging of heavy leads is eliminated. As yet no way has been found to cut down the size of the electrodes so they are difficult to use in confined spaces, but there is apparently a broad field to which this practice can be applied to advantage.

A Word for —and to— Purchasing Agents

Railroad purchasing agents have come in for considerable criticism from time to time on the ground that purchases are based on price rather than quality. During the past two years other industries than the railroads have been obliged to disregard ultimate costs in meeting their immediate necessities with the limited funds available. Not all manufacturers are agreed that railroads make price the sole factor governing the placing of orders. Apparently certain roads are greater offenders than others in this regard. In extreme cases it seems that everything is left to the purchasing agents who, if not technical men, know little about the tools, equipment or material purchased, except the price. Several manufacturers have expressed the opinion that the tendency to buy on price has been decreasing in the past few years and especially since the war. This has probably been brought about by the introduction of well-trained technical men into the purchasing departments, enabling more clear-cut, standard specifications to be drawn. In a specified case one manufacturer writes that "the purchasing methods of railroads have been changed considerably in the last few years, indicating that more modern, businesslike methods are being employed by some roads." However that may be, there is still room for improvement, especially in the purchase of shop machinery and labor-saving equipment. So few orders are placed for this equipment, compared to the enormous number of other orders, and the relative amounts of money involved are so small that there is perhaps a natural tendency for purchasing agents to consider shop equipment and tools relatively unimportant. They should not forget that money spent for shop machinery and equipment is in the nature of an investment rather than a routine expense. Considered in this light, a small saving in the first cost of a tool which may be used anywhere from 10 to 20 years is immaterial compared to its durability, convenience of operation and productive capacity.

French Railroads in 1921

The article by Marcel Peschaud regarding the conditions and results of operation of the French railways in the year 1921 shows that while these railways have not recovered from the effects of the war, they are recovering with remarkable rapidity. The five large lines which are operated by private companies had an aggregate operating deficit in 1921 which, at the present rate of exchange, amounted to about $38,000,000 in American money. Including fixed charges their deficit was about $160,000,000. These figures are, however, a great improvement over those of 1920, when the operating deficit was $130,000,000, and the total deficit $260,000,000. The reduction in the deficit was due both to advances in rates and reductions of operating expenses. In spite of these changes, however, expenses were still 430 per cent more than before the war, while earnings were only 195 per cent more. Each of the large private railways now has more locomotives and freight cars than before the war in 1913, the total increase in number of locomotives being 32 per cent and in freight cars 22 per cent. Freight business on the other hand, was less than in 1913. Nothing is said about the change in number of passenger cars since 1913, but passenger business was 12 per cent larger than in 1913, and those who have traveled recently in France know that passenger equipment is inadequate and trains generally are crowded. The number of employees was reduced nine per cent as compared with 1920, but was still 28 per cent larger than in 1913, "because," as M. Peschaud says, "the lines continued to suffer under the burdensome effects of the eight hour day without having been able to obtain, as they had hoped, a revision of the truly unreasonable conditions of its application." The American reader will, we believe, find M. Peschaud's article

very interesting because of the opportunity it gives both to compare and contrast the railway developments that have occurred in France and in the United States within recent years. Among other things the American reader probably will grasp the significance of M. Peschaud's statement that the deficit of the State Railway in 1921 was, in American money, about $67,500,000, or over one-half as large as the combined deficit of the five large private railways. The State Railway is not comparatively a large system, but like most government-managed railways it shows remarkable ability in producing deficits. There is much talk in France about the desirability of selling or leasing it to a private company for operation. This would work a hardship on the multitude of useless employees who would lose their jobs, but would give quite a substantial relief to the French taxpayer.

A Tribute to the Safety Movement

The results of the safety movement among the railways were emphasized in a striking manner at the recent triennial convention of the Brotherhood of Railroad Trainmen in Toronto, when this organization voted to increase the amount of insurance for members from $2,000 to $2,700 while retaining the same rate as heretofore. The amount of insurance was thus increased 35 per cent without any additional cost. No finer tribute could be paid to the safety movement than this action on the part of the employees themselves, evidencing as it does the decrease in the number of casualties to their members. The reasons for this decrease are evident; modern equipment embodying accident preventive features, better roadbeds, corps of efficient safety supervisors and instructors and a staff of employees, who are co-operating in putting the "safety" principles into effect. The distressing feature of the safety movement at the present time is the increase in the number of grade crossing accidents at the time when the number of casualties to employees is being reduced. Here the railways are facing a different problem, for instead of conducting an educational campaign among groups of employees under direct control, it is necessary to reach large numbers of scattered individuals. Furthermore it is difficult to penalize the public for its carelessness, although it is interesting to note that the Southern Pacific is suing careless drivers who crash into its trains or otherwise damage its property, while the Northern Pacific and other roads have installed train "checkers" at important grade crossings to detect those guilty of "chance taking," who later receive written advice regarding the importance of protecting their own lives.

Electric Heat in Railroad Shops

Electric heat cannot be used economically for general heating purposes, such as the heating of buildings, but in spite of this fact electric heating devices in various forms are finding a place in railroad shops. The term, "electric heating devices," is apt to suggest to the casual reader such things as toasters, flat irons, grills and percolators, but in industry it now applies to such apparatus as paint and varnish drying ovens, glue pots, soldering iron furnaces, sherardizing drums, core baking ovens for foundry work, ovens or furnaces for shrinking pits, ovens for drying and baking armature and field coils; melting pots for lead, tin and babbitt; air heaters for cabs, vats for impregnating woods; furnaces for annealing brass, steel and malleable iron parts; furnaces for heat treating steel forgings, for case hardening, for tempering tools, etc. Rivet heaters and electric welders may also be properly classified as electric heating devices. "Electric heating of houses would be a gross waste rather than a conservation of fuel resources and so prohibitive in cost to users as to be beyond all consideration." This statement was made in a report on electric cooking and heating by consulting engineer Wyer, an electrical expert. It is generally considered to be correct and can be used properly as a guide, but it does not mean that such devices as listed above cannot be used to effect large economies. In many cases fuel burning devices are less efficient than those utilizing electric heat. In other cases much can be saved because the material to be heated will not be oxidized in the electric furnace or because the electric heat can be controlled automatically and held within limits of a few degrees. Many new electric heating devices have been perfected and anyone who happens to be in a position to use such equipment may profit by studying their advantages.

Which Do Railway Employees Prefer?

MOST OF THE coal mines of the country have been shut down and most of their employees have been out of work for three months because the managements and employees have been unable to agree on any method for settling a controversy regarding wages. Recently the importation of non-union workers by the operators and wholesale murder by the strikers have been adopted as means of settlement in one part of southern Illinois.

There is a wage controversy going on between the railways and a large number of their employees. The situation in the railroad industry is different from that in the coal mining industry in one very important respect. The government has established for the railroad industry a board of arbitration—the Railroad Labor Board—for settling controversies which may arise regarding working conditions and wages.

The railway employees, as well as the railways and the public, are represented on this Board. In 1920 it awarded to the employees the largest advance in wages ever made in any industry in history. The railways accepted the award. A strike and prolonged and extensive unemployment were avoided. Since then the same Board has awarded reductions in wages which, if accepted by the employees, would leave most of them with about the same money wages, but with wages having larger purchasing power, as those they had before the large advance was granted in 1920. The existence of the Labor Board and the policy it has followed have resulted in railway employees being paid higher wages than those received by most men doing similar work in other industries. After the reductions awarded, which are to go into effect today (July 1), the employees affected will still, according to the findings of the Board, be paid higher wages than those of men doing similar work in other industries of the country.

If the employees peaceably accept the awards they will have steady employment at good wages, whether compared with those they have received in the past or with those received by other workers. If they strike, many of them will go through a period of unemployment when, like the coal miners, they will have no wages; and they will disregard the decision of the Railroad Labor Board which heretofore, if it has favored either side, has favored them and not the railways.

The Transportation Act relies upon public opinion to enforce the awards of the Labor Board. Public opinion demands that the employees as well as the railways shall accept the awards made by it when made in the exercise of its legal authority. The awards to which the employees object were so made. If the employees strike they will be defying both

the Labor Board and public opinion. They will show that public opinion is not sufficient to secure conformity to the Board's awards by the employees. It is most improbable that after striking they would get higher wages than those awarded by the Board. It is quite possible, however, that they would destroy the whole plan of peaceably settling labor controversies in the railroad industry which the government has established.

Which would railway employees rather have—a situation like that now existing in the coal mining industry or one like that now existing in the railroad industry? Apparently, their leaders, while perfectly willing to accept all decisions made by the Board which are in their favor, would rather destroy it than accept any decisions it may make which are adverse to their claims. Will the employees support their leaders in trying to carry out such an unfair policy? Will they support their leaders by engaging in a strike which almost certainly would not result in their getting higher wages than those awarded by the Board or which economic conditions would force the railways to pay them, but which might result in the destruction of the plan of settling labor controversies which, on the whole, has thus far worked to the advantage of the employees?

We shall soon know whether railway employees prefer such anarchic conditions as now prevail in the coal mining industry, or the orderly and, from their standpoint at least, beneficial procedure in respect to labor controversies which has now prevailed in the railroad industry for more than two years.

Overloading the Division Engineer

ONE OF THE MOST FRUITFUL topics for discussion among maintenance of way officers is the maximum length of sub-division which should be assigned to a roadmaster or track supervisor. This question could be raised with equal appropriateness with reference to the proper length of the division engineer's territory. It is hard to reconcile the discrepancies in the lengths of territories or in the number of miles of line assigned to division engineers on different railways. Roads of more or less similar physical characteristics and traffic vary in their practices in this respect almost as widely as roads totally unlike. This may arise because of the fact that the present division limits are the heritage of organizations developed many years ago when there was a smaller mileage of tracks per mile of line and fewer other complicating factors.

In general the division engineer is in effect an assistant superintendent in charge of maintenance of way and as such his territory coincides with that of the division superintendent. A few months ago there was a distinct tendency, particularly among the western roads, to reduce the number of divisions by giving each superintendent more mileage. This in turn has added to the mileage of tracks under the supervision of the division engineer. In some cases his problem has been complicated still further by the fact that his jurisdiction has been extended to include two or more divisions.

The division engineer has to exercise detailed supervision to secure the best results. His forces are scattered in small units over the entire territory and do not come to a common point at any time in the regular course of their work. To exercise such supervision it is necessary for the supervisory maintenance of way officers to visit the gangs on the line frequently in order to insure that they are performing their work economically. It is impossible for the division engineer to do this over a long division of multiple track line handling heavy traffic. It is practicable, of course, to handle a greater mileage of single track lines with medium to light traffic than of busy multiple tracks and divisions of 500 miles or even more are not impracticable in most such cases. But a dense traffic multiple track division of 300 miles of line may aggregate as much as 800 miles or more of main tracks in addition to terminals. Such tracks must of necessity be maintained in condition to handle comparatively fast and dense traffic, and the forces required are increased accordingly. The magnitude of maintenance of way expenditures today is so great that it would seem desirable that the officers of the maintenance of way and operating departments study their organizations at frequent intervals in the light of the conditions which exist in order to keep them abreast of the developments of the road itself. It is not unlikely that such an investigation would develop the fact that there are divisions which should be lengthened—and others that should be shortened to secure the best results.

Coal, and the Railroad Situation

IT IS HIGH TIME that the effects that may be produced by the coal strike on the transportation situation and general business were given more consideration. There is very great danger that unless something is done soon to increase the production and transportation of coal there will be thrown upon the railways after the strike is ended a burden greater than they can bear. The public should be warned now of conditions which apparently are going to develop on the railroads unless the amount of coal given to them to handle speedily is largely increased.

The *Railway Age* in an editorial in its last issue gave some facts which indicate that a serious congestion of traffic and shortage of cars may come this fall and winter. Some persons and publications have expressed the opinion that we are unduly alarmed. Let us consider the situation in the light of the latest available facts.

In the year 1920 the railways handled the largest traffic in their history. Excepting coal, they recently have been handling more traffic than they did in the corresponding part of the year 1920. In the week ended June 11, 1920, the number of cars loaded with all kinds of freight was 930,976. Of this number 191,494 cars were loaded with coal, leaving 739,472 that were loaded with other freight. In the week ended June 10, 1922, the number of cars loaded with all kinds of freight was 846,002. Of this number only 94,824 cars were loaded with coal, leaving a total of 751,178 cars that were loaded with other kinds of freight. The number of cars loaded with freight other than coal was 11,706 more than in the corresponding week of 1920.

Traffic always increases during the late summer and early fall months. This is especially true of coal traffic. The average number of car loads of coal handled by the railways in the weeks from September 25 to December 18, 1920, was 217,200. This was 112,191 more than the number of cars of coal shipped in the week ended June 10, 1922. If the railways in the week ended June 10, 1922, had handled as much coal as the average amount handled weekly in the fall and winter months of 1920, their total car loadings would have been 958,193. The largest traffic they ever handled in any week was in that ending October 15, 1920, and was 1,018,539 car loads. Of this 226,671 car loads were coal, leaving 791,868 car loads of other traffic. If this figure be compared with that for the amount of traffic other than coal handled in the week ended June 10, 1922, it will be found that in this latter week the amount of traffic other than coal handled was *only five per cent less than the amount of traffic other than coal handled in the week ended October 15, 1920, the largest week's business in history.*

Does anybody doubt that traffic other than coal is going to increase between now and October? In 1920, between the

week ended June 11 and the week ended October 15, traffic other than coal increased 52,396 car loads, or over seven per cent. At that time the country was entering a period of violent business readjustment and depression, and the increase in traffic between June and October was not normally large. This year the country apparently is in a period of increasing business activity. This indicates that the increase in traffic other than coal between now and fall will be more than normal.

The amount of coal produced and transported during the first half of 1921 was about 60 million tons less than the average amount produced and transported in the first half of the last five years. This plainly indicates that after the strike ends the railways will be called upon not only to deal with at least a normal increase of other traffic, but to handle an abnormal coal business. All these facts seem to make it reasonably sure that after the coal strike is settled the demand for railroad transportation will be greater than ever before.

One of the most ominous features of the situation is that up to the date of the latest available report the amount of coal which had been carried by the railways to the Lake Erie ports and thence by water to the head of the lakes to supply the needs of the northwest was only about three million tons. At this time last year the amount of coal that had been dumped at the head of the lakes exceeded eight million tons. If the northwest is to have sufficient fuel to carry it through the winter there must be dumped at the head of the lakes during the season of navigation from 25 to 30 million tons of coal, and already the dumpings at the head of the lakes are five million tons below normal.

The situation developing demands speedy and constructive action. The production of coal must soon be increased. The shipments of all other freight which can be accelerated must be accelerated. The railways must get ready as rapidly as practicable to deal with a record-breaking business. The shipping public must prepare to co-operate with the railways by loading cars heavier and loading and unloading them as rapidly as practicable.

Whatever the cause or causes of traffic congestions and car shortages, it always has been in the past the custom for some newspapers and regulating bodies and many people to denounce and fume at the railways for such conditions. The railways are in no way responsible for the coal strike or its probable disagreeable and costly aftermath, and in this instance co-operation with them of all who can help solve the problem which will be presented should be substituted for the usual outcry against them.

New Books

The Engineering Index, 1921. 584 pages, 7 in. by 9½ in., bound in cloth. *Published by The American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York.*

The Engineering Index has for years been considered an absolutely essential reference book by those who wish to keep in touch with current engineering literature. The first volume of the Index appeared in 1892 and the book has been issued annually since 1906. The current volume contains over 14,000 items referring to articles which appeared in some 600 engineering and other technical publications. In the preparation of the Index the staff of the Society reviewed more than 1,200 periodicals, reports and other publications regularly received during the year by the Engineering Societies' Library, New York. These publications were printed in ten different languages and, as a result, the book is the most complete reference to scientific and engineering current literature in the world. The railway field is, if anything, even more completely covered than in former editions.

Letters to the Editor

[*The* RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.*]

Talk Money to Employees

CHICAGO.

TO THE EDITOR:

At a meeting of the Western Railway Club in Chicago a short time ago a paper pertaining to the education of railway employees was read by C. G. Juneau of the Chicago, Milwaukee & St. Paul. By a series of monthly bulletins, circular letters of instruction, and through meetings of employees this railroad apparently has accomplished wonderful results and the mechanical department officers are to be complimented not only as to their progress, but as to their sincerity in fitting their employees for better jobs, thereby helping the individual and by so doing helping the railroad. The writer has absolutely no criticism to make on Mr. Juneau's paper. The following is merely the result of thinking over the many good points brought out.

After considerable railroad service in the mechanical department, plus three years' service with a manufacturing corporation, I simply draw a comparison of the educational features in both lines and sum it up by saying that the railroads overlook in their endeavors to enlighten their employees the one big word "money."

In the manufacturing game we talk, eat and sleep money, not in a miserly fashion, but as a matter of pure business principle. Our first questions before buying a machine, for example, are: What is the cost? What will we make out of it? Can we afford it? Can we not resort to some other method? What is the other concern doing? Is it the best type of machine for the purpose? Have we enough work to keep it going? Will it take a skilled operator?

Everyone from the set-up man to the general manager is given an opportunity to voice an opinion and if the purchase is made everyone concerned is aware of the amount involved, the output expected, etc. Further, the general manager does not as an individual drop out in the plant, size up a situation, return to the office, order a machine, get it, and say to the superintendent "use it." To the contrary his superintendent reports, "The machine shop foreman wants an automatic machine and I approve his request," the committee is convened and the above questions are raised. The point is this: you can get results out of a machine when the man who expresses a desire for one gets it. If you force a machine on him your results are negligible.

When we run into a lot of scrap or defective parts we put the losses into money; we trace it to the individual responsible and we say to him, "Bill, you made $8.00 yesterday but you only earned $4.00. One half of your work was spoiled." We don't tell him he spoiled so many pieces; we put the figures in dollars and cents. On the other hand, if a day worker has given us an extraordinary amount of good work we place this to his credit and tell him in money how much he has saved.

We talk money to the individual employee in many ways. We say, "Bill, while you are a human being and we will treat you as such, nevertheless from a business standpoint we look on you as an investment. You are earning $2,400 a year. You represent to us an annual expenditure of $2,400 just the same as that milling machine you run. We

expect a ten per cent return from these two investments. When you and the machine earn this return, our company will prosper and so will you. If you or the machine don't function properly, we all lose. And as we most certainly expect to take care of any depreciation or break-downs in our machine investment, we most certainly will take care of you."

We get all of our lead men together in meetings and reflect all of their operations, losses, earnings, etc., by money figures, not pounds or pieces. We draw a circle (representing a dollar) on the blackboard and to reflect operating costs we portion this off in segments and show that for each dollar spent, 50 cents went for labor, 30 cents for material, 8 cents for overhead, etc., until the entire dollar is disposed of. We also show them in the same way the net results of the sale of a dollar's worth of goods. So much for making the article, so much for sales expense, and so on, taking in taxation, insurance, and last, but not least, the stockholders' share. Each employee is posted as to the value of the article he works on so that he will understand the monetary loss in the event it is spoiled.

Now, realizing that dollars and cents are seldom, if ever, mentioned to the railroad employees holding positions below that of supervisors, if I were in charge these are some of the things I would do:

Give the apprentices to understand that on everything they work they are using someone's money and to loaf or spoil through carelessness is nothing short of obtaining money under false pretenses. As the boys of today are our men of tomorrow, I would lay particular stress on this feature.

See that so far as is possible money values are placed on all commodities used. As it is now a foreman orders a piece of material, the requisition is priced by a clerk of the store department, sent to the shop accountant and distributed to the proper account. At the end of the month, the shop superintendent gets one figure showing what his bill for locomotive material was. He may know individual costs but the point is the man who is machining or applying the piece does not. Isn't it true that the average railroader thinks "This company is worth $250,000,000.00; what does a piece of material thrown away mean to them? I'll throw this away and get a new piece instead of repairing it." Now, if this man knew that the piece he was discarding represented one dollar instead of just a piece of material, he naturally would hesitate.

I would start a propaganda throughout my railroad so that every employee would think "How would I do this or what would I do if this was my own money I was spending instead of the company's?" If you can make the man feel that he is reaching right down in his jeans to pay for the work he is doing, you can rest assured he will be careful.

I wouldn't go to a car inspector and say, "Bill, number 53 had a derailment north of here last night. Defective drawbar dropped down; be careful." I would say, "Bill, by your carelessness number 53 was derailed; drawbar dropped down. Damage to equipment was $6,500 which is more money than you could earn in four or five years. You ought to work for this company for five years for nothing." And believe me he would sit up and take notice.

I would have the valuation department see that the man in charge of any equipment or property was cognizant of its value so he could go to the individual and inform him of the responsibility resting on him in handling a machine representing a given amount of the company's money.

I would tell my engine crews that it cost them so many dollars for coal for handling a passenger train over the division whereas the crew that handled the same train yesterday operated ten dollars cheaper. I would not mention the saving or waste in pounds; make it money.

I would see that my train dispatchers were informed of money losses by mishandling trains over their territory.

I would get my auditing department lined up to check joint facilities by first getting a true value of these facilities and working it down through the operation end so that I would not be paying out or investing money for the benefit of some other company.

I would say to my traffic department "The XYZ Railroad got that freight business out of Bloomington. You have lost so many dollars worth of business by failing to land it."

I would see that sufficient analysis was made of the work being performed by my supervisors to know that high salaried men were not being tied up with responsibilities that could be handled by cheaper men, so that the supervisor could devote more time to a study of economies. How many general foremen and foremen in the mechanical department are principally material chasers, so busy they have no opportunity for time study which more than anything else means money?

In every instance where I learned that another railroad was performing a certain operation more economically than I was, I would send my representatives over to find out why. And so on, always talking money.

Your employees should know more about actual costs and you can rest easy that their knowledge will be beneficial to you. I recommend that all railroads follow the lead of the Chicago, Milwaukee & St. Paul and emphasize particularly MONEY.

GRANT GIBSON.

The Transportation Act of 1920

TO THE EDITOR:

We have heard much criticism of the Transportation Act of 1920 from the public, the employee, managements and shippers. Each group condemns it on account of certain provisions, but to criticize this legislation intelligently, the act must be considered as a whole. Furthermore, this legislation must be considered from the standpoint of the transportation needs of the country as a whole, and not any particular state, community or other designated territory.

In order to grasp this viewpoint, we will illustrate with the grain grown in Kansas. As a matter of fairness to the Kansan, it would be asking too much to burden him with a transportation bill necessary to provide a return on sufficient railroad trackage and equipment to move the entire output of grain of that state, even to the border of his own state, for the reason that the amount produced is greatly in excess of his needs. The man in New York is as vitally interested in an adequate transportation system for Kansas as the Kansas man himself; likewise, this same principle is applicable to the products of the east, the north and the south. Therefore, as a matter of economy and self-preservation, the transportation bill of the country as a whole should be paid by the country as a whole and the transportation problem can only be handled fairly and economically as a national one.

There are four groups vitally interested in the transportation problem of our country; namely, the public, the employee, the shipper and the investor. Public opinion ranks them in the importance named, notwithstanding how unfair or unfortunate such classification may seem to an individual class. The interests of these four groups are shown in the order named which in itself shows the wisdom of public opinion's classification.

First—The public's interest is a transportation system adequate to take care of the needs of the country, at a reasonable cost for service, without interruption.

Second—The employee may have selfish interests, but his interests are subordinated to those of the public; therefore, he is entitled to a comparative fair rate of compensation, not hourly or daily, but annually under proper working conditions.

Third—The shipper may have selfish interests, but, his interests being subordinated to that of both public and employee, he is entitled to dependable service without interruption, rates on a parity with his competitors (both individual and community) and as low as will provide the necessary capital to create the transportation system demanded by the first interest and compensate the second interest.

Fourth—The investor, like the employee, may have selfish interests, but such interest is subordinated to that of the public and employee, and shipper, and under the present school of public thought, he will be permitted to make only a nominal return on his investment, the permanency of which will compensate him for the small return.

Will the Transportation Act properly administered provide such conditions essential to public welfare?

The Public.—The first interest of the public, "A transportation system ample to take care of the needs of the country" is provided by empowering the Interstate Commerce Commission to name rates that will permit a fair return on the investment in property used in transportation service (not guarantee as many ill-advised people have been led to believe). This provision, it must be understood, does not mention stocks, bonds or any other securities outstanding, but permits a fair return (the amount of which constitutes a fair return to be determined by the Interstate Commerce Commission from time to time.). The most recent decision of the commission reduces this rate from 6 per cent to 5¾ per cent on the value of the physical property employed in the system of transportation. Furthermore, the value is to be determined by the Interstate Commerce Commission.

Physical units of property constitute right-of-way, ties, rails, ballast, bridges, locomotives, cars, etc. The term does not include good will, which is a valuable asset.

The second interest of the public—reasonable cost of service—is provided for: in part, by the Railroad Labor Board, a creature of the public which names the rate of pay for labor costing 50 per cent of the total; in part, by the Interstate Commerce Commission's power to determine the maximum return on investment; and the general market for supplies which railroads use.

The Employee.—The selfish interests of the employee are guarded by the personnel of the Railroad Labor Board by a two-thirds of its members having no personal interest in the rate of pay; likewise, justice to the employee is guaranteed Board through another two-thirds of its members.

The Shipper.—His first interest, "dependable service without interruption" is guaranteed by the Interstate Commerce Commission's power to provide rates ample to secure capital to provide the transportation system and the power of the Labor Board to name rates of pay that will attract employees. It may be argued that the latter has not power to enforce its decisions and much criticism has been directed at this feature. However, this provision is one of its strongest and under a democratic form of government could not and should not be otherwise. This provision will be more rigidly adhered to by both managements and organizations of labor than any provision of the law and each decision of the Board will be more strictly obeyed than the preceding one.

His second interest, "rates on a parity with competitors," he has always enjoyed except in isolated cases and the Interstate Commerce Commission with its new power of naming minimum as well as maximum rates can prevent unduly low rates being named on specific commodities or in favor of communities and individuals.

His third interest, "as low rates as will provide capital to create a transportation system adequate for his needs." This interest is provided by permitting railroads to earn a fair return on investment in railway property, and the provision that the government is authorized to loan money at six per cent from its revolving fund, which will prevent railroads from being compelled to pay a higher rate in the future; furthermore, lower transportation rates will obtain through the increased traffic of the country and the provision restricting railroad building to projects authorized by the Interstate Commerce Commission restrains speculative enterprises and thus relieves the transportation bill of the country of the burden of supporting non-productive properties.

The Investor.—The interest of the investor, "his return on his investment," is not guaranteed as some would lead us to believe, but he is assured by the law that his government will permit rates for railroad service that should yield a fair return (5¾ per cent at present) on the value of the railroad property investment of the country. If he has been unfortunate and purchased securities representing which there is no physical units, he must take his loss; likewise, if he has purchased securities representing excess physical units, he is entitled to any gain therefrom.

It should not be assumed in the future all railroads will earn a 5¾ per cent rate of return and thereby establish a 5¾ per cent market for securities but on the other hand, railroad credit having been established by law on a sound base, will eventually enable railroads to borrow money at the lowest market rate.

This act also provides that if any railroad earns an income in excess of six per cent such excess amount is prorated equally between the government and the railroad. The government's proportion of excess earnings so accumulated is to be used to loan to railroads at six per cent for additional facilities. The railroad's proportion so accumulated must be set aside in a reserve fund until such time as such reserve fund equals five per cent of its physical property value. After such fund has been accumulated the railroad is permitted to distribute excess earnings.

NOTE.—The arbitrary rate of six per cent named by the act for the use of the fund accumulated from excess earnings should be amended to permit the commission to loan this fund at a fair rate of interest to be determined by the commission. Otherwise, the fund accumulated under this provision will lie dormant in the treasury as undoubtedly in the future only weak roads with poor credit will be compelled to pay six per cent for funds. Thus a fund created from excess charges for transportation will not be available for the enlargement of facilities at a nominal cost.

The two latter provisions of the act will react to the benefit of the public owing to the powers granted the commission to lower the rate of return permissible on railroad property from time to time in keeping with the market price of funds. Thus by the different features of the act dovetailing with each other, we furnish the public with an economical, adequate transportation system, through restricted building and economical financing, with an employee fairly compensated under proper working conditions, with a shipper contented with comparatively the cheapest rate ever enjoyed with uninterrupted service, and an investor contented with a nominal return, the permanency of which is assured by the growth of the country.

The additional benefits to be derived from the operation of the Transportation Act will be the reduction in operating expenses by the increase in capital expenditures. In other words, prior to the Transportation Act of 1920, there was no incentive for the making of capital expenditures, that is, the public was a great deal more watchful over the amount expended for interest and dividends on capital than for any other purpose; therefore, every railroad employee and officer was charging as much of any replacement to expenses as possible—owing to necessity, capital not being available. Now that a plan has been provided that will attract the necessary capital for increased facilities, the incentive has been restored to capitalize such betterments. Thus operating expenses will be relieved of the burden of many capital expenditures heretofore carried through necessity.

A. A. LAMPERT,
Auditor, Missouri & Illinois Bridge & Belt R. R.

One [illegible] River Bridges

Aurora Track Elevation Expedites Traffic

Burlington's Grade Separation Project Is Supplemented by a Plan for Increasing Facilities

THE ELIMINATION of grade crossings between the streets of Aurora, Ill., and the tracks of the Chicago, Burlington & Quincy is only one of a number of improvements to be effected by the completion of track elevation work now in progress in that city. The grade and alinement will be improved, additional trackage will be provided, new local freight and passenger facilities will be constructed and additional space will be afforded for the further development of the extensive locomotive and car repair facilities maintained by the Burlington in that city. These physical changes, coupled with a new operating arrangement, will greatly expedite the movement of traffic through what has been a neck-in-the-bottle on the main trunk line of the Burlington out of Chicago.

Looking North East from Spring Street, Partly Completed Embankment on the Right

Aurora is located 37 miles from Chicago where the three-track main line of the Burlington divides into a double track line to Galesburg and the west and southwest, a single track line to Savanna, Ill., and the north, and a single track line known as the Streator branch. While Aurora is the terminal point only for trains of the Streator branch, a considerable amount of switching is done here in connection with the transfer or interchange with the Elgin, Joliet & Eastern at Eola, three miles to the east and to fill out trains destined for Chicago. Being a manufacturing city of about 40,000 population, it originates a considerable amount of traffic which, together with the "company" freight incidental to the operation of the car and locomotive shops and a storehouse, also calls for an extensive switching movement. About 50 passenger trains are operated through the station each day, a portion of which must be afforded terminal facilities since Aurora is the terminus for a considerable part of the suburban passenger service maintained by the Burlington.

Physical conditions have seriously hampered the handling of the Burlington's business through Aurora. The city is located on the banks of the Fox river so that access to it is obtained only by a descent into the river valley. This has entailed appreciable grades on the railroad, particularly to the east on the line to Chicago and to the west on the Savanna line. It has also resulted in a rather tortuous alinement and this, together with the 0.5 per cent grade eastward, has necessitated pusher service for freight trains. A further complication was a right of way only 36 ft. wide through the busi-

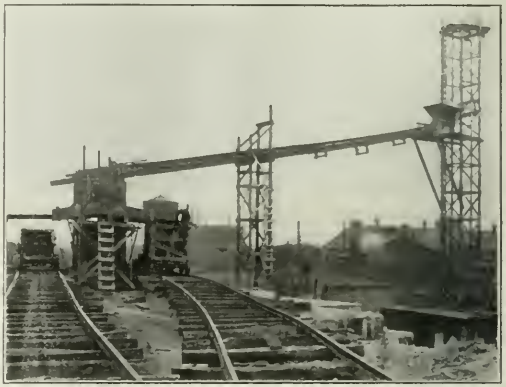
ness part of the city and immediately west of the passenger station and engine terminal. This terminal and the adjacent shop facilities have been seriously cramped for space and because of the lead tracks which enter them from the south it has been necessary to conduct the switching movements across important business streets where the right of way is the narrowest. This also had served to interfere with the efficient handling of the suburban passenger trains.

Coupled with this unsatisfactory condition as regards the handling of railway traffic has been an exceedingly serious situation with respect to grade crossings in the city streets, which was responsible in 1914 for the passing of an ordinance by the city and an order by the State Public Utilities Commission providing for grade separation. After some investigation as to the possibilities of a detour line that would enable through traffic to avoid the city, a decision was made to adopt a plan for track elevation involving a considerable revision of alinement and accompanied with provision for additional tracks and other added facilities that would greatly increase the traffic capacity of the line through the city. An auxiliary project has been the construction of a yard and engine terminal at Eola to facilitate interchange with the Elgin, Joliet & Eastern and provide adequately at that point for all remaking of main line freight trains that is necessary. This not only releases considerable yard trackage in Aurora occupying space which will be utilized for the enlargement of the locomotive and car repair facilities but it will also greatly reduce the amount of switching within the city.

The plan for track elevation provides for the elevating of the tracks a maximum of about 22 ft., so as to provide adequately for under-crossings for the streets and obtain a maximum eastbound grade of 0.3 per cent compensated which will obviate the necessity for pusher service. The total length of the elevation is 4.51 miles on the main line and 0.67 miles on the Savanna line.

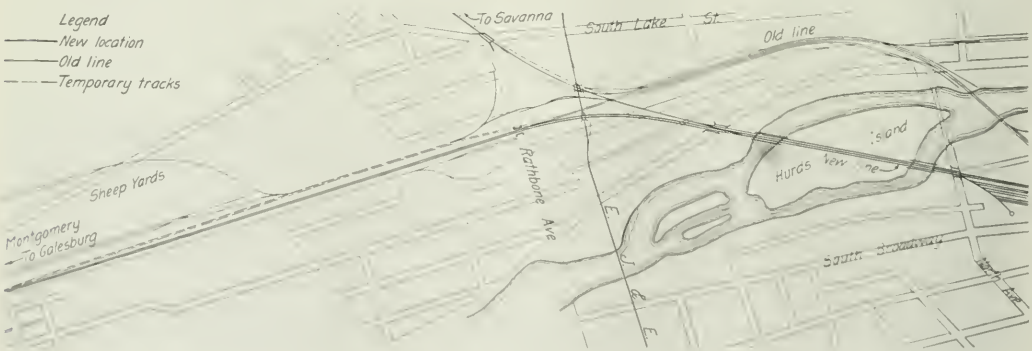
South of the station a marked improvement in the alinement was effected by a new line across Hurds Island. North of the station the new location is thrown against the hillside to the east as a means of obtaining support for the elevated line. This change also adds to the space available for the shop facilities.

The project provides subways for the passage of 14 streets underneath the tracks and also for two under crossings of the Aurora branch of the Elgin, Joliet & Eastern which crosses the Burlington in the southern portion of the city. Physical conditions favor the construction of the runoffs connecting the new and the old grades at the ends of the track elevation territory. At the north end of the city this occurs in a cut where three overhead crossings are readily provided for the only streets crossing the right of way. On the Savanna line the runoff is very readily made because the original grade was on a 0.9 per cent descent into the city, while on the Galesburg main line the change of grade involves a runoff a mile long extending almost to Montgomery, the first station to the south. This involves some changes in the tracks serving the sheep yards maintained by the Burlington at that point, but the problem was not complicated in any way by intersecting streets or highways.



The Concrete Plant as Seen from the Elevated Structure. Hopper Car Loading Station on the Left

One interesting feature of the project was the cutoff across Hurds Island involving a fill 32 ft. high and arch bridges across the two branches of the Fox river, one of three 65-ft. arches and the other two arch spans of the same length.



South End of Track Elevation District

Another unusual complication on this line was the presence of an abandoned stone quarry on the location, which had been excavated to a depth of 70 ft. below the track level. The filling of this quarry required 400,000 yds. of material.

Reinforced Concrete Structures

Following established practice on the Burlington, the street subways are of reinforced concrete of the character shown in the photographs. In general, these consist of four spans of reinforced concrete slabs supported on abutments and three reinforced concrete bents. At one point, the crossing of Benton, Broadway and Clark streets by one continuous structure on a skew entails rather complex construction.

Here it was necessary to introduce structural steel fascia girders to carry the ends of floor slabs not supported by the bents. In other respects, the subway construction conforms closely to that followed by the Burlington on the other track elevation work.

For the three blocks from Fox street to Spring street a marked departure has been made from usual practice in the use of a continuous elevated viaduct of reinforced concrete in place of an embankment supported between retaining walls

The Temporary Passenger Station Looking South West

and pierced by subways at the intersecting streets. Comparative cost estimates of the two forms of construction under the conditions imposed at this point gave favorable results for the elevated concrete viaduct, but an important factor in the decision to adopt this form of construction was the value of the space below the tracks, since it is located in the heart of Aurora's business district. The type of construction adopted, a flat slab construction with columns spaced 19 ft. in one direction and 18 ft. the other lends itself very readily to the use of this space either as passageways or for commercial purposes.

The Construction Plan

Unlike most grade separation projects, the Aurora track elevation was readily prosecuted according to a plan that gave a minimum interference with train operation. Obviously, the two changes of line were of special advantage in this connection, since the work on the new alinement could be carried out without interference with train movement. For the construction of the runoffs at the ends of the work, temporary operating tracks were provided on offset locations.

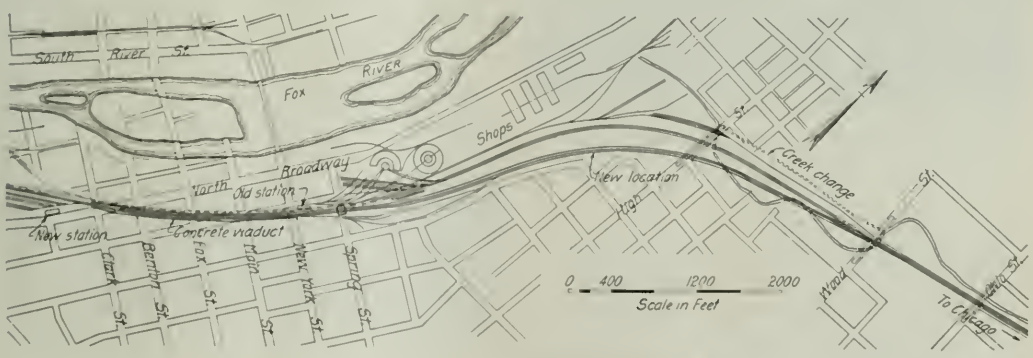
The plan adopted calls for four main tracks on the elevation north of Spring street and five tracks south of that point, but only three tracks are to be constructed at the present time. The neck-of-the-bottle, that is from New York street to Washington street, was broken by the purchase of additional right of way to make room for two operated tracks on the surface while the structure is being built for three tracks on the new grade. The flat slab viaduct is of particular advantage in this connection because it obviates the necessity of a temporary retaining wall between the two surface tracks and those on the elevation. This is clearly brought out in one of the photographs.

Work Started at the South End

The initial work was done on the structures at the south end of the district. This included the river bridges and the subways at North avenue, River street and Rathbone avenue, as all these could be built without interference with the track. Following this, temporary main tracks north of Montgomery were constructed and a contract awarded to Morris & Daugherty for the filling between Montgomery and the north end of the cutoff. This involved a million cubic yards of filling and was taken from a shovel cut west of Montgomery, the average haul being about 3½ miles. This work was carried out intermittently for a number of years, during which the other structures on the southern portion of the project were completed until 1920, when traffic was turned over the cutoff with a runoff at Broadway.

About that time work was undertaken on the north end of the project, the grading on the relocated line being carried as far as possible without involving interference with the existing yards north of Spring street. In conjunction with this work, the viaduct at High street was constructed and the piers for viaducts at Wood and Ohio streets were partly built. They will not be completed until the temporary tracks are abandoned. The viaduct for High street involves four truss spans and several reinforced concrete approach spans.

The final and most complicated step in the work is now in progress and comprises the closing of the gap between the ends of the work previously done. This involves the work in the business part of the city including the provision for structures over eight streets and the filling north of Spring street, where the embankment will cover a considerable portion of the freight yard which cannot be abandoned until additional yard facilities are completed at Eola.



North End of Track Elevation District

The prosecution of this portion of the work also involves the solution of the problem of a new passenger station which was finally concluded by the selection of a new site 3,000 ft. south of the existing station on unoccupied land fronting on South Broadway. Here space was available for six station tracks in addition to the three main tracks and four coach

storage tracks, a turntable and a cinder pit. All the station tracks are to be elevated, with access to and from the passenger station by means of a subway with three communicating stairways. To permit the wrecking of the old station at New York street preparatory to the construction of the elevated structure, the new station site was utilized for a temporary station which consists virtually of the south end of the final station track layout supplemented by a temporary station building. Work on the new station will be undertaken shortly.

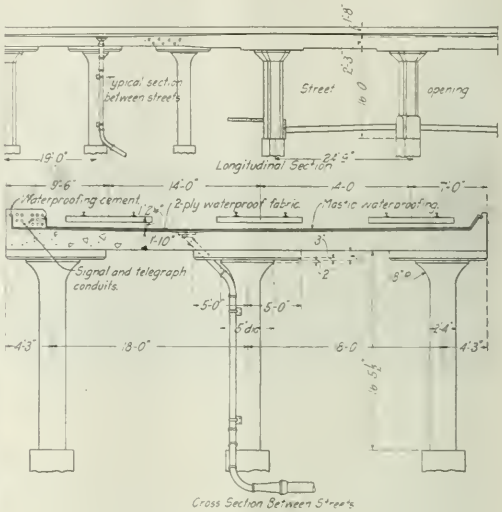
The work between Clark and Spring streets is primarily a structural one since the grading is a relatively minor feature. It involves the placing of 15,500 cu. yd. of concrete, a quantity clearly justifying the application of considerable thought to the development of an efficient concreting plant. This has taken the form of a duplicate mixing plant in the space immediately west of the tracks between Benton and Clark streets where some buildings and a yard were acquired with a right of way purchase. This afforded space for the storage of 9,000 bbl. of cement and some large piles of gravel and for the housing of two concrete mixers with superimposed material hoppers of 60 cu. yd. capacity, four hoisting engines

The "Neck of the Bottle" Looking North East, Temporary Tracks on the Left, New Three-Track Concrete Viaduct on the Right

for the handling of two material derricks and two elevating towers, two locomotive type boilers supplying steam to the concrete mixers, the hoisting engine and two pumps. One of the old buildings is also used as a carpenter shop for the housing of power tools used in connection with the form work.

The concrete is elevated in towers and discharged in chutes by which it is transmitted direct to a considerable part of the form. For the more remote work, that is north of Benton street, the concrete is chuted into auxiliary hoppers which in turn deliver the concrete to hopper cars operated on a standard-gage track erected above the structure. These cars are delivered to the forms by Fairmont section cars, as illustrated in one of the photographs. This double concrete plant operated with the motor car delivery has a capacity of 50 cu yd of concrete per hour continuous operation. It has been effective in placing 486 cu yd in 11 hr, while there is a faster record of 211 cu. yd. in 4 hr and 45 min. The duplication of the mixer was considered essential as insurance against a stoppage of the work in case of a breakdown which would have been a rather serious matter for the flat slab construction adopted between Fox and Spring streets. This concrete plant is being used for all of the work except the footings and columns of the flat slab structure. For these a portable concrete plant set up on a car operated on a track laid between the columns was used. This plant was equipped with a tower high enough to reach the tops of the columns.

The presence of bed rock at a reasonable depth below the



Typical Details of the Concrete Viaduct

surface afforded an easy solution of the foundation problem. Rectangular pits were excavated to the rock level and filled with concrete to the surface. In most cases the rock was found at a depth of from 12 to 19 ft. but for one of the bents a cleft or fissure was encountered which required an excavation to a depth of 40 ft. before the rock was reached. The excavation was made with the aid of two small derricks

A Typical Track Elevation Subway

mounted on cars, one of these being a rail layer derrick with a self-propelling car. These derricks were used to hoist bottom-dump buckets which had been filled by hand and were dumped into wagons, each derrick car serving several pits simultaneously.

The program now laid out contemplates the completion of the work during the coming season. The concrete structure is now virtually completed as far as Main street so that the remaining work consists only in extending this to Spring street. The grading involves the completion of the fill from that point to the vicinity of Liberty street and the completion of the runoff at the north end, a total of about 200,000 cu. yd of fill.

This project is being handled under the general direction of A. W. Newton, chief engineer, and C. L. Persons, assistant chief engineer, of the Chicago, Burlington & Quincy. All bridges and viaducts were designed under the direction of G. A. Haggander, bridge engineer; all building work has been done by the building department under the direction of W. T. Krausch and all signal work under the supervision of J. B. Latimer, signal engineer. C. J. McCarty, engineer of track elevation, is in direct charge of the work on the ground.

The Effect of Traffic Fluctuations on Operating Expenses

To what extent should expenses increase when traffic increases? How large a decrease in expenses should be expected when traffic decreases? These are questions which constantly confront all executive and operating officers as the tide of traffic rises and falls. Everyone familiar with the facts and conditions of railroad operation knows that operating expenses neither increase nor decrease in the same ratio as traffic. It is a matter of judgment, however, as to the extent to which expenses lag behind traffic changes.

This question, like almost all statistical problems, is not subject to definite rule. The cause of the condition is well known. In the grand total of railroad operating expenses, there are certain items which fluctuate with traffic. There are others which are but partly affected, and a few which are practically unaffected by normal fluctuations in business over a considerable period. There is a fourth element, which includes maintenance expenses and which is, to a certain degree, subject to company policy. In the first or directly variable element are included labor expenses at large stations, yard expenses in large terminals and through freight train expense. In the second or semi-variable group are included expenses of medium sized stations and yards and expenses for local freight trains. In the third, or fixed group, are included supervisory expense and expenses for small stations and yards, towers, drawbridges and crossings, the larger proportion of passenger train expenses and general and traffic expenses. This classification is subject to many qualifications. Almost all accounts contain elements of fixed and variable expense, and at times of depression, all expenses are subject to reduction. Nevertheless, it is believed that for normal increases and decreases, the operating charges fall into these general groupings.

It is of no value to know that expenses are divided into three groups of which one is fixed, one variable and one semi-variable. It explains the cause of the condition, but it does not analyze its effect. The following method was developed in an attempt to determine for use of operating officers the extent to which expenses should follow traffic changes. This method was applied to transportation expenses alone, since maintenance charges are to so great an extent dependent upon policy.

The measure of expense used was the man hours. This was due to the fact that labor is the controlling factor in transportation expenses, the changes in the amounts of fuel and material used being reflected in fluctuations in charges for labor. The man hours, rather than payrolls, were used on account of the disturbing element of changes in wage rates.

The measure of freight traffic used was the gross ton miles. This unit reflects better than any other the amount of transportation which the operating department is called upon to handle.

The factor used in measuring passenger business was the passenger train miles. Here again it should be pointed out that the most desirable unit is that which controls the expense. The increase in the number of passengers necessitates little, if any, additional expense, and even the increase in the number of cars per train does not materially affect the passenger expenses as a whole. On the other hand, the addition or elimination of a train directly affects all passenger train expenses and may reflect a change in the amount of business which will justify an increase or decrease in passenger station and yard expenses.

We have then the transportation man hours, gross ton miles and passenger train miles. In the study made, these statistics were obtained by months for a three year period. They were then all translated into index numbers, using the first month of the first year as 100. The results below are fictitious but are indicative of the results obtained:

Index Numbers—January 1st Year = 100

	First year			Second year			Third year		
Month	Man hrs.	Gross ton miles	Pass. train miles	Man hrs.	Gross ton miles	Pass. train miles	Man hrs.	Gross ton miles	Pass. train miles
January	100	100	100	101	105	102	103	104	102
February	96	94	88	96	100	90	98	92	90
March	100	102	92	101	109	103	103	100	101
April	103	106	100	103	116	104	101	98	102
May	105	113	103	104	118	105	102	104	101
June	105	112	108	104	115	109	103	103	102
July	106	106	115	108	118	117	102	103	109
August	107	109	118	109	119	120	101	100	108
September	107	112	117	110	122	119	102	103	108
October	107	118	108	110	128	110	101	102	104
November	103	111	104	106	114	106	100	100	103
December	101	104	102	104	106	105	99	96	100

The next problem which presents itself is that of determining the relative effect of freight and passenger business. The fluctuations of the two differ widely and it is necessary to obtain the combined effect of the two on the man hours. The importance of freight and passenger business on different railroads varies. If transportation expenses are made up, half freight and half passenger, it is possible to obtain the combined index by finding the simple average of the gross ton mile and the passenger train mile indexes. For example, in January of the first year, the combined index would be 100, February 91, March 97, April 103 and so on. On the other hand, if expenses are divided one third passenger and two-thirds freight, a weighted average of the two would be necessary. The combined index for January would be 100, February 92, March 99, April 104, etc. With a combined index of freight and passenger business, it is possible to check the fluctuations of all traffic with the changes in man hours. The simplest method is to show the increase or decrease each month, compared with the previous month.

	First year				Second year				Third year			
Month	Man hrs.	Monthly fluctuations	Traffic index	Monthly fluctuations	Man hrs.	Monthly fluctuations	Traffic index	Monthly fluctuations	Man hrs.	Monthly fluctuations	Traffic index	Monthly fluctuations
January	100	....	100	....	101	....	103	....	103	1	3	— 3
February	96	— 4	91	— 9	96	— 5	95	— 8	98	— 5	1	— 1
March	100	+ 4	97	+ 6	101	+ 5	106	+11	103	+ 5	101	—10
April	103	+ 3	103	+ 6	103	+ 2	110	+ 4	101	— 2	100	— 1
May	105	+ 2	108	+ 5	104	+ 1	112	+ 2	102	+ 1	103	+ 3
June	105	....	110	+ 2	104	....	112	....	101	— 1	103	....
July	106	+ 1	111	+ 1	108	+ 4	118	+ 6	102	+ 1	102	— 1
August	107	+ 1	114	+ 3	109	+ 1	120	+ 2	101	— 1	100	— 1
September	107	....	115	+ 1	110	+ 1	121	+ 1	102	+ 1	100	+ 2
October	107	....	113	— 2	110	....	119	— 2	100	— 2	103	— 3
November	103	— 4	107	— 6	106	— 4	110	— 9	100	....	101	— 1
December	101	— 2	103	— 4	104	— 2	106	— 4	99	— 1	98	— 1
Total increase	...	+11	...	+34	...	+14	...	+26	...	+ 8	...	17
And decreases	...	—10	...	—21	...	—11	...	—23	...	—13	...	5

On the basis of the first example given above of the combined business index, the results would be:

February minus 9
March plus 6
April plus 3

For purpose of simple illustration, it is assumed in this example that freight and passenger traffic are equal in importance. The traffic index numbers given above, are, therefore, combined on that basis and the fluctuations of traffic and man hours are given in the table at the bottom of the preceding page.

In the first year, the decrease of traffic in February, as compared with January, is nine points, the decrease in man hours four points. March shows an increase in traffic over February of six points, while man hours increased but four points. For the first year, the total traffic increases amount to 24 points, while the man hour increases total eleven points. The total traffic decreases amount to twenty-one points, the total man hour decreases equal ten points. Likewise in the other two years, the man hour increases as compared with the traffic decreases, are as 14 to 26 and 8 to 17, while on the decrease side the ratios are 11 to 23 and 13 to 25. From this it is evident that the increases or decreases in man hours over a considerable period, were approximately one-half the increases or decreases in traffic. For this particular railroad, it is to be expected that the *per cent of increase or decrease in man hours and expense will be about one-half the per cent of increase or decrease in traffic.* The actual results on one railroad were 56 per cent for one year, 58 per cent in the second and 57 in the third.

It is not necessary, of course, to use the percentage actually obtained from the results of actual operation. If a better performance is to be sought in the example given, the standard percentage of increase to be expected would be a figure less than one-half the percentage of increase in business. If traffic increased 10 per cent, it would be the task of the operating department to hold the expenses to a figure less than 5 per cent above those for the period with which comparison is being made. On the other hand, when traffic decreases, the attempt will be made to reduce expenses by more than one-half the per cent of decrease in traffic. The value of the compilation similar to that shown above is that it shows what actually has taken place during several years and is a measure of what can be done.

This analysis is extremely valuable in the checking of expenses from month to month over a period of time. It is not practicable for short periods when fluctuations in business are frequent and do not materially affect expenses. Moreover, many exceptions to the rule will be found over longer periods because of particular conditions.

Nevertheless, it provides a measure of the relationship of traffic and expense fluctuations which will enable the chief operating officer to determine whether transportation expenses as a whole have been sufficiently reduced or too greatly increased. It provides a check on the entire situation, without attention to any special group of expenses.

Freight Car Loading

WASHINGTON, D. C.

THE NUMBER OF cars loaded with revenue freight show another considerable increase during the week ended June 17 to a total of 860,772, as compared with 775,328 in the corresponding week of last year and 916,736 in the corresponding week of 1920. As compared with the week of June 10 this was an increase of 14,000. The decrease as compared with 1920 was only 55,964 and is more than accounted for by the decrease in coal loading of 96,702. The coal loading was 63,172 less than for the corresponding week of 1921 and it was also a decrease of 2,688 as compared with the week before. The loading of miscellaneous freight alone showed an increase of 74,000 cars as compared with last year. All classes of commodities except grain and grain products and coal showed increases as compared with last year and all districts showed increases, while there were increases as compared with 1920 in the Pocahontas, Southern and Southwestern districts.

The summary, as compiled by the Car Service Division of the American Railway Association follows:

REVENUE FREIGHT LOADED SUMMARY

ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, JUNE 17, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L. C. L.	Miscellaneous	Total revenue freight loaded: This year, 1922	Corresponding year, 1921	Corresponding year, 1920
Eastern	1922	9,225	7,683	8,076	1,629	6,004	3,613	70,945	90,978	193,153	.....	.....
	1921	6,764	3,126	42,591	951	5,375	1,671	57,559	70,331	.....	188,568	217,429
Allegheny	1922	2,138	2,490	16,822	4,681	3,153	9,140	51,713	76,196	166,335	.....	.....
	1921	2,480	2,822	48,273	2,194	3,063	6,535	43,937	50,949	.....	160,193	196,502
Pocahontas	1922	185	112	30,514	245	1,544	21	6,450	4,188	43,259	.....	.....
	1921	189	148	24,124	141	1,293	24	5,377	3,708	.....	35,005	33,839
Southern	1922	3,520	2,230	23,033	720	19,625	1,084	37,785	42,783	130,780	.....	.....
	1921	3,197	2,022	18,323	442	14,609	792	35,850	34,509	.....	109,744	124,991
Northwestern	1922	9,601	8,147	6,461	1,608	18,860	36,830	31,044	39,354	151,905	.....	.....
	1921	10,897	8,020	4,882	625	14,039	18,216	26,849	32,163	.....	115,691	157,773
Central Western	1922	10,267	10,946	4,510	227	6,429	2,768	33,972	44,016	113,135	.....	.....
	1921	11,723	9,971	1,959	138	6,167	687	31,417	35,459	.....	108,521	127,581
Southwestern	1922	4,397	2,543	2,720	192	8,465	366	16,135	27,387	62,205	.....	.....
	1921	5,606	2,139	4,155	121	6,077	738	15,604	23,774	.....	57,606	60,621
Total Western Districts	1922	24,265	21,636	13,691	2,027	33,754	39,964	81,151	110,757	327,245	.....	.....
	1921	27,628	20,120	22,996	884	26,283	19,641	73,870	91,396	.....	281,818	343,975
Total all roads	1922	39,333	29,151	92,136	9,302	64,082	53,822	248,044	324,902	860,772	.....	.....
	1921	40,288	28,238	155,308	4,612	50,563	28,863	216,593	250,893	.....	775,328	.....
	1920	34,425	29,840	188,838	11,011	61,468	71,374	164,693	355,087	.....	.....	916,736
Increase compared with 1921		.....	913	.....	4,690	13,519	24,959	31,451	74,009	85,444	.....	.....
Decrease compared with 1921		955	.....	63,172	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared with 1920		4,908	.....	.....	.....	2,614	.....	83,351	.....	.....	.....	.....
Decrease compared with 1920		.....	689	96,702	1,709	.....	17,552	.....	30,185	55,964	.....	.....
June 17, 1922		39,333	29,151	92,136	9,302	64,082	53,822	248,044	324,902	860,772	775,328	916,736
June 10, 1922		40,035	29,765	94,824	9,008	62,358	46,372	248,405	315,235	846,002	787,283	930,976
June 3, 1922		37,931	27,792	86,636	8,927	58,923	31,552	217,254	281,640	750,645	693,903	808,907
May 27, 1922		45,713	29,50	91,370	8,851	64,020	23,871	247,331	310,464	871,111	795,335	898,169
May 20, 1922		42,772	29,133	81,967	9,135	61,930	16,917	243,971	306,434	792,459	770,991	862,074

The freight car surplus for the period June 8 to 15 showed a further reduction of 15,320, as compared with the preceding week, to 268,865.

THE GENERAL OFFICES of the Western Maryland, in Baltimore, have been moved from the Morris Building to the Standard Oil Building.

Shop Workers' Walkout Scheduled for July 1

Unless Roads Agree to Restore Old Working Rules, Abolish Contracting and Keep Wages Up

ACCORDING TO A lengthy telegram from B. M. Jewell, president of the Railway Employees' Department of the American Federation of Labor, to T. De Witt Cuyler, chairman of the Association of Railway Executives, the unionized shop crafts will go out on a strike on July 1—unless the roads will agree to maintain wages at present levels, restore some working rules abolished by the Labor Board and do away with the contracting of repairs. This telegram was received at Mr. Cuyler's office on June 28. Mr. Jewell's telegram follows:

Mr. Jewell's Telegram

Since passage of the Transportation Act a series of controversies between the carriers and their employees have developed a situation wherein today approximately two-thirds of the men engaged in railway service are voting upon withdrawal from employment.

The responsibility for this situation rests squarely upon the Association of Railway Executives, of which you are chairman.

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Slow Down, Dangerous Curve Ahead

This telegram is for the purpose of making clear to you and to all others interested the measure of your responsibility.

1. The Transportation Act provided machinery for negotiations and ready adjustment of disputes regarding grievances, rules and working conditions which the carriers from the outset refused to employ. It provides: "Section 302. Railroad Boards of Labor Adjustment may be established by agreement between any carrier, group of carriers, or the carriers as a whole, and any employees of subordinate officials of carriers or organization or group of organizations thereof." On March 10, 1920, ten days after the Transportation Act went into effect, the 16 standard railroad labor organizations requested the railroad managements to continue the operation of National Boards of Adjustment, but after considerable correspondence this request was refused.

On March 24, and April 5, 1920, the chairman of the Railway Employees' Conference Committee addressed letters respectively to the chairman of the Railway Managements' Conference Committee and to the chairman of the Association of Railway Executives, requesting the continuation of National Adjustment Boards which had successfully functioned previously and were provided for in the Transportation Act. You replied that the association was opposed to the continuation of National Boards.

On July 29, 1920, the chairman of the Railroad Labor Board wrote a letter to the interested parties, directing attention to the above quoted section, which he stated contemplated "as an essential part of the machinery to decide disputes between the carriers and their employees the creation of railroad labor boards of adjustment."

After further discussion and conferences, the Labor Board was notified September 6, 1920, that at a meeting of the Association of Railway Executives, a resolution had been adopted, declaring that the "carriers of the country are unable to agree with the suggestion presented for the formation of National Boards of Adjustment."

Following this, the carriers refused to submit the question of continuing National Boards of Adjustment to the United States Railroad Labor Board, and after submission of the question by the railroad labor organizations, the Labor Board decided on December 7, 1920, that it had no power to "exercise jurisdiction over the question of creation of adjustment boards." Thus, in the beginning of operation under the Transportation Act, the carriers refused to establish what the Labor Board has described as "An essential part of machinery to decide disputes between carriers and their employees." It thus became evident early in the development of the present controversies that the purpose of the carriers in dealing with their employees were, first, to organize managements for national action in support of uniform policies; second, to avoid negotiations with the employees organized likewise for national action; third, to attempt to impose the national policies of management upon local organizations of employees; and fourth, upon the inevitable failure of such unfair methods of negotiation, to throw upon the Railroad Labor Board an unintended and impossible burden of arbitration.

2. Another example of the national program of the carriers was evidenced in their position regarding the national agreements. On April 14, 1921, after a hearing before the Labor Board, a decision was rendered abrogating the national agreements as of July 1, 1921, and referring the negotiation of an agreement relating to rules and working conditions to the carriers and their employees, in accordance with the sixteen basic principles laid down by the Labor Board. In these negotiations on each railroad, the railway executives presented a nationally agreed upon program for the modification of some of the most important rules, upon which agreement with the employees was thus made impossible. The matter was then submitted to the Labor Board, who later issued Decision 222, proposing amendments of Rules 6, 10, 12, 14, 15, 46, and 177, which were not acceptable to the employees.

It will be noted that these proposals of the Labor Board affecting the rules above mentioned were in line with the nationally-agreed-upon program of the railway executives.

3. During proceedings before the Labor Board concerning rules and working conditions, after the carriers had completed their case and before the employees had even had an opportunity to present their case, it will be recalled that Mr. Atterbury in behalf of the railway executives made a peremptory demand for the immediate abrogation of the national agreements, and for an immediate reduction of wages of maintenance of way employees. This demand was shortly followed by a meeting of the Association of Railway Executives, resulting in the presentation by managements of the respective railroads at a uniform reduction in wages to the employees. There was no real attempt made in carrying out this demand to negotiate a wage agreement, but upon the refusal of the representatives of the employees on the different systems to sign on the dotted line, the disputes thus inaugurated by concerted action on a national scale by the railway executives, and which were not submitted for national or even genuine local negotiation, were brought before the Labor Board.

Following the decision in this first wage hearing of 1921, the same procedure was repeated and after further hearings decisions have been rendered within the last sixty days, attempting to impose upon the railroad employees reductions in wages in violation of the principles laid down in the Transportation Act to govern the fixing of reasonable wages. These decisions are not only unjust as amply shown in the minority opinions of the Board, but

are in violation of the requirements of the Transportation Act, and are wholly outside any authority conferred upon the Board. They amount to nothing more than a proposal on the part of six members of the Labor Board, that the employees should accept unjust and unreasonable wages as their acquiescence in the program of the Association of Railway Executives to pay returns on billions of dollars of railway securities, representing no actual investment, and to reimburse the railways for the losses caused by present and past inefficiency in operation and dishonesty in financial management, by denying to the railway employees a fair return upon the investment of their life and labor in the transportation industry.

The railway executives have been able by concerted action to induce six members of the Labor Board to overthrow the precedents of a generation of arbitrations, establishing the principle that the financial obligations of a railroad do not provide a reason for denying to the workers a just and reasonable wage

The findings of six members of the Labor Board upon the question of wages would make the railways a parasitic industry surviving only by the process of denying a reasonable livelihood to the workers.

You well know that rates of pay, involving wages of 23 cents per hour, $1.84 per day, or $563.00 per year, are not rates of pay bearing the relation "between wages and cost of living" required in the Transportation Act.

Senator Cummins, who was more responsible than any other person for the language of the Transportation Act has stated publicly that it was the intention of the government to provide in the act that railroad employees should under all circumstances receive a living wage, and he has stated that "it is no more right to fix the wage below the point of living and comfortable living than it is to fix a return on capital below a reasonable point."

It is clearly in violation of the intention of the Transportation Act, which provides for a minimum return of 5½ per cent to the owners and provides for a salary of $10,000.00 per year for members of the Labor Board, that the wages of any employee in the railroad industry should be fixed upon so low a basis that he cannot support himself and family in a condition of decent living, make provision for the necessary education of his children and provide against the vicissitudes of sickness and old age.

It is simply impossible to show that the wages sought to be imposed upon the railroad employees through the concerted action of the railway executives meet these requirements.

4. During the progress of the controversies above set forth the various railroad systems—obviously acting pursuant to a prearranged program—have undertaken to contract out from under the operation of the transportation systems, both work and shops wherein work necessary to the operation of these systems is carried on. The two-fold purpose of this procedure has been, and even has been frankly admitted to be:

First: To take the men employed out from under the protection of the railroad labor organizations and to destroy their effectiveness, and,

Second. To deny these large groups of employees engaged in the transportation industry from such meager protection as the Transportation Act might afford them.

This program has been in such clear conflict with the purposes of the Transportation Act and such an obvious attempt on the part of the railroads to evade their legal obligations, that the Railroad Labor Board has issued orders specifically holding such contracts so utilized to be void.

Here, the employees have had a vivid demonstration that the management of the railroads will use or violate the Transportation Act as suits their purposes and is to their advantage.

It should be clear that the conduct of the carriers in their relations with their employees as heretofore outlined and as carried on pursuant to the policies determined by the Association of Railway Executives, has operated intentionally to create dissatisfaction among the employees and to hamper their collective efforts simply to maintain reasonable wages and working conditions. A desire has been shown to avoid and discourage the settlement of disputes by negotiation, to create, by carefully planned strategy, sharp differences of opinion and then to carry a program of unconscionable demands before the Labor Board, on the theory that, a compromise decision being the usual product of such a board of arbitration the managements would be able to deprive the employees of some part of their just dues in each proceeding.

You are also aware as we are, that a minority of enlightened and humane executives of the railway systems have been forced by this procedure and by pressure of financial interests, to take part in this national drive against fair treatment of the railway employees. By the refusal at the outset by the executives to permit continuation of boards of adjustment they have been able to force the employees to abandon their natural efforts to negotiate agreements with individual carriers and groups of carriers, and to compel them in protection of their interests to act through national organizations in order to meet on a comparable basis, the national organization of the managements. The system federations, being organizations of the employees of a single railway system, have had complete authority to enter upon and carry through negotiations with the respective railway systems, but the national organization of the carriers has been unwilling to permit in this manner the more humane and enlightened managements to agree upon just and reasonable wages, which would have operated to prevent the establishment of unjust and unreasonable wages elsewhere, which the majority of the executives, under pressure of the financial controllers of the railroads, have desired to impose upon the employees as a part of a nation wide drive against the interests of labor.

The unhappy result of the policies adopted and carried out by the Association of Railway Executives is now made clear in accordance with the laws governing the various organizations of railroad employees involved, it has become necessary to submit to the employees for their own determination, a matter fundamental to their daily life and the well being of themselves and their families,—the question of their willingness to continue to render service.

First: Under the inadequate wages submitted by the action of the Railroad Labor Board, and to become effective July 1, 1922.

Second: Under the injust amendments of Rules 6, 10, 12, 14, 15, 46 and 177, proposed in Decision 222 of the Labor Board, and

Third: Under the illegal practices of the railroads in contracting out work and shops which have been and are a normal and necessary part of the transportation industry.

The votes of the employees upon these questions show in each instance the decision of an overwhelming majority of the employees to withdraw from the service of the railroads, rather than to continue under these intolerable conditions. It, therefore, becomes the obligation of the representatives of these employees to sanction their withdrawal from employment. The national organization of the executives of the railroads and their concerted action in support of a common program, have forced the employees of the railroads as represented in their several organizations, to co-operate nationally for the protection of their common interests, despite their desire and the expressed purposes of their organizations to preserve negotiations and to bring about agreements between the representatives of management and employees on each railway system so far as possible.

There is, however, one benefit which may come to the carriers and their employees, and to the general public, from the fact that there are national spokesmen of the conflicting interests who might be able to halt a nation wide withdrawal of men from employment in the railway service, if the railway executives sincerely desired to avoid this consequence of their previous course of action. For this reason, in behalf of and by the authority of the executive council of the railway employees' department, I am informing you and through you informing the responsible heads of the various railway systems in the United States, and also the Pullman Company, most of which are represented in the Association of Railway Executives, that unless an immediate arrangement can be made: (1) To continue the payment of the wages at present in force; (2) to restore operation under Rules 6, 10, 12, 14, 15, 46 and 177, as they existed prior to the amendments thereof proposed in Decision 222; and (3) to discontinue the contracting out of work and shops, pending negotiations between the Association of Railway Executives and the Railway Employees' Department, looking toward adjustment of the existing disputes upon these questions, a sanction of withdrawal from employment on July 1, 1922, as voted by the employees, will be unavoidable.

Canvassing the Strike Vote

General committees at Chicago, the headquarters of the Railway Employees' Department of the American Federation of Labor and at Detroit, headquarters of the maintenance of way union have been in session canvassing the strike vote polled among these two classes of employees. Statements emanating from both headquarters are to the effect that the men are voting overwhelmingly in favor of a strike. However, unconfirmed reports indicate that the returns have been coming in rather slowly and that a much larger percentage of the workers are not in favor of a strike at this time than would be indicated by the statements issued by the heads of the organizations involved. These reports have brought forth more emphatic statements from various labor leaders to the effect that the ballots so far tabulated show that approximately the same overwhelming ratio in favor of a walkout is shown on all three of the issues put up to the men—use of the contract system by the roads, abolition of time and one-half for overtime and Sunday work, and the recent wage cut ordered by the Labor Board.

The sentiment prevailing among western railroad officers and about the headquarters of the Railroad Labor Board, is that the present threats of a nation-wide strike are merely repetitions of the strategy employed by railroad labor leaders so often in the past and that when the issues are brought to a head, there will be no general concerted movement although there may be sporadic disturbances which will be entirely local in nature

Regarding the possible intervention of the Railroad Labor Board, as was the case in the threatened strike of train service employees last October, B. M. Jewell, president of the Railway Employees' Department of the American Federation of Labor, is quoted as saying:

"The President, through the Railroad Labor Board, stopped the threatened railroad strike of last October. He told the Board to justify its existence. The Board got busy and the strike was called off. If President Harding again tells the Board to justify its existence it will not be able to do so this time because we are going to strike. We have our backs to the wall and we are going to fight."

Board Renders Six Decisions on Contracting

Several decisions, interesting in the light of the threatened strike, were handed down by the Board on June 24. Its decision regarding contracting, rendered recently in the Indiana Harbor Belt case and described in the *Railway Age* of May 13, page 711, is applied to six similar disputes which have been before the Board for some time.

The disputes so decided by the Board include the following:

That between the Chicago Great Western and its shop employees over the leasing of repair tracks at South St. Paul, Minn., to the A. S. Hecker Co., on July 25;

that between the Chicago Great Western and its clerks, foremen, freight checkers, stowers, stevedores and truckers over the contracting of the operation of a freight transfer platform at Oelwein, Iowa, by the A. S. Hecker Co., on October 5;

that between the Missouri, Kansas & Texas and its shop employees over the contracting of the operation of its railway shops at Sedalia, Mo., Parsons, Kan., and Denison, Tex., to the A. S. Hecker Co., in April;

that between the Chicago Great Western and its maintenance of way employees over the contracting of certain extra gang and regular section labor work at rates of pay lower than those established by the Board;

that between the St. Louis, Brownsville & Mexico and its shop employees over the contracting of passenger car cleaning at Brownsville, Tex., on April 1 and;

that between the Indiana Harbor Belt and its maintenance of way employees over the contracting of certain maintenance of way operations to Colianni & Dire.

The details of several of these disputes have been outlined in previous issues of the *Railway Age*.

The reaction of the employees to these decisions is indicated by the comment of John Scott, secretary of the shop crafts organization, who declared:

"The fact that the Board after months got busy and put out these decisions doesn't give us any assurance that contracting will cease."

He thought the decision would not ameliorate the men's grievances.

At the same time Ben W. Hooper, chairman of the Board, issued a statement expressing the belief that the railroads will abide by the Board's decisions in this regard in the future and announcing his intention of calling their attention more firmly to this violation.

"Some of the carriers," he said, "have proceeded upon the assumption that, because they contracted various kinds of labor before the Transportation Act, this practice is still legal and proper. To my mind, it seems so unjust and unfair to employees and so violative of the spirit of the Transportation Act that public sentiment cannot uphold it.

"Of course the Board has not held that the carriers may not contract their work. It has simply held that such contracts cannot have the effect of removing the railway employees from under the application of the Transportation Act. I still believe that the carriers will all get in line with the Board's decisions on this question and it is my purpose to press this matter upon their attention."

Labor Board Opens Hearings on Contracting

On June 26 the Board commenced the hearing of 28 disputes, all involving alleged violations of the Transportation Act and of the orders of the Board through the contracting of shop and maintenance of way work and other similar activities.

The disputes which are now being heard by the Board, the carrier, the organization and the "bone of contention" are as follows:

The New York Central vs. the Federated Shop Crafts, contracting of car repair shops at East Buffalo.

The New York Central vs. the Brotherhood of Railway Clerks, contracting the work of laborers at the Orange avenue freight house and Union depot, Cleveland, Ohio.

The New York Central vs. the American Federation of Railroad Workers, contracting of the Campbell street shop, Toledo, for the repairing of cars.

The New York Central vs. the American Federation of Railroad Workers, the contracting of the work of coach cleaners and of employees in mail and baggage rooms at Toledo.

The New York Central vs. the Brotherhood of Railway Clerks, the contracting of the work of freight handlers at the Franklin street station, New York, Weehawken, Barclay street and St. Johns Park stations to the New York Marine Company, and the Sixtieth street, Thirty-third street stations and Pier No. 83, North River, to Spencer & Sons.

The Indiana Harbor Belt vs. the Federated Shop Crafts, contracting of shop and enginehouse operation at Gibson, Ind.; Blue Island and Norpaul, Ill.

The Chicago Great Western vs. the Federated Shop Crafts, the contracting of shops at Oelwein, Iowa.

The Chicago Great Western vs. the United Brotherhood of Maintenance of Way Employees, the contracting of the work of foremen, mechanics, helpers and laborers in the maintenance of way and structural departments, to the Hecker Construction Company, on March 31, 1922.

The Erie vs. the American Federation of Railroad Workers, the contracting of the work of crossing watchmen, flagmen and trackmen.

The Erie vs. the Brotherhood of Railway Clerks, the contracting of the work of clerical and station forces.

The Chicago & Alton vs. the United Brotherhood of Maintenance of Way Employees, the contracting of coal chute, pump and cinder work, engine watchmen, etc., in the fuel and mechanical departments at various points.

The Wheeling & Lake Erie vs. the American Federation of Railroad Workers, the contracting of wheel room and air brake work at Toledo.

The Cincinnati, Indianapolis & Western vs. the Brotherhood of Locomotive Engineers and the Brotherhood of Locomotive Firemen and Enginemen, the contracting of locomotive hostler work on December 10, 1921.

The Cincinnati, Indianapolis & Western vs. the Brotherhood of Railway Clerks, the contracting of the work of clerical and station forces at Indianapolis.

The Cincinnati, Indianapolis & Western vs. the Federated Shop Crafts, the contracting of shop work.

The Cleveland, Cincinnati, Chicago & St. Louis vs. the Brotherhood of Railway Clerks, the contracting of the work of freight handlers at Indianapolis and other points to the A. S. Hecker Company.

The Cleveland, Cincinnati, Chicago & St. Louis vs. the Federated Shop Crafts, the contracting of the Beech Grove Shops to the Railway Service Corporation on March 20, 1922.

The Michigan Central vs. the Federated Shop Crafts, the contracting of the car repair shop at Detroit to the Illinois Car & Manufacturing Company.

The Delaware, Lackawanna & Western vs. the Brotherhood of Railway Clerks, the contracting of the work of freight handlers and freight check clerks at the Hoboken and Jersey City piers to the New York Marine Company; at East Buffalo to Hanrahan & Co., and at Scranton to Downey Brothers.

The Chicago, Rock Island & Pacific and the Chicago, Rock Island & Gulf vs. the United Brotherhood of Maintenance of Way Employees, the contracting of coal chutes at Courtland, Kan.; Fairbury, Neb. and Lincoln, and a pumping station at South Bend, Neb.

The Atchison, Topeka & Santa Fe vs. the United Brotherhood of Maintenance of Way Employees, the contracting for the painting of buildings, water tanks and bridges, the driving of piles and other bridge construction work, the construction and repair of turntables, right of way fencing, the re-decking of viaducts and other bridge and building department work.

The Bangor & Aroostook vs. the Federated Shop Crafts, the contracting of car shops at Houlton, Maine.

The Boston & Albany vs. the Federated Shop Crafts, the contracting of car cleaning at the Exeter Street Yard, Boston.

The Pere Marquette and the Fort Street Union Depot Company vs. the Federated Shop Crafts, the contracting of the Baldwin Power Plant, April 25, 1921, car repairing at Ionia, Grand Rapids and the Saginaw Shops, and car cleaning at Detroit in March, 1922, to the Kellogg-Grego Railway Service Corporation.

The Western Maryland vs. the Federated Shop Crafts, the contracting of shop work.

The Missouri, Kansas & Texas vs. the United Brotherhood of Maintenance of Way Employees, the contracting of the positions of crossing watchmen at Clinton, Mo., to the mayor of that town.

The Ann Arbor vs. the Federated Shop Crafts, the contracting of shop work.

The argument in the first of these cases to be heard by the Board followed very closely the previous arguments which have been made by representatives of both the carriers and the employees in previous and similar contract cases, the employees contending that this contracting constituted a violation of the Transportation Act and of the Board's orders and the representatives of the carriers holding that there is nothing in the act to prohibit the contracting of operations of this character, that it has been the practice of the railroads for many years and that it has been done in the interest of efficient and economical operations.

Pennsylvania's Maintenance and Signal Men Agree to Reductions

The Pennsylvania has reached an agreement with some 42,500 of its employees—signal and telegraph men and maintenance employees—agreeing to a modification of wages "to conform with the lower costs of living, the general conditions of employment throughout the country and the demand of the public for cheaper transportation." The railroad's announcement says in part:

> The negotiations were entirely voluntary and were conducted solely between the management's representatives on the one side, and elected representatives of employees on the other, free from outside intervention. The information on which these negotiations were based was gathered jointly by representatives of the management and of the employees, from industries in the territory served by the Pennsylvania System. The management desires to thank not only the employees and their officers concerned, for the spirit in which the negotiations were conducted, but also the industries along the lines of the system, for their co-operation in furnishing.
>
> This successful outcome of the wage negotiations with the maintenance of way and telegraph and signal employees, constitutes one of the most notable achievements, thus far recorded, by the Pennsylvania Railroad's employees' representation plan. This plan, for the amicable settlement of controversial questions, was first put into effect, by mutual consent, on January 1, 1921. Since that time, and prior to the opening of negotiations over the pending wage revision, the plan has been instrumental in bringing to peaceful and satisfactory settlement, more than 9,000 controversial questions between management and employees.

Although no official announcement has been made as to the extent of the reductions agreed to by the Pennsylvania's employees, it is understood that, in general, they are somewhat less than those ordered by the Labor Board.

An Aeroplane View of the Baltimore & Ohio's Grain Elevators and Freight Terminals at Locust Point, Baltimore, Md.

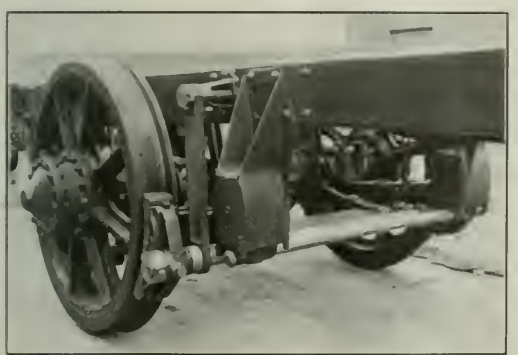
The B. & O. recently established a record for the fast handling of grain through the elevators shown by loading 285,000 bushels of grain into vessels in 13 hours.

Developments in Gasoline Passenger Rail Cars*

New York Railroad Club Discusses Design, Power Requirements and Operating Results of Self-propelled Cars

By W. L. Bean
Mechanical Assistant to the President, New York, New Haven & Hartford

MANY CARRIERS have lines of road which, on account of traffic diversion to trolley lines, or to highway vehicles, or through other causes are unprofitable, while short line railroads are very definitely confronted with a high cost of transportation. Large losses are sustained through operating steam trains, with expenses ranging approximately from 75 cents to $1.50 per train mile and with revenues from 20 cents to $1.00. Expenses mentioned are those for train and enginemen's wages, fuel, lubricants, enginehouse expense and maintenance of equipment. Item, of interest on investment, superintendence (including dispatching), maintenance of way, signals, stations, station employees, and kindred items, are not included. Naturally, there are wide differences in the total costs of furnishing service as between different roads or portions of the same road, but when segregation is made of the items accruing to each separate route or schedule, discrepancies between revenues and expenses show that the patrons of the carrier are usually receiving service at less than cost.



Rear Truck Showing Brake Rigging and Spring Pockets

The excess of costs over revenues is such that usually it would be difficult, if not impossible, to handle the business at a profit. Hence the possibility for many carriers seems to be that of decreasing deficits rather than transforming them into surpluses.

There may well be consideration of the desirability of carriers further developing the costs of rendering service on thin lines of road and acquainting the public with the facts, especially with the inauguration of service through the utility of equipment different from that commonly used. The public does not always receive innovations in the best of spirit, consequently, if a clearer understanding of the relation between revenues and expenses could be had, the logic of the situation might appeal. Railroad managements are rightly expected to devise ways and means to reduce transportation costs but they must receive the co-operation of patrons.

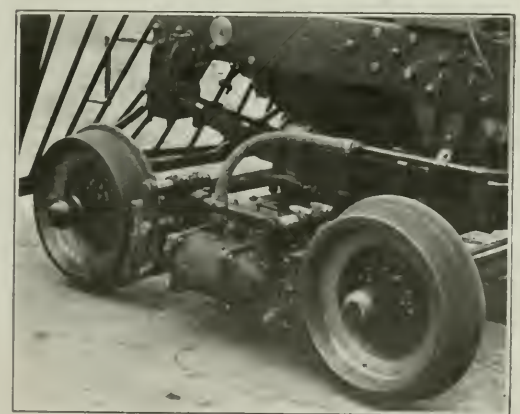
Self-propelled railway cars have been in use for a considerable number of years, but not to wide extent. The subject has received an encourageing impetus recently and if there is progress along right lines, accomplishments should be considerable and of early realization.

The gasoline engine is attracting the widest attention and it appears further development will be chiefly through its use, although light weight Diesel type machines may offer competition and steam is not out of the running.

As in previous developments, two forms of transmission of power from the engine to the wheels and axles are prominent. While gasoline-mechanical drive is at present in the fore-front, there is renewed interest and endeavor to revive the gas-electric system along new lines, embodying lighter construction and less power than formerly used.

Adaptation of Highway Motor Trucks

Adaptation of highway motor trucks to rails has been considerable in extent and with generally satisfactory results. At a reasonable first cost, it is possible to modify a highway vehicle to adapt it to rail use and to produce a reliable piece of equipment which will operate at low cost for fuel, oil, and maintenance. The production of vehicles which stand up under the severe conditions of highway use have favored the operation of similar appliances on rails. Skillfully designed clutches, transmissions, gear shifts, etc.; heat treated alloy steels; efficient systems of lubrication; light weight parts of great strength, durability and flexibility, have worked out well. Furthermore, the extensive use of automotive vehicles for passenger and trucking service has resulted in a wide knowledge of automotive design, construction and operation, thereby making less difficult the adaptation of this equipment to railroad service than would otherwise obtain. Usually the adaptation has been through using the rear pair of wheels to do the driving and substituting a four wheel swivelling truck at front.



Front Truck Showing Direct Acting Brake Cylinder and Cushioned Spring Rigging

Many have been doubtful about the success of a single

*Abstract of a paper read before the New York Railroad Club at New York, May 18, 1922.

pair of wheels operating on rails at speeds necessary for passenger service. It can be stated, however, that the greatest success has resulted and over a sufficient period of time to demonstrate there is nothing to be feared in the trailing of a single pair of wheels under a car of this sort. It is not recommended, of course, that cars be operated at high speed in reverse motion, but it has not come to notice that any difficulty has been experienced in backing six wheel rail cars, the usual backing movement being under speeds of 25 m.p.h.

Advantages in Using Standard Equipment

Equipment of this sort should utilize all possible parts which have been developed and are of minimum weight and maximum strength and durability. The carrier is benefited by the stocks of parts available for quick delivery through the extensive service stations of the manufacturers. Furthermore, the advantage of a stable organization back of the product which is being put into use is important.

In further consideration of the six wheel arrangement, it may be stated that there is no advantage in going to more wheels under a car which can be propelled by existing automotive truck power plants. However, in order to secure acceptable riding qualities in the rear of a six wheel vehicle, it is desirable to have a wheel of a relatively large diameter; namely, 36 in. to 40 in. and arrangements to absorb shocks by rubber or other devices in connection with springs. Special consideration should be given to keeping the unsprung weight to the absolute minimum.

Operating Costs

Cars built on two to three ton chassis have a gas consumption of 8 to 11 miles per gallon and cars built on five ton chassis a consumption of from 4 to 6 miles. The consumption, of course, depends on atmospheric temperature, length of run, loading, grades and especially speed. Maintenance should not exceed five cents per mile on the smaller car or eight cents on the larger one, over a period of time. Other operating and maintenance costs depend on local conditions, particularly as to wages. One man is required for the mechanical operation of the car but whether he can handle the collection of tickets and the performance of such other duties depends altogether on local conditions. First cost of a car of the smaller type is usually around $9,000, and of the larger car around $16,000, depending on the refinements of construction and particularly whether or not the body is built for severe or mild weather conditions.

Depreciation charge rates are not established but a reasonable assumption is that vehicles of this sort can be perpetuated as long as it is desirable to maintain them. The final disposition of these cars probably will be determined from obsolescence rather than physical depreciation, and this will be determined largely by the rate at which manufacturers are able to develop something better than is offered at present.

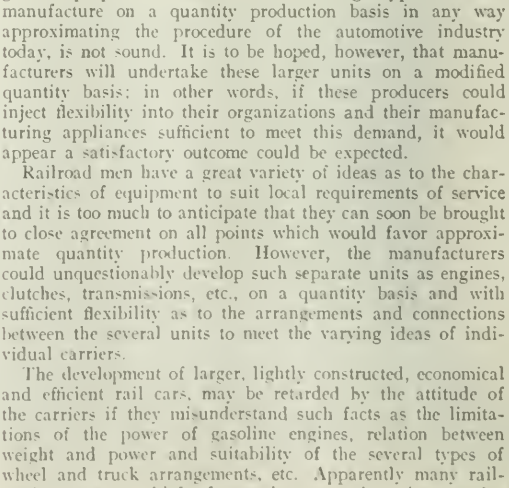
Cars of Larger Capacity Needed

Development of the present six wheel cars was relatively simple but in designing cars to meet from 50 to 75 per cent greater capacity requirements one is confronted by a different problem. This is unfortunate because, although a considerable field for cars of the six wheel type exists, there is a substantial and persistent demand for larger cars. Six wheel cars are built on the basis of two to three ton chassis seating about 24 to 28 people, with a nominal baggage space and cars on the five ton chassis seat about 35 people with a baggage space of approximately 50 sq. ft. There is need for a car which will seat from 50 to 60 people and have a baggage space of about 100 sq. ft. and be able to make speeds of 40 to 45 m.p.h. in either direction. This requirement cannot be met by adaptation of any highway vehicle and requires the design of a new outfit. A double four wheel truck arrangement is necessary because even if a power plant of sufficient capacity were available in a highway chassis, it would not be practicable to operate with a single non-swivelling axle except possibly on exceptional conditions of straight track. Twenty-five feet is about the practicable limit for distance between front truck center pin and rear axle center.

If similar economies are to ensue with the larger car, the same characteristics of construction and weights per horsepower must prevail as in present equipment. A typical rail car weighs 23,750 lb. light; with 35 passengers, two man crew and 2,000 lb. baggage, the weight (at 150 lb. per person) is 31,300 lb. or 489 lb. per brake horsepower. For cars which operate at speeds of 40 m.p.h. on level or nearly level track, the nominal loaded weight per brake horsepower should not exceed 440 lb.

Gasoline propelled vehicles developed a number of years ago were of usual railroad type and experience with them in the consideration of later experience with lighter vehicles, points out the necessity of not following usual railroad equipment types.

Automotive truck manufacturers are the logical agencies for the successful development of the larger cars. These



Chassis of Mack Rail Motor Car

manufacturers, however, appear lacking in confidence that there is a sufficient field of sale of such vehicles to warrant undertaking the expense of engineering development and additional shop equipment necessary to produce on a quantity basis. Anticipation that there will ever be sales of gasoline-propelled rail cars of few enough types to favor manufacture on a quantity production basis in any way approximating the procedure of the automotive industry today, is not sound. It is to be hoped, however, that manufacturers will undertake these larger units on a modified quantity basis; in other words, if these producers could inject flexibility into their organizations and their manufacturing appliances sufficient to meet this demand, it would appear a satisfactory outcome could be expected.

Railroad men have a great variety of ideas as to the characteristics of equipment to suit local requirements of service and it is too much to anticipate that they can soon be brought to close agreement on all points which would favor approximate quantity production. However, the manufacturers could unquestionably develop such separate units as engines, clutches, transmissions, etc., on a quantity basis and with sufficient flexibility as to the arrangements and connections between the several units to meet the varying ideas of individual carriers.

The development of larger, lightly constructed, economical and efficient rail cars, may be retarded by the attitude of the carriers if they misunderstand such facts as the limitations of the power of gasoline engines, relation between weight and power and suitability of the several types of wheel and truck arrangements, etc. Apparently many railroad men cannot think of operation except in trains contain-

ing a multiplicity of units. They have so long been accustomed to couple up a series of cars that when they approach the proposition of transporting a few passengers and a little baggage and mail they endeavor to string the proposition out into two or more cars when there is not revenue enough to support the operation of one car. Those railroad men who attack the problem from this standpoint appear as incorrect in their assumptions as some of the manufacturers who have undertaken the design and construction of single gasoline rail cars having eight wheels where the driving is done on all eight wheels and no contemplation of hauling any trailers is involved. Such excess driving mechanism absorbs power without compensating benefit and is a liability instead of an asset.

Little Need of Trailers at Present

It should not be understood that there are no conditions under which trailer operation may be desirable or that as development progresses, propelling units capable of handling two or more cars may not become available and desirable, but the need at present is a real single unit within the limits of weight carried by two four-wheel trucks.

Rolling friction increases more rapidly as wheels and axles are added rather than through the addition of weight, and for the same total weight on rails the frictional losses are greater than hauling the same weight on fewer wheels.

As the body is lengthened the weight increases at a faster rate than length because of the necessity for sufficient beam strength in the underframing but it is better to have a little more dead weight in a car underframe than to have two units and to add weight through multiplicity of wheels and through the addition of draft gearing for multiple car operation.

The use of trailers furthermore may raise questions in regard to the number of men required in the crew and thereby disrupt estimates with respect of economies versus steam. Under many conditions a train consisting of two or more cars with a seating capacity of perhaps 60 people and with a small baggage compartment, would be unhandy to operate around terminals as compared with the same capacity in a single car, particularly if the single car operated in either direction.

Double end operation is certain to attract increasing interest and there are assurances by some manufacturers that successful double end control mechanism can be applied so that a single car can be operated with equal facility and speed in either direction and therefore be used in the same manner as a trolley car.

Consideration of the expense of self-propelled cars should carry with it the many factors involved, beginning with first cost and the attendant charges for interest on investment, taxes, insurance, depreciation, operation and maintenance. Equipment provided for a given service, therefore, should cost the minimum.

When considering larger capacity cars it should be remembered that weight increases much more rapidly than capacity and that the economies obtained from the use of small cars may not be possible with those of greater size. As the size of vehicles increases, the margin of profit rapidly decreases.

Engines should be so chosen and applied as to reduce vibration to a minimum. Larger cooling surfaces should be provided than are sufficient for the same engines on highway trucks.

Gas-Electric Cars

The gas-electric car is receiving consideration by engineers of two large electrical manufacturing companies in conjunction with car builders, gas engine builders and railway engineers, with the idea of obtaining lighter construction than in former designs. The gas-electric car has a number of advantages over the gas-mechanical drive, one of which is the ease by which double-end operation can be secured and by which power can be transmitted to any or all of the wheels of the car. However, because of the characteristics of gas-electric equipment, it is not possible to use as small an engine as with the mechanical drive.

Final figures from current studies are not available but preliminary values indicate that gas-electric equipment will weigh in the neighborhood of 25 to 50 per cent more per unit of carrying capacity than gas-mechanical. The input-output efficiency of the electric generator multiplied by the input-output efficiency of motors, gives an overall transmission efficiency of about 75 per cent to 80 per cent for the gas-electric, this being the per cent of power delivered from the crank shaft to the rim of the wheels. In mechanical drive of the automotive type, the corresponding efficiency is about 85 per cent.

Furthermore, the combined weight of generator, motors and control apparatus is greater than corresponding parts in a mechanical drive. The combined effect of lower transmission efficiency plus greater weight of machinery reacts on the size of gasoline motor, which reaction increases the weight of body and trucks. It will be surprising if a gas-electric car can be produced which will weigh as little per unit of carrying capacity as a gas-mechanical. Weight, however, is of prime importance in gas-engine design, cost, operation, maintenance, reliability and availability.

Those who have given most study and have had most experience with both the gas-electric and mechanical drive agree, at least on one point, that construction must be light if operation is to be satisfactory. Use of carefully designed parts, heat treated metals, avoidance of all unnecessary parts, reduction of friction in bearings, in truck parts and from atmospheric resistance is imperative. It is impossible in the space available to go into detail on many points but a few of the details may perhaps be considered profitably.

Details of Construction

The six-wheel design has demonstrated its ability to track well. Because of unsymmetrical wheel arrangement and absence of a swing bolster at one end, cars of this design operate well with lack of lateral oscillation even at speeds in excess of 40 miles an hour on track which is not the best.

Four-wheel trucks with too short a wheel base in conjunction with small wheels do not ride well. It is necessary to keep the wheels in excess of 30 in. and preferable to have a wheel base in excess of 48 in. Experience indicates the wisdom of using shock absorbing devices in connection with the spring arrangement. An efficient hand brake should be provided in addition to the air brake. The air compressor should be of sufficient capacity to supply air for blowing a signal whistle in addition to operating the brake.

The body should be designed to give lightness, ability to withstand vibration without setting up noises, to be of pleasing appearance, to have sufficient strength and to provide protection from the elements. Body construction for cars operating in warm climates, of course, can be much lighter than in the north. Hair felt insulation in walls between the belt rail and the floor and beneath the floor with proper sheet metal protection beneath the latter, has been found helpful in dampening body noises and providing warmth.

Seats should be of light design and because of the character of the service, closer spacings, shorter backs, shorter seats and narrower aisles can be used, providing thereby greater capacity for a given floor area than with the usual passenger coach. Since railway cars can be made wider than street cars, seats can hold three persons on one side of the aisle and two on the other side.

In small cars it is relatively easy to heat through the use of exhaust gases from the motor but in large cars, seating 50 or 60 people, especially if designed for double end operation, it is not an easy problem and it may be necessary to

rely on a hot water or a hot air heater but the provision of electric current for the circulating of the air in the latter case is also not easily arranged in cars having mechanical transmissions.

At speeds above 25 m.p.h. wind resistance absorbs a large part of the power produced. The unit pressure due to wind resistance increases as the square of the speed while the horsepower expended in driving the car against this pressure increases as the cube of the speed.

The continued operation of steam trains to handle 30 or 40 passengers and small amounts of baggage, mail and express, is wasteful and should be supplanted by more efficient equipment. Existing gasoline cars can handle the traffic offered on many light lines but occasional spurts requiring the seating of 60-75 people create a need for a larger car. In many cases, the change from expensive steam locomotive to cheap gasoline car operation, hinges on the production of the larger capacity self-propelled vehicle. The small gasoline cars built on modified highway chassis are exceedingly satisfactory to the extent of their capacity. Surely American engineers can increase that capacity 50 per cent to 75 per cent with corresponding efficiency, reliability and economy of operation. If the carriers and manufacturers get together properly, the problem can be solved and without either party hazarding funds of such extent that they are worth considering in view of the benefits possible.

RESULTS OF OPERATION ON NEW YORK, NEW HAVEN & HARTFORD

Car No.	Total daily miles	Total miles to May 6	Total revenue passengers to May 6	Average passengers per trip			Total trips	Total minutes delay in period	Delay per trip minutes	Number stops per day	Trips replaced by steam train	Number trips per day	Average speed M. P. H.
				Revenue	Non-revenue	Total							
9000	146	12,441	11,115	20.	8.5	28.5	533	218	0.4	42	3	6	23
9001	59	5,479	6,822	19.6	3.8	23.4	366	340	0.9	12	10	4	25
9002	139	10,396	11,013	39.6	3.6	43.2	301	179	0.6	25	25	4	20

Car	Operating between	In service
9000	Derby, New Haven, and New Hartford, Conn.	January 4, 1922
9001	Fairhaven and Tremont, Mass.	January 18, 1922
9002	Litchfield, Danbury and Waterbury, Conn.	January 30, 1922

Discussion

C. B. Young (general mechanical engineer, Chicago, Burlington & Quincy): A gas-electric car was placed in service on the Burlington in 1902. The gasoline engine was heavy, poorly balanced and not thoroughly developed at that time. As a result the use of the car was abandoned within a year or so. In 1904 or 1905 we purchased a steam car designed by Mr. Toltz, formerly mechanical engineer of the Great Northern. The boiler was of the vertical type with superheater. This car was more or less of a failure due to its heavy weight and insufficient capacity of boiler and engine. A gasoline car which will weigh about 16,000 lb. has been ordered recently from the Edwards Railway Motor Car Company.

In developing motor cars it should be remembered that such cars can never take the place of a small engine and should not be used where one or two trailers are necessary or where switching of freight cars is to be done.

H. P. Edwards (president, Edwards Motor Car Company): As general manager of several short line railroads, I have been experimenting with gasoline-propelled passenger cars for the past seven or eight years. Where conditions are favorable large economies can be obtained by using this method of propulsion. Some short lines, however, do not pay the standard wages prevailing on larger systems and are able to provide steam trains at an operating cost of 50 cents per mile. In such cases there is little incentive to change to gasoline cars. The successful self-propelled passenger car has thus far been of small capacity, not over 50 passengers. Cars seating from 75 to 80 people with a large baggage compartment have been tried but the operating costs are reported to be as high as 90 cents per mile.

F. S. Gallagher (engineer rolling stock, New York Central) told of the development of the gasoline car since it was first tried out in 1891. To meet present requirements he considered a car which would seat 60 to 70 people essential.

C. Lewis Diesterweg (president, Bowen Motor Railways Corporation): There is today a considerable mileage of branch and short line roads built at a heavy expense which does not pay the cost of operation. By changing from steam operation to gasoline motor-driven cars many of these roads could be converted into valuable feeders for the trunk lines which own them. The first car we built was for the Westfield Motor Railway at Westfield, Ill., and is operating on the old Sidell & Olney which had been sold as junk but was bought in three years ago by people along the line and since operated by them. This car has covered some 100,000 miles with practically no care and few replacements. Cars of later design are in service on a number of other roads.

Charles Guernsey (general manager, Service Motor Truck Company): The field for gasoline rail cars is limited by the size of the engines available and the economies of the situation. When cars become of such size and initial expense that the operating costs approach that of steam equipment they cease to have an advantage. For the present cars should be built for a passenger seating capacity of not over 50 or 55 and sufficiently light to be handled satisfactorily by a motor of not over 70 hp.

Dwight C. Morgan (vice-president, Pittsburgh & Shawmut): The cars used on the Pittsburgh & Shawmut were purchased from the Bowen Motor Railways Corporation and were designed along railroad lines, not as a makeshift but as a real substitution for steam passenger coaches. They are popular with the public and have been very satisfactory from an operating point of view. The cost of operation, compiled by I.C.C. classification, has averaged 55 cents per motor car mile as compared with 71 cents for previous steam service.

E. S. French (vice-president, White River Railroad): After thorough investigation we placed in service on our road in Vermont a high pressure steam railroad car made by the Unit Railway Car Company. This car weighs about 60,000 lb. and while the schedule does not call for trailer service, an extra car is frequently hauled. The boiler is designed for 1,000 lb. pressure and uses oil fuel. At present, with fuel oil purchased for 3½ cents per gallon, the fuel cost is about 2.45 cents per car mile and lubricating oil about 0.3 cent. The engine is of the two-cylinder, piston valve type and extremely simple. The power available is more than ample while the flexibility and ease of control are noticeable. After five years' experience we are still convinced that high pressure steam offers the best power for unit cars.

AUTOMATIC TRAIN CONTROL DEVICES have been ordered by the Interstate Commerce Commission on leading railroads of high traffic density. It has long been apparent that this must come in time. But the latest accident report shows three collisions occurring on lines unprotected or meagerly protected by automatic block signals. The purpose of train control is to prevent disaster when an engineer fails to observe the signals, but on these unprotected lines there are no signals to observe.—*Springfield Republican.*

Freight Claim Division of A. R. A. Meets in Denver

Means of Reaching Goal of Fifty Per Cent Reduction in Claim Payments Principal Topic

THE THIRTY-FIRST annual session of the Freight Claim Division of the American Railway Association was held in Denver, Colo., on June 20-22, with about 175 freight claim and claim prevention representatives in attendance. The principal work before the convention was the consideration of important changes in the freight claim rules. Numerous changes were adopted which are expected to facilitate the investigation and payment of claims. Several rules were also amended to eliminate delays in apportioning paid claims, thus providing for more economical accounting practices.

Freight Claim Prevention Committee Reports

The report of the Committee on Freight Claim Prevention was adopted in full. This report consisted of a detailed discussion of the results that had been accomplished during the past year and a description of the activities in which the committee had been engaged. It said in part:

"In November, 1920, your committee adopted as a slogan 'Cut loss and damage in half—it can be done.' This slogan has been translated into an accomplished fact. The monthly reports of claim payments are now showing a reduction of 50 per cent or more in the freight claim expense under the corresponding months of last year. While the decreased volume of traffic and price deflation were factors in bringing this result about, to a very large extent the improvement reflects increased activities of the railways and their joint agencies in studying and eradicating the causes of claims. It is particularly gratifying to note a reduction of 23.4 per cent in the number of new claims presented in the first quarter of 1922 compared with the same period in 1921, in the face of an increase of approximately 11 per cent in the number of cars loaded in the first quarter of 1922. Also, at the end of the first quarter of this year there were carried over as unadjusted only 229,880 claims, whereas at the end of the corresponding quarter in 1921 there were on hand 408,629 unsettled claims, a reduction of 43.7 per cent.

"For the year 1921 the main efforts of the committee, through its special representatives, were devoted to the encouragement of freight claim prevention organizations on the individual lines where none existed and the stimulation of activities on the part of lines already organized. To this end, the committee's bulletin service was inaugurated, having in mind the dissemination thereby of valuable thoughts and suggestions among all interested. The bulletin service is conducted in five series. One series is called 'Freight Claim Prevention Suggestions' and is addressed to superintendents, copies being sent as information to chief operating, claim prevention and freight claim officers. These contain suggestions as to methods which have been found useful on certain lines and may be found applicable on others. Another series is entitled 'Freight Claim Prevention Suggestion Letters,' and is addressed to general managers, general superintendents and superintendents of transportation, copies being sent as information to claim prevention and freight claim officers. These are issued less frequently than the 'Suggestions' to superintendents and deal more with matters of recommended practice and policy. The third series is designated 'Freight Claim Prevention Bulletins' and is addressed to freight claim and claim prevention officers only. Carried thereby is material of particular interest to those officers and of a nature different from the other series mentioned. A further series is known as 'Crop Condition Reports,' issued from time to time as conditions warrant and is sent to freight claim and claim prevention officers. A fifth series is known as 'Information' bulletins and are addressed to chambers of commerce throughout the United States."

Perishable Freight

"Plans are now being perfected for a national drive against perishable freight irregularities, which for the year 1921 cost the railways approximately $20,000,000. The months of July and August have been set apart for special education work among all employees in perishable freight service, to the end that there shall be a better understanding of tariff and operating rules and that service defects shall be reported promptly to responsible agencies and corrective action taken. The substantial savings which can be effected through expert inspection of fruits and vegetables and fresh meats to determine the true cause of damage—whether by disease, violation of package or loading regulations, etc., or through fault of the carrier, will be emphasized during the campaign; likewise the importance of each road maintaining a perishable freight service department where the volume of such business justifies."

"Figures for 1921 show that approximately $14,000,000 was charged for loss and damage to fruits and vegetables, an average of $18 per car transported, this amount being nearly seven times the amount per car for loss and damage to live stock. Discussions in the territorial conferences developed great need for inspection service at both initial and destination points."

The committee, after carefully considering the views of the territorial representatives offered the following recommendations:

(1) That perishable freight should be given adequate inspection at destination;

(2) That the inspection services of established inspection bureaus, including that of the U. S. Department of Agriculture, be fully utilized so far as available and that such service be extended to cover as much of this traffic as possible when damage is found or reported by consignee;

(3) That damages due to field diseases and other conditions controllable at the source, to improper packing and bracing, or to other preventable causes, shall be reported to the initial lines;

(4) That damages shown to have resulted from transportation or temperature failures en route shall be reported to the line responsible by the carrier whose investigation determines such failures;

(5) That such reports shall be by letter or form, as may be determined upon to meet the individual conditions of each reporting line; but in either case the facts must be fully covered.

(6) That each carrier shall notify the Secretary the title and address of its official designated to handle such reports;

(7) That carrier receiving such reports will investigate same with the view of determining and applying remedial measures;

(8) That, inasmuch as the arrival of perishable traffic at destination in good condition is of general importance, equally affecting the interests of agriculture transportation agencies and the public at large, efforts should be made to co-ordinate the inspection service of the Bureau of Markets, U. S. Department of Agriculture, with the efforts of the transportation lines, to the end that the department shall investigate at their source the conditions such as field diseases, etc., developed in inspection at destination.

On December 7, 1921, a conference was held in New York by the special representatives of the committee with the representatives of the National Association of Finishers of Cotton Fabrics, the New York Textile Bureau and the Converters' Association to discuss ways of reducing loss and damage to cotton piece goods, estimated at $200,000 per annum. Plans were worked out for joint study of the matter by the organ-

izations represented, together with the eastern claim conference and the Trunk Line Freight Inspection Bureau. The convention's attention was also called to the desirability of extending bureau inspection of concealed loss and damage to all cities where the volume of business warrants. This service, the committee felt, has been satisfactorily performed by the Western Weighing and Inspection Bureau at an average cost of 51 cents per inspection and is preferable to individual road inspection because it secures uniformity, is more efficient, and costs less; also it is a distinct advantage in having inspection made by a disinterested organization.

In addition the following subjects came before the committee for consideration and action thereupon during 1921-1922: Improved methods of loading sacked goods to provide better side door protection; damage caused to automobiles by improper bracing; proper strapping for shipping containers; proposed central bureau for reporting over and short freight of unusual character or value; mailing waybills for astray l.c.l. freight; cotton shortages; reducing claims on household goods; co-operation with the American Railway Express Company; damage to fresh meats and packing house products; reducing loss and damage claims on live stock; damage to newsprint paper; wrongful deliveries made on presentation of stolen or forged papers.

Addressed by Retiring Chairman

H. C. Pribble, who has been chairman of the Freight Claim Division for nearly four years, briefly summarized the activities of the division since the last annual meeting. The undertaking of "cutting losses and damages in half" will be realized, he said, if the claim payments figures available for the current year and the revenues for the same period maintain their ratio for the balance of 1922. If so, the claim payments and the ratio will be less than one-half of that of 1921. While the Freight Claim division did not bring the changes which produced these results, he continued, it was the first to have the vision and then promote the necessary work to be done. He also said: "Claim prevention naturally involves many departments of a railroad, hence several of the divisions of the American Railway Association. We will have to be quite circumspect in dealing with these matters lest we presume upon the prerogatives of some other division. It was found that the efforts of several of the divisions were over-lapping and causing some confusion, hence President Aishton called a meeting of the chairmen and secretaries of the divisions on January 31, 1922, with a view to adopting a policy which would reduce these conflicts to a minimum. An advisory council was formed of representatives of all of the divisions, whose duty it is to canvass the activities of all of the divisions and adopt a program of operation to avoid conflicts. Any matter of importance that may come up hereafter and which may involve more than one division will be referred to this advisory council for decision as to how it shall be handled. Of course this refers only to our claim prevention work.

"I know of no way to advance the desired friendship with patrons of the railways more than by prompt and intelligent investigation of freight claims and their adjustment on fair and reasonable lines with our claimants at the earliest possible time. I do not mean to say that we should pay any claims we have not heretofore paid. If our investigation shows we owe a claim, the claimant is entitled to his money promptly. If the investigation shows he is not entitled to the payment, we should be able to convince him in a way that will not lessen his friendship. Our success, individually or collectively, can rest permanently on no other basis than honest, fair and prompt adjustment of our claims with our patrons."

Colonel Dunn Talks

B. W. Dunn, chief inspector of the Freight Container Bureau of the American Railway Association, discussed the problems of that body in one of the most interesting and constructive talks before the convention. "We are asked," he stated, "to make an engineering study of the construction of a container to give it the strength necessary to meet certain destructive forces. We are asked to pass upon the strength of a freight container to carry 100 lb. of freight but we are not told the maximum destructive force that container will encounter in transit. While that service is being performed that container is liable to meet certain destructive forces. If a car is handled in a certain way during transit, forces are going to be generated which will have a tendency to break that container. We know how to test and prepare specifications for a container where it is expected to carry 100 lb. of freight under normal conditions, but what we do not know, is the maximum shock that that freight car is liable to receive."

Fitch Elected Chairman

William C. Fitch, freight claim agent of the Southern Pacific, was elected chairman of the freight claim division for the ensuing year. J. B. Baskerville, assistant general claim agent of the Norfolk & Western, was elected first vice-chairman to succeed H. C. Howe, recently deceased, while J. F. Horrigan, freight claim agent of the Northern Pacific, was elected second vice-chairman to succeed Mr. Fitch. Lewis Pilcher remains as secretary of the division. H. M. Moors, freight claim agent of the Southern Pacific in Louisiana, C. M. MacDonald, freight claim agent of the Boston & Maine, H. C. Pribble, general claim agent of the Atchison, Topeka & Santa Fe and W. B. Kellett, freight claim agent of the Ft. Worth and Denver City were elected members of the general committee. R. L. Calkins, freight claim agent of the New York Central and H. R. Grachau, freight claim agent of Chicago, St. Paul, Minneapolis & Omaha, remain on that committee, their terms having not yet expired. H. B. Bierman, general freight claim agent of the Missouri, Kansas & Texas of Texas, was elected chairman of the Appeal committee, the other members of which are J. J. Hooper, general claim agent of the Southern and J. F. Horrigan, freight claim agent of the Northern Pacific.

It was decided to hold a second freight claim prevention congress in the early fall, the place and date to be determined later by the general committee. It will, however, probably be held in Chicago in either September or October.

International

Cushions to Make Sleeping in German Day Coaches More Comfortable

Results of Operation of French Railways in 1921

Deficit Reduced About One Billion Francs—Earnings 190 Per Cent Greater Than Pre-War; Expenses, 429 Per Cent Greater

By Marcel Peschaud

General Secretary of the Committee of Management of the Great French Railways

In 1921 a new railway regime, established by the convention of June 28, 1921, was substituted in France for that instituted by the conventions of 1883. Although the law sanctioning this convention was not promulgated until October 29, 1921, and the convention was not ratified by the shareholders of the railway companies until January and February following, the financial organization provided for came into operation with retroactive effect as from January 1, 1921, this date marking the commencement of the fiscal year for the companies.

From the administrative point of view the new regime brings about co-ordination between the managements of the different lines by the establishment of a Committee of Management dealing with all questions of a general nature of common interest, and between the managements and the general interests of the country, by the establishment of a Superior Council, a consultative body, on which have seats, together with the representatives of the lines and of the employees, representatives of general national interests (commerce, industry, agriculture) and also of the great public administrations interested.

The Common Fund

From the financial point of view this co-ordination takes the form of the establishment of a common fund for all the railways, from which each railway may draw sums required to enable it to meet unearned expenses and charges, and to which the prosperous lines are to pay in their surpluses after all their own charges have been met. In principle the equilibrium of this fund is secured by the working of the tariffs; and eventually, if economic circumstances do not allow of the necessary advances in rates, it will be maintained at the expense of the public treasury, the government having requested the companies to make advances to the fund for its account and the companies borrowing the necessary sums for that purpose.

The reports which have just been presented by the Boards of Management of the great private companies to the meetings of shareholders, show what have been the results of the first year of this new regime. It will not be possible to appreciate fully the effects of the Convention until 1922, because, although it came into force as from January 1, 1921, it was not really applied with all its provisions until January, 1922.

The financial position of the French private railway companies in 1921 appears much better than in 1920, in spite of the economic crisis and the drought, which have hampered traffic. In the case of the five large concessionary (private) lines the deficit on the operation account has been reduced from 1,300 million francs in 1920 to 383 million francs in 1921; and the total deficit, in spite of the heavier fixed charges for the loans, was only 1,600 millions in 1921, a decrease of 1,000 millions on the preceding financial year.

It is to be noted that only the concessionary (private) lines are referred to here. The state lines generally do not publish their reports until a year later than the companies.

Issues of Bonds

The issues of bonds by the companies in 1921 were of greater importance than in the preceding years. In the first place, the expenses connected with the purchase of rolling stock, the constructing of new lines and especially electrification, were greater; and, while awaiting the coming into force of the new regime, and under the legal authority given them in 1914, the Nord and P. L. M. companies continued in 1921 the issue of bonds to cover the deficiency for the financial year (653 million francs for the two lines) as these companies, in contrast to the other three large private lines, have ceased to enjoy the guarantee of the state since 1914.

The amount of capital raised by the companies in 1921 was, consequently, the highest attained since they were established. The bonds and debentures sold reached a total of 3,052,000,000 francs. This new capital was distributed as follows among the individual companies:

	Capital realized
Nord	694,000,000 francs
Est	120,500,000 francs
Paris-Lyons Mediterrean	1,427,500,000 francs
Paris-Orleans	562,800,000 francs
Midi	247,400,000 francs
Total	3,052,200,000 francs

Previous to the war the proceeds of issues did not exceed a total of 400 millions for all the companies taken together. In 1918 the amount increased to nearly 500 millions. In 1919 it reached 1,396 millions and in 1920, 1,062 millions. What an effort was made by the companies in 1921 can be judged from the fact that the figure of their issues exceeded 3,000 millions.

Thus the amount of the bonds issued by the five companies from their establishment to December 31, 1921, reached 21 billions 425 millions. If to this be added the share capital raised (1,318 millions) the figure of 22 billions 800 millions is arrived at, which represents the call upon savings made since their establishment by the only concessionary lines still in existence.

Interest Charges Heavier

Unfortunately, if the issues of the companies were considerably larger in 1921 than in the preceding years, the expenses for interest and redemption were also greater. The minimum rate of interest and redemption for the bonds, which did not exceed 5.5 per cent in 1913, and had risen to 7.5 per cent in 1919 and to 8.5 per cent in 1920, increased to 9.5 per cent in 1921. This progressive increase is the consequence of the general increase in the price of capital.

The desire to take advantage of the coming fall in the rates of interest led the companies to continue in 1921 the issue of short period debentures, repayable in 2, 3, 4 or 10 years. These debentures, on which the companies undertook to pay the taxes, were very favorably received by the public.

On the other hand, the Midi and Orleans companies issued 6 per cent bonds in the United States and the Nord, P. L. M. and Orléans companies have more recently floated loans on the London market, which have had great success, although the rate at which they were issued was lower than that of the last loans floated in France. The subscription lists were open for a few minutes and the amount was subscribed immediately. It can be seen from this that the credit enjoyed by our great companies is as good abroad as in France.

The net capital liabilities (after deduction of the annual

payments due by the state) have increased since 1913 and 1920 as shown by the following table:

NET CAPITAL LIABILITIES (SHARES AND BONDS)

Companies	(In Millions) Net capital liabilities In 1921	In 1920	In 1913	Increase % in comparison With 1920	With 1913
Nord	156.3	226	122	—30%	28%
Est	149	124.6	110	20%	35%
P. L. M.	338.7	327.6	248	3%	36%
P. O.	206.3	162.5	146	23%	37%
Midi	128	78.1	67.7	33%	52%
Total	978.3	918.8	693.7	3%	36%

If, in order to make a comparison with the year 1920, there are added for 1921 the payments due by the state, a total of 1 billion 123 millions is arrived at, an increase of 205 millions, or 22 per cent, on the figure for 1920. The charges connected with the share capital have remained perfectly unchanged. The progressive increase in the charges must be ascribed to the bond capital.

During the past financial year the companies continued regularly to insure the retirement of their capital. The number of bonds repaid in 1921 increased, for the concessionary lines, to 340 million francs. If there be added to this figure the retirement of shares (about 15 millions), a total figure of retirement of 355 millions is arrived at. On December 31, 1921, the amount of retirements effected since the establishment of the companies was 5 billions 934 millions of bonds and 300 millions of shares.

Capital Expenditures

Capital expenditures were made for the construction of new lines, for electrification, for various works and for the purchase of rolling stock.

The work of constructing new lines, which was suspended during the war and resumed from 1919 onwards, was continued. On the P. L. M. the work on the line from Nice to the Italian frontier via Sospel, and on the Est the construction of the line from St. Dié to Saales is in progress. On the Midi the work of constructing the trans-pyrenean lines is being actively carried on. The shareholders' meeting authorized the company to advance to the state in 1922 a sum of 56 millions for the covering of the expenditure connected with this work.

During 1921 the electrification programs of the great railway systems entered upon the period of realization. The Orléans, which is to electrify about one-third of its system, submitted to the Ministry of Public Works projects relating to the electrification of the lines from Paris to Orléans and from Bretigny to Dourdan. As regards the other portions of the system which are to be electrified, it has granted the contract for the construction of hydraulic works in the Haute-Dordogne district and obtained an interest in the construction of another hydraulic works, on the Creuse, the work on which has commenced.

The P. L. M. has completed its preparations for the first stage of its electrification program. It contemplates, first of all, the equipment, within a period of four years, of the line from Culoz to Modane, the prolongation of which in Italy is already electrified; then, simultaneously with the electrification of the line from Nice to Coni, in course of construction, that of the Nice suburban section between Cannes and Mentone. On the Midi, which is to be almost entirely electrified, the work is in full progress.

Reconstruction of Destroyed Railway Systems

The reconstruction of the lines destroyed by the Germans may be regarded as accomplished. On the Nord the destroyed constructive works have been finally restored (5 tunnels, 600 rail-bearing bridges and viaducts, 160 over-bridges); as regards railway stations, 353 station buildings and 339 goods sheds have been rebuilt. In the large centres the reconstruction and transformation have been carried out in accordance with the best technical plans. The shunting (switching) stations in particular have been reconstructed with improvements calculated to insure the best results from the labor employed, while at the same time permitting, in proportion as may be necessary, a considerable increase in output. On the Est the work of restoring the destroyed lines is nearly finished. The reconstruction of the great bridges over the Meuse, which had been delayed by the floods, will be completed this year. The same will be the case with the station buildings, the sheds and the gate-keepers' houses which have to be rebuilt.

More Locomotives and Freight Cars Than Before the War

The rolling stock of the companies increased still further in 1921. On December 31 it comprised 14,464 locomotives (as compared with 10,959 in 1913 and 11,333 in 1920) with an output, in round figures, of 14,000,000 steam h.p. (as compared with 11,000,000 in 1913 and 13,000,000 in 1920).

The number of goods wagons increased from about 300,000 in 1913 to 345,000 in 1920 and 367,000 in 1921.

The number of passenger coaches has slightly decreased since 1920 owing to certain lines having discarded coaches the type of which was no longer suited to present requirements, or the renovation of which would have been too expensive.

Because of the decrease in the traffic there is a plethora of rolling stock on the French railways.

Results of Operation in 1921

The gross receipts of the concessionary (private) lines amounted to 4 billions 910 million francs in 1921, an increase of 193 per cent over 1913 and of 10 per cent over 1920. Operating expenses were lower than for 1920 by 8 per cent, amounting to 5 billions 292 million francs; but they are still higher than in 1913 by 430 per cent.

The Est Company alone shows small net earnings; the other companies show deficits. The deficit on operation for all the concessionary lines taken together amounted to 383 millions, distributed as follows:

Companies	Gross receipts (in millions)	Working expenses (in millions)	Net earnings (in millions)	Ratio of working expenses to gross receipts
Nord	984.6	1,059.5	— 74.9	107%
Est	910.1	908.2(2)	+ 1.9	99%
P. L. M.	1,670.8	1,732.4	— 61.6	104%
P. O.	923.8	1,094.3	— 170.5	120%
Midi	420.2(1)	498.4	— 78.2	118%
Total	4,909.5	5,292.8	—383.3	108%

(1) Net receipts (after deduction of taxes and rebates).
(2) Including the repayment of one-fifth of the proceeds of the increase in the rates (Convention of November 10, 1916).

The deficit from operation amounted in 1920 to 1,927 millions. The decrease in the deficit amounted in 1921 to 913 millions—that is to say, 70 per cent. This decrease is even more important than appears at first sight, because the operating account of the companies is burdened in 1921 with expenses which were payable by the state in 1920, these being the family allowances and the bonuses for the increased cost of living granted to pensioned employees. In 1920 these expenses, taken together, represented a total of about 115,000,000. Taking these into consideration for 1920 the total deficit for that year would be 1,312 millions. The actual decrease in the deficit in 1921 was therefore 1 billion 29 millions. This improvement in the operating results was due both to an increase in the earnings and a reduction of expenses.

The increase in earnings is in part due to the fact that the last advance in rates authorized by the law of February 14, 1920, which brought the total of the increases up to 140 per cent for goods rates and up to 70.75 and 80 per cent (according to the class) for passenger rates, benefited

the whole of the financial year 1921, whereas it affected only the last ten months of 1920. It is further to be ascribed to the general increase in traffic in 1921, especially in passenger traffic, due to the improvements in their service made by the companies. The increase is of importance on the Nord and Est systems above all. In fact, it is upon those systems that the increase in traffic has been greatest.

The receipts for the conveyance of passengers reached 1 billion 233 millions, representing 25 per cent of the total gross receipts. The advance in the rates having been 70.75 to 80 per cent, according to the class, it will be seen that that advance did not lead to a reduction of the traffic, seeing that the receipts from the latter increased by 151 per cent as compared with 1913.

The number of passengers carried exceeded on all the lines the figures for 1913 and 1920. It amounted to about 436,000,000 for the large private companies, as compared with 379,000,000 in 1920 and 388,000,000 in 1913; the increase is 15 per cent as compared with 1920 and 12 per cent as compared with 1913.

Improvements in Passenger Service

The increase in traveling is to a great extent due to the improvements effected by the companies in the train service. The companies have again put into force the sale of collective return tickets to the members of certain associations and have granted fresh facilities for collective family traveling. Furthermore, they have continued to make improvements in long-distance connections. New express trains have been introduced, direct services have been established, for instance, between Strasbourg and Bordeaux, and between Bordeaux, Toulouse and Marseilles. The south express, which had not been running since the war, has been reinstated. To encourage tourist traffic they established joint offices at Brussels, Berne, New York and Rome. With the same object they continued to extend the motor car services in the districts favored by tourists and joined in the establishment of hotels or encouraged the hotel industry in those districts.

At the same time the service became more regular. The number of delays to trains, which had reached 48 per cent after the war, was almost insignificant in 1921, being 2.8 per cent on the Nord system, 1.72 per cent on the Est, 3.17 per cent on the P. L. M., 1.79 per cent on the P. O. and 4.3 per cent on the Midi.

The tonnage conveyed by fast freight trains has decreased somewhat in comparison with 1920. This decrease is partly explained by the reversion to slow-train conveyance for certain classes of traffic, especially as regards the conveyance of animals, which was previously effected by fast train. The receipts of the companies for slow-train traffic amounted to 3 billions 62 millions, an increase of 10 per cent as compared with 1920 and of 224 per cent as compared with 1913. They represent 62 per cent of the total gross receipts.

The increase in the receipts in 1921 as compared with 1920 is, as has already been said, partly due to the fact that the advances in the rates authorized by the law of February 14, 1920, were in force throughout the financial year 1921, while they benefited the financial year 1920 only during 10 months, it is due also to the unification of the goods tariffs which was carried out during the financial year 1921 and brought about certain increases in the rates. It is estimated that the total advance in rates amounts to from 220 to 230 per cent—something very near the increase recorded in the receipts. The latter would have been much greater had it not been for the economic crisis and the drought in 1921.

As regards the lines as a whole, the tonnage carried by slow train was slightly larger than in 1920 (139,900,000 tons as compared with 139,800,000) but it has not yet reached the figure of 1913.

The Nord and Est systems are those which show the greatest increase in tonnage. This is chiefly due to the growing activity in connection with the reparation work in the devastated districts. But these lines are far from having recovered their pre-war traffic in coal and metallurgical products, which came from the mines or works at present undergoing reconstruction.

On the P. O. system the tonnage decreased by 15 per cent as compared with that of 1920, but was still greater than in 1913. On the P. L. M. the tonnage carried by slow train was less than in 1920 or 1913, but the ton mileage was greater by 5 per cent than in 1913.

On the Midi the tonnage carried by slow train was 3.7 per cent less than in 1920 and also less than in 1913.

On these three systems the diminution in the tonnage has been chiefly in minerals and metallurgical products. This shows that the decrease in traffic is caused by the industrial crisis and that when the latter is over the traffic will regain its vigor.

The great lines have taken certain measures to encourage the development of traffic. On the Est the allowances granted on the conveyance of complete train-loads of minerals have been increased. They amount at present to a total of 29.25 per cent for a train of 600 net tons in private 40-ton wagons. The improvement in the working conditions of the great lines has enabled relaxations to be made in the regulations relating to the storage of goods at stations. Since November 1, 1921, the charges for warehousing and standing have been considerably reduced, the reductions for the warehousing of goods varying from 20 to 90 per cent and for standing places from 10 to 50 per cent. The lines are studying the readjustment of tariffs in order to meet the reduction in the value of the goods, and in doing so are endeavoring to give preference to raw materials and long-distance traffic.

Operating Expenses 429 Per Cent Higher Than in 1913

The working expenses in 1921 were 5 billions 292 millions, as compared with 5 billions 758 millions in 1920. In 1913 the expenses amounted to only 999 millions, and in 1921 were still greater than in that year by 429 per cent, whilst the earnings have increased only 193 per cent from 1913 to 1921.

Companies	Working expenses (in million francs) in 1921	in 1920	in 1913	Increase or decrease in comparison with 1920	1913
Nord	1,059.5	1,216	207	—12%	+411%
Est	908.2	896	188	+ 1%	+383%
P. L. M.	1,732.4	1,858	340	— 6%	+409%
P. O.	1,094.3	1,240	184	+11%	+494%
Midi	498.4	546	80	— 8%	+525%
Total	5,292.8	5,758	999	— 8%	+429%

The reduction in expenses in 1921 is to a great extent attributable to the reduction in expenditures for fuel, to improvements effected in the service and, in a lesser degree, to the decrease in the cost of the staff.

The decrease in the expenditure for fuel, which amounted to 53,000,000 on the Est system, 155,000,000 on the P. O., 56 per cent of the expenditure for 1920 on the P. L. M. and 30,000,000 on the Midi, is chiefly due to the fall in the price of coal. The average price per ton on the P. L. M., for instance, which was 266 francs in 1920, comes out at 187 francs for 1921; that is to say, 30 per cent lower.* The prices at the end of the financial year were around 150 francs, but that figure is far removed from the pre-war price (30 francs in 1913).

The decrease in the expenditure for fuel is also due to the decrease in the consumption per kilometre of the engines. On the Est system, for instance, the consumption per kilometre of the locomotives was reduced from 24 kilograms in 1920 to 20.6 kilograms in 1921. Likewise, on the P. L. M., the consumption of coal per kilometre, which had fluctuated between 24.5 kg. and 22.5 kg. in 1920, diminished to about

*Figured at the present rate of exchange, these prices for coal were about $26 per ton in 1920, and about $18 per ton in 1921. A franc at present exchanges for about 10 cents in American money.—*Editor.*

20 kg. during the last three quarters of 1921. During 1921 that line continued its experiments for improving the consumption of the locomotives by the utilization of superheating and the pre-heating of the feed water.

The Paris-Orléans completed the fitting-up of the apparatuses for firing with fuel oil (mazout) on three of its locomotives. The runs hitherto made on fuel oil (mazout) have not justified the more extensive use of that method of firing.

Employees Reduced 9 Per Cent

Generally speaking, the cost of the personnel declined in 1921. This decrease is in part attributable to the diminution in the number of employees. The decrease in the traffic on certain lines and the greater experience gained by the employees engaged since the war (thanks, more especially, to the establishment of traffic and transport schools) enabled the lines to discharge a certain number of minor officials and day laborers and to make less appeal to the services of auxiliary labor. The reduction of personnel amounted to nine per cent.

NUMBER OF EMPLOYEES

(Including Auxiliary and Temporary Employees)

Companies	Number in 1921	Number in 1920	Decrease %
Nord	72,444	76,909	5%
Est	65,464	75,326	13%
P. L. M.	103,771	118,577	14%
P. O.	65,490	72,179	10%
Midi	34,705	35,331	2%
Total	341,874	378,322	9%

The number of employees is still greater by 28 per cent than in 1913, because during 1921 the lines continued to suffer under the burdensome effects of the 8-hour day, without having been able to obtain, as they had hoped, a revision of the truly unreasonable conditions of its application to the railways. The additional expenses for materials and staff entailed upon the six great lines by the 8-hour law amount to about 1,100 million francs. That figure represents rather more than half of the total deficit of the lines.

Maintenance Expenses Increased

The expenses for repairs to rolling stock increased slightly in 1921. This increase was due to the measures taken to accelerate the reconditioning of the rolling stock, which had been postponed during the war. It was also due to the important nature of the repairs effected in 1921 to rolling stock which was in a very bad condition, for in 1920 the lines began by repairing the locomotives and wagons which were least damaged so as to be able to recondition a large number of units more rapidly. This work is nearly completed. The expenses for the maintenance of tracks and buildings also increased, for in 1920 they had to be reduced owing to the scarcity of materials. This increase was also due to the energy with which the work of rehabilitating the tracks of certain lines was pushed forward with the object of permitting the running of heavy engines.

To sum up, the earnings increased in 1921 in spite of the crisis which bore hard upon industry and contributed to the decrease in traffic, and there has been a decrease in expenses in spite of the paying off of a considerable amount of arrears left by the war and the taking upon themselves by the lines of the payment of grants to the employees which were formerly paid by the state. The point cannot be too strongly emphasized that these results, which are shown by a decrease in the deficit from operation, were attainable only by means of a continual effort on the part of the managements. If traffic has increased, this is due in the first place to the fact that the companies whose lines had been damaged in the war pushed forward, with the greatest energy, the work of reconstruction which was to enable the districts served by them to carry on a more normal life. It is also due to their having progressively increased the number of passenger trains and encouraged tourist traffic. It is further due to the fact that, thanks to the continuous improvements in their methods of working and the care they have devoted to the organization of a personnel hastily recruited on the morrow of the armistice, they have obtained greater regularity in their passenger and goods services. Finally, they endeavored to effect every possible economy—in the cost of personnel—by reducing the number of employees; in the cost of fuel, by improving its consumption.

The Balance of the Financial Year

If the deficit on the subsidiary services and the capital liabilities be taken into account, the operation of the concessionary (private) lines shows a total deficit of 1,351 million francs in 1921. This deficit no longer falls upon the state, as was the case when interest was guaranteed, but upon the fund established by the Convention of June 28.

Although the accounts of the state railway for the financial year 1921 have not yet been definitely made up (the accounts for the year 1920 have only just been published) it is possible, judging by the credits voted by Parliament on the budget, to estimate the results of operation for the year. They show a deficit on operation of 675 millions in round figures—that is to say, nearly half as great as the deficit of all the five concessionary (private) lines taken together. Thus the operating results for the whole of the French railway systems taken together show a deficit of, in round figures, 2,026 millions in 1921. [At the present rate of exchange this is about $203,000,000.—*Editor.*]

This figure does not include the special war-time compensations (720 francs per official), which were still paid by the state in 1921. The amount of these for 1921 is about 320 millions—namely, 250 millions for the concessionary (private) lines and 70 millions for the state railway system. If these be taken into account the total deficit of the concessionary lines comes to 1,600 millions, as compared with 2,610 millions in 1920; thus the deficit has decreased by 1,000 millions, or 38 per cent. For the whole of the French lines, including the state railway system, the deficit comes to 2,345 millions in 1921, as against 3,530 millions in 1920, there being thus a decrease of 33 per cent.

The "convention" of June 28, 1921, authorizes the institution of a management premium intended to give the companies, and also their personnel, an interest in the development of traffic and in economy in expenses. The premium for the company consists of two elements, both based upon the comparison of the year under consideration with the year 1920. The first is equivalent to three per cent of the increase in the receipts (not including advances in rates). The second is equivalent to one per cent of the decrease in the deficit or, if the receipts exceed the expenses, to one per cent of the total of the surplus and the deficit for 1920. In the case of the Nord and Est systems this ratio has been raised from one per cent to two per cent. If the deficit is greater than for the financial year 1920 the company is subject to a penalty proportional to the amount of this increase in the deficit, to be charged against the premiums for the following years. Generally speaking, the premium granted to the personnel is double that for the company.

For the concessionary lines the premiums thus earned for the financial year 1921 amount to 32,576,000 francs, of which sum 11,326,000 francs goes to the companies and 21,250,000 francs to the personnel. In the case of the state railway system the premium in connection with the first element amounts to 130,800 francs, being 43,600 for the railway and 87,200 for the personnel. As regards the second element, the state railway system not only does not benefit by any premium at all, but is penalized 351,000 francs, which will have to be made up out of the premiums for subsequent years.

The premiums have to be paid out of the joint fund. The latter showing a deficit, the amount of the premiums must be added to the lines' deficit mentioned above. Thus the

total deficit chargeable to the joint fund comes to 2,059 millions, 1,384 millions for the concessionary (private) lines and 675 millions for the state railway system.

Thus, although there is still a deficit, the financial position of the companies shows an improvement as compared with 1920. What are the prospects for the financial year 1922? In the first place, the increase in earnings is bound up with the resumption of economic activity and that resumption, of which symptoms were thought to be perceptible at the end of last year, is not yet clearly discernible. Furthermore, it is under present circumstances not possible to contemplate increases in the tariffs capable of establishing the financial equilibrium of the lines. On the contrary, the industrial crisis, while contributing to the decrease in traffic, leads to numerous demands for rate reductions being made in the hope that a decrease in the rates for the conveyance of certain commodities or industrial materials would lead to a revival of business. The companies, being desirous of facilitating this revival, have undertaken, in agreement with the public authorities, a revision of the unified tariffs, which had in some cases placed an excessive burden upon certain kinds of traffic and had caused difficulties in certain transactions. Numerous tariffs have already been revised and proposals submitted to the Minister of Public Works; others are being considered. The result of all this revisionary work will be a considerable reduction of the rates which are burdening industry and commerce. It is to be hoped that this will increase traffic and that this increase of traffic will compensate for any losses the railways may suffer.

As regards expenses, the lines will find themselves charged in 1922 with the expenses connected with the allowance to employees for the increased cost of living, amounting to 720 francs, hitherto borne by the public treasury. They will also have to meet the considerable additional expenses resulting from the increases in pensions. On the other hand, there will be a further decrease in the expenses for fuel in 1922; moreover the hope seems justified that there will be a decrease in the cost of personnel owing to a more reasonable application of the 8-hour law.

In spite of all it does not seem that the lines will be able to establish their financial equilibrium, and in 1922 they will again have to resort to borrowing to cover their deficit. It may nevertheless be hoped that this deficit will decrease progressively from year to year, thanks, on the one hand, to the efforts made to develop traffic, and, on the other hand, to the re-establishment of normal economic conditions.

Annual Meeting of Freight Station Section—A. R. A.

Large Attendance—Illuminating Discussions of Many Topics—Inspiring Address by Gen. Atterbury

THE ANNUAL meeting of the freight station section of the American Railway Association was held in Philadelphia, Pa. on June 20, 21 and 22, J. C. Gilmore, chairman of the Section presiding. The members were welcomed to Philadelphia by Robert L. Russell, vice-president of the Philadelphia & Reading and by E. J. Cattell, city statistician. More than 400 members and guests attended the meeting.

Detailed and instructive discussions were held concerning all kinds of freight station activities, but most of the formal action taken was in the shape of resolutions instructing committees how to handle various reports in connection with the parent association. One interesting discussion was that on checking of inbound l.c.l. freight. Descriptions were given of the practice of the Erie Railroad at Cleveland, the Atchison, Topeka & Santa Fe at Kansas City and the Louisville & Nashville at Cincinnati.

Weighing freight loaded into cars from freight houses was discussed at a considerable length. The report on this subject says that probably 90 per cent of the outbound freight houses of the country have no adequate equipment of platform scales, and that at such stations not more than 5 per cent of the freight is weighed. At one station where a count was made for four days it appeared that the consignors had shown the weight on their bills in only 87 per cent of the shipments.

The Committee on Uniform Way Bill has induced the accounting officers' association to make some—but not all—of the improvements which are desired by the local agents. The question of making useful records of the cost of operating a freight house was discussed briefly, but the consensus of opinion was that usually the desired data is not obtainable at reasonable cost; and the subject was dropped. The use of tractors in freight houses was discussed in the same connection. The subject had been studied at length by the committee in charge but here also no cost comparisons could be made with satisfaction, because of the inability to get the records giving all the desired information.

A proposition that a quarterly circular should be issued informing members of the activities of the different committees was warmly approved by the meeting.

Officers. The election of officers of the Section for the ensuing year resulted in the choice of C. M. Teschemaeker (C.&A.), Chicago, for chairman; H. W. Maynard, Jr., (C.N.J.), New York, first vice chairman; and J. R. Hitchcock (A.T.&S.F.), Kansas City, Mo., second vice chairman.

Local Freight Agents as Promoters of Good Relations with the Public

The feature of the meeting on Thursday morning, June 22, was an address by Gen. W. W. Atterbury, vice-president of the Pennsylvania Railroad. Gen. Atterbury said in part:

The work of no other group of railroad men is of greater importance to the welfare of the transportation industry than the work of men in the freight departments. A comparatively new field of public service has in recent years opened up to you—a form of public service of the highest importance. Railroads are regulated by: (1) Congress; (2) Interstate Commerce Commission; (3) State Legislatures; (4) State Public Service Commissions; (5) County Governments; (6) City Governments. Railroad regulation depends upon a well-informed public opinion existing behind all of those regulatory bodies. The railroad problem will never be settled in the courts, for public opinion has its say even after the court of final resort has passed its decision. Our legislators, public utility commissioners and other public officers mean to act wisely. The public in turn means to act wisely and justly. They can act wisely and justly only if they know the true situation.

No other transportation officials, either as individuals or as a group, come into such close contact with the public as do the local agents. None have a better opportunity to cultivate in personal ways a fuller understanding of the railroads and a spirit of co-operation with them in the interest of the common welfare. Here, then, is a new and wonderful field of real service which has opened up to you. To take an efficient part calls for an earnest self-education and a sincere interest—not only a selfish interest in your own welfare but a statesmanlike interest in the welfare of our entire country.

Freight agents are the railroads' "antennae." They are most happily situated to serve as interpreters of the railroad to the

public, and to interpret public sentiment to the railroad men themselves. What shippers think about you is, in most cases, what they think about the railroads. To them, you are the railroads.

The railroads more than any other industry are forced to combat continuously campaigns of misrepresentation, conducted by individuals or organizations whose interests are not those of the public, nor of the employees whom oft-times they profess to lead * * *. I have no quarrel with the man who conscientiously believes in the policy of governmental ownership and operation of the railroads. That is not a moral proposition. But believing, as we do, that the public welfare will be served most efficiently and most economically through private ownership and private operation, under a wise governmental regulation, confined to regulation, we should be remiss in our public duty if we did not inform those with whom we come in daily contact of the reasons for our faith.

This resolves itself, to a large degree, to a question of ways and means. The railroads usually are not well prepared to talk to the men on the street in the simple terms which he understands, and it is this man and members of his family who vote who in the last analysis are back of the governmental policy toward our railroads, and in time their ideas will find their reflection in the laws upon our statute books, and in the decisions of the courts.

The railroad problem to most people means something extremely complex; but the principles underlying the railroad problem may be stated in language simple enough for all to understand. The truth must be learned primarily through statements of the fundamental facts. The public wants to know the facts. There are intcrests which purposcly misinterpret the facts. Not a day passes but that important facts about the railroads are distorted or misrepresented in their presentation to the public.

Every freight agent in the country should feel that it is a part of his duty, first, to educate himself in a proper way about the business in which he is engaged; second, to pass that information on in the countless ways which come to him. The proper handling of this duty is fully as important to his usefulness as the handling of freight. Furthermore, you will find that there is a genuine desire on every hand for information of the kind that you can convey.

There is no other business about which so much can be known. There are no railroad secrets. Every detail can be had for the asking.

Ever since Federal Control, and to some extent before that, a number of so-called economists presuming to speak for the railroad employees of the country have been filling thousands of pages of official records with distorted or misinterpreted facts. As an example—the return which the railroads are allowed to earn is set by governmental authority at a percentage (at present 5¾ per cent) of the property value of the roads as determined by the Interstate Commerce Commission. This is quite different from allowing railroad investors the same percentage return upon their securities * * *. The valuation of the railroads has been under constant attack. The valuation upon which the railroads are allowed to earn a return is determined not by the railroads themselves, but by the government. On this work the government and the railroads have spent more than fifty millions of dollars already.

Again, it is alleged that railroad policies are determined by a small group of banking interests. The fact is that there are more than one and one-half million owners of railroad securities. About thirty million insurance policy holders and about eleven million savings bank depositors have a direct financial interest in the railroads.

There are numerous misapprehensions in relation to wage rates and freight rates. But that is not enough—a great mass of prejudice and ignorance remains. A false picture still abides in the minds of thousands upon thousands. The only way to remove that picture is to substitute a new picture, based upon facts the authority of which can not be questioned and, more important, it must be based upon performance which will tell its own story and paint its own picture.

The railroads must suffer the results of business depression, but the railroads are not in the same catagory as ordinary private business. Their profits are limited by law. Their rates are set by government authority. Their expenses are, to a large extent, determined by government authority. The management has little latitude as compared with ordinary private business in the matter of making money. A private business in times of prosperity may make ten, twenty, fifty or more per cent. It may prepare for the lean years and the years of adversity. The railroads are allowed to do no such thing.

The railroads in the last five years have earned less than four per cent per annum. If railroad facilities are to be increased so that they may meet the demands of the commerce of this country now soon to increase, investments in railroads must be made attractive. This is a very simple situation concerning which there is a great misunderstanding, but which every man in the freight departments of railroads can put before his neighbor or his customer in a way that can not fail to be understood. It is not a matter of railroad selfishness. It is a matter of the public weal.

Outside Contract Repairs to Locomotives Found Justified

WASHINGTON, D. C.

THE INTERSTATE COMMERCE COMMISSION has issued two additional reports on its investigation of the cost f locomotive repairs in outside contract shops, in which it finds justified the resort by the Chicago & North Western to outside shops to obtain classified repairs for its locomotives during 1920, including 35 repaired by the American Locomotive Company, "although apparently for the most part at costs materially in excess of those for similar work in its own shops."

The commission also says that contracts negotiated by the Seaboard Air Line in 1920 with various concerns under which 51 of its locomotives were given classified repairs, although at average costs materially in excess of those for similar work in its own shops, were not found to have been unwarranted.

Commissioner Hall dissented from the finding in both cases for the reasons stated in connection with previous reports, that the proceeding goes beyond the province of the commission and should be discontinued. In the report on the North Western case, the commission says in part:

"In 1919, with the approval of the Railroad Administration, 20 locomotives were sent to the shops of the American Locomotive Company for class repairs, under an estimate made upon inspection, at an average cost of $16,859.30 per locomotive. In December, 1919, an additional ten were similarly forwarded to that company on substantially similar terms. In February, 1920, the regional director approved, subject to the concurrence of the corporate officers, the sending of ten more, and 15 were in fact forwarded. This was done upon a suggestion by wire from the American company that the locomotives be sent without awaiting estimates, which would be promptly prepared and submitted and which it had no reason to believe would not be in line with the estimates covering those sent during federal control; but the bills finally rendered averaged $23,944 per locomotive. Between March and October, 1920, respondent sent 35 more locomotives to the American shops, eight to the Manitowoc Shipbuilding Corporation, and two to the Elgin, Joliet & Eastern Railroad shops, all without bids or contracts. Of the 35 to the American shops, final bills for ten sent in July averaged $27,534 per locomotive, and final bills for the remaining 25 averaged $29,534. The repair cost of the two sent to the Elgin, Joliet & Eastern averaged $12,690, while those of the only two sent to Manitowoc comparable in type with the others averaged $20,857.

"Respondent has refused to pay the bills of the American covering the last 35 locomotives repaired, deeming them excessive, and, in view of the American's refusal to revise the bills, thinks it likely that the matter can be adjusted only by litigation. The dispute appears to involve a total of approximately $500,000.

"The cost of similar work in respondent's shops is computed by the investigators to range approximately from $8,000 to $13,000, depending upon the type of locomotive. However, the record abundantly establishes the critical condition of the respondent's motive power and respondent's inability to cope with the situation in its own shops, and, subject to the possibility that preliminary estimates might have resulted in better terms, fully justifies the resort to outside shops for assistance."

Beginning soon after the end of federal control, the Seaboard entered into various contracts with industrial concerns under which 51 of its locomotives were given class repairs,

at an aggregate cost of $815,424.41. The work performed and the cost thereof were divided as follows: Baldwin Locomotive Works, Philadelphia, Pa., 25 locomotives, $545,974.72; Charleston Dry Dock & Machine Company, Charleston, S. C., nine locomotives, $80,552.28; Merrill-Stevens Shipbuilding Corporation, Jacksonville, Fla., four locomotives, $49,760.15; Southland Steamship Company, Savannah, Ga., six locomotives, $55,681.98; Broadfoot Iron Works, Wilmington, N. C., four locomotives, $48,462.66; and Woodward Iron Works, Birmingham, Ala., three locomotives, $34,992.64. With the exception of the Baldwin plant, the several contract shops were located on respondent's lines, and for the movements thereto and therefrom no freight charges were incurred. The freight charges to and from the Baldwin plant were still in dispute at the time of the hearing, but were estimated to be between $400 and $500 per locomotive, in addition to the foregoing figures. Per locomotive, the Baldwin charges were much the highest. The commission says:

"The shop records indicate that, with the exception of those made at the Baldwin plant, the contract repairs were generally lighter than the same class of repairs made on the same classes of locomotives in respondent's shops, while those at the Baldwin plant were average class 3 repairs.

"During the 20 months of federal control the Railroad Administration expended an aggregate of $438,663 on shop buildings, shop machinery and tools, and engine houses and appurtenances, chargeable to capital account; but the extent to which these expenditures increased the capacity for classified repairs is not shown. Based upon reports to the Railroad Administration and taking 43 locomotives repaired in respondent's shops as contrasted with the figures covering 44 of the 51 locomotives repaired in the contract shops, the average cost per locomotive is shown as $7,156.97 in respondent's shops and as $14,913.79 per locomotive in the contract shops.

"The total cost of the repairs in the contract shops, inclusive of estimated freight charges, material furnished by respondent, and inspection by respondent, is shown as $836,030.27, an average of $16,392.75 per locomotive. The cost of substantially similar repairs on the same classes of locomotives in respondent's shops in the same period is computed to average $7,722.59 per locomotive, on which basis the total excess cost of the contract repairs was $442,178.16, or an average of $8,670.16 per locomotive. The items of cost in respondent's shop are labor and materials, inclusive of shop and store expense, but including no other overhead account, on the ground that respondent's overhead expense remained practically constant notwithstanding the repair of the 51 locomotives outside.

"It was suggested at the hearing that by putting respondent's shops on a nine-hour basis the necessity for sending locomotives to the contract shops might at least have been reduced. The suggestion was answered by testimony on behalf of respondent that certain of the shopmen agreed to work overtime on condition that the same schedule should be followed in all the system shops, and it appears that at the Savannah shop the men declined to work overtime. There is also testimony to the effect that extensive shipyard strikes along the Atlantic coast in the summer of 1920 released large numbers of skilled mechanics who could have been secured by respondent, but this was after all the contracts had been made.

"While there is much detailed evidence of record, the determinative facts are few. There were more locomotives on the line at the end than at the beginning of federal control, which increased respondent's capacity to move traffic, but all were actively engaged and likewise increased the demands upon the shops by so much. This is shown by the larger number in and awaiting shop for class repairs at the later date; and the condition of the motive power necessarily was aggravated by the materially greater gross-ton and locomotive mileage in 1920 than in 1919, due to the increased traffic. The figures submitted tend to confirm respondent's estimate of the maximum capacity of its shops, and the accrued bad-order power was considerably in excess of that capacity at all times in 1918, 1919 and 1920. The figures also indicate that the shops were so fully utilized from the time private control was resumed and the striking increase in traffic on the line began that no substantial increase in the output would have been reasonably possible. While some of the figures are rather close, it does not appear that the awards of the contracts were unjustified."

National Transportation Institute Strongly Endorsed

WASHINGTON, D. C.

THE MOVEMENT FOR the organization of a National Transportation Institute, as an institution under private disinterested auspices to make fundamental studies into transportation and its relationships and to promote education in the processes, methods and relationships of transportation among those responsible for transportation performance, as well as to the general public, is strongly endorsed in letters from leading members of Congress and members of the Interstate Commerce Commission which are being published in pamphlet form by President Bird M. Robinson of the American Short Line Railroad Association. The place for the establishment of such an institution was proposed by Mr. Robinson several months ago and was outlined in his address at the annual meeting of the Short Line Association at Washington on April 25 (*Railway Age*, April 29, 1922, page 1030). The plan has since been recommended by the Joint Commission on Agricultural Inquiry in its report on transportation, which is about to be submitted to Congress, and Edgar E. Clark, formerly chairman of the Interstate Commerce Commission, has consented to be chairman of the board of governors. Those active in the work of organization, in addition to Mr. Robinson, include Sydney Anderson, chairman of the Joint Commission on Agricultural Inquiry, and D. D. Conn, who, as chief of the division of transportation of the Joint Commission, had charge of the transportation part of the commission's investigation. The letters from members of Congress are largely from those who as members of the committees on interstate commerce have been especially interested in transportation affairs.

Would Fill An Imperative Need

In a letter to Mr. Clark, Representative Anderson says:

"I am glad to know that this recommendation is in the process of realization through the proposed creation of a National Transportation Institute. We have just completed a year of investigation of transportation in all its phases, with special reference to its economic aspects and relationships. The outstanding thing which a year of investigation has developed, is that there is no organized body of information touching the economic relations of different transportation agencies to each other, or to agriculture, industry, trade, commerce or finance; nor is there any organized basis of knowledge upon which sound transportation policies can be predicated.

"There is, it is true, a mass of data touching operation, physical valuation, car movement, etc., but almost nothing upon the effect of rates or transportation service upon the movement of commodities, the volume of traffic, or the state of business of the country. There are many problems vitally affecting transportation agencies, shippers and the public, which should be studied from an impartial standpoint on the basis of definitely ascertained fact. No agency today is engaged in research with respect to transportation problems in an economic sense or in organizing the facts of transportation on a basis equivalent to that which has preceded the discovery and application of most of the methods, machinery and organization of modern industry, engineering and science.

"There is very great need for the establishment of an institute

to obtain and organize the facts of transportation in all its relationships and to make fundamental studies from which the process and practice of transportation can be determined and reduced to a definite formula of action. Such an agency would also be a splendid instrument of education, not only of those responsible for transportation performance and regulation, but also of the general public.

"The creation of a National Transportation Institute under thoroughly disinterested, private auspices, would fill an imperative need in a field which so far has scarcely been touched."

Must Be Wholly Disinterested

Chairman Cummins, of the Senate Committee on Interstate Commerce says:

"I assume that the institute is to be wholly disinterested, for it would be of little or no value unless established on this basis. With this understanding I feel free to say that nothing is more needed at this time than an organization having for its purpose the ascertainment and dissemination of the truth respecting transportation. I do not mean the ascertainment of the isolated facts alone but the intelligent and impartial marshalling of the facts in their relation to each other.

"There is no subject upon which the people are so easily misled, no subject upon which misrepresentation or half-truths are so fatal to sound judgment, as that of transportation. I congratulate the people of the country upon your selection as leader of this most worthy undertaking and earnestly hope that the institute will achieve the highest success."

Four Distinct Considerations

Chairman Winslow, of the House Committee on Interstate and Foreign Commerce, in a letter to Mr. Anderson, says:

"From your brief yet most interesting elaboration of the fundamental thought underlying this recommendation I gleaned that your commission had in mind primarily four distinct considerations: First, the desirability of keeping current the statistical data and compilations which the commission has made as one of the results of its study and investigations; second, the need for accurate and reliable data relating to transportation in its broad and comprehensive sense to the end that there may be found a sound basis of fact upon which the various agencies and instrumentalities of transportation may be properly correlated under a broad transportation policy; third, the desirability of more intensive study of the fundamental principles of transportation including those scientific and academic problems which for obvious practical reasons are not within the legitimate scope of the prescribed powers and duties of the Interstate Commerce Commission and other kindred governmental agencies; and fourth, the dominant importance of supplying the means and facilities for educating those who desire to enter the transportation business in some capacity and of informing the public on all aspects of transportation—a thing so vital to their happiness and prosperity.

"I was delighted to learn that this splendid conception already has taken on definite form and that there is now on foot a movement for bringing your purpose to realization through the establishment of a national transportation institute. As I understand it and speaking broadly, this plan contemplates the financing of the institute by private contributions from carriers, shippers and the general public and that the definition of the policies and the direction of the activities of the institute is to be under the authority of a disinterested board of competent, public-spirited governors whose eminence in their respective fields and whose character are beyond cavil.

"During my brief service in the House of Representatives I have been a member of the committee on interstate and foreign commerce. I was a member of that committee during the 66th Congress when we were confronted with the task of providing an adequate transportation system following the termination of federal control. I doubt if the magnitude of that undertaking is yet appreciated even in substantial degree by the American people. The great and ever present difficulty involved was our inability to obtain accurate and indisputable facts. The carriers would submit their contentions, the shippers theirs, and perhaps other special interests would regale us with their views. The net result invariably was that we were forced to resort to compromise concerning the real facts of the problem. Palpably no question can ever be solved properly upon a compromise fact basis. Facts in their essence are truth and truth cannot be compromised. If some means can be provided for the intensive and scientific study of the fundamental principles of transportation and this instruction can be directed by impartial and competent minds, the prime difficulty of meeting the transportation requirements of the nation, so far as legislation is concerned, will largely be met. To be sure, the institute must be kept free of any suspicion of domination by special interests and its instructors must be men of acknowledged authority on the subjects entrusted to them. In the light of your broad experience, it will not be necessary for me to add that it must be kept absolutely free from partisan politics and be cast upon a broad American basis. The great subject of transportation is in no sense political—it is economic—and its proper solution is imperative if the interest of the people is to be the guide. Every man, woman and child in America is a constant consumer of transportation. It enters as an important element into everything we eat, wear, consume or employ. Notwithstanding its basic and fundamental character and its paramount importance to agriculture, industry and commerce, up to this time little or nothing has been done in a definite way to get at the fundamental principles and policies upon which transportation may be developed, fostered, correlated and controlled. Vast sums are appropriated from the federal Treasury for the study of insects, birds, bees and shrubs, which is as it should be and I am not protesting, but we must not overlook this much more important thing called transportation and leave to chance and accident the development of adequate transportation services. With the complexities of modern life ever increasing, with the requirements of the people constantly taking on larger and larger proportions, it is indefensible not to take timely action to meet the radically changed and rapidly changing order of things.

"An institute of the character your commission has in mind will, in my judgment, be the largest single factor in bringing this important work into definite shape and in building for a transportation system which will be adequate not alone to your requirements and mine but which will serve posterity as well."

A Need for Such an Institute

Commissioner Esch, in a letter to Mr. Clark, says:

"In my opinion there is need for such an institute. Its most beneficial purpose would be in the collection of reliable data as to all forms of transportation, the co-ordination of such data and application to the solution of the problems now existing and which may hereafter arise. During my service as a member of the House committee on interstate and foreign commerce there have been occasions when the need of reliable and unbiased information was felt. A transportation institute composed of men of large experience and of highest type and actuated by a zeal to serve the public interest would be of great value, not only to both houses of Congress, but to regulatory bodies state and federal and to the general public. Your large experience in transportation matters and knowledge of the problems which both carrier and shipper have to meet fit you in high degree to perform the duties and meet the expectations of the Transportation Institute. I can assure you that your connection with the institute will be an assurance of its success."

At Eight o'Clock every morning, the Canadian Pacific has 36 trans-continental trains on their way across the continent, while at the same time 36 dining cars are serving breakfast. These trains include the "Trans-Canada" which makes the journey from Montreal to Vancouver, 2,885 miles, in 92 hours.

Photo by Kadel & Herbert.

Advertising Its Radio Service

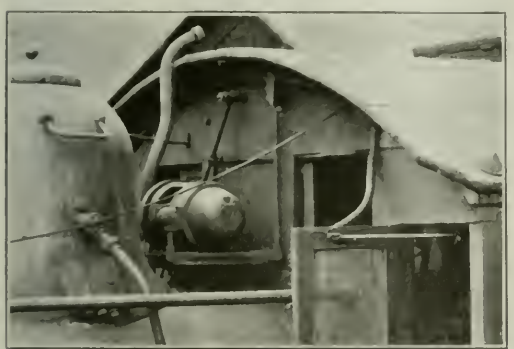
Effect of Design on Headlight Maintenance

Cost of Turbine-Generator Operation Calls for Careful Consideration in Selection of Equipment

By R. Wayne Cargo
Westinghouse Electric & Manufacturing Company

HEADLIGHT TURBINE UNITS seem to be a small item of equipment. The cost is about one fourth of one per cent of the total cost of a locomotive, yet this small part when considered for all the railroads of this country, will aggregate a large amount which is deserving of careful attention.

The following figures will give an approximate idea of the investment and cost of operating these units. It should be borne in mind that these figures are not based on any



The Union Railroad Mounts the Headlight Unit as Shown

actual operating data, but rather are taken as approximate, and are used merely as an example to show what is invested in these installations.

A railroad having one hundred equipments at $125 each, has an initial investment of $12,500. Repair parts should be maintained in stock at all times, to the amount of $15 a unit. This adds to the initial investment $1,500, making the total investment, therefore, $14,000.

The maintenance, including labor on these units, will run from $50 to $100 a year, with say, an average of $75 a year. This will result in an annual maintenance cost of $7,500.

Turbine units will take about 200 pounds of steam an hour, and then to be in use an average of eight hours a day for three hundred days a year, the cost of steam at 50 cents per hundred pounds, will give a total of $24,000 a year for steam on these 100 machines. Including the maintenance cost, the operating cost is, therefore, $31,500 a year on 100 machines. This does not include oil or other minor items.

The performance of most of the units of today does not warrant a life of more than five years. Therefore, depreciation will be at the rate of 20 per cent a year, to which should be added interest on the investment at 6 per cent. Based on the $14,000 initial investment, this makes an addition of $3,640 a year to be added to the operating cost of $31,500. This, therefore, gives a total cost of $35,140 a year for operating one hundred turbine-generator headlight units.

If these figures are extended to take in the thousands of equipments in service, it will result in a very large figure which merits the closest consideration.

One of the first considerations should be Are these figures justifiable? In view of the performance of large turbine generator units for stationary work, they are not justifiable, even with the allowance made for the wide difference in the class of service. Other equipment on the locomotive includes nothing which would in any way nearly approximate these costs.

The main points to be considered in the selection of the headlight unit should be

1—Reliability
2—Ruggedness
3—Simplicity
4—Efficiency
5—Accessibility for inspection
6—Finish and workmanship.

Greater reliability is necessary in order to cut down the high maintenance charges and repair cost. The unit should not be selected on account of the ease of repair and the extreme accessibility, but rather the frequency of repairs, and cost of repair parts should be the prime consideration. A machine having a great number of wearing and adjustable parts is always subject to frequent adjustment and renewal.

Typical Installation of Headlight Unit on the Buffalo, Rochester & Pittsburgh Railroad Locomotive

These are the items which make up the bulk of maintenance charges.

The class of service to which the headlight turbine-generator is subject is very severe, and calls for the most rugged construction possible. All of the parts should be heavy and well proportioned.

Special attention should be given to the bearings, to see that these are as large as possible, and in fact these should be larger than would ordinarily be called for in other classes of service. The best grade of self-alining ball bearings should be used.

The castings should be heavy to withstand the severe shocks and rough handling in operation. The design should be so arranged that there is no chance of difficulty from temperature or mechanical distortion of the unit. The preferable way would be to have only one bearing fixed in bolting the unit down; the steam and electrical ends of the

unit should be unsupported, and, therefore, the unit would be free to expand, due to temperature differences. The bolting down should be so arranged that the unit would not be distorted when it is secured.

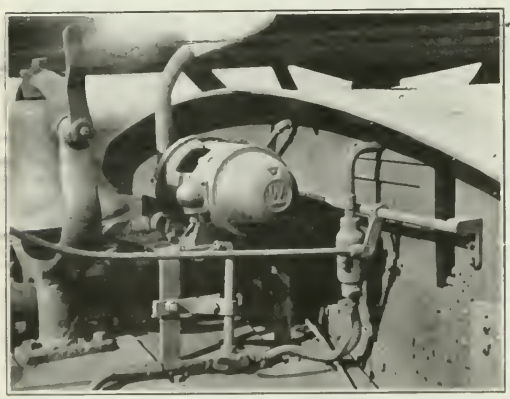
Due to the high rotative speed of the unit, there are heavy centrifugal forces set up. This, therefore, requires extremely heavy armature and turbine rotor. Also these should be of as small diameter as possible. The quill type of construction on the armature is not preferable in this class of apparatus, as the small diameter necessary for ruggedness cannot be obtained.

The turbine rotor should be especially designed to eliminate any distortion from heating or rough handling, as this would quickly put the unit out of balance. There should be enough metal in the rotor to readily obtain perfect balance. Stamped or forged, inserted blades will not lend anything to ruggedness, but rather, take from it. The rotor should be made of steel throughout, as cast iron or sheet iron will not give the desired strength.

Simplicity of design is very desirable. There should be as few parts as possible in the whole unit, and especially the moving parts, which are subject to wear, should be at an absolute minimum. There should be as few adjustments as possible, which is only brought about through simplicity of design.

The governor should be arranged for the minimum number of parts, with the minimum number of adjustments. These parts should be rugged and accurately finished. The governor should be connected to the valve as directly as possible, eliminating all lever mechanism, which tends to stick and wear, and consequently, necessitates adjustment and replacement.

The inlet valve should be simple in design and operation. This part is subject to cutting from the steam, wear from the action of the governor and clogging up from accumulation of scale and boiler compound. There should be no long



One Method of Mounting the Headlight Unit as Used by the Long Island Railroad

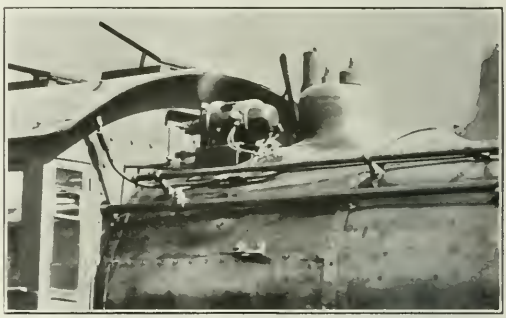
valve sleeves or stems which can become clogged with scale or subject to wear, with the consequent steam leakage and poor regulation.

Stuffing boxes on turbine shaft should be as simple as possible and not subject to adjustment. All manner of renewable or adjustable packing should be avoided.

On the generator end the wiring should be all inside of the frame so that connections should not have to be broken when dismantling. Connections from the outside should be made in such a way that the conduits or permanent wiring on the locomotive will not have to be disturbed.

Efficiency is an item which has not usually been given the consideration it deserves. This has been on account of the fact that the first thought has been for reliability. If the unit were operated, which had a steam consumption of 125 pounds an hour instead of 200 pounds an hour, there would be a saving of $90 a year on each unit. This is based on the previous assumption of steam cost and length of operation. When extended to the great number of units in service, $90 a machine is no inconsiderable item. Efficiency, therefore, deserves the fullest consideration, along with the other items.

The units should be accessible only for inspection and not for repair or adjustment. A unit which is totally enclosed is the most preferable, as it eliminates the collection of dust, corroding gases, moisture and oil. While the unit should be enclosed, arrangements should be made for ease of inspection of interior, for trouble. Adjustments, however, should not be especially accessible and should not be many in number. They should be made only by authorized persons who are familiar with the unit, otherwise unauthorized persons are likely to make incorrect adjustments and spoil the operation of the unit. Ease of repair is not of greatest importance but frequency of repairs should be given prime consideration.



The Headlight Unit As Mounted on the Pittsburg & Lake Erie Railroad Locomotive

Workmanship and finish are items which should receive careful attention. The finish of the individual parts and the way they are fitted together reflect the ability of the manufacturer to turn out a reliable and rugged unit, as well as an efficient one. The finish will usually be the best index to the character of the machine. If the rotor is well made and well finished, there will be higher efficiency obtained. If the governor parts are made of the best grade of material, accurately machined, with the elimination of pins, using in place carefully made knife edges and knife edge blocks, the regulation and operation of this governor will be far superior to one using rough cast parts and pivot pins.

By observing these various points of the machine, giving particular attention to the material and the finish, the purchaser or operator will be furnished with a very good idea of the reliability and efficiency of the machine which is in question.

"Trains Will Run in Kansas," says Governor Henry J. Allen. Asked if he believed the government should interfere in the event of a walkout, he replied: "Surely the men can always strike, but the government should see that the roads are kept running. There will be no tie-up in Kansas. If the men go on strike the roads will be run anyway, and the strikers will not be allowed to interfere. Section 9 of our industrial court law takes care of that."

Annual Meeting of the A. S. T. M. at Atlantic City

THE TWENTY-FIFTH annual meeting of the American Society for Testing Materials was held this year at the Hotel Chalfonte-Haddon Hall, Atlantic City, N. J., on June 26-30 instead of at Asbury Park, N. J., as has been the custom for the past several years. The election of officers for 1922 was as follows: George K. Burgess, chief, division of metallurgy, bureau of standards, Washington, D. C., was elected president; W. H. Walker, vice-president; and D. M. Buck, W. M. Corse, W. K. Hatt and J. R. Onderdonk, members of the executive committee. The meeting was well attended, the registration for the first two days being in excess of 500, considerably more than the previous year.

In the annual address of the retiring president, C. D. Young, general supervisor of stores, Pennsylvania Railroad, Philadelphia, Pa., attention was called to the growth of the society and emphasis was placed upon the fact that this growth was not evidenced until the society had freed itself from the limitations previously existing from the old International Association. He stated that the most characteristic feature of the society was the independence of its members from preconceived notions and arbitrary standards. He brought out that American standards of quality have forced recognition throughout the world, have stabilized production and employment through the broadening effect of increased markets and have made it safer for manufacturers to accumulate stocks during dull periods.

Report on Cast Iron

While revised specifications for cast-iron car wheels were submitted as tentative at the annual meeting of the society last year, the committee has nevertheless continued work on the subject and this year presented a further revision of the car-wheel specifications as the result of this study and the very wide discussion of the cast-iron wheel throughout the country. The standard specifications for foundry pig iron adopted in 1904 and revised in 1909, have been brought up to date by making a few changes found desirable as experience was acquired. New specifications were presented to cover what the committee classified as "high-test" cast iron to include those irons which show higher strengths than the usual run of material. In the production of these cast irons, considerable steel scrap is added to the mixtures, and with a high degree of metallurgical skill the foundryman is able to turn out exceptionally good metal. In order to differentiate this high-grade material from the lower ranges of castings, none the less good in their class, these new specifications have been prepared to enable the consumer of castings to call for a superior article and to give him some assurance that he will get quality of article which he calls for.

Reports on Iron and Steel

The Committee on Steel, among other work, presented the report of the joint committee of the society and the American Railroad Association. This report was given on page 1588 of the June 20 issue of the *Railway Age* June Dailies. A paper by Lawford H. Fry on the Tensile Properties of Steel Castings presented a study of the tensile properties of steel castings of the grades currently used for railroad service. About 600 tests from seven manufacturers were examined, grouped into two series. In the first series the tensile properties as usually determined are compared to show the relation between strength and ductility, and the relation between the yield point and the elastic limit determined by the method for forgings adopted by Committee A-1 on Steel. In the second series methods of greater precision than are applied in commercial testing are used to compare the so-called true elastic limit with the yield point. These tests show that with even a moderate degree of precision in the method of measurement, annealed cast steel is found to behave as a plastic rather than an elastic material and the term "elastic limit" has, as a consequence, little meaning.

Detailed data were presented by Committee A-5 on Corrosion of Iron and Steel bringing the results of the tests on copper bearing and non-copper bearing plates up to date. The data are in the form of numerous tables which give the composition, the percentage of copper, the condition of the plate at various stated periods, etc. The results of the tests conducted at Pittsburgh, expressed in a general form, are indicative of the effect which copper is having on the rate of corrosion. Practically all of the light gage non-copper-bearing sheets in the Pittsburgh test failed after 28 months' exposure, whereas only 6 of the 146 copper-bearing sheets had failed at that time. At the end of 64 months' exposure there still remains two full groups of copper-bearing sheets, as well as 18 other scattered copper-bearing sheets with no failures. The heavy gage non-copper-bearing sheets now show 87 of the total 120 sheets failed, five groups showing entire failures, whereas none of the 132 copper-bearing sheets have failed at this time. This information continues to bear out the conclusions of the 1921 report that copper-bearing metal in the Pittsburgh location shows marked superiority in rust resisting properties as compared to non-copper-bearing metal of the same general composition.

Electrical and Magnetic Weld Testing

This paper by T. Spooner and I. F. Kinnard, research engineers, Westinghouse Electric and Manufacturing Co., Pittsburgh, Pa., desbribes a series, too long to be given here, of laboratory tests applied to arc butt-welded steel plates to determine the possibility of developing electrical and magnetic tests that would be capable of revealing the quality of such welds, the summary of which is as follows: The methods of application consisted in measuring the electrical or magnetic potential drop across the weld with a definite e.m.f. or magnetic potential applied on opposite sides of the weld. This drop was compared with the drop over an equal length of unwelded plate. After completing the electrical and magnetic tests the plates were cut into strips one inch wide at right angles to the welds and these strips tested for tensile strength.

The electrical, magnetic and tension tests showed a very fair general agreement among themselves and with the known quality of the welds as reported by the welder. The electrical and magnetic tests tended to smooth out small local defects, thus giving an approximation of the average quality of the weld over a distance of several inches. In other words, the variations by these tests were not as great as shown by the tension tests but are perhaps just as good an indication of the quality of the weld as a whole.

The electrical and magnetic methods of test show considerable promise, at least as applied to butt-welded plates. A really poor weld will be demonstrated without a shadow of doubt.

By some suitable alterations in the details of the apparatus so as to provide a more rugged portable device there seems little doubt that the methods could be applied commercially, thus greatly increasing the possible applications of electrical and gas welding, since it should be feasible to eliminate poorly welded sections before any harm could result to the completed structure.

Other Reports and Papers

Among the other reports and papers which were presented and are of interest to railway men desiring detailed data are those on concrete and concrete aggregates, timber, fatigue of metals and a symposium on impact testing of materials, etc.

General News Department

Representative Burke, of Pennsylvania, has introduced in the House a resolution authorizing the Railroad Labor Board to rescind its decisions reducing the wages of certain classes of railroad employees, effective on July 1.

Senator Guglielmo Marconi, inventor of wireless telegraphy, is to be the recipient of the John Fritz Medal for 1922. The presentation is to take place at the Engineering Societies' Building, 29 West Thirty-ninth street, New York, on the evening of July 6.

The United States Spruce Production Corporation has sold Spruce Production Corporation Railroad No. 1, extending from Disque Junction to Lake Pleasant, Wash., 36 miles, to Hill, Scritsmeier & Lyon, who propose to use it for logging operations and to operate it as a common carrier.

Samuel Gompers, president of the American Federation of Labor, was re-elected without opposition last week at the convention in Cincinnati, Ohio. It was his 41st election to that office. Portland, Oregon, was chosen as the place for the next convention, which will be held in October, 1923.

Reduction of losses of perishable commodities will be conducted by the Freight Claim Division of the American Railway Association during the months of July and August. During the year 1921 approximately $20,000,000 was charged to the loss and damage account as the outcome of losses and damages to perishable commodities, excluding live stock.

Francis A. Dever, assistant engineer for the Duluth, Missabe & Northern at Duluth, Minn., has been awarded the Strathcona Memorial Fellowship in Transportation at Yale University for the next academic year. Mr. Dever graduated from the College of Engineering and Architecture, University of Minnesota, with the degree of B. S. in C. E. in 1920, and has been connected with the above railroad since his graduation.

B. & O. Wars on Social Diseases

The Baltimore & Ohio Association of Railroad Surgeons at its annual meeting held in Chicago on June 16, decided to inaugurate a campaign of education among its employees to teach them the dangers of contagious and social diseases. Dr. Page Edmunds, of Baltimore, Md., consulting and general surgeon for the system, said: "The Baltimore & Ohio is taking out of its service all persons who may be contaminated and is attempting through propaganda to educate them."

Supplement No. 2 to the 1921 Rules of Interchange

A supplement to the 1921 Rules of Freight Car Interchange has been prepared by the Arbitration Committee and the Committee on Prices for Labor and Materials. This supplement, in addition to interpretations of existing rules by the Arbitration Committee, announces the extensions of the effective dates of certain rules which are to become effective during the year 1922; also labor allowances for R. & R. or R. of Transom Draft Gear and Parts, recommended by the Committee on Prices for Labor and Materials.

A. S. C. E. Elects Dunlap Secretary at Portsmouth Meeting

The American Society of Civil Engineers through its Board of Direction at the annual convention held at Portsmouth, N. H., on January 21 and 22, has elected J. H. Dunlap, professor of hydraulics and sanitary engineering, University of Iowa, Iowa City, Ia., as secretary of the society. Professor Dunlap was born at Harrisville, N. H., on September 9, 1882, and is a graduate of Dartsmouth College. Before entering university work, he spent some time in government reclamation and in railway service. Professor Dunlap succeeds to the office held temporarily by Herbert S. Crocker and E. M. Chandler, respectively acting secretaries since the retirement of Charles Warren Hunt in 1920.

Adjustment of Brake Power on Tank Cars

Request has been received from a majority of the owners and operators of tank cars for an extension of the effective date for complying with the provisions of Circular S. III-11 of the Mechanical Division of the A. R. A., issued May 15, 1919, and the Tank Car Specifications for the Adjustment of Brake Power on Existing Cars. It is stated that this request is due to the general business conditions prevailing for some time and also to the fact that so many of the cars were scattered throughout the country, many of them having been stored on railroad sidings, making it difficult, if not impracticable, for the owners to complete the work in the time limit set.

This request has been granted by the General Committee and the effective date for complying with the requirement of the Tank Car Specifications in the matter of Adjustment of Brake Power on existing tank cars is extended to July 1, 1923.

Looking for Good Men

In connection with their regular work of visiting freight stations for the purpose of supervising the billing and instructing agents, representatives of the claim department of the Southern Railway are under instructions to be on the lookout for local office employees whose work shows that they are worthy of promotion; and to make report of such cases. Already, several local office men have received promotions as the result of recommendations made. This plan is in pursuance of the policy announced some time ago to the effect that wherever possible preference would be given to worthy local office men for promotions in the freight traffic department. Rate classes have been organized at the larger stations all over the system, offering station employees a means of acquiring the training which will fit them to hold more responsible positions.—*Southern Railway Bulletin.*

A Memorial To a Great Explorer

As a tribute to David Thompson, who explored and surveyed a good part of western Canada from 1784 to 1826, the Canadian Pacific Railway, in conjunction with the Hudson's Bay Company, is preparing to erect a memorial building on the shores of Lake Windermere, B. C., where Thompson established the first white man's trading post west of the Rocky Mountains, and made the first accurate records and surveys. The memorial structure will be built in the form of a Hudson's Bay fort with stockades and bastions. It will be used partly as a museum for local Indian relics and antiquities, and partly as a recreation hall for Lake Windermere summer camp. The formal opening of this memorial building is being arranged for September 1, and will be accompanied by an Indian pageant.

Valuation of Telegraph Property

The Interstate Commerce Commission has assigned for argument, in briefs to be filed on or before October 1, questions of law regarding the making of inventories of property used by telegraph companies and by other carriers in connection with its railroad valuations. In the Texas Midland case the commission held that a telegraph line is necessary in the conduct of the business of the carrier and the cost of reproducing the telegraph property was inventoried with that of the railroad. The notice

of the hearing says that the commission is continually confronted with the necessity of determining whether any part of the telegraph property used by any telegraph company shall be inventoried to any common carrier other than that telegraph company in cases where it clearly appears that the property is owned by the telegraph company and also in cases where the matter of ownership has not been agreed upon by and between the carriers who use the property; and the commission desires further light on the questions of law that have been presented from time to time.

Durability of Treated Ties

The annual inspection of more than 25,000 ties in test tracks on 20 divisions of the Chicago, Burlington & Quincy, located in eight states, last fall showed that 88 per cent of the untreated ties in these sections had been removed on account of decay, after 12 years' service in contrast with 1.6 per cent of those treated with creosote, 4.4 per cent of those treated by the Card process (creosote and zinc chloride) and 12 per cent of those treated with zinc chloride. These results were obtained with 20 different species of wood. The results of these tests to date are summarized as follows:

SUMMARY
(Regardless of Species)

	Total ties placed in track	Total removed to date	Percentage removed account decay	Percentage removed account other causes
Straight creosote	3,261	198	1.6	4.5
Card	15,846	2,518	4.4	11.5
Burnett	2,492	629	12.0	13.2
Untreated	3,263	3,106	88.0	7.1

Fuel Savings on the Pere Marquette

A letter by Frank H. Alfred, president and general manager of the Pere Marquette, addressed to all employees who have to do with the handling and consumption of fuel, calls attention to the excellent fuel performance obtained on that road during the month of April. Passenger, freight and switching records for that month show an improvement over March, 1922, and also a better showing than in the same month of 1921. The fuel performance in these periods was as follows:

	April, 1922	March, 1922	April, 1921
Passenger service			
Average car miles per ton of coal	117.30	109.00	111.10
Freight service			
Pounds of coal per 1,000 gross ton miles	144.00	148.87	187.64
Switching service			
Average miles per ton	14.19	13.47	14.21

The increase in the average car miles per ton for April, 1922, over March, 1922, is 7.61 per cent, and over April of last year, 5.58 per cent. In freight service the record shows a 3.29 per cent better performance in April than in March of this year and a 23.26 per cent better showing than for April of last year, this being in part due to the better quality of coal used.

Transportation of Natural Gas Gasoline

The results of a study of the hazards involved in the transportation of natural gas gasoline, made by the Bureau of Mines, in co-operation with the Association of Natural Gasoline Manufacturers and the Bureau of Explosives, are given in a report by D. B. Dow, chemical engineer of the Bureau of Mines, which is now being distributed by the Association of Natural Gasoline Manufacturers, 821 Mayo building, Tulsa, Okla. The investigation was undertaken at the request of the Interstate Commerce Commission.

Several very disastrous explosions and fires have occurred in the shipment of natural gas gasoline. The Ardmore, Okla., explosion of September 27, 1915, in which 47 were killed and 500 injured, was the most disastrous. Shipping regulations designed to prevent such accidents have failed in many cases to accomplish their purpose, and new regulations have been proposed in the hope that accidents may be prevented in the future.

It was found that pressures developed in standard cars were much higher than pressures developed in insulated cars, particularly in summer months. Due to this difference in pressure, insulated cars are desirable for the shipment of natural gas gasoline, not only from the standpoint of safety, but also from the standpoint of economy.

Every effort should be expended in prevention of carelessness in unloading tank cars of natural gas gasoline. The men who have charge of unloading should be thoroughly instructed as to proper methods of procedure and be required to pass examinations as to their fitness for this work.

Railway Consolidation Plan

The Interstate Commerce Commission on June 23 issued a statement saying that during the preceding 10 days the commission had received many telegrams, letters and copies of resolutions from individuals, chambers of commerce, labor organizations, and others, with reference to the recent decision of the Supreme Court affecting the Southern Pacific and Central Pacific railroads. Some ask that the commission seek to have the decree of the Supreme Court withheld; others that it invoke legislation to counteract the effect of the decision. "Manifestly," the statement says, "the commission cannot consider such requests. It is also requested to exercise promptly its powers under the Interstate Commerce Act, particularly the provisions of section 5.

On August 3, 1921, the commission adopted a tentative plan for the consolidation of the railway properties of the United States into a limited number of systems. It said at that time that the tentative plan was put forward in order to elicit a full record upon which the plan to be ultimately adopted can rest. The commission has recently conducted a hearing concerning the carriers in the southeastern region, and its work has been planned in such a way and its engagements are such that hearings with reference to carriers in the west are not likely to be held before October. In the meantime, telegrams, letters and resolutions can be of no assistance to the commission as they cannot be made a part of the record.

"Where the Railroad Has Failed"

This is the title of an editorial of nineteen paragraphs in "The Mutual Magazine" of the Pennsylvania Railroad for June. It reads, in part:

"We are sometimes forced to believe that our railroad organizations are incomplete; that they need experts to expound the virtues of the railroad. The public needs to be told that it costs eight dollars to ship a ton of freight from Harrisburg to Philadelphia by railroad, and *thirty dollars* by automobile.

"The public must be reminded that the railroad goes 300 miles from the city and brings in a supply of milk at a price which every one can afford. . . . This service advertising man needs, also, to tell the employes the great advantages they are enjoying; of the millions their company has voluntarily spent to provide a pension system; of the spirit of helpfulness that is shown at all times by our Relief Department. Our railroad must not be too modest to point to the expense and effort involved in providing easier work when we become incapacitated for our regular jobs; to the great advantages and education we get from a free transportation that enables us to see the country in a way that the men and women of no other industry can enjoy.

"The railroads have done more for the development of our country, generally, and for their employes, especially, than any other industry or institution, and they have suffered most from being misunderstood and misjudged. No matter how good the service or how great its advantages, it will not be appreciated or popular unless constantly referred to."

General Foremen's Convention

The International Railway General Foremen's Association has issued the following announcement of its 1922 meeting:

"The General Foremen's convention, scheduled at Chicago for September 5, 6, 7 and 8, 1922, affords an opportunity for a period of intensive instruction that no general foreman or his superior officer can consistently disregard.

"Held annually at a nearly central point in the United States and at a time of the year that is the most favorable for the average railway shop supervisor to absent himself from his duties, the attendance will comprise a class of energetic, earnest workers who will put vim into their meetings and return to their tasks broadened and advanced in their ideas.

"Insofar as the foreman has been the subject for a great many printed articles showing his acts to be commendable or otherwise, as the spirit of the writer impelled his ideas, it brings out this

Operating Statistics of Large Steam Roads — Selected Items for the Month of April, 1922,

Region, road and year		Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross, Excluding locomotive and tender	Ton-miles (thousands): Net, Revenue and non-revenue	Average number of locomotives on line daily: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:													
Boston & Albany	1922	394	210,167	226,511	26,187	4,370	68.9	205,900	72,031	114	30	20.9	...
	1921	394	220,385	237,696	26,416	4,081	62.9	216,812	81,690	129	28	17.9	...
Boston & Maine	1922	2,455	494,538	547,999	46,124	10,908	71.4	535,098	210,115	318	133	29.5	38
	1921	2,469	489,087	543,926	47,003	10,242	69.4	536,513	223,839	353	107	23.3	71
N. Y., N. H. & H	1922	1,959	406,723	443,817	29,493	10,561	71.0	499,942	196,864	275	83	23.1	17
	1921	1,959	433,899	465,465	27,914	9,734	66.7	506,194	212,045	302	71	19.0	35
Great Lakes Region:													
Delaware & Hudson	1922	887	270,832	361,460	30,228	7,039	63.3	426,629	195,481	283	36	11.4	182
	1921	880	342,539	447,123	30,334	8,240	66.6	558,674	273,965	277	38	12.0	118
Delaware, Lacka. & West'n	1922	994	393,452	477,931	91,725	12,773	73.2	609,884	246,998	304	60	16.4	74
	1921	995	495,662	605,651	113,703	14,810	67.3	837,989	388,453	305	54	15.0	41
Erie (inc. Chic. & Erie)	1922	2,309	740,282	808,509	43,497	24,017	63.6	1,339,832	545,654	539	226	29.5	119
	1921	2,259	788,251	892,428	36,926	25,109	60.6	1,402,423	687,487	579	137	19.2	127
Lehigh Valley	1922	1,316	463,180	504,936	65,876	12,999	66.4	702,949	296,823	433	123	22.1	176
	1921	1,316	523,374	579,759	55,810	14,542	62.6	897,340	418,206	421	118	21.9	140
Michigan Central	1922	1,827	487,663	498,284	17,462	15,531	64.8	796,465	294,074	316	90	22.1	82
	1921	1,829	414,321	421,184	17,994	12,598	64.4	661,567	271,243	326	93	22.1	106
New York Central	1922	5,675	1,545,556	1,700,504	95,015	55,314	65.1	2,900,389	1,106,661	1,026	568	35.6	333
	1921	5,655	1,498,778	1,638,337	116,823	51,420	63.5	2,913,391	1,230,250	1,089	564	34.1	381
N. Y., Chic. & St. L.	1922	510	308,916	309,978	342	10,418	68.2	514,916	193,677	115	34	22.9	43
	1921	510	312,729	314,061	409	9,360	67.4	479,844	186,286	111	55	33.3	39
Pere Marquette	1922	2,191	324,709	336,826	6,043	8,321	64.2	464,201	207,432	163	51	23.8	11
	1921	2,207	304,180	319,363	6,162	7,803	58.1	371,817	202,114	161	48	22.9	19
Pitts. & Lake Erie	1922	228	84,722	89,089	554	2,230	60.8	148,094	77,090	69	11	14.1	13
	1921	225	68,966	75,880	850	2,226	60.4	157,503	83,836	69	14	16.5	28
Wabash	1922	2,418	537,006	564,513	4,818	14,975	69.8	762,229	301,750	259	72	21.8	25
	1921	2,418	487,970	507,256	6,213	14,190	68.3	753,118	313,268	274	69	20.0	47
Ohio-Indiana-Allegheny Region:													
Baltimore & Ohio	1922	5,235	1,566,257	1,801,643	137,506	39,933	64.1	2,384,772	1,124,598	905	453	33.4	181
	1921	5,185	1,515,880	1,892,092	114,088	36,815	60.9	2,325,703	1,109,839	1,008	427	29.7	196
Central of N. J.	1922	689	209,767	234,926	32,771	4,705	65.2	263,306	118,286	223	38	14.4	49
	1921	679	240,391	266,263	34,920	5,452	60.1	361,798	179,295	194	71	26.7	17
Chicago & Eastern Ill.	1922	945	174,689	174,900	2,147	4,005	65.5	212,806	93,650	125	49	28.3	59
	1921	1,131	191,036	192,034	2,918	4,423	63.4	262,771	128,487	130	46	26.2	54
C., C., C. & St. L.	1922	2,387	568,540	602,121	4,528	16,659	61.8	980,444	435,682	317	139	30.5	36
	1921	2,375	581,477	608,418	1,710	15,084	57.2	963,036	412,843	324	118	26.7	62
Elgin, Joliet & Eastern[1]	1922	459	86,000	95,813	6,191	2,655	68.5	182,789	98,483	91	18	16.3	23
	1921	456	82,202	90,558	6,060	2,394	68.7	169,842	91,361	99	9	8.4	34
Long Island	1922	394	43,662	47,810	8,735	510	57.8	29,533	10,934	38	7	16.0	...
	1921	395	39,767	47,013	6,809	451	60.9	24,403	9,053	34	9	20.8	4
Pennsylvania System	1922	10,882	3,622,453	3,877,105	263,490	97,007	66.0	5,868,709	2,689,140	2,562	873	25.4	796
	1921	10,893	3,406,812	3,698,834	253,912	86,951	62.9	5,857,101	2,912,248	2,720	709	20.7	1,017
Phila. & Reading	1922	1,119	452,064	495,970	54,003	10,702	62.7	668,039	320,069	382	77	16.8	223
	1921	1,119	472,741	534,077	66,568	11,743	61.5	803,837	437,347	348	82	19.1	139
Pocahontas Region:													
Chesapeake & Ohio	1922	2,548	667,442	723,089	16,813	20,280	56.4	1,549,693	821,095	437	108	19.8	76
	1921	2,543	663,409	715,869	18,469	18,289	56.2	1,416,087	750,407	440	110	20.0	75
Norfolk & Western	1922	2,228	860,420	1,037,492	43,657	25,266	57.8	1,984,993	1,095,766	606	96	13.6	174
	1921	2,210	599,817	733,800	24,515	16,472	60.7	1,220,806	656,560	581	106	15.4	235
Southern Region:													
Atlantic Coast Line	1922	4,923	728,460	740,484	11,738	17,511	59.4	927,213	328,019	311	102	24.7	14
	1921	4,887	722,279	725,522	11,621	15,391	58.1	838,499	298,449	294	122	29.3	3
Central of Georgia	1922	1,908	210,067	212,614	4,040	4,780	75.3	232,198	103,289	112	25	18.0	7
	1921	1,908	227,127	228,929	2,457	4,507	67.8	243,078	109,425	115	23	16.7	...
I. C. (inc. Y. & M. V.)	1922	6,137	1,368,876	1,379,283	33,595	37,197	65.6	2,130,533	870,113	752	82	9.8	130
	1921	6,151	1,542,194	1,548,706	34,636	37,764	63.5	2,381,943	1,065,897	746	102	12.0	24
Louisville & Nashville	1922	5,021	1,527,556	1,660,590	62,243	27,302	60.2	1,761,541	823,430	583	94	13.9	11
	1921	5,026	1,383,561	1,466,703	51,929	23,148	59.9	1,482,763	690,367	556	99	15.1	53
Seaboard Air Line	1922	3,537	464,282	472,795	8,552	10,572	65.7	556,001	211,095	192	71	27.1	...
	1921	3,537	422,260	426,294	4,840	8,775	63.1	474,533	177,605	175	85	32.8	...
Southern Ry.	1922	6,942	1,277,663	1,301,215	31,217	28,217	67.6	1,447,115	585,436	865	185	17.6	30
	1921	6,942	1,125,014	1,143,239	27,073	23,933	67.3	1,246,083	511,631	906	216	19.3	131
Northwestern Region:													
C. & N. W.	1922	8,376	1,215,788	1,250,128	18,185	25,986	69.2	1,305,565	548,273	803	237	22.7	79
	1921	8,319	1,286,001	1,316,712	19,289	24,742	67.5	1,357,704	584,526	625	331	34.6	22
C. M. & St. P.[2]	1922	11,027	1,331,642	1,370,005	58,394	33,065	63.6	1,800,029	744,814	823	226	21.5	96
	1921	10,618	1,200,146	1,238,637	57,306	28,361	64.0	1,537,809	659,576	786	268	25.4	152
C., St. P., M. & O.	1922	1,726	272,124	290,121	10,692	5,252	73.3	257,883	106,993	151	57	27.4	37
	1921	1,726	263,381	275,874	10,501	4,684	69.1	240,484	98,121	155	53	25.5	38
Great Northern	1922	8,266	657,578	682,844	27,880	18,601	69.1	1,009,495	468,803	615	147	19.3	168
	1921	8,164	631,653	651,268	25,229	16,337	70.8	877,445	421,305	614	177	22.4	280
M., St. P., & S. Ste M.	1922	4,384	415,482	449,854	6,230	9,522	72.8	462,877	209,175	344	60	15.0	31
	1921	4,225	412,309	416,645	5,652	8,591	68.6	436,910	194,688	346	54	13.5	52
Northern Pacific	1922	6,414	640,242	668,336	42,858	19,157	70.7	1,002,140	451,866	552	158	22.2	99
	1921	6,408	610,976	636,315	41,613	17,286	69.4	944,997	441,230	554	165	23.0	166
Ore.-Wash. R. R. & Nav.	1922	2,166	173,888	195,514	29,090	4,341	73.4	233,908	110,373	115	41	26.3	1
	1921	2,198	177,551	195,397	23,425	4,594	74.1	255,763	128,626	116	46	28.5	11
Central Western Region:													
Atch., Top. & Santa Fe	1922	9,798	1,369,973	1,433,530	64,081	36,591	65.8	2,011,607	734,591	788	158	16.7	216
	1921	9,771	1,464,640	1,553,854	67,208	39,809	62.6	2,111,520	761,575	809	160	16.5	158
Chicago & Alton	1922	1,010	245,247	247,758	3,983	5,095	63.7	286,249	116,983	107	55	33.7	13
	1921	1,010	292,557	297,818	3,601	5,935	60.4	363,853	154,768	127	42	24.8	21
Chic., Burl. & Quincy	1922	9,326	1,241,331	1,293,286	63,229	32,241	67.6	1,732,589	759,693	713	243	25.4	90
	1921	9,326	1,340,756	1,398,889	62,916	34,142	63.0	2,040,957	952,652	700	258	26.9	139
Chic., Rock Isl. & Pacific	1922	7,662	1,132,535	1,145,177	10,094	24,820	66.6	1,298,656	510,741	611	144	19.1	90
	1921	7,662	1,178,516	1,190,502	10,925	24,090	64.5	1,319,013	550,613	558	179	24.3	40
Denv. & Rio Grande West'n	1922	2,593	188,733	232,991	45,096	4,199	69.5	235,766	112,114	229	79	25.7	38
	1921	2,593	166,133	204,455	37,053	3,640	68.8	205,209	98,641	223	86	27.8	62
Oregon Short Line	1922	2,360	262,070	274,732	21,333	6,352	67.8	369,607	166,336	169	59	25.8	43
	1921	2,359	260,087	268,115	16,586	5,783	68.1	344,036	166,205	184	45	19.7	51
Southern Pacific	1922	6,983	916,415	1,050,864	176,477	27,064	66.6	1,529,358	621,568	545	209	27.7	42
	1921	6,975	978,186	1,125,722	222,071	25,494	62.5	1,509,274	599,972	537	227	29.7	49
Union Pacific	1922	3,665	638,527	648,408	34,759	21,588	77.3	1,038,154	426,011	396	135	25.4	158
	1921	3,615	662,755	672,300	31,356	20,898	73.4	1,097,503	485,272	393	158	28.7	114
Southwestern Region:													
Gulf, Colo. & Santa Fe	1922	1,895	187,265	195,799	4,064	4,784	66.6	267,286	115,358	129	20	13.4	34
	1921	1,895	252,423	256,733	4,876	6,032	64.8	348,095	157,561	90	56	38.4	..
Missouri, Kans. & Tex.	1922	1,658	212,977	213,100	5,088	5,805	60.6	324,954	124,898	140	39	21.7	69
	1921	1,710	219,614	219,940	5,930	5,534	61.6	314,592	128,431	131	47	26.4	48
Mo., Kans. & Tex. of Tex.	1922	1,738	185,765	190,795	3,737	3,582	58.8	209,219	78,275	85	54	39.0	17
	1921	1,740	209,778	214,139	1,898	4,085	58.1	248,602	99,884	101	47	31.9	22
Missouri Pacific	1922	7,315	931,88[illegible]	941,757	28,295	22,653	69.6	1,215,218	526,206	412	172	29.4	2
	1921	7,263	1,003,875	1,010,447	26,741	22,470	68.3	1,269,213	574,851	381	178	31.9	28
St. Louis San Francisco	1922	4,761	755,579	765,155	11,374	13,995	64.3	789,594	329,007	346	99	22.3	30
	1921	4,761	717,566	727,179	12,258	12,364	65.0	708,247	307,481	338	151	30.9	45
Southern Pacific Lines (in Texas and Louisiana)	1922	3,710	544,224	545,650	4,827	11,292	65.6	662,062	292,922	192	92	32.5	14
	1921	3,647	527,371	530,411	3,505	9,965	61.0	612,964	263,748	172	115	40.1	1
Texas & Pacific	1922	1,953	208,525	208,525	1,416	4,906	64.1	267,866	102,145	122	73	37.2	28
	1921	1,952	272,498	272,498	3,868	5,789	63.8	324,853	126,785	118	76	39.0	18

[1] No passenger train service.

Compiled by the Bureau of Statistics of the Interstate Commerce Commission. Subject to revision.

Compared with April, 1921, for Roads with Annual Operating Revenues above $25,000,000

Region, road and year	Average number of freight cars on line daily: Home	Foreign	Total	Per cent unserviceable	Stored	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton-miles per car day	Car miles per car day	Net-ton miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotive and tender	Passenger service: Train-miles	Passenger-train car-miles
New England Region:														
Boston & Albany........1922	[illegible],566	4,503	8,[illegible]	6.9	915	980	343	16.5	298	26.[illegible]	6,095	207	290,834	1,887,399
1921	3,442	4,409	7,851	6.7	1,078	984	371	20.0	347	27.6	6,912	204	306,682	1,939,864
Boston & Maine........1922	16,908	13,146	30,054	18.8	1,775	1,082	425	19.3	233	16.9	2,852	159	775,980	4,240,230
1921	17,814	13,537	31,351	18.7	4,717	1,097	458	21.9	238	15.7	3,0[illegible]2	157	839,9[illegible]1	4,424,1[illegible]6
N. Y., N. H. & H.... 1922	24,749	14,835	39,584	24.9	1,730	1,2[illegible]9	484	18.6	166	12.5	3,349	168	960,264	6,038,777
1921	24,469	15,887	40,356	17.0	3,028	1,167	489	21.8	175	12.1	3,608	173	1,037,818	6,443,292
Great Lakes Region:														
Delaware & Hudson.... 1922	11,383	6,282	17,665	7.5	4,059	1,575	722	27.8	369	21.0	7,347	201	184,313	948,612
1921	11,309	5,735	17,044	8.7	2,381	1,631	800	33.3	536	26.6	10,373	195	185,875	951,293
Delaw're, Lacka. & West'n.1922	18,439	6,167	24,606	10.4	936	1,538	623	19.3	335	23.7	8,283	182	476,022	3,404,712
1921	16,861	6,813	23,674	9.3	955	1,691	784	26.2	547	31.0	13,019	173	479,606	3,446,633
Erie (inc. Chic. & Erie)..1922	39,225	15,861	55,086	18.1	9,731	1,810	737	22.7	330	22.8	7,876	151	652,557	4,671,699
1921	39,011	14,626	53,637	15.3	16,131	1,893	872	27.4	427	23.4	10,146	151	661,430	4,948,977
Lehigh Valley........1922	32,581	7,871	40,452	11.2	11,106	1,518	641	22.8	245	16.1	7,516	183	339,072	2,641,504
1921	31,572	9,788	41,360	14.7	3,620	1,715	799	28.8	337	18.7	10,590	161	355,767	2,652,544
Michigan Central..... 1922	18,454	11,422	29,876	18.3	239	1,633	603	18.9	328	26.7	5,367	127	529,304	4,713,869
1921	19,147	10,649	29,796	15.4	2,472	1,597	655	21.5	303	21.9	4,942	128	556,851	4,769,008
New York Central.....1922	82,955	40,754	123,709	18.7	10,552	1,877	716	20.0	298	22.9	6,500	128	2,271,766	18,226,756
1921	89,932	48,149	138,081	10.4	38,006	1,914	821	23.9	297	19.5	7,252	125	2,272,325	17,732,476
N. Y., Chic. & St. L.... 1922	4,912	4,995	9,907	7.8	1,356	1,667	627	18.6	652	51.4	12,653	112	84,508	543,209
1921	6,445	4,566	11,011	14.4	2,251	1,534	596	19.9	564	42.0	12,170	116	89,005	532,219
Pere Marquette........1922	11,135	10,610	21,745	13.2	833	1,430	629	24.9	318	19.9	3,156	127	234,520	1,201,569
1921	10,903	9,861	20,764	14.2	1,000	1,222	665	25.9	325	18.4	3,052	162	280,123	1,368,844
Pitts. & Lake Erie.....1922	20,094	8,181	28,275	38.2	1,236	1,748	910	34.6	91	4.3	11,274	82	106,971	544,606
1921	17,373	6,987	24,360	13.9	2,743	2,284	1,216	37.7	115	5.0	12,441	89	108,118	565,236
Wabash...............1922	13,128	9,282	22,410	11.8	808	1,419	562	20.2	449	31.9	4,160	166	540,215	2,864,717
1921	13,039	9,160	22,199	11.0	914	1,543	642	22.1	470	31.2	4,319	161	508,429	2,627,692
Ohio-Indiana-Allegheny Region:														
Baltimore & Ohio.......1922	71,022	33,128	104,150	14.5	11,966	1,523	718	28.2	360	19.9	7,161	188	1,412,175	8,893,198
1921	69,967	27,878	97,845	12.1	6,414	1,534	732	30.1	378	20.6	7,135	183	1,342,466	8,495,894
Central of N. J..........1922	20,219	8,027	28,246	5.9	9,942	1,255	564	25.1	140	8.5	5,723	206	319,636	1,542,346
1921	20,458	8,596	29,054	29.5	4,478	1,505	746	32.9	206	10.4	8,808	193	311,724	1,465,664
Chicago & Eastern Ill.. 1922	16,938	2,682	19,620	14.2	8,679	1,218	536	23.4	159	10.4	3,303	180	210,372	1,392,275
1921	17,239	3,063	20,302	9.5	8,188	1,376	673	29.0	211	11.5	3,787	181	231,849	1,475,984
C., C., C. & St. Louis....1922	17,866	16,498	34,364	16.1	5,973	1,724	766	26.2	423	26.2	6,085	133	676,778	4,237,080
1921	19,023	15,537	34,560	11.2	3,621	1,656	710	27.4	398	25.4	5,793	140	709,041	4,547,638
Elgin, Joliet & Eastern[1] .1922	9,595	5,543	15,138	9.3	396	2,125	1,145	37.1	217	8.5	7,147	139	(1)	(1)
1921	10,468	3,970	14,438	4.5	3,952	2,066	1,111	38.2	211	8.1	6,673	149	(1)	(1)
Long Island............1922	2,125	4,376	6,501	3.9	193	676	250	21.4	56	4.5	925	387	184,675	1,028,692
1921	2,151	3,557	5,708	3.8	980	614	228	20.1	53	4.3	765	434	189,358	1,008,575
Pennsylvania System.....1922	211,420	73,748	285,168	12.5	52,224	1,6[illegible]	742	27.7	314	17.2	8,238	150	4,795,152	31,670,290
1921	215,683	66,993	282,676	7.5	88,696	1,719	855	33.5	343	16.3	8,912	145	4,897,356	32,186,885
Phila. & Reading........1922	23,988	12,220	36,208	5.6	3,850	1,478	708	29.9	295	15.7	9,531	182	472,629	2,183,856
1921	27,644	11,095	38,739	10.2	5,877	[illegible],700	925	37.2	376	16.4	13,032	182	512,254	2,317,968
Pocahontas Region:														
Chesapeake & Ohio......1922	37,591	11,577	49,168	13.6	212	2,322	1,230	40.5	557	24.4	10,742	132	424,087	2,350,302
1921	38,252	11,838	50,090	8.2	9,550	2,135	1,131	41.0	499	21.6	9,835	134	427,885	2,427,132
Norfolk & Western......1922	31,011	8,138	39,149	5.0	862	2,307	1,274	43.4	933	37.2	16,396	160	379,980	2,364,617
1921	37,664	5,919	43,583	8.0	9,197	2,035	1,095	39.9	502	20.7	9,903	168	378,324	2,329,900
Southern Region:														
Atlantic Coast Line......1922	22,244	11,608	33,852	13.8	...	1,273	450	18.7	323	29.0	2,221	126	814,142	5,772,580
1921	22,392	11,016	33,408	15.5	...	1,161	413	19.4	298	26.4	2,036	145	841,045	5,920,071
Central of Georgia.......1922	4,459	3,515	7,974	15.8	...	1,105	492	21.6	432	26.5	1,805	149	307,658	1,608,411
1921	4,996	3,792	8,788	23.7	...	1,070	482	24.3	415	25.2	1,912	160	311,410	1,562,112
I. C. (inc. Y. & M. V.)..1922	46,428	18,747	65,175	9.2	11,600	1,556	636	23.4	445	29.0	4,726	147	1,505,586	10,141,609
1921	47,777	17,183	64,960	8.1	11,351	1,545	691	28.2	547	30.5	5,776	143	1,457,936	9,085,445
Louisville & Nashville....1922	36,524	14,958	51,482	11.1	85	1,153	539	30.2	533	29.4	5,466	169	1,015,157	5,918,129
1921	38,530	14,170	52,700	22.7	117	1,072	499	29.8	437	24.4	4,578	167	904,134	5,135,687
Seaboard Air Line.......1922	13,159	11,600	24,759	31.9	...	1,198	455	20.0	284	21.7	1,989	168	590,749	3,537,439
1921	11,544	8,445	10,989	21.5	...	1,124	421	20.2	296	23.2	1,674	181	576,745	3,358,856
Southern Ry............1922	37,901	21,893	59,794	17.6	...	1,135	458	20.7	326	23.3	2,811	163	1,252,850	7,207,874
1921	39,614	20,326	59,940	10.3	7,341	1,108	455	21.4	285	19.8	2,457	205	1,319,232	8,095,064
Northern Region:														
C. & N. W..............1922	46,828	22,963	69,791	7.5	4,700	1,074	451	21.1	262	18.2	2,182	190	1,525,182	9,316,379
1921	48,274	21,803	70,077	8.1	7,000	1,056	455	23.6	278	18.5	2,342	205	1,613,599	9,642,837
C. M. & St. P.[2] 1922	51,130	22,571	73,701	15.3	...	1,352	559	22.5	337	23.5	2,252	166	1,401,289	8,443,590
1921	44,909	16,288	61,197	12.4	5,633	1,281	550	23.3	359	24.1	2,071	171	1,437,736	8,650,519
C., St. P., M. & O.......1922	3,799	10,459	14,258	11.0	1,906	948	393	20.4	250	16.8	2,066	172	301,368	1,610,643
1921	3,933	11,742	15,675	11.3	4,163	913	373	20.9	209	14.4	1,895	190	312,750	1,744,372
Great Northern.........1922	45,186	5,196	50,382	14.7	...	1,535	713	25.2	310	17.8	1,890	164	953,022	5,541,979
1921	46,724	7,398	54,122	14.9	...	1,389	667	25.8	259	14.2	1,720	177	968,931	5,672,123
M., St. P., & S. Ste. M..1922	18,840	5,569	24,409	12.8	2,353	1,114	503	22.0	286	17.8	1,591	130	416,984	2,256,149
1921	17,138	6,275	23,413	12.2	3,524	1,060	472	22.6	277	17.8	1,536	140	425,873	2,298,438
Northern Pacific.......1922	35,900	6,933	42,833	10.0	1,302	1,565	706	23.6	352	21.1	2,348	135	826,083	5,195,817
1921	37,862	7,212	45,074	12.3	11,008	1,547	722	25.5	326	18.4	2,295	137	823,346	5,090,283
Ore.-Wash. R. R. & Nav..1922	6,631	2,549	9,180	3.0	3,256	1,345	635	25.4	401	21.5	1,698	226	245,981	1,594,173
1921	5,113	3,767	8,880	4.2	2,067	1,441	724	28.0	483	23.3	1,951	211	247,742	1,592,742
Central Western Region:														
Atch., Top. & Santa Fe..1922	49,496	11,807	61,303	7.7	14,291	1,468	536	20.1	399	30.2	2,499	150	1,683,023	12,792,245
1921	47,538	12,222	59,760	9.9	10,990	1,44[illegible]	520	20.7	425	32.8	2,598	156	1,744,476	13,152,464
Chicago & Alton.........1922	9,893	3,792	13,685	3.4	2,500	1,167	477	23.0	285	19.5	3,860	193	263,655	1,553,778
1921	9,420	4,234	13,654	4.7	1,700	1,214	5[illegible]	26.1	378	23.9	5,107	190	282,967	1,591,748
Chic., Burl. & Quincy...1922	48,331	17,687	66,018	8.[illegible]	7,776	1,396	612	23.6	384	24.1	2,715	162	1,400,834	8,918,499
1921	50,420	16,120	66,540	13.1	1,888	1,522	711	27.9	477	27.2	3,406	163	1,487,635	9,545,599
Chic., Rock Isl. & Pacific..1922	31,007	13,078	47,085	9.0	7,142	1,147	451	20.6	362	26.4	2,222	172	1,249,644	7,044,537
1921	31,901	16,887	48,788	10.6	9,870	1,128	457	22.9	376	25.5	2,395	179	1,301,586	7,383,079
Denv. & Rio Gr'de West'n.1922	13,489	2,676	16,165	11.3	[illegible],767	1,249	594	26.7	231	12.5	1,441	211	2[illegible]2,257	1,576,810
1921	13,347	2,066	15,413	10.9	3,511	1,236	594	27.1	213	11.4	1,[illegible]68	231	228,839	1,675,796
Oregon Short Line.....1922	6,475	3,539	10,014	7.2	148	1,410	635	26.2	554	31.2	[illegible],350	142	278,263	1,901,208
1921	7,729	3,120	10,849	5.9	2,927	1,323	639	28.7	511	26.1	2,349	145	290,216	1,993,300
Southern Pacific.........1922	23,5[illegible]1	17,307	40,8[illegible]	6.6	3,674	1,669	678	27.0	507	33.0	2,967	148	1,273,069	9,924,857
1921	21,852	18,455	40,307	11.2	6,435	1,743	613	23.5	496	33.6	2,867	159	1,352,499	10,7[illegible],335
Union Pacific............1922	17,383	6,139	23,52[illegible]	14.6	3,409	1,6[illegible]	667	19.7	604	39.6	3,874	162	831,314	6,658,612
1921	1[illegible],897	7,309	[illegible]7,[illegible]06	[illegible]2.1	7,842	1,656	732	23.[illegible]	595	34.9	4,475	162	836,[illegible]63	6,829,544
Southwestern Region:														
Gulf, Colo. & Santa Fe. 1922	7,429	3,279	10,708	[illegible].0	788	1,427	616	24.1	359	22.4	[illegible],030	146	188,810	1,066,[illegible]1
1921	9,907	3,036	12,943	4.9	1,048	1,383	624	26.1	406	24.0	2,773	144	189,277	1,090,806
Missouri, Kans. & Tex..1922	8,919	5,233	14,152	6.9	4,281	1,5[illegible]6	586	21.5	294	22.6	[illegible],510	144	257,362	1,830,511
1921	9,[illegible]61	4,525	1[illegible],786	7.9	1,463	1,43[illegible]	585	23.2	311	21.7	[illegible],503	148	264,337	1,936,469
Mo., Kans. & Tex. of Tex.1922	359	10,802	11,161	7.[illegible]	2,507	1,1[illegible]6	4[illegible]1	21.9	234	18.[illegible]	1,501	160	263,881	1,554,811
1921	367	12,051	12,418	4.5	1,175	1,185	476	24.5	268	18.9	1,914	156	267,302	1,674,326
Missouri Pacific.........1922	33,486	17,533	51,019	8.1	[illegible],633	1,304	565	23.2	344	21.3	[illegible],398	160	901,325	5,201,036
1921	33,361	16,101	49,46[illegible]	8.4	8,313	1,264	573	25.6	387	22.2	2,638	158	916,814	5,293,019
St. Louis-San Francisco..1922	20,991	9,143	30,134	8.[illegible]	...	1,045	435	23.5	364	24.1	2,304	184	772,440	4,029,359
1921	21,357	9,855	31,212	7.0	...	987	429	24.9	328	20.3	2,153	200	754,159	4,272,751
Southern Pacific Lines (in Texas and Louisiana)[3]...1922	8,608	12,301	[illegible]0,909	8.9	1,451	1,217	538	25.9	467	27.4	2,632	127	524,[illegible]29	3,377,353
1921	9,019	13,753	2[illegible],772	16.2	3,422	1,162	500	26.5	396	23.9	2,410	140	523,647	3,269,698
Texas & Pacific.........1922	6,444	4,427	10,871	19.8	...	1,285	490	20.8	313	23.5	1,744	146	271,991	1,743,005
1921	6,136	5,468	11,604	18.5	...	1,192	465	21.9	364	26.1	2,165	160	306,603	1,933,654

[1]Includes Chicago, Terre Haute & Southeastern from July 1, 1921, only.

[3]Includes Galveston, Harrisburg & San Antonio, Houston & Shreveport, Houston & Texas Central, Houston East & West Texas, Iberia & Vermillion, Lake Charles & Northern, Louisiana Western, Morgan's La. & Tex. R. R. & S. S. Co., and Texas & New Orleans.

thought: Is the foreman to blame for his lack of knowledge or his apparent inability to keep step with the rapid progress of the railway mechanical department? If due consideration is given to the fact that four years of constant training is necessary to produce a passable mechanic, we would say that the foreman who rarely sees any shop except the one in which he is employed and meets no mechanical men other than his daily associates, is not to be censured but rather to be praised for what he does accomplish, and that the time spent at an annual convention or meeting yields large returns.

"Numerous men holding responsible positions today attribute their success and value to their employer largely to the broadening influence gained by attendance at business sessions. Each railway general foreman as a matter of benefit to the stockholders by whom he is employed, his superior officers, and himself should not only be permitted but required to attend the convention of the International Railway General Foremen's Association."

Railroads Appeal to Employees on the Strike Issue

A number of railroad presidents have issued circulars or letters to employees calling attention to some of the fundamental principles involved in the consideration of the strike problems now coming up for decision. C. H. Markham, president of the Illinois Central, appealed to employees to declare themselves against the strike and stand by their employer. He said, in part:

"There is no pending issue on our railroads in regard to piecework and the contracting of shop plants to outsiders. Under these circumstances, you cannot be expected to do otherwise than cast your ballot against a strike on the Illinois Central system. On the ballot relating to rules, there are seven rules mentioned. On four of these rules your representative and our management reached agreements. The remaining three were referred to the United States Railroad Labor Board and by that board decided. * * * "You have received successive general increases in wages and two general decreases, the most recent one to become effective July 1, 1922. * * * Since you have accepted all decisions of governmental agencies that have been favorable to you, my confidence in your spirit of fair play is such that I do not believe you will decline to accept a decision when it is unfavorable to you.

"I am in full sympathy with your ambitions for better working conditions. I earnestly desire that you shall be happy in your employment with the Illinois Central system. I want to do all that I can to advance your interests. I have frequently said in public speeches and newspaper interviews and in conversations with our patrons that there is no more loyal and efficient group of men than the employees of the Illinois Central system. I ask you not to cast your ballot until you have given consideration to both sides of this question, and if you do that I am sure you will reach the right conclusion."

W. H. Finley, president of the Chicago & Northwestern, issued a statement to his employees under the caption "The North Western—Your Railway," in which he declared that if a strike should be called against the decisions of the Railroad Labor Board, it would not only destroy at once the spirit of co-operation which it has taken years to develop but it would also be a strike "against this country's progress toward prosperity." He called upon all employees to stand by the road, stating that the Chicago & North Western had accepted without question the orders for the Labor Board to increase the pay of its men.

W. G. Besler, president of the Central of New Jersey, referring to former circulars issued by him said:

"In each of those letters I emphasized the fact that our relations have always been based upon the principle of *a square deal.* The Transportation Act of 1920 is the law of the land, and this company and its employees, as law-abiding citizens, are bound to respect and obey it.

"In all of the increases and adjustments in pay and working conditions which have been ordered by the Labor Board, some of which were retroactive, the Jersey Central has lived absolutely up to the requirements of the law. * * * I understand that strike ballots have been passed among some of our employees, and that you are requested to vote upon a strike. As your president, and the head of the Jersey Central family, I call upon each and every member thereof to abide by the lawful decision of the United States Railroad Labor Board. I advise and urge this as your best friend. * * * It is only by a continuance of your steadfast loyalty to the employer with whom you have been associated so many years, that we may continue to enjoy that certainty of position and wage which has become a part of our everyday life. * * * Loyalty insures continued permanent position. Loyalty avoids unhappiness, distress and all that goes with dishonorable conduct."

E. J. Pearson, president of the New York, New Haven & Hartford, reminded his employees that a vote for a strike now can only be construed as a vote against organized society. There are 30,000 employees on the New Haven system. If a strike is called, "it follows that the 17,000 employees of the maintenance of way and maintenance of equipment departments will have arrayed against them a public, which is exclusively served, of about four million people. Can a strike be won against such odds? * * * The revision of rules and reduction in rates so far awarded by the labor board, together with all prospective reductions for other classes, assuming they are made on the same percentage basis, will only offset about one-half of the loss in revenue from the reductions in rates which have been ordered in the hope and belief that business is waiting for them in order that it may drive ahead upon some basis of cost which can be regarded as reasonably permanent for some time to come.

"If this theory of the reductions is correct, the readjustments to be made on July 1st will result in a material benefit to workers generally, as industry will revive and start those activities so essential to the comfort, well being and economic existence of all. No individual class can reasonably hope to receive preferential economic treatment as compared to other classes, beyond that which may be definitely established by common consent of society as a whole.

"The public shows no disposition to be unreasonable. * * * There is every confidence in the integrity and ability of the labor board, either individually, or as a group. It has been called upon to decide some of the most momentous questions of peace times. It has searched diligently for the truth. * * * This company seeks, in every way, to avoid disputes with its employees. It believes that in the interest of itself and of society in general, its employees should be well paid; but neither employer nor employee can hope to escape the inexorable effect of economic law. * * *"

The Transportation Act of 1920 contemplates prosperous railways; fair and liberal treatment of employees, proper service for the patrons and reasonable returns to the owners. On the success of the latter, depends the ability of the management to provide the two items first mentioned, also its ability to improve facilities and to more largely stabilize regularity of employment. A railroad is made by the combined endeavors of its officers and employees, by the endeavor of every individual.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—F. M. Nellis, 165 Broadway, New York City. Next convention, May, 1923, Denver, Colo. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—J. F. Gettrust, The Ashton Valve Company, 318 W. Washington St., Chicago. Meeting with Air Brake Association.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, Supervisor of Demurrage and Storage, C. & N. W. Ry., Chicago.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—L. A. Stone, C. & E. I. Ry., Chicago. Annual meeting, Oct. 17-23, San Francisco, Cal.

AMERICAN ASSOCIATION OF ENGINEERS.—C. E. Drayer, 63 E. Adams St., Chicago.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—F. L. Duncan, 332 So. Michigan Ave., Chicago.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 10 and 11, Seelbach Hotel, Louisville, Ky.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400, Union Station, St. Louis, Mo. Next Convention, August 23-25, 1922, Kansas City, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—I. W. Welsh, 8 W. 40th St., New York.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS AND PIPE FITTERS' ASSOCIATION.—C. Borcherdt, 202 North Hamlin Ave., Chicago, Ill.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, General Secretary, 75 Church St., New York, N. Y. Annual meeting, November, 1922.

Division I. Operating

Freight Station Section (including former activities of American Association of Freight Agents) R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.

Medical and Surgical Section. J. C. Caviston, 75 Church St., New York.

Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association). J. C. Caviston, 75 Church St., New York, N. Y.

Telegraph and Telephone Section (including former activities of the Association of Railway Telegraph Superintendents) W. A. Fairbanks, 75 Church St., New York, N. Y. Annual meeting, September 20-22, 1922, Colorado Springs, Colo.

Safety Section. J. C. Caviston, 75 Church St., New York.
Division II—Transportation (including former activities of the Association of Transportation and Car Accounting Officers). G. W. Covert, 431 South Dearborn St., Chicago, Ill.
Division III—Traffic. J. Gottschalk, 143 Liberty St., New York.
Division IV—Engineering. E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Exhibit by National Railway Appliances Association.
Construction and Maintenance Section. E. H. Fritch.
Electrical Section. E. H. Fritch.
Signal Section (including former activities of the Railway Signal Association). H. S. Balliet, 75 Church St., New York, N. Y.
Division V—Mechanical (including former activities of the Master car Builders' Association and the American Railway Master Mechanics' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Exhibit by Railway Supply Manufacturers' Association.
Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill.
Division VI—Purchases and Stores (including former activities of the Railway Storekeepers' Association).
Division VII—Freight Claims (including former activities of the Freight Claim Association). Lewis Pilcher, 431 South Dearborn St., Chicago, Ill.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Next convention, October 17-19, 1922, Cincinnati, Ohio. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—A. Leckie, Industrial Agt., Kansas City Southern Ry., Kansas City, Mo.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(Works in co-operation with the American Railway Association, Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Exhibit by National Railway Appliance Association.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—(See American Railway Association, Division V.)

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—R. D. Fletcher, 1145 East Marquette Road, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—T. F. Whittelsey, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY FOR STEEL TREATING.—W. H. Eiseman, 1600 Prospect Ave., Cleveland, Ohio. Annual convention, Oct. 2-7, 1922, General Motors Building, Detroit, Mich.

AMERICAN SOCIETY FOR TESTING MATERIALS.—C. L. Warwick, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—E. M. Chandler (acting secretary), 33 W. 39th St., New York. Regular meetings 1st and 3d Wednesdays in month, except July and August, 33 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.
Railroad Division—A. F. Stuebing, Manager Editor, Railway Mechanical Engineer, Woolworth Bldg., New York.

AMERICAN TRAIN DISPATCHERS' ASSOCIATION.—C. L. Darling, 1310-1311 Mallers Bldg., Chicago, Ill. Next convention, June 18, 1923, Chicago.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—S. D. Cooper, A. T. & S. Fe R. R., Topeka, Kan. Next meeting, January 23, 1923, New Orleans, La.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, Northern Pacific R. R., St. Paul, Minn.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Thomas De Witt Cuyler (chairman), 61 Broadway, New York, N. Y.

ASSOCIATION OF RAILWAY SUPPLY MEN.—A. W. Clokey, 1658 McCormick Bldg., Chicago. Meeting with International Railway General Foremen's Association.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—(See American Railway Association, Division I.)

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railway Association, Division II.)

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—D. J. Higgins, American Valve & Meter Company, 332 S. Michigan Ave., Chicago. Meeting with convention of American Railway Bridge and Building Ass'n.

CANADIAN RAILWAY CLUB.—W. A. Booth, 53 Rushbrook St., Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, New Morrison Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—Thomas B. Kneneke, 604 Federal Reserve Bank Bldg., St. Louis, Mo. Meetings, first Tuesday in month at the American Hotel Annex, St. Louis.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 2d Thursday in January, March, May, September and November, Hotel Iroquois, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. P. Elliott, Terminal Railroad Association of St. Louis, East St. Louis, Ill. Annual convention, August 22-24, Chicago.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—D. B. Wright, 34th St. and Artesian Ave., Chicago, Ill. Meeting with Chief Interchange Car Inspectors' and Car Foremen's Association.

CINCINNATI RAILROAD CLUB.—W. C. Cooder, Union Central Bldg., Cincinnati, Ohio. Meetings, 2d Tuesday in February, May, September and November.

EASTERN RAILROAD ASSOCIATION.—E. N. Bessling, 614 F St., N. W., Washington, D. C.

FREIGHT CLAIM ASSOCIATION.—(See American Railway Association, Division VII.)

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—C. H. Treichel, Grand Central Station, Chicago. Regular meetings, Wednesday preceding 3d Friday in month, Room 1414, Manhattan Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Annual convention, August 15-17, Hotel Sherman, Chicago. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—George P. White, 747 Railway Exchange, Chicago. Meeting with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, 702 E. 51st St., Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn. Next convention, September 5-8, Chicago.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—C. W. Sullivan, Garlock Packing Co., 326 W. Madison St., Chicago. Meeting with International Railway Fuel Association.

MASTER BOILER MAKERS ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Division V.)

MASTER CAR BUILDERS' ASSOCIATION.—(See A. R. A., Division V.)

NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—Warren C. Nixon, Western Tie & Timber Co., 905 Syndicate Trust Bldg., St. Louis, Mo.

NATIONAL ASSOCIATION OF RAILWAY AND UTILITIES COMMISSIONERS.—James F. Walker, 41 Lafayette St., New York. Next convention, September 26, 1922, Detroit, Mich.

NATIONAL PLATING TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, People's Gas Bldg., Chicago. Annual exhibition at convention of American Railway Engineering Association.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, excepting June, July, August and September.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3d Friday in month, except June, July and August, at 29 W. 39th St., New York.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Nexon, 600 Liberty Bldg., Broad and Chestnut Sts., Philadelphia, Pa. Annual dinner, February 1, Waldorf-Astoria, New York.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, General Electrical Co., Chicago. Annual meeting with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—R. J. Himmelright, 17 East 42nd St., New York. Meeting with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, C. & O. Ry., Richmond, Va. Next meeting October 10-13, 1922, Pittsburgh, Pa.

RAILWAY SIGNAL ASSOCIATION.—(See A. R. A., Division IV., Signal Section.)

RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A., Division VI.)

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meeting with A. R. A., Division V.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W. Ry., Sterling, Ill. Annual convention, September, 19-21, 1922, Hotel Statler, Cleveland, Ohio. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill P. O. Box 1205, Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. L. Carrier, Car Serv. Agt., Tenn. Cent. Ry., 319 Seventh Ave., North Nashville, Tenn. Next meeting, October 19, St. Augustine, Fla.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—H. S. White, 9 N. Jefferson St., Chicago.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hilburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Annual convention, September 12-15, Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—Bruce V. Crandall, 14 E. Jackson Boulevard, Chicago. Regular meetings, 3d Monday each month except June, July and August.

P. & A. Photo

Loading Meat at Chicago for 48-Hour Train to New York to Connect With Liner to Europe

Traffic News

R. S. Kreitler has been appointed traffic commissioner of the Canton Chamber of Commerce, Canton, Ohio.

Reductions of about ten per cent have been made by the Pennsylvania Railroad in the ferry boat rates, at New York and Philadelphia, for the transportation of automobiles, trucks and other vehicles, this traffic being classed as freight and as coming under the order of the Interstate Commerce Commission calling for a general reduction of ten per cent on July 1.

The Southern Railway, for the summer tourist season, announces the "Land of the Sky Special," a train giving over-night service between Asheville, N. C., and the Southeast with through sleeping cars from Wilmington, Charleston, Savannah, Atlanta, and Macon. Through sleeping car lines have been established to Asheville from Chicago and St. Louis in addition to which the lines from New Orleans, Mobile, Montgomery, Birmingham, and Chattanooga have been re-established for the summer. Sleeping car lines have also been established between Memphis, Tenn., and Richmond, Va., via Asheville, and between Cincinnati, O., and Goldsboro, N. C., via Asheville.

Coal Production

Production of soft coal has taken a sharp upward turn in the twelfth week of the strike, according to the Geological Survey bulletin, and may approach 5,500,000 tons. Production of anthracite remains practically zero.

Complete returns on the eleventh week (June 12-17) show a production of 4,986,000 tons of soft coal and 22,000 tons of anthracite. The record of the twelfth week (June 19-24) shows a prompt recovery from the traffic congestion which had interfered with the placement of cars at mines in Eastern Kentucky and parts of West Virginia. The increased production comes not from any of the strongly organized fields, but results from a gradual return to work in non-union fields affected by the strike, and from increased activity in districts of the Far West where demand has hitherto been insufficient to call out full production. The accumulation of unbilled loads is still declining and the draft upon consumers' stockpiles continues. In the eleventh week of the strike the daily average number of unconsigned loads of bituminous coal was 4,672. The total is now less than a sixth of that in the week of April 8. Counting 50 tons to a car, the quantity of unbilled coal is now about 250,000 tons. In comparison with the country's daily requirements of over a million tons, this appears small

Freight Commodity Statistics—Three Months

The Bureau of Statistics of the Interstate Commerce Commission has compiled a statement showing by districts the freight tonnage transported by Class I steam railways for the quarter ended March 31, 1922. Below will be found a comparison, by general classes of commodities, of the tonnage transported in 1921 with that transported in 1922:

Class of commodities	Number of tons originated		
	Quarter ended Mar. 31, 1921	Quarter ended Mar. 31, 1922	Percent of increase 1922 over 1921
Products of agriculture	26,038,239	25,754,849	*1.09
Animals and products	5,911,716	5,881,188	* .52
Products of mines	115,791,162	120,906,905	4.42
Products of forests	20,646,604	19,265,592	*6.69
Manufactures and miscellaneous	[illegible]	[illegible]	2.94
Merchandise—All L. C. L. freight	[illegible]	[illegible]	* [illegible]
Total	218,083,067	222,581,084	2.06
	Total tons carried		
Products of agriculture	[illegible]	[illegible]	1.41
Animals and products	[illegible]	10,077,556	[illegible]
Products of mines	[illegible]	[illegible]	6.68
Products of forests	[illegible]	36,464,473	[illegible]
Manufactures and miscellaneous	[illegible]	[illegible]	[illegible]
Merchandise	15,906,966	16,013,192	.67
Total	402,114,193	416,298,809	3.53

* Decrease.

Commission and Court News

Interstate Commerce Commission

The commission has suspended until October 28 the operation of schedules published by the Missouri Pacific which propose to establish from Sioux City, Ia., to various points in Arkansas and Missouri south of St. Louis, Mo., rates on grain and grain products 5 cents per 100 lb. higher than the rates from Omaha.

The commission has suspended until October 13 the operation of schedules published by the St. Louis-San Francisco which propose to limit the territory to which sugar stored in transit at Wichita, Kansas, could be reshipped, thereby resulting in increased charges on such traffic to the extent of the local rates from Wichita to ultimate destinations of the reshipped product.

The commission has suspended from June 22 until October 20 the operation of schedules published by the Mobile & Ohio which propose the cancellation of joint through rates on crushed, ground and rough-quarried limestone, carloads, from Columbia Quarry No. 2, Ill., and Krause, Ill., to St. Louis, Mo., when routed via Vulcan, Ill., and the Missouri Pacific Railroad, and the application in lieu thereof of switching charges ranging from 10 to 60 cents per net ton in addition to the present rate of 70 cents.

State Commissions

The Railroad Commission of California, in conjunction with the State Corporation Commissions of Arizona and New Mexico, after a two days' conference on the United States Supreme Court decision in the Southern Pacific-Central Pacific dissolution case, sent a telegram to the Interstate Commerce Commission urging that body to hasten the proposed grouping of railroad lines in the western region. Under the tentative plan proposed by the Interstate Commerce Commission the Southern Pacific and the Central Pacific are left as one system.

Ticket Frauds on the New York Central

The Public Service Commission of New York decided, last December, in favor of the railroad company, on a complaint made by Lanman Crosby of the alleged injustice of requiring him to provide himself with a copy of his photograph to show to conductors with his monthly commutation ticket. In the full report of the commission, which has recently been issued, interesting details are given of the practices which led to the establishment of the requirement that photographs must be provided.

The report deals with the suburban traffic to and from New York City on two divisions, the Hudson and the Harlem. Typical stations are Ossining, 30 miles from New York, where the one-way fare is $1.10, and the cost of a ride on the monthly ticket 17 cents; White Plains, 22 miles, one-way fare 82 cents, commutation 14 cents.

The company sells as many as 20,000 commutation tickets a month. These tickets for at least four years past have been misused. They were to be bought at various stores, fruit stands, bootblack stands, poolrooms, barber shops, cigar stores and groceries in most of the small towns.

Continuing, the report says:

Detectives rented commutation tickets in a great many of the small places, and conductors took up tickets on the trains from parties to whom they were not issued. Bundles of tickets so taken up were presented at the hearing. It was obvious as shown by the signatures of the purchasers thereon and of the persons from whom they were taken that they were presented by others than the purchasers. At Ossining one man rented space in a store, and dealt in these tickets, and on Sunday night could be found on the station platform collecting the tickets from persons to whom he had rented them, on their return. One woman at White Plains had eighteen or twenty tickets a month. The practice was, at the start of each month, for her to give a customer wishing to go to New York and return the price of a commutation ticket to be taken out in his or her own name.

The next man or woman did the same, and the process continued until the dealer had accumulated enough tickets to last during the month. One could go to her, secure a ticket, ride to New York and return on it, pay her the charge, and return the ticket to her. Her charge was considerably less than the regular rate which the passenger would have needed to pay.

The company procured injunctions against persons renting out these tickets, in the State and Federal courts, and restrained, for instance, in Ossining 13 persons, in Poughkeepsie 37 persons, in Newburgh 44 persons. The injunctions, however, did not stop the sales by other people.

After the requirement of the photograph on the commutation tickets was put in effect, the sale of commutation tickets fell off in one month at—

Ossining	165
Peekskill	94
Poughkeepsie	62
White Plains	300
Mount Kisco	78
Yonkers	148
Harrsdale	50

Commutation tickets with a like photographic requirement have been used on the Baltimore & Ohio between Philadelphia and Wilmington, on the Pennsylvania between Philadelphia and New York and between Trenton and North Philadelphia, and 100-ride tickets for the season of 1921 with such a requirement were in use on the Central of New Jersey between New York and Bradley Beach.

Personnel of Commissions

H. D. Loveland, a member of the California Railroad Commission since its organization in 1907, died at his home in San Francisco on June 11.

Court News

Charge for Parking Showman's Cars Valid, Though Not in Tariff

The Alabama Supreme Court holds that a railroad is entitled to make a charge to a showman for parking his cars on its tracks for 45 days, although such charge is not contained in its tariffs.—A. G. S. v. Wood (Ala.), 90 So. 502.

Coal Spur—Right of Eminent Domain

The Pennsylvania Supreme Court holds that an extension of a railroad to be employed largely to take coal from certain coal mines is a public use sufficient to justify the exercise of the right of eminent domain.—Pioneer Coal Co. v. Cherrytree & Dixonville (Pa.) 116 Atl. 45.

Spur Track Held Unnecessary

Although a spur track would be a great convenience to certain shippers and decrease their operating expenses, the Arkansas Supreme Court holds that this is not a service the railroad is required to furnish, where adequate facilities for all shipping purposes are furnished these and all other shippers at the regular passing track, in the absence of a contractual right to have the spur maintained.—Thomas-Bowman Cooperage Co. v Missouri & North Arkansas (Ark.) 237 S. W. 101.

Assumption of Risk—Question for Jury

The Circuit Court of Appeals, Third Circuit, holds that where an employee calls the attention of his foreman to a defect in the tool he is using (in this case a wrench) and objects to using it, but returns to his work with it, without an assurance of reparation from the employer, the question whether he voluntarily assumed the risks incident to the use of the defective tool was for the jury in an action under the Federal Employers' Liability Act; and that the test is whether the conduct of the foreman was such as to justify the employee in relying on the foreman's judgment rather than on his own in the continued use of the tool, or, on the other hand, whether the danger from the defect in such continued use was so imminent that no man of ordinary prudence would hazard it.—L. V. v. Skoczyla, 278 Fed. 378.

Foreign Railway News

Japanese Railway Buys American Electrical Equipment

The Westinghouse Electric & Manufacturing Company announces that it has received an order for motor car and substation equipment from the Chichibu Railway which operate in the vicinity of Tokio, Japan. A large part of this new equipment will be a duplicate of the large order shipped from the Westinghouse Company's plant at East Pittsburgh to the Chichibu Railway during the past year.

L. & N. W. Withdraws Bill Permitting Highway Transport

The London & North Western has withdrawn its support of the bill before Parliament which was drawn to allow it to engage in the transportation of freight by motor upon the highways. The company's loss of interest in the bill is due, apparently, to the insistence of the Ministry of Transport that the rates to be charged be regular railway rates and not those established by competing highway trucking concerns. The railway rates are, as a general rule, higher than the highway rates; consequently the railway could hope for little business if restricted as the Ministry of Transport proposed.

Death of Noted British Mechanical Officer

LONDON.

Norman J. Lockyer, locomotive works manager of the North Eastern Railway at Darlington, England, and one of Britain's best known railway mechanical men, died recently. Mr. Lockyer commenced his apprenticeship with Sir J. Whitworth & Co., Ltd., of Manchester, England, in 1877. Subsequently he served in the works of the Manchester, Sheffield & Lincolnshire Railway at Gorton until 1882, when he was employed by the running department. In 1885 he joined the staff of Sir A. M. Rendel, being employed in superintending the manufacture of locomotives for the Indian State and other railways. In 1896 he was appointed manager of the works of Sharp, Stewart & Co., Ltd., of Glasgow, the locomotive builders, and in 1899 he became works manager of the Gateshead Locomotive works of the North Eastern Railway. He was transferred to the Darlington works in 1909. He was the inventor of a number of devices for use on locomotives and in railway shops, one of the best known of his locomotive invention being called the "Lockyer" double-beat regulator valve.

Rhodesia Wants Railways

It has been reported, says Trade Commissioner P. J. Stevenson, Johannesburg, in a report to the Department of Commerce, that Rhodesia demands railroads before entering the Union of South Africa. A railroad between Walvis Bay, Southwest Africa, and the Wankie coal fields in southern Rhodesia is considered most important, since it will afford an outlet through Walvis Bay for Wankie coal to the east coast of South Africa and will open up Southwest Africa and the Bechuanaland Protectorate for development. A road extends from Walvis Bay to Grootfontein and if extended, as desired, it would form the first transcontinental railroad in Africa.

Next is the linking up of West Nicholson and Messina, which would give southern Rhodesia access to the sea through the port of Lourenco Marques. At present a roundabout route through the Union or through the less important port of Beira is used. A road is desired also between Sinoia in southern Rhodesia and Broken Hill in northern Rhodesia, to form the connecting link that would afford an outlet through Beira for the large volume of copper from the Katanga District of the Belgian Congo. The people of Rhodesia are said to consider the road to Walvis Bay as an economic necessity and to expect its early construction.

Equipment and Supplies

Locomotives

Mitsui & Company, New York City, has ordered from the H. K. Porter Company two locomotives for export to Siam.

The Delaware, Lackawanna & Western contemplates asking for bids in the near future on about 30 locomotives.

The Southern Railway has ordered 15 Mikado type locomotives from the American Locomotive Company. The Southern is also inquiring for 15 Pacific type locomotives.

The Lehigh Valley, reported in the *Railway Age* of June 24 as inquiring for 5 locomotives, has ordered 5 Mikado type locomotives from the Baldwin Locomotive Works.

The New York, Chicago & St. Louis, reported in the *Railway Age* of June 10 as contemplating buying about 10 locomotives, has ordered 14 locomotives from the Lima Locomotive Works.

The Magna Arizona Railroad has ordered 1 Consolidation type locomotive from the American Locomotive Company. This locomotive will have 22 by 28 in. cylinders and a total weight in working order of 199,000 lb.

The Chosen Railway (Korea) has ordered 6 Pacific type locomotives from the American Locomotive Company. These locomotives will have 24 by 26 in. cylinders and a total weight in working order of 203,000 lb.

The Standard Slag Company, Youngstown, Ohio, has ordered two 4-wheel switching locomotives from the American Locomotive Company. These locomotives will have 16 by 24 in. cylinders and a total weight in working order of 99,000 lb.

The Tennessee Copper Company, Copperhill, Tenn., has ordered 1, 6-wheel switching locomotive from the American Locomotive Company. This locomotive will have 20 by 26 in. cylinders and a total weight in working order of 133,000 lb.

The W. F. Carey Company, 90 Wall street, New York City, has ordered 2, 4-wheel switching locomotives from the American Locomotive Company. These locomotives will have 14 by 22 in. cylinders and a total weight in working order of 79,000 lb.

The Lehigh Portland Cement Company, Allentown, Pa., has ordered one 4-wheel switching locomotive from the American Locomotive Company. This locomotive will have 11 by 16 in. cylinders and a total weight in working order of 43,000 lb.

The Chicago & Eastern Illinois, reported in the *Railway Age* of June 17 as inquiring for ten Mikado type locomotives, has ordered this equipment from the American Locomotive Company, and expects to place orders for six Pacific type locomotives this week.

The Abitibi Power & Paper Company, Montreal, Quebec, has ordered one Mogul type locomotive from the American Locomotive Company. This locomotive will have 19 by 26 in. cylinders and a total weight in working order of 141,000 lb. This company has also ordered 1 Shay locomotive from the Lima Locomotive Works.

Freight Cars

The Norfolk Southern is inquiring for 286 steel underframes.

The Philadelphia & Reading is inquiring for 100 refrigerator cars.

The Brooks Scanlon Company, Kentwood, La., is inquiring for 25 steel logging cars.

The Delaware, Lackwanna & Western is inquiring for 380 gondola car bodies of 40 tons' capacity.

The Lehigh & New England is inquiring for 50 low side composite gondola cars of 50 tons' capacity.

The Chicago, Milwaukee & St. Paul is reported to be preparing to make repairs to about 800 gondola cars in its own shops.

The Temiskaming & Northern Ontario is inquiring for from 50 to 75 steel underframe, double-sheathed box cars of 40 tons' capacity.

The Buffalo & Susquehanna, reported in the *Railway Age* of June 17 as inquiring for 200 hopper car bodies of 55 tons' capacity, has ordered this equipment from the Standard Steel Car Company.

The Norfolk & Western, reported in the *Railway Age* of June 17 as inquiring for 1,000 single-sheathed box cars of 50 tons' capacity, is inquiring in addition to that number for 1,000 hopper cars of 70 tons' capacity.

The War Department is offering for sale 7,554 new railroad cars including box, flat and gondola cars—all built by American manufacturers for military service in France. Bids for this equipment will be received until 3 p. m., July 6, at Washington, D. C.

The Pennsylvania Salt Manufacturing Company, Philadelphia, Pa., has ordered from the General American Tank Car Corporation 5 tank cars for transporting liquid chlorine. This is in addition to the 10 cars ordered from the same company as reported in the *Railway Age* of June 10.

The Northern Pacific, reported in the *Railway Age* of June 24 as having ordered part of its large freight car inquiry, has just placed an order for 1,000 automobile box cars and 250 stock cars with the General American Car Company. This company is expected to place orders for 250 gondola cars this week.

The New York Central has ordered 1,106 self clearing hopper cars of 55 tons' capacity from the American Car & Foundry Company, 18 low side gondola cars of 70 tons' capacity from the Standard Steel Car Company and 49 high side gondola cars of 50 tons' capacity from the Buffalo Steel Car Company.

Passenger Cars

The Boston Elevated is inquiring for 40 tunnel cars.

The Brown-McFarland Company is inquiring for 30 electric car trucks.

The Virginia Coal & Iron Company is inquiring for one private car.

The Carnegie Steel Company, Pittsburgh, Pa., is inquiring for one pay car.

The Texas & Pacific is inquiring for one combination baggage and express car.

The Atchison, Topeka & Santa Fe is inquiring for eight buffet library cars.

The New York Central is building three steel baggage cars at its West Albany shops.

The Chesapeake & Ohio has ordered one steel private car from the Pullman Company.

The Metropolitan Railway of Barcelona, Spain, is inquiring through the car builders for 20 subway cars.

The Philadelphia & Reading is inquiring for 5 all-steel baggage cars 63 ft. long and for 5 all-steel combination baggage and mail cars 63 ft. long with 30 ft. mail compartments.

The Chicago & Eastern Illinois, reported in the *Railway Age* of June 17 as contemplating the purchase of a number of baggage cars, will send out inquiries for 17 cars as soon as specifications are completed.

Iron and Steel

The South Manchurian Railway will receive bids until July through New York export houses for 7,000 tons of 100-lb. rail.

THE NORTHERN PACIFIC has ordered 270 tons of steel from the American Bridge Company for overhead bridges between Minneapolis, Minn., and St. Paul.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS will receive bids until July 7, for a large number of bolts, screws, nuts, iron bars, billets, plates, sheets, shapes, nails, wire, axles and tubes, the equipment to be supplied for period between July 1 and October 1 of this year.

Track Specialties

THE PENNSYLVANIA is inquiring for 100,000 tie plates for 100-lb. rails.

Machinery and Tools

THE CHICAGO, BURLINGTON & QUINCY is inquiring for 11 traveling cranes, the largest of which are two 225-ton cranes for its new shops at Denver, Colo. This company is expected to issue another machine tool list at an early date to equip the new shop.

THE GREAT NORTHERN is inquiring for 350 spout hoist machines, 350 cam shaft levers, 36 steel motor pinions, 36 steel spur gears, 36 nine-inch bearings for 2 7/16 in. diameter line shafting, 18 five-inch bearings for the same shaft dimensions and 4,030 ft. of cold rolled steel line for shafting of 2 7/16 in. diameter.

Miscellaneous

THE NORFOLK & WESTERN will receive bids until 12 o'clock noon, July 12, at Roanoke, Va., for its requirements of couplers and repair parts; 10,000 steel switch plates and 2,200 signal rail bonds.

THE PITTSBURGH & LAKE ERIE will receive bids until 12 o'clock noon, July 6, at Pittsburgh, Pa., for three months' requirements of car and locomotive axles, slag ballast, Portland cement, stovepipe iron, pickled steel sheet, galvanized sheet steel, wire nails, wire rope, steel billets, bars, shapes and plates.

THE NORFOLK & WESTERN will receive bids until 12 o'clock noon, July 5, at Roanoke, Va., for its requirements from July 1 to September 30, of miscellaneous steel castings, cast steel truck bolsters and cast steel side frames; 3,000 tons of steel shapes, plates and bars; and its requirements of brake shoes. Bids are also requested for 200 cast steel side frames, 100 cast steel truck bolsters and 50 cast steel body bolster center castings.

Signaling

THE CHICAGO, BURLINGTON & QUINCY has placed an order with the Federal Signal Company for 50 Federal type "4" top post signals to be installed in the vicinity of Aurora, Illinois.

THE CHICAGO, BURLINGTON & QUINCY will install signals on 89 miles of single track and 20 miles of double track at various points this season in addition to the 56 miles reported in *Railway Age* of May 20.

THE ST. LOUIS-SAN FRANCISCO has placed an order with the Federal Signal Company for a 48-lever Saxby & Farmer interlocking machine and other necessary materials for the rebuilding of an interlocking plant at Aurora, Mo.

THE GRAND TRUNK has placed an order with the Federal Signal Company for 24 Federal type "4-A," 3-position, U. Q. bottom post signals, for an installation of automatic permissive block signaling on its line in the vicinity of Yarmouth, Maine.

CHICAGO BURLINGTON & QUINCY.—This company will soon request bids for the installation of light signals between Hannibal, Mo., and Louisiana and between Ewhanks, Ill., and Quincy, the distances totaling 32 miles, and has under consideration the installation of signals between Lytle, Wis., and Bluff Siding and between Arapahoe, Neb., and Indianola, this distance totaling 45 miles.

Supply Trade News

Charles M. Schwab, chairman of the board of directors of the Bethlehem Steel Corporation, has been elected chairman of the board, also of the **Chicago Pneumatic Tool Company**, New York, to succeed John R. McGinley, who resigned as chairman but who remains as a director of the company.

The business of the Pittsburgh High Voltage Insulator Company, Pittsburgh, Pa., will be carried on in the future under the name of the **Westinghouse High Voltage Insulator Company**. The change in name does not affect the management or method of conducting the business of the company which will continue to be carried on as it has been in the past.

The U. S. Light & Heat Corporation, Niagara Falls, N. Y., has received orders for about 500 USL car lighting devices in the last sixty days from the following railroads; Atchison, Topeka & Santa Fe; Boston & Maine; Chesapeake & Ohio; Chicago, Rock Island & Pacific; Norfolk Southern; Norfolk & Western; Pennsylvania; and Wabash.

Colonel Walter J. Riley, president of the O. J. Jordan Company, East Chicago, Ind., has been appointed chairman of the Interstate Harbor Commission, a joint commission of the states of Illinois and Indiana and the United States Government, to consider the development of a harbor in the vicinity of Hammond, Ind., which project when carried out will include extensive rail as well as water terminals.

The Products Distributing Corporation, 360 Madison avenue, New York has been organized as a selling company for a direct drive axle generator and system for the electric lighting of railway cars. The equipment will be built by the Wagner Electric Company of St. Louis, Mo., under the E. M. Fitz patents. The generator used with this equipment is of the self-regulating, constant-voltage type and is mounted directly on one of the car axles.

The engineering staff of the **Strauss Bascule Bridge Company**, Chicago, has been reorganized and is now as follows: **J. B. Strauss**, president and chief engineer; **C. A. Ellis**, vice-president and engineer in charge of design; **P. L. Kaufman**, assistant secretary and contracting engineer; **C. E. Paine**, designing engineer. The New York office has been discontinued and new eastern offices opened at room 603 Albee building, Washington, D. C., in charge of **J. C. Eversman**. **L. O. Hopkins**, who was transferred about a year ago from the Strauss Bascule Bridge Company to the Strauss Yielding Barrier Company, is no longer connected with the latter company and his relations with both companies have been entirely severed.

William H. Eager, since 1918 first vice-president of the **Whitman & Barnes Manufacturing Company**, Akron, Ohio, has been elected president to succeed A. D. Armitage, who resigned on June 7, in order to give more of his time to his duties as vice-president and general manager of the J. H. Williams Company, Brooklyn, N. Y., with executive offices in Buffalo. Mr. Armitage still remains a member of the Whitman & Barnes board of directors. Mr. Eager is a graduate of the Massachusetts Institute of Technology, and for the past 16 years has been with the Whitman & Barnes Manufacturing Company, having joined the organization as assistant superintendent of its Chicago factory, later becoming works manager and in 1908 he was elected treasurer. In the early part of 1909 he was transferred to Akron, two years later he was appointed sales manager, and in 1918 was elected first vice-president. **Frank W. Oliver** has been appointed eastern sales manager of the Whitman & Barnes Manufacturing Company, with headquarters at 64 Reade street, New York City. Mr. Oliver has been connected with the drill and reamer industry continuously for 23 years.

Financial Plan for Improvements of Lima Locomotive Works

The Lima Locomotive Works, Incorporated, plans to complete the extension to its manufacturing plant at Lima, Ohio, at an estimated cost of $1,500,000. The program of enlargements and additions has been in progress during the past three years and approximately the same sum has already been spent. The completion of these additions will increase its capacity about 50 per cent.

The Board proposes to redeem $1,393,000 of first mortgage bonds which are now outstanding, as the interest and sinking fund payments amount to $170,000 per annum, equivalent to 12.2 per cent. on the amount of bonds now outstanding.

To provide money for these purposes new financing is required, which can be done to best advantage by an issue of common shares without par value. The board proposes that the certificate of incorporation be amended so as to change the existing common stock into shares without par value, giving each present common stockholder two such shares for each of his present shares, and so as to make the total authorized issue of such new common stock 300,000 shares, and to provide that the preferred stock, which is now convertible into the existing common stock on the basis of share for share, shall be convertible into such new common stock on the basis of two common shares without par value for each preferred share, and further to provide that while any of the preferred stock remains outstanding, the holders of the new common stock shall be entitled to one vote for each two shares held by them. While the preferred stock will thus retain in full its preferential position as to assets and dividends, and its conversion privilege and proportionate voting position will be protected, the common stockholders will receive two shares for each one they now hold, and there will be available for subscription such additional number of shares as will provide the desired new capital.

A special meeting of the stockholders has been called to be held at the principal office of the company in Richmond, Virginia, on July 14, 1922, to vote on the necessary amendment of the certificate of incorporation and incidental matters mentioned in such notice.

Subject to such amendment being authorized by the stockholders the board has resolved to offer to the common stockholders of record at the close of business on July 20, 1922, the right to subscribe for and purchase at the price of $50 per share, one and one-third shares of such new common stock for each share of the existing common stock.

Preferred stockholders as such will not be entitled to subscribe for the new common stock. They can, however, obtain the right to do so by converting their stock into common stock on or before the close of business on the 20th day of July, 1922.

There are now outstanding 23,560 shares of preferred stock and 48,550 shares of the present common stock. If no more of the preferred stock should be converted, the number of preferred shares outstanding after the completion of the financing would remain at 23,560, and the number of common shares would be 161,967.

The stock transfer books will be closed, for the purposes of the stockholders' meeting from three o'clock p. m. on June 28, until ten o'clock a. m. on July 15, 1922, during which period no conversion of preferred stock into common stock is permitted, but the books will be reopened on the last mentioned date, in order to afford an opportunity for transfers and for conversion of preferred stock, until three o'clock p. m. on the said 20th day of July, 1922, at which time all subscription rights will belong to common stockholders then of record. Subscriptions will be received up to the close of business on August 16, and payment of one-half of the subscription price or $25 per share will be required at the time subscription is made. The payment of the balance of the subscription price or $25 per share will be required on or before the close of business on September 15. Suitable subscription warrants will be mailed as promptly as possible after the close of business on July 20, 1922, to the common stockholders of record at that time.

The quarterly dividend of 1¼ per cent. on the existing common stock of the company will be paid on September 1, 1922, to holders of existing common stock of record on August 15, 1922. The new common shares which will be offered for subscription as above stated, will not participate in this dividend, but will be entitled to participate in all dividends which may be declared on the common stock of the company from and after September 2, 1922. The next following quarterly dividend date will be December 1, 1922.

Trade Publications

The Federal Signal Company, Albany, N. Y., has issued a bulletin, numbered 12-A, describing in detail its new neutral direct-current relay, style "M." This relay is said to embody a new design of contact finger, giving a wide range of adjustment without bending any of the parts, and a new type of trunnion and adjustable armature support claimed to insure perfect alinement of the bearing holes.

Flood and Searchlights.—The Pyle National Company, Chicago has recently issued supplement 2, of catalog 101, illustrating and describing a series of flood lights and searchlights adapted to the lighting of yards, loading platforms, locomotive coaling operations and construction work and general roundhouse illumination. The bulletin includes a list of parts for this equipment and presents illustrations to show the application of the lights to various kinds of night work.

Insulating and Soldering.—A catalogue supplement describing insulating and soldering compounds and announcing the extension of that line of products has been issued by the Westinghouse Electric & Manufacturing Company. The publication is known as 5-A, Supplement No. 2. The materials discussed in the supplement are baking and air-drying varnishes, insulating compounds, finishing materials, including paints, enamels, lacquers, etc., insulating glue, soldering flux, and lubricating oil.

Welding Rods and Electrodes.—A 40-page handbook known as Catalog No. 500 has recently been issued by the Page Steel & Wire Company, Bridgeport, Conn., which gives a variety of information concerning Page-Armco welding rods and electrodes for oxy-acetylene and electric welding. The catalog is well illustrated and, in addition to the welding rod data, it contains a fund of miscellaneous information useful to the welder concerning the metallurgy of iron and steel, amount of welding material required per lineal foot of weld, definitions of electrical units, mensuration factors, wire gage table, etc.

Shipment of Creosoted Fir Ties from Victoria, British Columbia to India is now claimed to be a permanent business. Last year two full shiploads were sent. They were experimental, the Indian Government also testing at the same time Burmese, Javanese and Australian woods. Of all the imported woods the British Columbia material was most satisfactory and another lot of 7,000,000 is now going forward.

Photo by International

In the West Virginia Coal Fields

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company, which was reported in the *Railway Age* of June 3 as receiving bids for station extensions and alterations at Lubbock, Texas, and Waynoka, Okla., to cost approximately $15,000 each, has awarded contracts for this work to E. F. Ware, El Paso, Texas.

BUFFALO, ROCHESTER & PITTSBURGH.—This company has awarded a contract to the Ogle Construction Company, Chicago, for the construction of a 1,200-ton frame coaling station at Rickers, Pa., to include Duplex hoisting equipment with two-way buckets and complete sanding facilities.

CHESAPEAKE & OHIO.—This company has awarded a contract to Fairbanks, Morse & Company, Chicago, for the construction of an 800-ton reinforced concrete coaling station, sand drier and cinder handling plant at Clifton Forge, Va. The coaling station will have pockets for three kinds of coal, viz., run-of mine, passenger engine stoker and freight engine stoker. The station will be electrically operated and will have a hoisting capacity of 100 tons per hour. The station is equipped with a coal crusher and screen so that run-of-mine coal can be prepared for stoker use if necessary. The ash handling facilities will consist of two 200-ft. pits equipped with clam-shell buckets on overhead traveling cranes. The estimated cost of this work is $92,000. The same contractors will also build a 500-ton, reinforced concrete coaling station, sand drier and cinder handling plant for this company at Thurmond, W. Va., to cost approximately $52,600. This station will handle both run-of-mine and stoker coal and will also be provided with a crusher and screen. The station is to be electrically operated with a hoisting capacity of 75 tons per hour. The cinder disposal plant provides for underground haulage. The company has awarded a contract to the Fairfield Engineering Company, Lancaster, Ohio, for the construction of a 300-ton frame coaling station at Charlottesville, Va., to cost approximately $15,500. A 250-ton frame coaling station will be built by company forces at Raleigh, W. Va. A Robertson cinder conveyor will also be installed at this point. The cost of this work is estimated at $18,000. The company has awarded a contract to J. T. Nuckols, Richmond, Va., for the construction of a reinforced concrete freight house, 52 ft. by 523 ft., at Norfolk, Va., to replace a structure destroyed by fire. This will be a one-story structure except for 101 ft. at one end, where two stories will be provided for office use. In this structure panels of "Gunite" siding will alternate with rolling steel doors. Four fire walls of hollow tile construction and automatic fire doors will be provided. The roof will be of reinforced concrete slabs covered with 4-ply built-up asbestos roofing. This work will cost approximately $161,000. This company in conjunction with the state highway department of Virginia is eliminating a grade crossing at Longdale, Va., by the construction of a subway. Major Bros. & Company, Clifton Forge, Va., have the contract for this work which will cost approximately $20,000. The awarding of contracts to Joseph E. Nelson & Sons, Chicago, for extensive engine terminal improvements at Peru, Ind., and Peach Creek, W. Va., were noted in the *Railway Age* of June 24.

CHICAGO, BURLINGTON & QUINCY.—This company is calling for bids for the construction of a new 6-stall engine house at Rock Island, Illinois, bids to close July 6.

CHICAGO & NORTH WESTERN.—This company, which was reported in the *Railway Age* of May 13 as contemplating the rebuilding in the near future of its 12-stall engine house at Ashland, Wis., and in the *Railway Age* of June 24 as calling for bids for the construction of this work, has awarded the contract to C. W. Gindle, Chicago.

CHICAGO, ROCK ISLAND & PACIFIC.—This company is contemplating the construction of a freight station at Omaha, Nebraska, to cost in the neighborhood of $200,000.

ERIE.—This company, which was reported in the *Railway Age* of June 3 as expecting to call for bids in the near future for an extension to its shops at Hornell, N. Y., has awarded the contract for this work to the Bates & Rogers Construction Company.

HOUSTON & BRAZOS VALLEY.—This company has applied to the Interstate Commerce Commission for a certificate authorizing construction of an extension from a point 1.9 miles south of Clute Station, Texas, in a northeasterly direction 13 miles, to Hoskins Mound, to reach a sulphur deposit.

ILLINOIS CENTRAL.—This company has awarded a contract to G. A. Johnson, Chicago, for and is now undertaking the construction of an addition to the hospital at Chicago, to cost approximately $250,000.

ILLINOIS CENTRAL.—This company, which was reported in the *Railway Age* of June 17, as calling for bids for the construction of a water supply line at Kankakee, Ill., to cost approximately $20,000 has awarded a contract to the Railway Water & Coal Company, Chicago.

KANSAS & OKLAHOMA.—This company has located and is preparing to build an extension to its present line northwesterly through Hugoton, Kan., and on to Trinidad, Col. A preliminary route has been established as far as Colorado.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—This company will rebuild its 16-stall roundhouse recently destroyed by fire at Gladstone, Mich., although plans concerning the date of rebuilding and the type of structure are as yet indefinite.

PENNSYLVANIA.—This company is receiving bids for the following projects: The elevation of tracks and the elimination of grade crossings on the Conemaugh division from the Ft. Wayne connection at Anderson street to Thirtieth street bridge (Northside) Pittsburgh, Pa., and the construction of a reinforced concrete arch bridge to carry a state highway over the tracks of the Indiana branch, Conemaugh division, at a point south of Reed station, Pa. The work on the two above projects will be in charge of George Nauman, assistant to chief engineer, Pittsburgh, Pa. This company is also receiving bids for the construction of an undergrade bridge on line of Station avenue at Cornwells, Pa. The structure will have a 27 ft. roadway and a 6 ft. sidewalk. The work will be in charge of J. P. Temple, assistant engineer, Philadelphia, Pa.

UNION PACIFIC.—This company has authorized and will undertake at the earliest possible date the construction of 20.47 miles of second track on the Oregon Short Line through Glenns Ferry, Idaho. The timber treating plant which this company was reported in the *Railway Age* of April 29 as planning to construct at The Dalles, Oregon, at an expenditure of approximately $500,000, has been authorized and a contract for the grading awarded to Grant Smith & Company, Portland, Ore., pursuant to the company's plan to push the work to an early completion and store ties in the near future. The company's plans relative to extensive improvements to its store department facilities at Pocatello, Idaho, Rawlins, Wyo., and Grand Island, and Omaha, Nebr., as reported in the *Railway Age* of April 29, have advanced to the point that it has installed gantry crane on a 1,000-ft. runway at Pocatello and expects to start in the near future the construction of a 175-ft. addition to the store house at that point as well as a small paint storage cellar. The 7½-mile extension of the Homedale branch of the Oregon Short Line, reported in the *Railway Age* of May 13, as having been authorized by the Interstate Commerce Commission, is now under construction and will be completed this season. The company expects to start in the near future and complete this season the construction of the Delta-Fillmore branch of the Los Angeles & Salt Lake, but does not contemplate undertaking this year the construction of the proposed terminal facilities at Los Angeles for which property has been acquired, as reported in the *Railway Age* of April 29.

VIRGINIAN & WESTERN.—The Interstate Commerce Commission has issued a certificate authorizing this company which is a subsidiary of the Virginian to construct an extension from the end of the Virginian Connecting Branch, a distance of 3.6 miles. The commission, however, denied the request for permission to retain the excess earnings because the new line will be operated as a part of the Virginian.

WABASH.—This company, which was reported in the *Railway Age* of June 24 as calling for bids for the construction of a reclamation plant at Decatur, Illinois, has awarded the contract for this work to C. W. Gindle, Chicago.

Railway Financial News

ATCHISON, TOPEKA & SANTA FE.—*Asks Authority to Acquire Control.*—This company has applied to the Interstate Commerce Commission for authority to acquire control of the Santa Fe & Los Angeles Harbor by lease and purchase of its stock.

ATLANTA & ST. ANDREWS BAY.—*Abandonment of Line Authorized.*—Upon further hearing and consideration of the results of a suspension of operation for an experimental period, the Interstate Commerce Commission has issued a certificate authorizing the abandonment of operation of this company's branch line between Panama City and St. Andrews, Fla.

ALABAMA & MISSISSIPPI.—*To Be Sold.*—This railroad will be sold at public auction on July 31 at Pascagoula, Miss., by Hernando Money, special commissioner. The road operates between Vinegar Bend, Ala., and Pascagoula, 78 miles. It has been in the hands of a receiver since March 17, 1921.

BOSTON & MAINE.—*Asks Authority for Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to enter into an agreement for the issuance of $1,815,000 of equipment trust certificates, the proceeds of which, together with a government loan of $1,212,500, are proposed to be used to acquire equipment to the amount of $3,049,700. It is proposed to offer the certificates to several banks in Boston who have expressed a desire to bid on them and to sell them on the basis of not less than 6½ per cent.

BUFFALO, ROCHESTER & PITTSBURGH.—*Merger Report Denied.*—President William T. Noonan has issued a statement denying the report that his road would be included in a merger of the Western Maryland, the Wheeling & Lake Erie, and the Toledo, St. Louis & Western.

CANADIAN NATIONAL RAILWAYS.—*Annual Report.*—The annual report issued this week contains a combined income account for the year ended December 31, 1921, as follows:

	1921	1920
Gross Operating Revenue		
Canadian Northern	$69,088,474	$66,695,399
Canadian Government Railways	40,964,304	44,537,804
Grand Trunk Pacific	16,638,678	14,408,550
Canadian National Railways	$126,691,456	$125,641,753
Operating Expenses		
Canadian Northern	$75,564,385	$82,953,979
Canadian Government Railways	46,551,603	54,987,680
Grand Trunk Pacific	20,668,370	24,543,064
Canadian National Railways	$142,784,357	$162,484,722
Net Deficit from Railway Operations		
Canadian Northern	$6,475,911	$16,258,580
Canadian Government Railways	5,587,299	10,449,876
Grand Trunk Pacific	4,029,692	10,134,514
Canadian National Railways	$16,092,902	$36,842,970
Tax Accruals		
Canadian Northern	$1,191,891	$1,185,652
Canadian Government Railways	35,744	61
Grand Trunk Pacific	357,395	45,409
Canadian National Railways	$1,585,029	$1,231,122
Total Operating Deficit		
Canadian Northern	$7,667,802	$17,444,232
Canadian Government Railways	5,623,043	10,449,937
Grand Trunk Pacific	4,387,086	10,179,923
Canadian National Railways	$17,677,931	$38,074,092
Non-Operating Income		
Canadian Northern	$1,119,350	$1,845,995
Canadian Government Railways	457,352	1,737,979
Grand Trunk Pacific	863,186	1,837,442
Canadian National Railways	$4,139,888	$5,421,415
Deductions from Gross Income		
Canadian Northern	$1,011,242	$125,637
Canadian Government Railways	845,066	720,096
Grand Trunk Pacific	801,668	812,405
Canadian National Railways	$2,657,976	$1,658,138
Total Deficit Before Fixed Charges		
Canadian Northern	$5,559,694	$15,733,875
Canadian Government Railways	6,010,756	9,432,055
Grand Trunk Pacific	4,425,568	9,154,886
Canadian National Railways	$15,896,019	$34,310,816
Fixed Charges		
Canadian Northern Railway System—		
Interest due public	$17,595,708	$13,993,695
Interest due government	13,224,208	10,326,261
	$30,819,916	$24,319,956
Grand Trunk Pacific Railway—		
Interest due public	$3,977,447	$4,270,244
Interest due government	1,535,474	1,539,224
Interest on receiver's certificates	1,702,887	808,352
Interest due Grand Trunk Railway	2,742,192	2,256,468
	$9,958,000	$8,874,288
Canadian National Railways	$40,777,916	$33,194,244
Total Deficit		
Canadian Northern Railway System	$36,379,610	$40,043,831
Canadian Government Railways	6,010,756	9,432,055
Grand Trunk Pacific Railway	14,283,568	18,029,174
Canadian National Railways	$56,673,934	$67,505,060
St. John and Quebec Railway (leased)	316,045	346,015
	$56,989,979	$67,851,075
Operating Ratios		
Canadian Northern	109.37	124.38
Canadian Government Railways	113.64	123.46
Grand Trunk Pacific	124.21	170.34
Total	112.70	129.32

CENTRAL VERMONT.—*Authorized to Issue Equipment Notes.*—The Interstate Commerce Commission has authorized an issue of $754,000 of equipment notes.

CHICAGO, MILWAUKEE & ST. PAUL.—*Asks Authority for Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to assume liability in connection with $8,085,000 of 5 per cent equipment trust certificates for the purchase of 6,500 freight cars and 25 locomotives. The certificates have already been offered for sale by White, Weld & Co.

CHICAGO UNION STATION COMPANY.—*Authorized to Issue Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $6,150,000 of first mortgage 5 per cent bonds to be sold at not less than 97 and the proceeds used for construction purposes. The proprietary companies were also authorized to guarantee the bonds.

CINCINNATI, INDIANAPOLIS & WESTERN.—*Asks Authority to Sell Bonds.*—This company has applied to the Interstate Commerce Commission for authority to sell $1,000,000 of first mortgage 5 per cent, 50-year, gold bonds at not less than 70. The company has also applied to the Interstate Commerce Commission for a certificate authorizing the acquisition and operation of that part of the Chicago & Indiana Coal Railroad extending from Brazil, Ind., 25.76 miles, to a connection with the Cincinnati, Indianapolis & Western in Parke County, Ind.

GREAT NORTHERN.—*Certificate for Abandonment Denied.*—The Interstate Commerce Commission has denied this company's application for authority to abandon 3.69 miles of its Portland branch in Traill county, N. D., on the ground that the saving to be effected would be relatively small and that the towns served would be placed at a disadvantage.

KANSAS CITY, MEXICO & ORIENT.—*Guaranty Certified.*—The Interstate Commerce Commission has issued a final certificate stating the amount of this company's guaranty for the six months' period of federal control as $478,904, of which $38,904 was still to be paid. For the Kansas City, Mexico & Orient of Texas the commission certified the amount of the guaranty as $554,715, of which $84,715 was to be paid.

LAKE ERIE & WESTERN.—*Authorized to Issue Notes.*—This company has been authorized by the Interstate Commerce Commission to issue $1,300,000 of 6 per cent promissory notes for the purpose of refunding indebtedness.

MAGMA ARIZONA.—*Asks Authority to Issue Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue at par $800,000 of capital stock to provide funds for changing the road from narrow to broad gage, improving the grade and providing equipment.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Dividend Case.*—Federal Judge W. F. Booth, at Minneapolis, Minn., has decided that the common stockholders are entitled to the 2 per cent. semi-annual dividend declared March 13, to be paid out of an undivided surplus accumulated between 1909 and 1919.

Equal dividends of 2 per cent on the common and preferred stocks were declared March 13, though the preferred stock had a 7 per cent preference as to dividends declared out of any one year's earnings. The Continental Insurance and Fidelity Phoenix Insurance companies, large holders of preferred stock, brought suit enjoining payment of the 2 per cent on the common stock, claiming that the preferred stockholders must be paid at the full annual rate of 7 per cent before the common stock participated in the earnings.

Missouri, Kansas & Texas.—*Asks Dissolution of Receivership.*—A decree was filed in the federal court at St. Louis, Mo., on June 28 by the bondholders and other interested parties for the dissolution of the road's receivership.

Objection was entered by the Kansas City Terminal Railroad Association and nine constituent railroads to one provision in the decree—the plan for the withdrawal of the Missouri, Kansas & Texas from the use of the Kansas City Union Station and establishment of its own station.

The decree held that the interests of the road and its creditors could be served best by dissolving the receivership and selling the assets. It pointed out, however, that operation under the receiver had been successful. The decree asks that the sale be held in the M., K. & T. station at Colbert, Okla.

Belief was expressed that the financial interests now controlling the road would bid it in at an auction sale.

An outline of the reorganization plan was published in the *Railway Age* of November 26, 1921, page 1043.

Norfolk & Portsmouth Belt.—*Asks Authority to Sell Bonds.*—This company has applied to the Interstate Commerce Commission for authority to have certified and delivered by the Fidelity Trust Company of Philadelphia $150,000 of 5 per cent gold bonds and to sell them at not less than 85, the proceeds to be used to pay off some notes.

Texas & Pacific.—*Annual Report.*—The annual report issued this week shows the following income account for the year ended December 31, 1921:

	1921	1920
Operating revenues	$35,600,474	$41,844,190
Operating expenses	28,424,905	37,459,040
Net revenue from railway operations	7,175,569	4,385,150
Tax accruals	1,437,974	1,337,259
Railway operating income	5,727,387	3,039,567
Equipment and joint facility rents—net Dr.	1,181,698	1,565,440
Net railway operating income	4,545,689	1,474,127
Non-operating income	341,322	3,316,283
Gross income	4,887,011	4,790,410
Interest on funded debt	1,792,166	1,729,870
Total deductions from gross income	2,146,287	2,399,578
Net income	2,740,724	2,390,832
Income appropriated for investment in physical property—road	1,925,502	2,241,815
Total appropriations of income	2,422,097	2,989,564
Income balance	318,627	Def. 598,732

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out to the several roads the following amounts:

Lehigh Valley	$4,600,000
Northern Alabama	125,000
Cincinnati, Findlay & Ft. Wayne	18,900

Dividends Declared

Baltimore & Ohio.—Preferred, 2 per cent, semi-annually, payable September 1 to holders of record July 15.

Central Railroad of New Jersey.—2 per cent, quarterly, payable July 15 to holders of record July 5; 2 per cent, quarterly, payable August 15 to holders of record August 3.

Norfolk & Western.—Common, $1.75, quarterly, payable September 19 to holders of record August 31; adjustment preferred, $1.00, payable August 19 to holders of record July 31.

Northern Central.—4 per cent, semi-annually, payable July 15 to holders of record June 30.

Philadelphia & Western.—Preferred, 1¼ per cent, quarterly, payable July 15 to holders of record June 30.

Trend of Railway Stock and Bonds Prices

	June 27	Last Week	Last Year
Average price of 20 representative railway stocks	64.91	64.42	53.14
Average price of 20 representative railway bonds	86.38	85.47	73.08

Railway Officers

Executive

Walter L. Stanley, whose election as vice-president of the Seaboard Air Line was announced in the *Railway Age* of June 17 (page 1513), was born at Wytheville, Va., on May 24, 1871. He was graduated from Emory and Henry College, Emory, Va., and studied law at the University of Virginia. He then practiced law for five years and then entered the service of the legal department of the Norfolk & Western. He went with the Seaboard Air Line on September 1, 1901, and served consecutively as claim agent, claims attorney, assistant to the president, assistant to the federal manager (under the Railroad Administration) and general attorney, in which latter position he was serving at the time of his promotion to the vice-presidency. Mr. Stanley was also a staff officer under the regional director of the Southeastern region. Mr. Stanley's headquarters have been at Atlanta, Ga., since 1916.

Walter L. Stanley

Michael H. Cahill, whose election as vice-president and general manager of the Seaboard Air Line was announced in the *Railway Age* of June 17 (page 1513), was born at Lexington, Ohio, in 1874. He received a high school education and entered railway service in 1891 as a messenger boy for the Baltimore & Ohio. He subsequently served that company as operator and train dispatcher and was then promoted to trainmaster and, later, to assistant superintendent. He was promoted then to division superintendent and served in that capacity on four different divisions. Thereafter he was general superintendent of the Pennsylvania and Maryland districts. With the exception of a short period when he was in the service of the Delaware, Lackawanna & Western, Mr. Cahill served continuously with the Baltimore & Ohio until 1920, when he went to the Seaboard Air Line at Norfolk, Va., as general manager, the position he held at the time of his election to the vice-presidency.

M. H. Cahill

Financial, Legal and Accounting

A. G. Gutheim, manager of public relations of the Car Service Division of the American Railway Association, has resigned to engage in the general practice of law at Washington, D. C., effective on July 1.

Operating

C. A. Braillier has been appointed supervisor of work equipment of the Atchison, Topeka & Sante Fe lines east, with headquarters at Topeka, Kans., effective June 12, to succeed Wm. Barnes, deceased.

Nicholas D. Connelly, whose promotion to superintendent of the Indiana Harbor Belt, with headquarters at Gibson, Ind., was reported in the *Railway Age* of June 17, was born on November 27, 1884 at Jackson, Mich., and entered railway service on August 18, 1899 as messenger boy in the telegraph department and the office of the trainmaster of the Michigan Central at Jackson Junction, Mich. He continued as messenger boy at this point and later in the offices of the chief train dispatcher and the division superintendent at Jackson, Mich., and thereafter as a telegraph operator at various points of the Michigan Central until December 14, 1905, when he was transferred to the Indiana Harbor Belt as a train dispatcher. Consecutively thereafter, he served as train dispatcher, switchman, conductor and yardmaster on the Indiana Harbor Belt, until 1912 when he was promoted to general yardmaster, from which position he was advanced in 1916 to trainmaster, with headquarters at Gibson, Indiana, the position he held at the time of his recent promotion to superintendent.

N. D. Connelly

Traffic

C. J. Faulconer has been appointed district freight agent of the Lake Erie & Western, with headquarters at Pittsburgh, Pa.; A. C. McKinley, district freight agent, with headquarters at Chicago; J. K. Leigh, district freight agent, with headquarters at Minneapolis, Minn.; W. B. Robbins, district freight agent, with headquarters at Detroit, Mich.; D. L. Holtz, district freight agent, with headquarters at St. Louis, Mo., and W. B. McGowan, district freight agent, with headquarters at Kansas City, Mo., all effective June 16. Effective the same date, J. H. McHugh has been appointed division freight and passenger agent at Peoria, Ill., H. C. Fisher, division freight and passenger agent at Sandusky, Ohio, and E. J. Hayler has been appointed commercial agent, with headquarters at Muncie, Ind., and W. A. Angrick, commercial agent, with headquarters at Kokomo, Ind.

Bernard W. Herrman, whose appointment as assistant freight traffic manager of the Norfolk & Western, with headquarters at Roanoke, Va., was announced in the *Railway Age* of June 10, page 1369, was born on October 10, 1866, at Dayton, Ohio. He was educated in the public schools and in 1882 entered the service of the Cleveland, Columbus, Cincinnati & Indianapolis (now C. C. C. & St. L.) and the Scioto Valley (now N. & W.). In 1890 he was promoted to contracting freight agent of the Big Four and the following year entered the service of the Norfolk & Western as traveling freight agent with headquarters at Columbus, Ohio. In 1893 he became local freight agent for the same company at Columbus and the following year entered the employ of the Cleveland, Akron & Columbus (now the Pennsylvania) in a similar capacity. In 1910 he became general agent of the Norfolk & Western at Cincinnati, Ohio, and in 1912 was promoted to assistant general freight agent, with headquarters at Columbus. In 1917 he was promoted to general freight agent with the same headquarters and in 1918 was transferred to Roanoke, Va., in a similar capacity. In this latter position he was serving at the time of his recent promotion.

Engineering, Maintenance of Way and Signaling

Major L. D. Blauvelt, former chief engineer of the Denver & Salt Lake, has resigned as state highway engineer of Colorado to become chief construction engineer for the commission established to construct the six-mile tunnel through the continental divide on the line of the Denver & Salt Lake, west of Denver, Colo.

Purchasing and Stores

R. J. Aul, storekeeper of the Indiana Harbor Belt, with headquarters at Gibson, Indiana, has been appointed to serve also as storekeeper of the Chicago River & Indiana and the Chicago Junction.

Obituary

William C. Arp, retired superintendent of motive power of the Vandalia, died at his home in Terre Haute, Ind., on June 16 at the age of 74 years after having been engaged in railway service for 48 years.

Archibald Stuart Baldwin, vice-president of the Illinois Central in charge of the Chicago terminal improvements and this company's extensive program of electrification in that city, died suddenly on the evening of June 26 on a Michigan Central train approaching Detroit on his return to Chicago after an extended visit in Europe where he attended the International Railway Congress at Rome, Italy, and spent considerable time thereafter studying European electrification systems. Mr. Baldwin was born at Winchester, Va., on September 28, 1861, and entered railway service in 1879 as a rodman on the Richmond & Allegheny, now a part of the Chesapeake & Ohio, a position which he left in 1880 to become assistant engineer of the Iron and Steel Works Association of Virginia. He was employed as assistant engineer and engineer of this company until 1882 when he re-entered railway service as a draftsman on the Philadelphia extension of the Baltimore & Ohio. Advanced a short time later to assistant engineer on this work, he continued in this capacity until 1885 when he became principal assistant engineer on the construction of the Missouri river bridge of the Chicago, Milwaukee & St. Paul at Kansas City, Mo., a position he occupied until 1886. Consecutively thereafter he was resident engineer of the Louisville, St. Louis & Texas from 1886 to 1887, assistant engineer on the Louisville & Nashville from 1887 to 1889 and roadmaster until December, 1901, when he entered the service of the Illinois Central as principal assistant engineer. He was advanced to engineer of construction on May 1, 1903, was promoted to chief engineer on March 20, 1905, and on August 1, 1918, was elected vice-president of the corporation, a position he held until March 1, 1920, when he was appointed vice-president in charge of the Chicago terminal improvements. Mr. Baldwin has been active in engineering associations for many years, having been president of the American Railway Engineering Association during 1916-1917 and president of the Western Society of Engineers during 1919-1920. At the time of his death he was the selection of the Illinois Section of the American Society of Civil Engineers for director.

A. S. Baldwin

One Hundred Carloads of Potatoes all destined for New England, left Cape Charles, Va., by the Pennsylvania Railroad, on June 16.

EDITORIAL

Railway Age

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INDEXES TO VOLUME 72

The indexes to the last volume of the Railway Age are now ready for distribution. Those desiring indexes to this volume should kindly advise the New York office, 2201 Woolworth Building.

Shop Crafts' Strike a Violation of Law

The omission of a small word frequently changes the meaning of an entire statement. The *Railway Age* in an editorial in its issue for June 24 said: "For the employees whose wages are to be reduced to strike would not be a technical violation of the Transportation Act, but," etc. The statement should have been: "For the employees whose wages are to be reduced to strike would not *only* be a technical violation of the Transportation Act, but," etc. There can be no question that the strike is a violation of law. Section 301 of the Transportation Act says: "It shall be the duty of all carriers and their officers, *employees* and agents to exert every reasonable effort and adopt every available means to avoid any interruption to the operation of any carrier growing out of any dispute between the carrier and the employees or subordinate officials thereof." The section then says that all disputes shall be, if possible, settled in conference between representatives of the railways and the employees, and concludes as follows: "If any dispute is not decided in such conference, it shall be referred by the parties thereto to the Board which, under the provisions of this title, is authorized to hear and decide such dispute." In this instance, after the Labor Board has given the shop crafts a full hearing and decided the matters in dispute, they have struck in an effort to accomplish the very purpose the law sought to prevent—that is, an interruption of transportation. The Transportation Act does not specifically provide any penalties for any violation of its labor provision except that requiring witnesses to appear and testify when subpœnæd. The violation of law involved in this strike is just as plain, however, as if all the strikers could be arrested and put in jail.

Back Up the Tool Committees

Personnel is conceded to be the most important factor in railroad shop production, but even an efficient, highly-organized personnel cannot accomplish satisfactory results when handicapped by inadequate shop machinery and equipment. There is no denying that literally thousands of old machines now used in railroad shops can readily qualify for the scrap pile and the recommendations of shop officials and tool committees regarding replacement of these machines should receive favorable attention. Recommendations of the tool committees represent the final and best mechanical department opinion which should be respected both as to the amount and kind of machinery purchased. Why discourage shop officials from developing improved methods by continually disapproving their requests for machinery needed in applying those methods? And why expect a shop once equipped to run for years without further additions and improvements? Machine tool design is in a state of continual change, the tendency being always toward more powerful, accurate, easily-controlled and productive machines. Any business or industry failing to take advantage of modern machinery, fails to a proportionate extent in earning a maximum return for its stockholders. Railway purchasing agents are as a rule more capable and broadly experienced than those serving industrial plants but most of the former know little about machinery which they are inclined to think of in terms of price per pound. Price is of far less importance in the long run than a machine's productive capacity, adaptability to the work and the amount of work available for it. These factors are all given consideration by the tool committee. It is a mistake to ignore the recommendations of these experts and furnish another machine simply because of a few dollars difference in price.

The Element of Speed

As a result of the unfortunate accident at Winslow Junction, N. J., on July 3, it seems not unlikely that the high scheduled speeds of passenger trains between Camden and Atlantic City may be the subject of some unthoughtful criticism. At the present writing, only meager press reports of the accident are at hand and it is impossible to determine whether or not the element of speed played any considerable part in the disaster. Attention should be called, however, to the fact that the Philadelphia & Reading and the Pennsylvania express train service between Camden and Atlantic City has few equals in this country when speed, comfort and safety, taken as a whole, are considered. The tracks of both railroads are excellent, of high standards of construction and maintenance. There are few curves and the lines are practically level. The equipment used in this service by both roads is of the best. The distance is short—less than 60 miles—and traffic is heavy. If there is any situation in the United States where high speeds may be safely scheduled it is here. Indeed, speaking generally, it would seem that these two railroads are to be congratulated upon the splendid services which they offer between the Jersey coast and Camden, whence ferryboats operate to Philadelphia. Passenger service in America, as a rule, is comfortable and safe and relatively fast. It is not as fast on the average, however, as the service in England. There are good reasons for this, of course. Travel in England is of much greater density than that in this country and the distances between cities are shorter. But between Philadelphia and Atlantic City the conditions are favorable to high scheduled speeds. With conditions as favorable as they are, the railroads would be remiss in their duty to the public if their scheduled speeds for express passenger service on these lines were less. Indeed, 40 miles an hour is doubtless a more dangerous speed in many places where it is prescribed than are the higher speeds on the Atlantic City lines of the Reading and the Pennsylvania. Speed as high as conditions of traffic, equipment and track justify is a factor in the service which railroads offer to passengers just as are comfort and safety.

"If due consideration is given to the fact that four years of constant training is necessary to produce a passable mechanic, we would say that the foreman who rarely sees any shop except the one in which he is employed and meets no mechanical men other than his daily associates, is not to be censured but rather to be praised for what he does accomplish." This quotation from an announcement of the convention of the General Foremen's Association, is commended to the higher officers for careful consideration. Nothing has demonstrated the importance of foremen more forcefully than the present strike. Loyalty of the rank and file to the road seems now to count for little, if it has not been entirely displaced by loyalty to the labor organizations. Under such conditions, the foremen are the pillars of the organization. This is true at all times; the strike merely serves to emphasize it. The emergency through which the roads are passing will accomplish some good if it brings home to the managements the necessity for standing back of the foremen with encouragement and support.

The Pillars of the Organization

The Matter of Statistics

THE RAILWAYS and the Interstate Commerce Commission are again discussing the matter of the Interstate Commerce Commission's statistical requirements. This question as it relates to both the Interstate Commerce Commission and the state commissions is an old one and has been recurring in one form or another for many years. The general impression is that the commissions require too much statistical data and that the reports are so extensive that their compilation represents a heavy financial burden upon the carriers. There is, no doubt, a great deal of truth in this opinion, but there are so many extenuating factors that the question is not a simple one. The chief of these factors is, of course, that the railways require accounts and statistics for purposes of management and many carriers find it advisable to compile for their own purposes data of one kind or another in addition to that required by statute or by commission regulation.

Attention has been directed from time to time to the large increase in the number of railway clerks and in their compensation, which increases are somewhat out of proportion with the increase in the number of other employees, the compensation of other employees, the amount of traffic handled, or the revenue therefrom. Of course, there are many reasons contributing to the increase in the number of clerks. Among them is the fact that today many employees are designated as clerks who in former times were reported under some other designation. Federal control, the valuation act, the guaranty period, rate cases, discussions before the Labor Board, etc., have further necessitated the compilation of all kinds of material and thereby increased the number of clerks engaged in that kind of work. Another and not an unimportant factor is the increasing proportion of l.c.l. freight, the accounting costs on which per dollar of revenue are much higher than on carload freight.

The question is in the hands of the railways through the Association of Railway Executives and through the submission of the question to the Railway Accounting Officers' Association. The accounting officers have appointed a special committee, headed by E. M. Thomas, comptroller of the Chesapeake & Ohio, which is discussing the matter for the association and for the railways with the Bureau of Statistics of the Interstate Commerce Commission. The reference of this important question to the Railway Accounting Officers' Association is a compliment to that body. The able analysis of the situation as presented by President J. J. Ekin of the association in his address before the opening session of the accounting officers meeting in Cleveland on June 7 (*Railway Age* of June 17, page 1485) is assurance that the matter is in able hands. The accounting officers at their annual meeting put themselves plainly on record as advocating simplicity in accounting and direct, practical and usable statistics.

There is unquestionably a great deal of work that can be done in this matter of statistical requirements. It is something in which railroad officers in all departments of railway work are interested, the operating department, of course, being primarily interested. It will be borne in mind, however, that the operating statistics which are at present being required by the Interstate Commerce Commission on the O. S. forms are in the case of most roads but a small proportion of all statistics which are compiled concerning operation. Many roads have come to the conclusion that they need rather elaborate statistical reports to check up their own affairs and there are many columns in these reports which do not appear in the figures required for submission to the Interstate Commerce Commission. On a great many roads statistics have grown up much like "Topsy." There are too many instances in which the compilation of statistics has been begun for a definite purpose but which purpose after a time has disappeared, notwithstanding which the figures have been continued. These are factors which must always be borne in mind in discussing this matter of commission requirements.

There is presumably much ground for the argument that the Interstate Commerce Commission does require much statistical material which is not urgently necessary. One is told from time to time of masses of statistics which are requested but are apparently not used. The commission must apparently also plead guilty to a charge that there is not a complete co-ordination of the statistics that are furnished the various bureaus. On various occasions one or another bureau of the commission has required the carriers to compile information already in the files of some other bureau. The commission, for one purpose or another, frequently has to call on the carriers for special reports or special studies. These are sometimes quite costly. The commission presumably gives the question of cost serious thought before issuing such requirements. Whether it gives the element of expense sufficient consideration on all occasions is, however, a question. The matter of co-ordination is an important one not only as between the bureaus of the Interstate Commerce Commission but as between the I. C. C. and the state commissions. There is much room for improvement in the present situation whereby different reports covering the same ground are required for submission to the different regulatory bodies.

In addition to considering the matter of statistical requirements the Interstate Commerce Commission, with the co-operation of the Railway Accounting Officers' Association, has undertaken a revision of the various accounting classifications, the first one to be revised being that of operating expenses.

The work of revising the statistical requirements of the commission logically begins with the revision of its classifications, and we strongly suspect that both the feature of revising the classification and revising the statistical requirements will be merged and worked out in accordance with a definite plan embracing both accounts and statistics. The operating expense account should state clearly the cost of performing the transportation service separated into the elements of payroll, material, fuel and miscellaneous. These accounts together with physical statistics, both operating and traffic, should form a basis reflecting the actual operation of the property and affording a comparison with other periods and with other roads, from which proper deductions and conclusions may be reached. The object of statistics is to establish facts and the first and primary object of these facts is their use. The first test for statistics should be their utility. It is axiomatic that no statistics should be compiled unless they serve a useful purpose.

As we see it, railway accounts and statistics should be compiled for use by four classes of users. The management, the regulatory bodies, the investor and the public. Insofar as concerns the management, they will be used as an aid in operating the property in an efficient and economical manner. The Interstate Commerce Commission should be furnished with them monthly and annually in summary form so that they may afford a guide or yardstick to the commission in determining whether the properties have been efficiently and economically operated. The investor needs them to the end that he may be enabled to invest his capital with a proper degree of judgment. The public's interest lies in the necessity that it be given the facts in order to be able to form an intelligent opinion upon the broader aspects of railway welfare.

It is to be sincerely hoped that the Interstate Commerce Commission and the Railway Accounting Officers' Association, when revising the classification and statistical requirements, will have in mind that what is desired by all concerned is a clear, direct and honest statement from month to month and year to year of railroad operations as reflected in the accounts and statistics prepared and published from time to time.

Permissive Feature Omitted from Automatic Stop Specifications

The Interstate Commerce Commission has seen fit, in its final order requiring installations of automatic train control, to omit the "permissive" feature in the specifications for automatic stops as originally adopted jointly by the A.R.A. Committee and the Commission's Bureau of Safety. This was in paragraph *b* which would allow an automatic stop to be installed so that it would be "under control of engineman, who may, if alert, forestall automatic brake applications and proceed." This was to be expected after certain questions were framed by the commissioners during the hearing, apparently for the purpose of placing in the records answers which would indicate that such a provision was dangerous and that enginemen as a class could not be trusted to perform their work faithfully and conscientiously. It is well known that all of the companies having devices of merit can meet the conditions imposed by the specifications in the Commission's order, but we still believe that for the good of the art this paragraph should have been inserted in the final specifications; or, in lieu of that, that railroads desiring to use devices operated on the permissive principle should have been allowed to do so.

As the specifications now stand it appears that a premium is placed by the Commission on the use of speed control. This may be compared to a contractor trying to erect a building by attempting to construct the top floors first. In the development of any device it is desirable to start with the simple fundamentals first, as then, under service conditions, other features which prove necessary or desirable can be added, eventually approaching the ideally constructed device for the use intended. Speed control has not been used in steam railway service on an extensive enough scale or under all operating conditions for a sufficient period to warrant putting on it the premium that the Commission does in its desire to obtain absolute safety. The Commission apparently takes no account of the fact that a device may be made so "safe" that it will prevent trains from getting over the road. Safety with dispatch should be the goal sought.

As a matter of fact, it would appear the Commission has "strained at a gnat and swallowed a camel." While it has omitted paragraph *b* for considerations of safety, in paragraph *c* under "Automatic Train Control or Speed Control" it allows of a medium speed restriction which requires the train speed "to be below a prescribed rate when passing a caution signal or when approaching a stop signal or a danger zone *in order to forestall an automatic brake application.*" Is the absolute safety sought obtained if a train running under a medium speed restriction can be automatically allowed to pass a stop signal? If enginemen as a class cannot be trusted to operate a permissive automatic stop feature what is to make them take action to handle their trains properly at a stop signal under such a provision? The engineman may be dead; or even if he is alert, he may, owing to fog or storm, slip by such a signal with disastrous results. How can elimination of the one feature and provision for the other in the same specification be justified?

The railroads are no doubt at fault and must bear part of the responsibility for the provisions in the specifications because, before train control was studied intensively by them, they adopted what were considered theoretically ideal requisites which appeared to be framed to discourage the development of the art. After more thorough study and investigation they are now inclined to change their views as to what is desirable. We believe that, like other safety devices, automatic stops and train control, if developed along right lines, will not only increase safety but will prove to be of material benefit in train operation; but they must be developed along proper lines if they are to be a success. Therefore, railroads that desire to use a simple automatic stop with the permissive feature should not hesitate to seek authority from the Commission to do so; and the Commission should be willing to allow wide latitude in the development of the art in order that greater safety may not be secured at the cost of serious interference with train operation.

The Real Issue in the Strike

The strike recently begun by certain railway labor unions puts the labor provisions of the Transportation Act to the first real test to which they have been subjected. Temporarily the labor provisions have "broken down." Their main purpose was to prevent strikes. In this instance they have failed to accomplish that purpose.

The situation created is quite different from that brought about by the switchmen's strikes in 1920. Those strikes occurred before the Railroad Labor Board really had begun to function, and were not ordered or authorized by recognized and well established labor unions. The present strike has been ordered by the heads of recognized and well established labor unions after full hearing and decision by the Labor Board regarding the matters in controversy. It is a revolt by the labor unions against working conditions and wages which the Board has held to be reasonable.

One of the grounds assigned for the strike is the system of contracting work adopted by some railways; but only a small number of the railways have contracted work, and following the Board's decisions condemning this policy practically all of them have agreed to abandon it. The contracting of work is, therefore, merely a pretext and not a real reason for the ordering of a strike on all the railways.

The strike might conceivably have either of two outcomes. It might result in the unions being beaten and the employees being required to return to work on the terms the unions have rejected; or it might result in the unions triumphing and the railways being forced to grant working conditions and wages different from those the Board has awarded.

The former outcome would be a victory not only for the railways, but also for the method of settling labor controversies which has been established by the government. It would result not only in the strikers losing their wages while they were out, but also probably in many of them losing seniority and pension rights and other rights and privileges which have been of value to them. The effect of such an outcome would be to vindicate the provisions of the Transportation Act and the decisions of the Railroad Labor Board,

to strengthen the Labor Board's position and increase its prestige, and to make unlikely important strikes in defiance of the law and of the Labor Board's decisions in future.

It is equally plain what would be the effects of even a partial victory by the labor unions. If by their strike they should gain any working conditions or wages which from their standpoint were more favorable than those awarded by the Labor Board, this would convince them and other railway labor unions not involved in the strike that they had more to gain by striking than by submitting their claims to the Labor Board and accepting its decisions. This would speedily result in the destruction of the method and machinery for peacefully settling railway labor controversies which have been established by the Transportation Act. Organized labor naturally is going to adopt that policy by which it thinks it can gain the most. Even partial success for the labor unions as the outcome of the present strike would mean the substitution of open warfare between the railways and their employees for hearings and decisions by the Labor Board as the usual method of settling railway labor controversies.

B. M. Jewell, head of the shop crafts' unions, says it is the railways' "next move." This is not correct. The "next move" is the public's, through its government. The public either does not want railway labor controversies settled by the methods and machinery it has established, or it does want them so settled. If it does not want them so settled it should at once repeal the labor provisions of the Transportation Act. This would be an announcement by the public that it desires the railways and the labor unions to settle their controversies by conferences or strikes and lockouts as such differences are settled in other industries. The managements of the railways would be no more fearful of the outcome of negotiations or struggles with the labor unions under these conditions than are the managements of other kinds of business concerns. Furthermore, they would be relieved of certain serious handicaps with which they are now burdened. They would not be required, for example, to operate under working rules much more restrictive and wages much higher than those in other industries as they have been recently. Each railway would then be able to make the best terms it could with its own employees instead of all of them being obliged to accept practically uniform terms established by a government body.

On the other hand, if the public prefers the method of settling railway labor controversies now established by law, and the results of which, except in few and isolated cases, public sentiment has compelled the railways to accept, then it plainly is for the public through its various government officials and bodies, particularly the Railroad Labor Board, to take the leadership in fighting this strike to a finish. It may be assumed with practical certainty that the railways will neither make any overtures to the labor unions that have caused this strike, nor pay attention to any overtures from them. For their own reasons, and regardless of the future of the present system of government regulation of labor controversies, they cannot afford to concede a jot to the strikers that has not been conceded to them by the Labor Board's awards.

The real issue presented is whether the labor unions involved will be allowed to flout a law passed by Congress and defy and destroy a governmental agency established by the public through Congress to carry out that law. The public and the government must determine that issue. The strike is not one against what the railways have done, but against what the government has done. The American people must either stand fast and their government must adopt measures which will completely defeat this strike, or witness the certain destruction of the means for peacefully settling railway labor controversies which the public by its government has established.

Letters to the Editor

A Few Terminal Suggestions

St. Louis, Mo.

To the Editor:

It is my opinion that, with few exceptions, no locomotive weighing more than 70 tons should be employed in a terminal. I hold this view because of the fact that there is more danger of damage to equipment and lading where the heavier locomotive is used, and at the same time greater delays occur to freight because of the practice of waiting for the accumulation of large trains before attempting to move them. Where small locomotives are employed frequent deliveries are necessary, and these frequent deliveries reduce the delay in moving traffic through the terminals.

I also think that many cars are too large. Too much power is employed in pulling empty car space around the country. With smaller cars less damage would result to them and to their contents because the shock in switching would be less severe.

One reason for the great increase in the payment for damages to cars and contents in recent years has been the intensive loading in over-large box cars, for the larger the cars and the more intensive the loading, the higher are the damage claims. There is some question regarding the economy of intensive loading. Since this campaign was started the number of claims for damages has increased greatly, while this campaign has also led to a great deal of indiscriminate loading which also contributes to damages.

Some of the railways are now experimenting with containers on flat cars for the handling of merchandise. While I believe that this will be a success, there is a still further step which could be taken, namely, the adoption of a different type of car altogether; a smaller car which could be made rain-proof and theft-proof, which could be transferred from railway car trucks to automobile trucks; could be run in on a depressed track and unloaded from that point with a derrick which would lift the lid off the car and unload in much the same manner as the hold of a vessel is unloaded. Such a car could be loaded more compactly and thus be able to stand the ordinary shocks of transportation better.

I also believe that too many loads are being transferred in the terminals. If it is possible to get a shipment through in the original car it should be done. Some roads are now transferring cars in large terminals to save per diem. More or less damage and loss is incurred invariably when these transfers are made.

Another thing which is needed in large terminals is that all freight shall be inspected and loaded as carefully as explosives, inflammables and acids are now handled. There is no apparent reason for all loading not receiving the same supervision, for the loss in claim payments would more than pay for it. The day will come when a shipper will have to furnish a certificate to the railroad for every package he ships. He now has to do this for explosives, inflammables and acids and there is no reason why he should not do it with flour, food stuffs and other shipments susceptible to damage.

There are also too many repair tracks in large cities. This work could be done cheaper and better on fully equipped zone repair tracks where the roads could employ a better class of men, install better methods of bookkeeping, and maintain supplies of the various parts of different cars. The existence of so many repair tracks creates a tremendous waste on account of the crude methods which are required at these outlying repair tracks.

A Superintendent.

The Labor Board in Session on Strike Issue—P. & A. Photo

Shopmen Begin First General Strike on July 1

A. F. of L. Leader Defies Labor Board Which Replies by Issuing Call for New Organizations

JULY 1, 1922, will go down in railroad history as a momentous day for then began the first nationwide strike of railroad employees, accompanied by a $400,000,000 rate reduction, a $135,000,000 wage cut and a traffic revival which, were it not for curtailed coal loading, would be practically equal to the volume of traffic in the record-breaking months of 1920. Of these First of July developments, the strike of shopmen and the threatened strike of maintenance of way, clerical and signal employees and stationary firemen and oilers, are holding the center of the stage.

The last two issues of the *Railway Age* contained details of the threat of a nationwide strike of those classes of employees affected by the Railroad Labor Board's recent decisions fixing new rules and working conditions and cutting wages. The story ended in the last issue with the "ultimatum" sent by B. M. Jewell, president of the Railway Employees' Department of the American Federation of Labor, to T. DeWitt Cuyler, chairman of the Association of Railway Executives, and promising a strike of the shop crafts unless the railroads agreed to refrain from applying the Labor Board's rulings on wages and certain working rules and to do away with the contracting of repairs.

J. W. Kline Issues Call for Strike on July 1

The order for a strike of shopmen on July 1 in protest against the wage reduction recently authorized by the Labor Board, against the changes in overtime rules which were made some time ago by the same body and against the practice of certain railroads in contracting for the operation of repair shops, was sent out on June 28 by J. W. Kline, who is president of the International Brotherhood of Blacksmiths.

"In compliance with the strike vote," the telegraphic order read, "all shop craft employees below the rank of general foremen are hereby granted sanction to suspend work 10 a. m. July 1 on all railroads and Pullman shops in the United States."

The direction of the strike was delegated to W. P. Johnston of the International Association of Machinists.

Carriers Reply to Jewell's "Ultimatum"

By coincidence, a meeting of the member roads of the Association of Railway Executives had been called some time previously for June 29 at Chicago to consider express contracts. Naturally, Mr. Jewell's ultimatum to Mr. Cuyler came up for consideration with the result that the following reply was drawn up, unanimously approved by the executives present and forwarded to Mr. Jewell over Mr. Cuyler's signature:

Your telegram conveys, on behalf of the shop crafts an ultimatum that, unless the carriers turn their backs on the Railroad Labor Board and its recent decision, and accept your terms, the employees on behalf of whom you speak will on July 1, resort to force in the shape of a strike and will attempt to interrupt the orderly processes of transportation on which the business, comfort and welfare of the American public depend. Meanwhile, before consideration could be had and this reply sent, the public press carries today the announcement that you have actually issued your strike order effective 10:00 a. m. July 1.

It is impossible within any reasonable limit of space to single out and reply to all the erroneous and misleading statements contained in your telegram. Suffice it to say there has been and is nothing in the conduct of the carriers to justify the act which you notify us you are about to commit. There can be no question about the facts.

The facts are that the terms on which in your telegram you insist, have been duly and fully presented to the Board. That Board has patiently heard the evidence on which you rely to support your demands, as well as that offered in opposition, and have listened to and duly considered your arguments in support of your position. You fully participated in this lawful arbitration and had your day in court.

The Board in this hearing decided against you and rejected the demands which you now insist that under penalty of a strike

we shall accept, and rendered a decision fixing the wages which in their opinion are just and fair under the circumstances.

In the spring of 1920 the Board heard the demands of labor for an increased wage, and in July of that year granted an annual increase which in its ultimate application amounted to approximately $700,000,000, making its decision retroactive for four months. The carriers loyally accepted the decision and paid the increased wage.

You demand now that we accept your decision and reject that of the Board. You are clothed with none of the power or authority of organized government. The Board is a creature of the United States statutes, is a part of the government to whom all good citizens hold loyalty and allegiance, and in what it has done in the matter of which you now complain has been performing a function expressly delegated to it by Congress. To submit now to your demands and to reject the decision of the Board would be to recognize your power and authority as greater than that of the government.

The consequences of the rejection of this constituted governmental authority and obedience to your invisible and irresponsible power would be to continue a charge on the producing and consuming public for transportation in excess of that which the government, through its Board, has now declared to be just and fair. This unjust burden shall not be put upon the public by a surrender on our part to your threat of force.

If the just authority of the government is to be successfully defied and the government is to be rendered helpless to protect its citizens in their peaceful and lawful pursuit, if patriotic and loyal obedience to government authority is to be denied, the act and the responsibility is to be yours. It shall not be ours. If you strike it will be against an order of a governmental tribunal—it will be a strike against the government of the United States.

Labor Board Calls Inquiry

Simultaneously with the dispatch of this telegram to Mr. Jewell, federal intervention was announced in a citation ordering the heads of the organizations threatening to strike and the executives of all of the Class I railroads to appear before the Board on June 29 for an inquiry into the "threatened interruption of traffic." This action was taken under Section 313 of the Transportation Act which gives the Board the right to initiate hearings to determine whether or not there has been a violation of any of its decisions. The citation named a number of carriers on which it is alleged certain work has been contracted in violation of the Board's decision and specifically requested the executives of these roads to be present. It was expected at this meeting that the procedure followed by the Board last October when the train service organizations were threatening to strike would be followed again to bring about the recall of the strike orders which were already out and the end of the threats being made by the other organizations. However, indications of the partial failure of this move became apparent the following morning with the receipt of a letter at the Board's office from Mr. Jewell intimating that he had changed his mind about answering the Board's call and instead of attending "under protest" that he might not be present at all.

Jewell Objects to Board's Investigation

His communication, addressed to the chairman of the Board, read in part:

I assume that a similar telegram (the Board's citation) has been sent to the executives of the shop craft organization. They are engaged in doing all in their power in behalf of an orderly and peaceable suspension of work on the part of those employees who expect to act upon the sanction to suspend work granted by these executives in compliance with the almost unanimous vote of the crafts. It appears to me that the result, even if not the purpose of the telegram and the proposed hearing, would be a confused and disorderly strike movement lacking authoritative control and almost inevitably resulting in a mob-like action which would be pregnant with grave possibilities which it is the chief desire of the executives of the organizations of employees to prevent and which it has been far too often the obvious desire of employers to incite.

In protection of the public interests in law and order and in conservation of the railroad industry and in aid of the disciplined conduct of half a million men under trying conditions, permit me to urge that no action be taken at the present time which would deprive the railroad employees of the immediate counsel and guidance of their chosen representatives.

A discussion of the right of the Board to institute such an investigation under Section 313 followed, Mr. Jewell contending that while this section applied to the carriers it did not apply to the employees because their conviction that "they cannot afford to continue to render service under the wages and working conditions fixed in a decision of the Board" does not constitute a violation of the Board's rulings. Mr. Jewell then continued:

A compulsory limitation upon the right to control one's own property, "may well be within the power of our government because all rights of property are creations of law. But a compulsory limitation upon the right to control one's own labor is not within the power of the government, because this right is a natural right and is protected by the Thirteenth Amendment of the Constitution of the United States which provides that involuntary servitude shall not exist within the United States. Therefore, Congress

Photo by Underwood & Underwood

Strikers Walking Out of the I. C.'s Burnside Shops, Chicago, on July 1.

did not and cannot grant authority to anyone to impose terms and conditions of labor upon the employees of the various transportation systems which these employees individually or collectively refuse to accept.

After quoting numerous passages from the Congressional Record purporting to show the views of the framers of the act at the time of its passage, Mr. Jewell continued:

It is also respectfully submitted that the Board being an administrative arm of the government should not take upon itself the authority to extend its own power or to issue any orders attempting to coerce men into non-acceptable employment, thus forcing them into involuntary servitude.

If the Board, by its direction in its telegram of June 29 to the effect that the status quo be maintained on all roads until the conclusion of its hearing means that the Board has entered an order suspending operation of its decision, such suspension of operation of decisions should be clearly and unmistakably expressed. If, however, it is the intention of the Board to direct the employees of the railroads to remain at work under non-acceptable wages and working conditions, such order is void both because it is not within the powers of the Board and because it is a violation of the Constitution of the United States.

A similar letter expressing practically the same views was received by the Board from Timothy Healy, president of the International Brotherhood of Firemen and Oilers.

Chairman Hooper Outlines Board's Views on Threatened Strike

The attitude of the majority on the Board at this time was reflected in a statement made by Chairman Hooper in which he declared that the Board made no mistake in its decision and intimated there would be no change in its opinion at the inquiry to follow. Chairman Hooper said:

The people of the United States are sick and tired of having railway transportation and traffic periodically interrupted by con-

traverses between railway management and employees. It was this feeling which moved congress to enact the Transportation Act.

The right to strike and tie up a private business is quite a different thing from any supposed right to shake and obstruct the flow of interstate commerce in this vast commercial nation. Railway transportation is not a private business. It is essential to the very existence of our republic and to the individual well being of every citizen.

It is evident to every student of the situation that the railway labor organizations have no just cause for serious complaint at the treatment they have received at the hands of federal wage tribunals during the war period and since.

The wages fixed by the recent decisions of this Board will purchase more than the wages received by them prior to the war. In other words, their wages have increased by a greater percentage than has the cost of living. In some instances the increase is strikingly notable.

With but slight exceptions the great carriers of the country have paid the wages fixed by the various succeeding government tribunals. Now that decreases have come the employees should be good sports and accept the reductions.

If a change in conditions should at any time justify increased wages this Board will most cheerfully respond to the situation. Moreover, if it should at any time be made to appear to the Board that any injustice has been done to any class of employees by any rule or wage decision, under a continuation of present conditions, it would be the duty of the Board to correct such mistake.

Let it be understood, however, that the Board is convinced at this time that it has made no mistake and committed no injustice of any noteworthy magnitude in its recent decisions on rules and wages. The Board has endeavored to conform to the requirements of the law and has established a schedule of wages higher than those prevailing, as a rule, in other industries. It is useless to repeat statistics on this subject.

The employees do have one substantial grievance against certain of the carriers, and that is the contracting of railway employment to so-called independent contractors. This is not simply a labor grievance, it is a public grievance. This policy carried to its legitimate end destroys the labor article of the Transportation Act, treats the United States congress with contempt, deprives the public of lawful protection from railway labor troubles, and grievously imposes upon the employees.

Photo by Underwood & Underwood

Striking Employees of the C. & N. W's Fortieth Street Shops, Chicago, Going to a Strike Meeting in a Ball Park

Neither need have any fear that the public will permit injustice to be done to them by the Railroad Labor Board. If the Board does not effectuate a substantial degree of justice both to the carriers and the employees, it will be wiped out by congress.

Inquiry Opens Without Shop Crafts' Leader

When the time for the opening of the Board's inquiry arrived, it became apparent that Mr. Jewell would follow out his intimated defiance of that body for neither he nor his assistants were present. After a wait of almost an hour the Board filed into the room, the chairman bearing subpoenas for Mr. Jewell and Mr. Healy. Both were issued.

The inquiry began, nevertheless, with the partial elimination of one of the grievances which the labor leaders contend was a big factor in producing the "overwhelming vote" to strike. Chairman Hooper launched an inquiry as to the attitude of the railroads on the subject of contracting, meeting with an immediate reply from A. B. Ramsdell, assistant to the vice-president and general manager of the Chicago, Rock Island & Pacific, who said:

"The Rock Island made the announcement this morning that it did not at this time or at any future period expect to contract out their labor for car repair work, has not been in the habit of doing so and we felt we were wrongly charged and wrongly classified on the docket. It is not the carrier's purpose to farm out or contract its labor."

Marvin Hughitt, Jr., vice-president of the Chicago & North Western, likewise replied, "We have been obeying all the decisions of the Board and do not understand why we have been cited here."

The chairman announced in turn that the Southern Pacific, the Atchison, Topeka & Santa Fe and the Boston & Albany, had already announced their intention of refraining from contracting out their labor and that the Cincinnati, Indianapolis & Western had telegraphed, "in the interest of harmony we will acquiesce in any decision you may make in our case relating to the shop contract matter." Similarly W. R. Seaton, general attorney of the Pere Marquette, announced that that carrier had withdrawn from the contracts for the operation of shops and for coach cleaning.

E. F. Grable Questioned on Threatened Strike of M. of W. Employees

E. F. Grable, president of the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers, under examination described the strike ballot issued by that organization, its contents, the manner of its distribution, and the laws of his organization relating to the calling of a strike.

"The calling of a strike or the calling for a ballot to be put out comes from the system division in our organization," Mr. Grable testified. "The president is empowered to sanction the strike after a representative vote has been received and a majority vote in favor of it."

Mr. Grable testified that the organization sent out approximately 650,000 strike ballots, that his total membership was approximately 200,000, that the latest check of the returns show that approximately 228,000 strike ballots have been returned and that approximately 55 per cent of these ballots had already been tabulated, the big majority being in favor of striking on the wage reduction issue, the only one included in the ballot. In reply to a question of R. M. Barton, a member of the public group on the Board, Mr. Grable stated that he had refrained from sending out any instructions or literature to influence the vote one way or another.

In explaining the vote, Mr. Grable said:

The reason for such a heavy vote in favor of striking is not entirely indicated by the ballot. Prior decisions of this Board are not being carried out properly by the carriers, decisions of the Board being ignored on some properties in their entirety, rehearings had and decisions not yet carried out or applied. The contract labor proposition which arbitrarily reduced maintenance of way employees, rates of pay, the matter of the eight-hour day which some properties are trying to make the ten-hour day as a regular proposition—all those things influenced the vote in favor of a strike. These things have caused the unrest, dissatisfaction and all the other terms you may care to apply to it, among the employees in our department on all properties. The executives of our organization have been severely criticised for months because we used our influence with the membership to go along with these things with a view that in the near future the proper result would be obtained from this Board.

If we understood this call from the Board to mean that these matters would be held in status quo for the time until this matter was gone into, our organization assured that further hearings would be entertained on increases in answer to our request and some sort of assurance given that they see as we do at this

moment, that the factors determining wages have changed materially since this case was filed and the evidence was presented—in favor of increases in wages rather than the decreases that were given us—our attitude might be different.

After mentioning in addition the upward trend in the cost of living and the alleged injustice in the failure to apply the wage reduction to supervisory forces, Mr. Grable continued:

These are the things that made the ballot come in as it has and these are the things that if we had definite and concrete assurance on, as president of the organization I would use my influence with the other officers and the membership accordingly.

Chairman Hooper Reassures M. of W. Leader

In reply to Mr. Grable's remarks about the increase in the cost of living, Chairman Hooper said:

Do you think it would be worth anything to your organization and to the members of it to know that if the evident present trend of cost of living continues upward in such a degree as to render an increase in wages just and reasonable, that this Board would just cordially take that matter up and consider that trend of conditions as it considered the contrary at the time of its decision?

Mr. Grable replied that it would be very helpful and Chairman Hooper proceeded to state the assurance more specifically in the following language:

The Board would like for your organization to understand that at any future time whenever conditions of that sort (an increase in the cost of living) become of sufficient importance and of such an appreciable character, you can predicate a request for an increase in wages on them and come with a reasonable plea of that sort to this Board, you should know and your organization should know, that this Board will as cordially give you an increase as it gave you the decrease and do it because it would be its sworn duty to do it under the Transportation Act.

Twenty-three Cent Wage Fiction Answered by Board Chairman

Chairman Hooper spoke at length on the misunderstanding and misstatements which are so prevalent in the discussion of the Board's decisions and their effect, citing as an illustration the 23 cent minimum wage fiction widely heralded as the rate of pay for all common labor in the maintenance of way department. He said:

The labor organizations complain a great deal about the unfairness of the press. I noticed one week in your paper "Labor" a statement accompanied by a cartoon to the effect that there were more than 100,000 men of the common labor class put on the 23 cent minimum wage by Decision 1028. That same statement was repeated in the issue of the following week and yesterday a congressman of the United States repeated it on the floor of Congress and put it in the Congressional Record.

Now, of course, such a very absurd and prejudicial statement as that does an injustice to everybody concerned, misleads men, inflames the minds of men who are concerned directly and men who are only indirectly affected. The truth about that matter is that there were about 6,000 men who were put on a minimum wage of 23 cents an hour and that was all in a certain section of the country where labor was cheap in all industries. Perhaps these statements are made through ignorance and sometimes through design, but they are hurtful in a case of this sort.

In reply to the direct question as to his intentions in regard to the further conduct of the threatened strike, Mr. Grable replied that the executive council of his organization met on July 3 at Detroit and that the presentation of the developments of the meeting and the assurances given, together with other assurances on points he raised, would be very helpful at that meeting. However, he made no definite promises although his attitude throughout the questioning indicated a desire to co-operate in preventing a walkout.

Carriers Promise to End Contracting of Repair Work

At the suggestion of Chairman Hooper the hearing then resolved itself into "a Methodist meeting for a minute or two," practically every executive present standing up at the suggestion of Chairman Hooper as "having come up through the ranks as railway employees." Chairman Hooper then said:

I want your men present here, who are authorized to represent your roads to get out of this contract business which is in violation of the decisions of this Board, and as we believe the Transportation Act. We want you to announce that fact now in the interests of not only industrial peace on your roads but in interests of fair play to your men. I am not asking you to say your action has been illegal because we differ about that. We are not asking you to concede you have violated the law, not even asking you to say you never will do any more contracting. But we are asking you to make this simple, frank announcement that the American people will approve. What I want you to do is simply to say that you will withdraw from the contract policy on your road, will cut out the contracts that are now outstanding and that you have no present intention of going back into it. That you don't do in the face of a threat to strike. You are not showing any lack of manhood or moral courage but you are simply expressing a desire to put yourself in line and in conformity with the decisions of this Board which is a government tribunal.

Jacob Aronson, representing the New York Central, the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis, was first to comply with Chairman Hooper's request, stating frankly that it was the belief of these carriers that their contracts were not in violation of the Board's decisions or of the provisions of the Transportation Act, but adding:

In the interest of harmony and with a definite view of removing every vestige even of colorable cause of complaint, these carriers are prepared now to say to the Board without prejudice to their legal rights that if such action will avoid a strike, they will undertake as soon as they legally may do so under the provisions of the several agreements to terminate the agreements of these carriers which have been evolved in the hearings this week that cover repair of equipment.

Similar statements were made by Ralph M. Shaw, general counsel of the Chicago Great Western; H. E. Byram, president of the Chicago, Milwaukee & St. Paul; Ralph Budd, president of the Great Northern; W. E. Williams, representing the Missouri, Kansas & Texas; Frank H. Alfred, president of the Pere Marquette; J. M. Kurn, president of the St. Louis-San Francisco; John G. Walber, representing the Ann Arbor; W. G. Bierd, president of the Chicago & Alton; Hale Holden, president of the Colorado & Southern, and C. W. Coe, assistant general manager of the Wheeling & Lake Erie.

These concessions on the part of the railroads named, made in the interests of uninterrupted transportation service and in an effort to co-operate with the Board in settling the controversy, were futile, however, insofar as the shop crafts were concerned. Mr. Jewell was not present nor could he be found by the officer delegated to serve the subpœna.

The examination of E. H. Fitzgerald, president of the Brotherhood of Railway and Steamship Clerks, Express and Station Employees; D. W. Helt, president of the Brotherhood of Railroad Signalmen of America, and Timothy Healy was comparatively short, each witness outlining the manner in which the strike ballots were prepared, distributed and tabulated and the authority of the chief executive to order a walkout. In each case it was developed that no strike orders would be issued in time to call out the men represented in these organizations before July 1. Both Mr. Fitzgerald and Mr. Healy predicted that some of their men would join the shopmen on July 1 despite their orders.

Shop Crafts' Leader Denounced by Chairman Hooper

The absence of Mr. Jewell from the hearings and the inability of the officers of the Board to serve a subpœna on him led to the following remarks by Chairman Hooper which are self-explanatory and which closed the hearing:

The Board has ample power to compel Mr. Jewell's presence here as a witness, not as a party to the controversy, but as a witness to material facts involved in this hearing.

Tomorrow, according to the letter of Mr. Jewell, and a previous notification received from him, is the day set for the strike of the organizations, the shop crafts, which he represents. That being the case, it is not worth while for this Board to adjourn this case over till tomorrow, to undertake to compel Mr. Jewell's presence here. No practical purpose could be subserved by it. The chair did want Mr. Jewell to understand that it has the

power to compel his attendance here, and had he been found, proper steps would have been taken to compel it. But, this Board feels that it has fully carried out the responsibility resting upon it under the Transportation Act, to use every available means to prevent labor disturbance which might result in interruptions of traffic. The Board having gone that far, and tomorrow being the day for the strike, no practical purpose can be subserved by an adjournment of this hearing in order to get his testimony.

The Board right here might express its appreciation of the different force of conduct adopted by the gentlemen representing the other organizations of employees, and also its appreciation of the very fine spirit shown by nearly all of the railroads. In my own mind I can think of but two exceptions, which I will not name.

So far as Mr. Jewell is concerned, let his blood be on his own head. Mr. Jewell has flouted a government tribunal, charged with the duty and responsibility to investigate this matter, not only in the interests of the public, but in the interests of his own organizations, and the interests of the carriers the railway transportation system of this country. He has shouldered the responsibility of his own volition, and the Board desires to pursue the matter no further.

The Strike Situation to Date

So ended the first effort of the government to intervene. The strike began promptly at 10 a. m. July 1, with varying success at different points. So far, it has been very difficult to determine the number of men actually out on strike or to estimate the effects of the walkout upon the ability of the railroads to meet the ever-increasing demand for transportation service. This is due largely to the fact that the strike was called on Saturday, two of the following three days being holidays. It is known, however, that in many places employees have gone out with the strikers confident that their seniority and other rights will not be taken away from them, with the intention of returning to work after the Fourth of July.

Labor Board Calls for New Unions

The first official expression of the opinion of the Board on the strike was announced on July 3 in the form of a resolution calling for the formation of new labor organizations and the protection of workers remaining on duty or hired to take the places of the strikers. This resolution said:

> Be it resolved that it be communicated to the carriers and the employees remaining in the service and the new employees succeeding those who have left the service to take steps as soon as practicable to perfect on each carrier such organizations as may be deemed necessary for the purposes above mentioned to function in the representation of said employees before the Railroad Labor Board, in order that the effectiveness of the Transportation Act may be maintained, and
>
> Be it further resolved, that, on any carrier, where either of the above named organizations, by reason of its membership severing their connection with the carriers, ceases to represent its class of employees, procedure similar to that above suggested in the case of the shop crafts is recommended, and
>
> Be it further resolved, that the employees remaining in the service and the new ones entering same, be accorded the application and benefit of the outstanding wage and rule decisions of the Labor Board, until they are amended or modified by agreements with said employees, arrived at in conformity with the Transportation Act, or by decision of this Board, and
>
> Be it further resolved, that, if it be assumed that the employees who leave the service of the carrier because of their dissatisfaction with any decisions of the Labor Board are within their rights in so doing, it must likewise be conceded that the men who remain in the service and those who enter it anew are within their rights in accepting such employment, that they are not strike-breakers seeking to impose the arbitrary will of an employer on employees; that they have the moral as well as the legal right to engage in such service of the American public to avoid interruption of indispensable railway transportation, and that they are entitled to the protection of every department and branch of the government, state and national.

By Wednesday it became possible to begin the reorganization of the shop forces on practically all of the carriers affected by the strike. Throughout the country thousands of new men are being hired daily and many shop men are returning to work before the expiration of the time limits variously set by different railroads at from July 5 to July 10. Mr. Jewell's claim of a "100 per cent" walkout have not as yet been specifically answered by railway officers, but the real conditions will be disclosed during the next week when detailed reports can be compiled.

Comparatively little violence has been reported from any point in the country, present reports indicating minor disturbances here and there but little or no action requiring extensive protective measures.

Maintenance Strike Called Off

After a long conference on the Fourth of July between the executive officers of the maintenance of way union and members of the Labor Board the threatened strike of these employees was called off, the official announcement to that effect being issued by E. F. Grable, president of the union. Mr. Grable's communication stated that it was the belief of the officers that "it is not wise for our membership to leave the services of the carriers until every resource has been exhausted that affords hope of a peaceful adjustment." The plan determined upon by the leaders of the maintenance of way organization includes the taking up with the railway managements of "all the grievances and controversies outstanding between the members of the organization and the carriers" including "revision of the recent wage decision of the Board, certain changes in rules and the question of contracting out labor." Another phase of the plan provides for continuing work under the present wages under protest with the understanding that any revision of wages obtained be made retroactive to July 1.

"With the best interests of the members of our organization at heart," Mr. Grable said, "It is our judgment that more will be gained for them by the program here outlined than could be derived from any other source. We believe that a just and generous public sentiment will sustain us in this policy and every move necessary to its accomplishment will be most vigorously stressed."

Mr. Jewell's Reply

Mr. Jewell's reply to the Board's resolution quoted in part above stated that that body has "outlawed itself" as the friend of the unions and has adopted a tragic attitude in attempting to force American workers to accept a wage scale below "decent" levels.

"The Board is now attempting to direct the organization of employees," Mr. Jewell said, "And to select those whom it will recognize as organizations of railway employees. In this partisan effort of the Board to destroy the effectiveness of the organization which the railway employees have formed by their own desire and in the exercise of their right of mutual aid and co-operation the Board has 'outlawed' not the organization of employees but itself.

"It is a tragedy that the Board has, first, allowed itself to be used as an instrument to lower the American standard of living at the behest of organized greed and, second, allowed itself to be used as an instrument of attack against the national organizations of labor that have been for a generation the means of peaceful, reasonable betterment of the conditions of the wage earners.

"The Labor Board has placed itself in the position of being not an arm of the government of the people of the United States—the Board has placed itself in the position of being an arm of an organized financial and employing interest which is engaged in a nationwide campaign to reduce wages below the level of a decent living, to check the rising standard of living for the American worker and to disintegrate the protective organization of the worker."

The Board's rejoinder to this letter was made public on July 5, Chairman Hooper pointing out that Mr. Jewell had previously announced that the striking shopmen were no longer "under the jurisdiction of the Labor Board" and that

furthermore the Board had not outlawed the shop crafts in its resolution.

"When certain of the employees went out of the employ of the carriers," Chairman Hooper's letter said, "A majority of those who remained in and those who may subsequently enter will be entitled to represent all of any given class of employees in any dispute before the Board. The Board will not cease to function merely because certain employees leave the service nor will the Transportation Act be annulled. It therefore follows that you are greviously in error when you state that the Board has 'outlawed' your organization.

"It has only accepted your own statement as one of facts and law that the striking men are not now employees of the carriers.

"You must know that you do this Board a grave injustice and yourself no credit when you characterize the Board as unfriendly to your organization, as being implicated in a 'drive' of the financial interests against the employees. You are too well aware of the numerous instances in which the Board has upheld all the railway labor organizations, recognized their right to function, declaring their right of collective bargaining and sustaining them in their resistance to efforts made here and there to deprive them of their rights and privileges. But because we have thus recognized the rights of the employers it does not follow that we can or should agree with them in every contention or that we should ignore the rights and interest of the public."

No Interference from Washington

WASHINGTON, D. C.

AFTER HAVING made it clear that the Railroad Labor Board has the full support of the administration and that it does not expect a stoppage of transportation, Washington officials appear to have adopted a "hands-off" policy with reference to the railroad strike. President Harding left the city for a holiday trip shortly after the strike began, Attorney General Daugherty also went on a trip and Secretaries Hoover and Davis were engrossed in their efforts to induce the coal operators and the miners' union officials to agree on a basis for negotiating a settlement of the coal strike.

No signs of the slightest intention on the part of the administration to interfere in any way were discernible in Washington and newspaper men were reminded by high officers of the government that a shop or maintenance of way strike could not stop traffic or even interfere seriously with railroad operation for some time. The attitude was in marked contrast to that displayed when a trainmen's strike was threatened last fall, when the attorney general and his assistants had complete plans prepared for enjoining the labor leaders and probably also tying up their strike benefit funds, on the ground that a strike against the orders of the Labor Board would require the exercise of governmental power to protect the vital right of the public to uninterrupted transportation service. Not the slightest sympathy was manifested in administration circles with the claim of the union leaders that they had not received a fair deal at the hands of the Labor Board. On the contrary, the view was expressed at the White House, on the strength of reports from Chairman Hooper of the board, that its action was fully justified and that when it spoke it enunciated the policy of the government. Therefore there was no suggestion of any compromise affecting the board's decision.

At the White House it was stated officially on Friday, after the strike order had been issued, that it was the function and duty of the Labor Board, delegated to it by Congress, to deal with wage controversies, that the board was the agency to express the government's policy and to be backed up by the government and that for the purpose of the present case it is the government. It was also added that the government expects to be supreme. A question by a newspaper man also brought out the fact that the President understands clearly that the 23 cents an hour rate, which the labor statements have used as the basis for their claim that the wages fixed are too low, applies to only a small percentage of the men and recognizes local conditions in some parts of the south and southwest.

The legal theory on which the administration was prepared to act in case of a trainmen's strike last fall was that it would be directly against orders or findings of the government, represented by the Labor Board, and not against the railroad corporations, and that, under the Debs and Adamson law case decisions of the Supreme Court, where a labor organization seeks, by an organized cessation of labor, to paralyze the public service of the railroads, the United States government, on the motion of the attorney general or other proper governmental representative, has the right to apply to a court for an injunction enjoining the employees from combining and conspiring to interfere with interstate commerce. Also that upon violation of such injunction, the court may inflict punishment by fine and imprisonment, as was done in the Debs case.

It was undoubtedly the fear of such action on the part of the government as well as the knowledge that a strike would have no popular support, that induced the brotherhood leaders to grasp the opportunity offered them by the statement of the Labor Board that it could not expect to clear its dockets for a wage reduction case for some time, and to call off their strike. Since that time Secretary Hoover has emphasized to the railroad executives the importance of preserving as good relations as possible with the train service employees, on the ground that they are the only class of employees indispensable to railroad operation, and that the mechanics and track forces in the main can be recruited from the general labor pool of the country.

Before the coal strike the government made some efforts toward mediation because there was no established tribunal to decide the controversy and after the strike had progressed for three months efforts were renewed to settle it by negotiation even on a compromise basis. However, when the shop and maintenance of way unions threatened a strike no efforts toward mediation were made because a governmental tribunal had adjudicated the dispute. The theory of the transportation act is not to prohibit strikes and that if a class of railroad employees is sufficiently dissatisfied with the wages fixed to be willing to take the chance of having its jobs taken by others the government has no right to interfere unless the public welfare is seriously affected. As it would probably be considered rather futile to try to stop a strike by injunction after it had been in progress for some time, and after the strikers have been outlawed, the failure to take any action at this time would seem to indicate a confidence that the wages established by the board are high enough to attract men to perform the necessary work, and that if the men who have been doing it are unwilling to continue, the railroads will have comparatively little difficulty in replacing many of them, besides having much of their maintenance work done by contract

F. C. GALLOWAY, station master of the Pennsylvania Railroad at Cincinnati, Ohio, writing to the Pennsylvania Railroad magazine, The Pennsylvania Standard, says that the public is better mannered than it was when he first came in contact with it in the railroad service, about 36 years ago. "The grumpy bluffer used to be always with us; but now he is an exception. The campaign for better manners among railroad men has had its effect on the traveling public, and passengers are more careful in their manners, lest they be excelled by a poor railroad man. The benefit derived has been mutual . . ."

Train Service Not Affected by Shopmen's Strike

Walkout Occurs in Midst of Holiday Rush—Many Employees Return and New Men Being Hired

THAT PASSENGER service was being handled on schedule and freight service practically without interruption and that a record-breaking holiday traffic was cared for without untoward difficulty were the outstanding features of the first few days of the shopmen's strike which began according to schedule at 10 a. m. on July 1

The response to the strike call was fairly general. Some roads reported that 100 per cent of their shop employees had left their work and others lost employees in their maintenance and clerical forces even though no strike had been called for the latter.

The Pennsylvania, which was not a party to the Labor Board's decision, has been affected by the strike to some extent, but its big shops at Altoona have lost few, if any men. The Reading stands out as an exception, its shop forces, being members of the Federation of Railroad Workers, were not called out.

The starting of the strike on Saturday morning offered a serious situation to the railroads because it timed the strike with the holiday passenger traffic. The railroads had to contend with a record-breaking holiday rush. The New York Central, to take one example, handled on Saturday 27 extra sections of passenger trains out of New York. The Pennsylvania between 6 o'clock Saturday morning and 6 o'clock Sunday evening moved 100,000 passengers to Atlantic City, Cape May, Wildwood and other South Jersey points, constituting one of the heaviest movements of holiday travel ever recorded in a similar period. Similar experiences were reported by the New Haven, the Boston & Maine and many other roads. The returning traffic Tuesday presented another problem but except for minor difficulties no trouble was presented other than that normally to be met with under such circumstances.

Determination of the full effect of the strike was difficult at the start because it was felt that many of the men who failed to report were merely laying off for the holiday. At any rate the railroads took prompt steps to meet the situation. Advertisements for men promptly appeared in the daily papers at all important industrial centers. Applications for employment were received in large numbers and between the new men secured in this manner and the fact that many of the regular employees have since returned to service the railroads have been able to report a rapidly improving situation. Some of the railroads, notably those in the New York metropolitan district have announced a further step in the form of action to remove from their payroll strikers who fail to return to work. The men have been told that they will lose their rights and will be hired only as new employees. New men now being employed to take the places made vacant by strikers are assured permanent positions if they prove themselves competent. This policy, it is explained, is in entire conformity with the resolution of the Labor Board which places the strikers without its jurisdiction. The new men are being paid at the new Labor Board scale.

E. M. Rine, vice-president and general manager of the Delaware, Lackawanna & Western and chairman of the conference Committee of Managers of roads entering New York, is quoted as saying after a meeting of the committee on July 3:

"A man who has left the service is gone. If his place is taken by a new man he loses his seniority. The new men will have permanent positions and protection, if they fill the bill.

"The railroad companies have hired more than 1,000 new men in this city since Saturday. We are not hiring strike-breakers. We are hiring men to take the place of men who have left their jobs. We don't raise any question as to whether they are union men or not."

The Long Island has announced to the public its plans for paying off the strikers on Friday.

Roads Appeal to Employees to Remain at Work

Just prior to the strike most of the roads issued statements to their shop employees and the public calling attention to the fundamentals involved in the strike, *i. e.*, that the strike is directed primarily against a lawfully-arrived-at decision of the Labor Board, a government tribunal.

A typical statement is that issued by P. R. Albright, general manager of the Atlantic Coast Line which follows in part:

Briefly stated the strike vote was taken on five points of alleged dissatisfaction as follows:

1. Installation of piece work without agreement by committees.
2. Right of railroads to contract their car and locomotive shops to contractors.
3. Failure of railroads to observe orders of the Labor Board.
4. Opposition to rules ordered by the Labor Board.
5. Reductions of wages ordered by Labor Board effective July 1, 1922.

The Atlantic Coast Line is in no way involved in any of these matters except that its employees have expressed opposition to several of the rules ordered put into effect by the Labor Board some months ago, to which only one member of the Board dissented in rendering the decision. The employees are also opposed to acceptance of the reduction in wages ordered by the Labor Board effective July 1, 1922.

In both instances conferences were held between representatives of the employees and the management of the Atlantic Coast Line Railroad, and upon failure to agree the questions at issue were submitted for a decision to the United States Railroad Labor Board in the regular orderly way provided for in the Transportation Act; the submissions being jointly signed by the management and the employees of the Atlantic Coast Line Railroad. In the case pertaining to wages the Labor Board has recently issued an official decision ordering a reduction in wages, concurred in by six of the nine members of the Board which includes all of the public representatives thereon. The strike, if called, therefore, is between the shop employees, headed by Mr. Jewell, and the American public acting through its representatives on a federal board delegated by the Transportation Act to decide such matters.

The Atlantic Coast Line Railroad has complied with all of the requirements of the law and has also complied with all of the decisions of the United States Railroad Labor Board. There has been almost complete absence of friction in the relations of this company with its employees and at the present time, through the best of individual effort on the part of employees and the supervisory officers, the operation of the railroad has more nearly approached normal peace time conditions than at any time since the war. It is much to be regretted that in spite of the facts as they actually exist, and without regard to the spirit of the law enacted by congress for the purpose of maintaining uninterrupted transportation, the employees of these classes should leave the service of this company in a body as proposed, which is without justification under the conditions which now prevail.

I make an appeal to the employees to remain at work, observe the spirit of the law by accepting the decisions of the Labor Board created by congress, and maintain uninterrupted service for the future welfare and benefit of themselves, the public and the company, all of whom are vitally and directly interested in that being done.

The Situation in the East and South

The following is a brief analysis of the situation on the various railroads in the East and South as of Wednesday:

Baltimore & Ohio

The situation on this company's lines at the beginning of the strike was shown in a statement issued on July 3, by C. W. Galloway, vice-president in charge of operation to be as follows:

"Complete reports from all principal points indicate 73 per cent members Federated Shop Crafts went out on strike Saturday and reports thus far received for first trick today indicate practically no change compared Saturday. Our movement Saturday was good and as much as we had been moving for several weeks past. Yesterday about usual Sunday average. Reports from several points indicate number of the men who went out Saturday will return by Wednesday. At Mt. Clare shop today some fifty men who had gone out returned to duty. There are no present indications of difficulty in moving passenger and freight traffic. Everything quiet."

Vice-president Galloway on July 5 described the strike situation as follows: "Complete reports from principal stations for all tricks July 4 indicate no change strike situation compared with Saturday. Reports from some points today for first trick show increased force by old men returning and new men hired. Movement yesterday somewhat less than Sunday and Monday account holiday as well as reduced operation at some points due to strike. No difficulty in moving passenger and freight traffic. Everything quiet."

Bangor & Aroostook

Out of approximately 410 shop employees, 80 per cent went on strike, causing no interference with traffic. The road is gradually filling vacancies with new men and a few of the strikers who are returning. Most of its outlying points are fully covered. The road advises that its power is in good shape with serviceable engines stored and that it anticipates no interruption to traffic.

Bessemer & Lake Erie

Shops working 100 per cent on Monday. A small number in the car forces at Conneaut Harbor, Ohio and Albion, Pa., ceased work. No cessation of train movement.

Boston & Albany

On Saturday morning about one-third of this company's employees in shops, engine houses, coal pockets, ash pits and at inspection points went on strike. A good many section men left the service. On July 3 the Allston shops were operating with a full complement. On the same day 85 men reported for work at West Springfield shops. There has as yet been no interference with freight or passenger service, which latter has been exceptionally heavy. There have been no disorders of any sort at any point on the line.

Boston & Maine

Despite heavy holiday passenger traffic beginning Saturday, passenger trains run with but little delay. Freight is being handled without embargo or restriction. There has been a heavy response to the company's advertisements for recruits. The new men are being assured of permanent positions if competent. Press reports told of 200 men who went on strike Saturday returning to work Monday.

Central of Georgia

Mechanical crafts walked out on July 1 but most of the colored helpers and shop laborers remained at work as did all mechanical foremen. These foremen with the assistance of laborers are getting trains out on time. A heavy holiday traffic was handled without material delay. No disturbances have been reported.

Delaware & Hudson

Practically all employees at the smaller terminals remained at their posts. At the larger terminals about 50 per cent of the engine house and stores department employees left the service, together with practically all car shop employees. About 400 new men have been employed to take the places of striking engine house employees, engine dispatchers and car inspectors. Trains are moving according to schedule.

Erie

This company's shops are operated by contractors and it is the contractors who are filling the places of striking employees. About 2,500 of the contractors' old force of 7,500 men are at work. Between 600 and 800 new men have been employed and about 200 former employees have returned to the service. All trains are being operated practically on schedule.

Lehigh & New England

None of this company's regular shop force of 270 employees were on duty July 5. A few transfermen, signalmen and linemen also were out.

Lehigh Valley

About 1,420 regular employees out of a force of 5,573 are at work. The road is successfully replacing the employees who have left the service. All trains are being operated on schedule including fast freights.

Long Island

C. D. Baker, general superintendent, made public the following statement Saturday afternoon:

"At ten o'clock this morning about 1,000 men stopped work in our Morris Park shops, including machinists, boilermakers, electricians and the usual shop craft men, in addition to a number of employees, classed as laborers, who do not come under the shop agreement.

"At the Long Island City engine house 300 of the 310 shopmen employed there went on strike. None of the shopmen in the Marine shops at Whitestone have stopped work. Practically all of the high tension men of the electrical department left the service. A number of car inspectors stopped work.

"It is difficult to determine exactly how many men have left the service for the reason that a great many of the men involved in the shopmen's strike order would not have been at work Saturday, Monday and Tuesday, which are holidays. In so far as the men actually employed in the shops are concerned, it is our belief that their leaving the service will not seriously affect the train service, as our equipment is in excellent condition and can be utilized for a long period without being shopped for repairs."

A special effort has been made by the striking employees, but without success, to stop the operation of the power houses at Long Island City.

The Long Island is advertising for shop employees. On July 3 announcement was made that the company would pay off on July 7 those shopmen who had "not seen fit to return to duty." Sufficient men, the announcement said, having been obtained to take care of the work necessary to be done at this time.

Maine Central

About 90 per cent of the shop forces left the service. No interruption to passenger service. Freight service being performed satisfactorily. Road is well fixed from the standpoint of power and equipment condition.

New York Central

The executive offices of the New York Central Lines in New York reported on Wednesday afternoon that the strikers were drifting back at practically all points over the system and applying for their former positions. At the outset of the strike on Saturday, the statement continued, the number of men in all the shop crafts who had left their work were distinctly in the minority. In some districts, the men remained at work 100 per cent, in defiance of the strike call, while the condition was variable in different localities and ranged from a complete walkout to the departure of merely handfuls of men, from some of the engine terminals and from the locomotive repair shops.

The combination of the record breaking holiday passenger traffic and the quitting of 50 car inspectors, air-brake men and others having to do with the make-up and inspection of passenger trains at Grand Central and Mott Haven yards presented the New York Central with an acute situation at New York during the first few hours of the strike. The amount of traffic necessitated the running of 27 extra trains or sections. The result was delayed service for a period in the afternoon but the situation was soon taken in hand.

Other men held in readiness were put in the places of the strikers and no train was cancelled. These car inspectors having directly to do with train operation quit generally at most terminal points but the railroad management succeeded in having their places promptly filled and avoiding interruption of passenger service.

From the beginning of the strike Saturday morning until Wednesday evening, each succeeding hour saw, the company reported, large forces employed at each point, the New York Central employing considerable numbers of men on Saturday, Sunday, Monday and Tuesday while Wednesday saw the beginning of the return in considerable numbers of old employees. No strike breakers were employed by the New York Central, it being stated that every man would be given a permanent position if he proved competent, that he would be protected at his work and that any strikers re-employed would have to 'come back as new employees with the loss of their seniority and pension rights.

It was stated on Wednesday that the complete loyalty and splendid service of the supervisory forces had enabled the railroad to continue full passenger and freight service, and that with the addition of competent men available to fill out the forces within a short time, the situation would improve from day to day. The strikers on this railroad generally had left their work peaceably and there was no disorder at any point, of consequence.

At some points, the strikers met on Wednesday and voted on the question of returning, these meetings generally resulting in the return of considerable numbers to work and at one point the vote was unanimous and the entire striking force returned to their work en masse.

The points on the New York Central chiefly affected are Albany, Utica, Syracuse, Rochester, Buffalo, Cleveland, Toledo, Elkhart and Chicago. Reports on Saturday were to the effect that only 17 men obeyed the first call and left work at the locomotive shop at West Albany.

New York, New Haven & Hartford

C. L. Bardo, general manager, issued the following statement on July 1:

"The New York, New Haven & Hartford reports no delays to trains on its lines due to the withdrawal of mechanical department forces at 10:00 A. M. today. There has been some slight delay to New Haven trains in starting from the Grand Central Terminal. Out of a total authorized force of 6,139 men, which covers the full complement for the entire 24-hour period (these forces working on an 8-hour day basis) all of the men on the first shift, which consists of about 2,500 men, withdrew from the service at 10 o'clock today, except 276 mechanics of various crafts at the several locations. All points are now being covered by competent men. While no strike has been ordered in the maintenance of way department, the reports so far received would indicate that from 100 to 200 laborers, widely scattered, failed to report for duty at the accustomed hour this morning, presumably as a result of the reduction in rates ordered by the Labor Board effective today."

On July 3 the road reported an improved situation with respect to mechanical department forces and similar reports followed on succeeding days. On Monday on the first shift there was an increase of 472 men as compared with the first shift on Saturday after the strike was called. On Tuesday there was a further increase of 4 men and on Wednesday another increase of 653. The New Haven has advertised extensively and is hiring skilled mechanics at the new Labor Board scale, applications for employment being received in large numbers. From the start of the strike passenger and freight service has been maintained on a normal basis.

Norfolk & Western

The strike of the shop employees has had the effect of slowing up freight movement on this company's lines to some extent, the interruption being greatest between Roanoke, Va., and Hagerstown, Md. More employees were on duty on July 5 than on July 1, the first day of the strike, and some improvement in the movement of freight traffic has been noted. Maintenance of way forces have been very slightly affected by the strike. On July 5, at 10 A. M., 99 clerks out of a total of more than 800 left the service at Roanoke.

Pennsylvania

The most important feature in connection with the strike insofar as it concerns the Pennsylvania System is that the Altoona shops are not affected. The situation on the system as a whole on the first day was described in a statement issued late in the evening to be as follows:

"As far as Philadelphia is concerned the Pennsylvania Railroad is practically unaffected thus far by the strike. Up to 4 p. m. out of a total force of 3,724 maintenance of equipment employees on the Philadelphia Terminal Division, including the West Philadelphia Shops, only 122 men failed to report. On the evening shift only 46 men were out. These numbers of absentees are in no way abnormal, especially before a holiday, and might occur under ordinary circumstances without attracting notice.

"Outside of Philadelphia, the Eastern Region showed about 2,500 men failing to report out of total forces of over 27,000. At certain points, notably in the neighborhood of New York City, where there had been considerable losses on the first shift, late afternoon and evening conditions showed improvement, and there is no point in the region at which any engine house or shop is unable to function.

"The Altoona Works were unaffected by the strike and worked with normal forces all day. These are the largest and most important shops on the Pennsylvania System, employing 12,000 men."

The report issued Sunday gave some interesting details concerning the holiday traffic.

"Throughout the Eastern Region more than 85 per cent of the normal Sunday forces reported. On the Philadelphia Terminal Division 100 per cent worked.

"Advertisements for men to take the places of those leaving the service have been inserted in the newspapers of a number of cities, including New York, Philadelphia, Camden and Atlantic City, and a number of new men have been hired for work at various points. Despite the day being Sunday, applications for permanent jobs have been freely made.

"Train service has not been affected in the slightest degree at any point by the strike. The volume of traffic, both passenger and freight, handled since the strike began, has been unusually large. Between 6 o'clock Saturday morning and 6 o'clock Sunday evening the Pennsylvania carried to Atlantic City, Cape May, Wildwood and other South Jersey points approximately 100,000 passengers, constituting one of the heaviest movements of holiday travel ever recorded in a 24 hour period.

"In addition to the regular trains, 48 extra trains and sections were operated to the shore in this interval. Throughout the entire Eastern Region, 640 extra passenger coaches were in service and these were operated from two to four round trips each. The total passenger travel in the Eastern Region has been about 25 per cent ahead of the corresponding portion of the holiday period of last year.

"Complete reports received today by C. S. Krick, general manager of the Eastern Region, regarding the traffic handled on Saturday at Pennsylvania Station, New York City, established definitely the fact that it was the heaviest ever recorded in a single day since the station was opened twelve years ago. Altogether 688 trains were operated in and out of the station during the day. They made up a total of 5,066 cars, carrying an estimated number of 303,000 passengers."

The reports on the following days indicated that the general tendency on the system was in the direction of improvement. Emphasis was placed on the fact that normal service both freight and passenger was fully maintained without difficulty. Wednesday night the situation was described as follows:

"Normal performance of all service both passenger and freight continued today on all four regions. Car and engine repair shops were generally closed for the holiday. Enginehouses at all points performed all functions necessary in connection with train movement. At a number of points men who had left their work reported back and asked to return to duty whenever they were needed. Everywhere conditions on the Pennsylvania System were not materially changed."

Philadelphia & Reading

This road is not affected, none of its shop employees having left the service. The shopmen on the Reading are not affiliated with the A. F. of L. but with the Federation of Railroad Workers.

Southern Railway and Other Southeastern Lines

In the south the strike had no very marked effect on the handling of traffic during the first few days of the strike and officials said it would be difficult to gage the situation before next Monday, as many undoubtedly remained away from work over the holiday who would return later.

Reports from the southeastern roads indicate that approximately 90 per cent of the shop employees obeyed the strike order and left their work on July 1, but a considerable number have returned to work in the days since. Some of the roads have posted notices fixing dates by which the men must return to their jobs or lose their rights but other roads had not yet taken this step. On some roads some of the men whose organizations had not yet authorized a strike went out in sympathy with the shopmen. On one large road the maintenance of way employees withdrew from the organization and formed a new one of their own.

There was some delay in the handling of traffic at certain points but no outstanding development had taken place during the first part of the week. The Southern Railway reported that most of its mechanics had gone out but that a few had returned at various points and that the strike had had practically no effect so far.

Virginian

Approximately 95 per cent of the shop crafts are out, but with no interference with operation.

Western Maryland

The *Railway Age* is advised as follows:

"Western Maryland Railway has contracted all repair work. Contractors have not lost a man as result of strike which began July 1. Pittsburgh & Lake Erie Railroad together with Western Maryland is, I am advised, the only line between Pittsburgh and Baltimore which is giving normal service under present conditions. I believe this is good evidence that the public obtains at least some benefit from the contract plan which Western Maryland Railway has had in effect since March, 1922."

Canadian Roads Not Affected

The Canadian National and the Canadian Pacific have not been affected by the strike. The application of the Labor Board's adjustment of shopmen's wages to similar occupations on the lines of the Canadian National is a matter of negotiation between the management and the unions interested. No decision has been reached as yet. On the Canadian National's American subsidiary, the Duluth, Winnipeg & Pacific, the shop employees went out on strike on July 1.

Economic Status of Rail Workers Still 18.75 Per Cent Above 1914

ANALYSIS of the wages of railroad employees by the National Industrial Conference Board shows that the wage cut recently ordered by the Labor Board leaves the four main classes of men affected with an economic status which is nearly 19 per cent higher than their position in 1914. Of the four classes affected, the car men stand at the top of the list with an increase of purchasing power of 33 per cent over the 1914 level, followed by unskilled labor, whose increase amounts to 19 per cent; that of the clerks 13 per cent, and of skilled shop mechanics. The study also demonstrates that even after the new wage cuts go into effect railroad employees will still constitute a preferred class of industrial labor, as their increase in real earnings and their actual money wages are still materially above the real wages and actual wages paid to employees of other industries performing a similar class of service.

The Conference Board's statement, made public on July 2, reads in part as follows:

The majority of railroad employees whose wages will be reduced after July 1 by order of the Labor Board are included in the shop forces, the track laborers, the clerks and the signalmen. Various other classes, such as the stationary firemen and oilers, have also had their wages reduced by the Labor Board's decision, but these form only a small percentage of the total number of railroad employees.

The shop forces include two main classes of employees, the skilled mechanics or the so-called locomotive crafts, comprising the machinists, blacksmiths, boilermakers, sheet metal workers and electrical workers, and the car men, whose duty it is to repair freight and passenger cars. The bulk of the car men are engaged in the repair of freight cars. The maintenance of way employees include, besides track laborers, a number of skilled mechanics, but as these mechanics are paid at the same rates as the mechanics in the shop crafts, unskilled labor only was taken account of by the Board in making the present estimates. The same applies to signalmen, who are chiefly electrical workers or unskilled laborers.

The skilled mechanics of the shop crafts have had an average working week of 48.06 hours since the signing in 1919 of the National Agreements defining the working conditions of this group of employees. Their rate of pay up to the present time has been 77 cents an hour for journeymen mechanics not engaged in autogenous welding, the autogenous welders receiving a differential of 5 cents per hour in addition to the regular mechanic's rate.

The recent decision of the Labor Board cut the rate of skilled mechanics 7 cents per hour, making a new hourly rate of 70 cents. It is fair to assume that the average number of hours of employment per week will not be less after July 1 than it has been during the past two and one-half years, and for the purpose of estimating the earnings of skilled shop mechanics under the wage cut, 48.06 hours have been taken as a basis. At this rate, skilled mechanics will receive pay for 48 hours at 70 cents plus .06 of one hour overtime at time and one-half, making their average weekly earnings $33.67 per week. This makes their average hourly earnings after July 1 70.1 cents. The average weekly earnings of this class of employees in 1914 was $19.73, which indicates a net increase over 1914 of 71 per cent in estimated average weekly earnings after July 1. The average hourly earnings of this class were 38.5 cents in 1914, making the increase over 1914 of the estimated new earnings 82 per cent. The index of actual hourly earnings divided by the index of the cost of living, which was 154.9 on June 1, and which will probably change but slightly in the next few months, gives an index of real earnings or purchasing power of actual earnings, based on the average hourly earnings, of 118, and based on the average weekly earnings, the real index is 110. In other words, the economic status of the skilled mechanics of the shop forces when expressed in purchasing power is 10 per cent higher than in 1914.

For the car men, computing the figures in the same manner, it is found that since the signing of the National Agreements reducing the working hours the average number of hours of employment per week is 48.59. Thus, car men whose rate has been reduced 9 cents from the present rate of 72 cents, will have average weekly earnings of $31.15, which is a 106 per cent increase over the average weekly earnings of $15.09 in 1914. Their average hourly earnings of 64.1 cents under the new rate show an increase of 150 per cent over the 1914 average hourly earnings of 25.6 cents. Their real earnings after July 1 based on their average hourly earnings will, therefore, be 61 per cent higher than in 1914, and based on their average weekly earnings, 33 per cent higher than in 1914.

The average number of hours of employment per week of *unskilled labor* since the signing of the National Agreements has been 49.86. The rate of pay of unskilled labor varies somewhat from one part of the country to another, and in the case of negro labor in some of the southern states, was as low as 28 cents per hour before the decision rendered by the Labor Board. However, the rate paid to unskilled white laborers in the northern and western states, including the great majority of the railroads of the country, has been 40 cents per hour. This rate, reduced 5 cents per hour by the Labor Board's order, will therefore be 35 cents per hour after July 1. Working 49.86 hours per week, the average weekly earnings of unskilled labor will therefore be $17.45 per week, which is an increase of 85 per cent over the 1914 earnings. The decision rendered by the Labor Board on December 16, 1921, while recognizing the principle of the eight-hour day, provided that track laborers should be paid overtime only after the expiration of the tenth hour of continuous service. The 1.86 hours over the regulation 48-hour week cannot therefore be computed at time and one-half in figuring the weekly earnings of this class of employees. The average hourly earnings will therefore be 35 cents or the same as the hourly rate of pay. This shows an increase in actual hourly earnings of 117 per cent over the average hourly earnings of 16.1 cents in 1914. The real earnings based on the average hourly earnings show an increase of 40 per cent; while real earnings based on average weekly earnings show an increase of 19 per cent.

The clerical forces of the railroads since the Clerks' National Agreement was signed early in 1920 have worked an average of 48.18 hours per week, and, as is the case with unskilled labor, the .18 extra hours over the regulation 48-hour week cannot be computed at time and one-half because of the decision of the Labor Board of January 22, 1922, which ordered that clerical forces should not be paid overtime until the expiration of the ninth hour of continuous service. No definite rate can be established for all classes of clerical employees, but their average hourly earnings in October, 1921, were 61.8 cents. The reduction of the Labor Board, which has just been ordered, equals 3 cents for some classes of clerks, and 4 cents per hour for other classes, or an average reduction of 3.8 cents, which will make the average rate per hour of all classes of clerks 58 cents after July 1. This is an increase in actual hourly earnings of 97 per cent over the 1914 rate and the real earnings of clerks based on their average hourly earnings will therefore be 28 per cent over the 1914 level. Working 48.18 hours per week, the average weekly earnings of clerks will be $27.94, an increase of 74 per cent over 1914. Computed on the basis of average weekly earnings, their purchasing power will have increased 13 per cent.

Thus, the average increase in purchasing power based on weekly earnings of the four classes is 18.75 per cent over the 1914 standard. The car men stand at the top of the list with an increase of 33 per cent, followed by unskilled labor, whose increase is 19 per cent, the clerks and unskilled shop men coming next with increases of 13 per cent and 10 per cent respectively.

Although comparisons of wages of railroad employees with employees in other industries cannot be made for all classes, and the latest reports of the National Industrial Conference Board on wages of employees in manufacturing industries do not give data for later than January 1, 1922, it is interesting to compare the wages of railroad skilled shop labor with those of the skilled employees of foundries and machine shops, who perform practically identical services. Thus we find that while the average hourly earnings of railroad skilled shop employees under the new wage cut will be 70.1 cents, those of employees in the foundry and machine shop industry stood at 56.1 cents on January 1, and the comparative average weekly wages stood at $33.67 and $25.08 for railroad and foundry and machine shop mechanics, respectively. The increase in real weekly earnings of foundry and machine shop employees over the 1914 level was only 5 per cent as compared with a 10 per cent increase for the railroad employees.

The same is true with regard to unskilled labor outside the railroad industry. The National Industrial Conference Board's studies show that the average hourly earnings of unskilled laborers in other than the railroad industry were 41.4 cents as compared with 35 cents for railroad labor on January 1, and the average weekly earnings of unskilled manufacturing labor were $19.04 as compared with $17.45 for railroad common labor. While real earnings for unskilled railroad labor increased 19 per cent in the eight-year period, those of unskilled labor outside of the railroad industry increased only 9 per cent. These increases are figured both for the railroad industry and for outside industries on the basis of the Conference Board's cost of living index for June 1 1922, which shows that the cost of living at that time was 6.6 points lower than on January 1.

Comprehensive Report on St. Louis Terminals

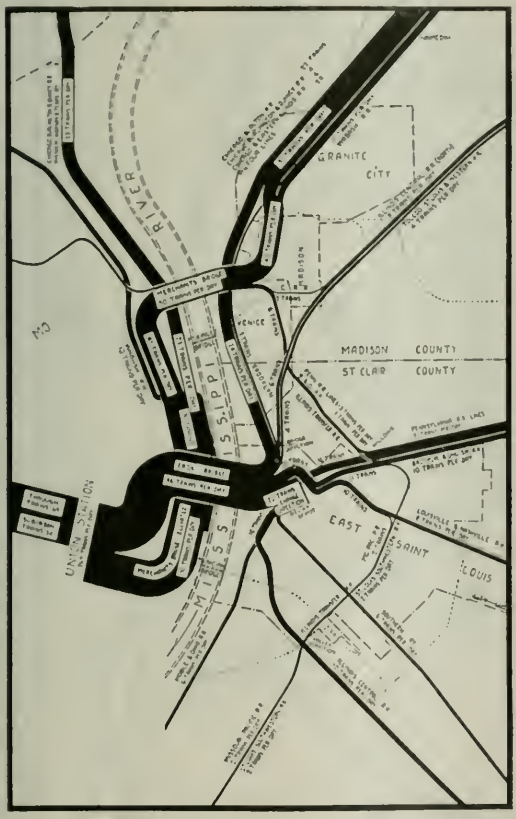
Engineers' Committee Recommends Improved Facilities and Partial Unification of Operation

WHAT IS PROBABLY one of the most complete reports ever made on railway terminals in this country was recently transmitted to the Terminal committee of the St. Louis Chamber of Commerce by the Engineers' committee appointed in 1920 to make a complete study of railway transportation in the St. Louis terminals. This report not only covers an exhaustive study of the entire problem with detailed recommendations for improving rail facilities in and about the terminals, but also includes a large fund of supporting data concerning railway facilities and operations in the St. Louis terminals as well as abstracts from recent reports on the railway problems of other urban areas. The report evidences a minute study of details and the recommendations made, while including the enunciation of general principles, are exceedingly specific in their reference to particular features of the intricate network which comprises the St. Louis railway terminal area. This study has borne fruit in recommendations for the improved routing of passenger trains, increased facilities at the Union Passenger Station of St. Louis, the unified classification and interchange of freight cars, a revised plan for the utilization of the Mississippi river bridges and an improved handling of the l.c.l. business. Electrification is found to be unnecessary and financially impracticable.

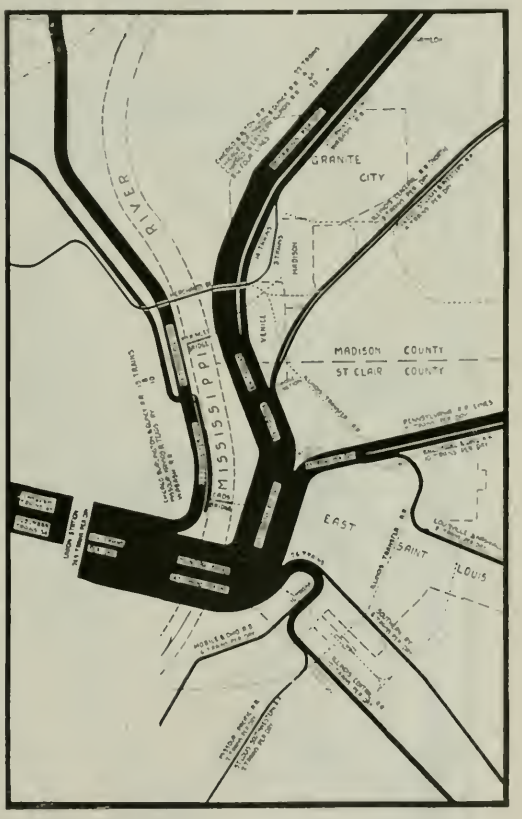
The St. Louis-East St. Louis Industrial District

The St. Louis-East St. Louis industrial district comprises an area in Missouri and Illinois about 25 miles square, of which the cities of St. Louis, Mo., and East St. Louis, Ill., occupy most nearly the central position. The Illinois side consists of what is known as the Great American Bottoms, a low level, fertile area, bounded on the east by bluffs. The Missouri side is an undulating surface of gently rolling hills, sloping gradually to the Mississippi. The St. Louis industrial district has a population in excess of 1,000,000.

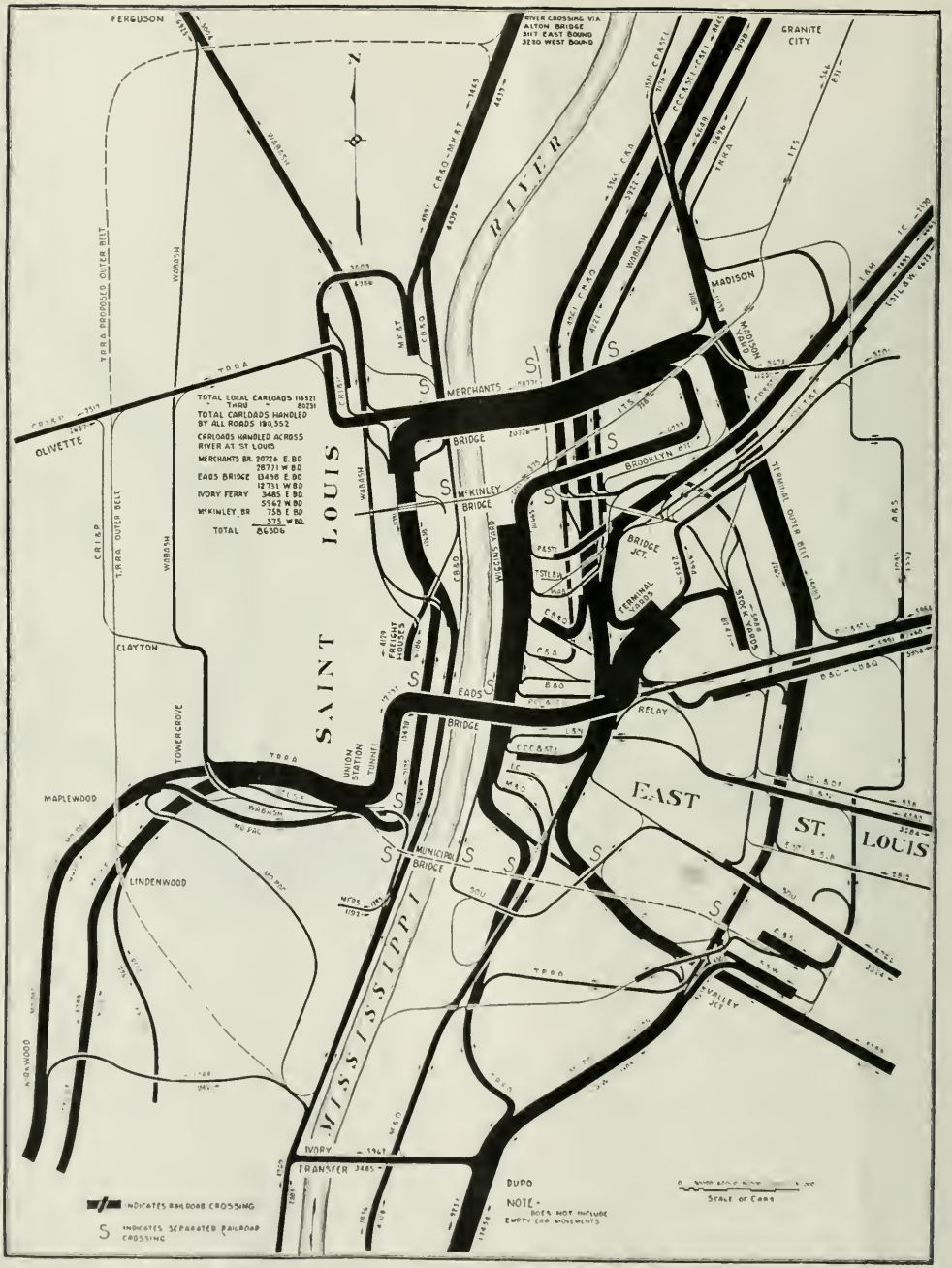
Local conditions at St. Louis and East St. Louis, such as the great expense of Mississipi river bridges have already resulted in considerable unification of terminal facilities in the Terminal Railroad Association of St. Louis, a belt line owned by 15 trunk lines. It was manifestly impossible for



Present Routes of Passenger Trains



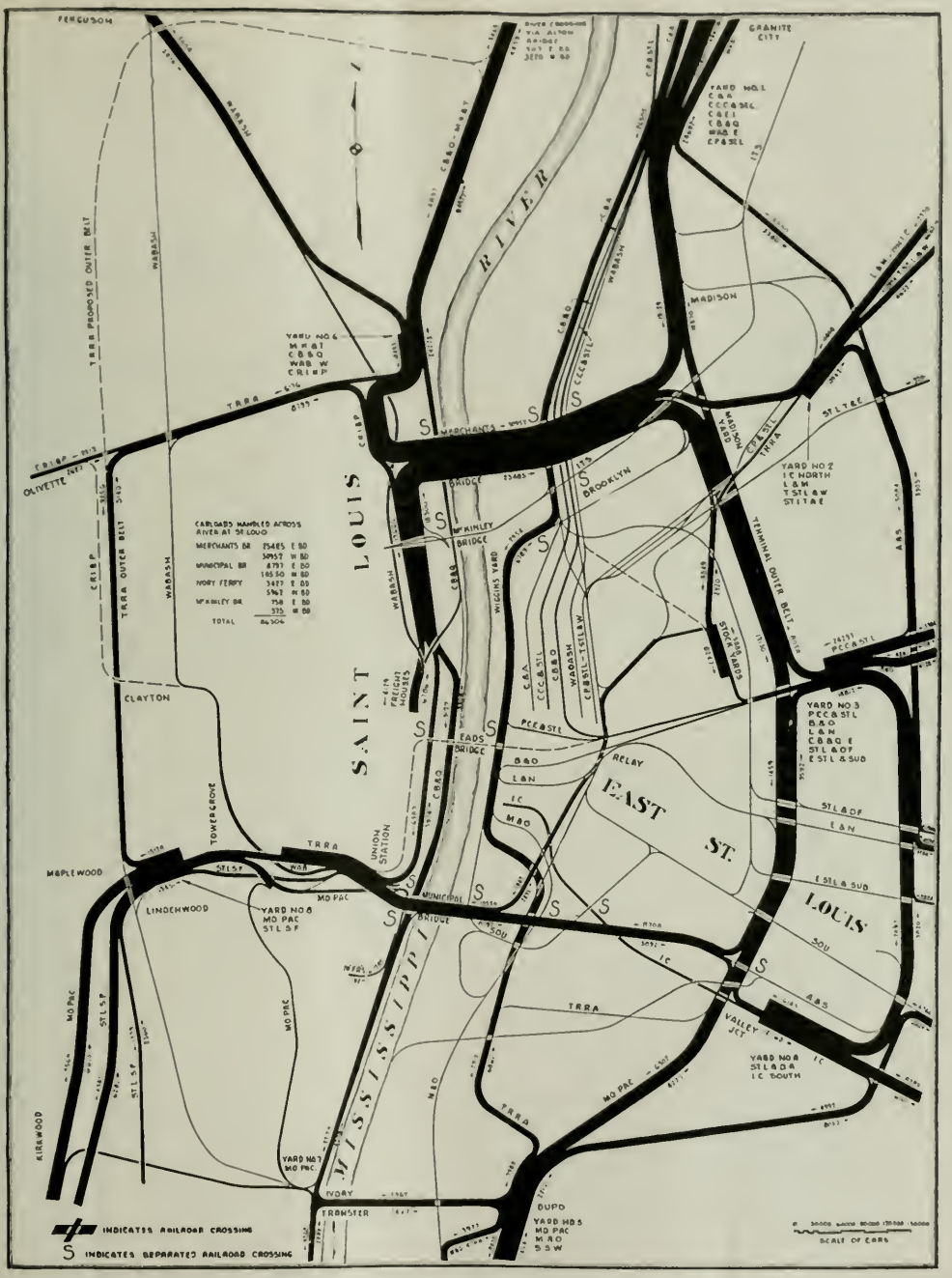
Proposed Routes for Passenger Trains



Composite Carload Freight Diagram—Present Routing

each railroad to provide terminals on both sides of the river and to provide its own river crossing facilities. Consequently, it was natural that one company should develop such facilities for the use of all.

The Terminal Railroad Association has become the most notable example in the United States of progress in unification of railroad terminals. Its facilities have been developed on the "co-operative" theory as distinguished from the "com-



Composite Carload Freight Diagram—Proposed Rerouting

petitive" theory under which the facilities of individual railroads are usually developed. At the same time each railroad has developed its own terminal facilities to a greater or less extent on one or both sides of the river on the competitive theory, while also relying on the facilities of the Terminal Railroad Association for additional advantages.

The river bridges play an important part in the solution of the terminal problem. Two of the bridges, the Eads

bridge and the Merchants bridge are controlled by the Terminal Association. The McKinley bridge is controlled by the Illinois Traction System, while the newest crossing, the Municipal bridge is owned by the City of St. Louis but has not been thoroughly co-ordinated into the general railroad situation by connections adequate to permit its extensive use by railroad trains. To permit this bridge to be adequately used the two present connections must be made permanent and at least four additional connections must be built.

Further recommendations of the committee with respect to the bridges are that the Eads bridge, which is of inadequate loading capacity and encumbered by a tunnel approach, should be abandoned for railroad traffic and that passenger trains should be transferred from the Merchants and the Eads bridges to the new Municipal bridge which should also be used for such freight traffic as can be handled over it more expeditiously than over the other crossings. The McKinley bridge also should be provided with additional approaches and connections which will enable it to be used to better advantage for freight traffic.

Improvements in Passenger Facilities

Eighteen railroad companies operate passenger trains in and out of the Union Station. The number of trains varies somewhat throughout the year, seasonal trains being added and taken off as necessity demands. A detailed study of the time tables of December, 1920, showed a total of 269 passenger trains each day. In addition, the Wabash Railway operates 10 suburban passenger trains per day in and out of St. Louis that do not use the Union Station, their terminus being an uncovered track on the river front at the foot of Olive street. The 269 passenger trains that use the Union Station may be subdivided as follows:

	Trains per Day
Western entrance	103
Eads bridge and tunnel	96
Merchants elevated	70

Little change is recommended for the routing of trains through the western entrance to the station except for the possible addition of two more passenger main tracks. However, attention is called to the objectionable features of the other two routings, that over the Merchants bridge and Merchants bridge elevated having a three mile stretch along the river front through a congested freight terminal and industrial area while the Eads bridge routing embraces a tunnel on the west approach, 1.5-per cent approach grades and an exceedingly congested condition in the vicinity of the Relay Depot in East St. Louis.

The solution offered for these conditions is to abandon both the Merchants and the Eads bridges for passenger service and substitute a route over the Municipal bridge, while for the 23 trains of the Chicago, Burlington & Quincy and the Missouri, Kansas & Texas which use the Merchants bridge elevated along the river front it is proposed to reduce interferences with other operations by an extension of the elevated structure for a considerable distance to the north. The present routing of passenger trains and the suggested rearrangement of routes are shown clearly in the two routing diagrams. The proposed plan for an east side rerouting involves the construction of some long approaches to the Municipal bridge, together with the elevation of the passenger tracks in the vicinity of the Relay Depot to eliminate grade crossings with freight tracks.

The Union Station

The St. Louis Union Station is one of the most conveniently arranged union stations in the country. Numerous features of this station have been copied in the design of other stations, notably the Union Station at Washington, D. C. and the C. & N. W. Station in Chicago. The statement is frequently heard that the Union Station is outgrown and overburdened with traffic and for that reason a new station will soon be required. On the contrary the station is not used to anywhere near capacity as evidenced by comparison with the South Station in Boston; other comparisons might be made, but it is thought this comparison, with the city most nearly equal in size to St. Louis, will suffice.

	No. of Tracks	Trains per Day	Max. Trains One Hour
St. Louis Union Station	32	269	50
South Station, Boston	28	660	87

The North Station in Boston handles over 420 trains per day on 23 tracks and is also subject to the interference of a drawbridge. The number of passengers handled annually in the three stations are as follows:

South Station, Boston	45,000,000
North Station, Boston	30,000,000
St. Louis Union Station	25,000,000

Although the Union Station as a whole is entirely satisfactory it is deficient in certain operating features both from the standpoint of the railroads and the public, the following being the more important of the criticisms offered:

(a) The surroundings are unsightly and the street and street railway approaches are inadequate.
(b) The balloon type train shed is hot in Summer, cold and damp in Winter, smoky, dark and dirty.
(c) The midway is too narrow.
(d) The platforms between tracks are too narrow.
(e) The station tracks are too short and the curves connecting the station tracks to the approach tracks are too sharp.

The first of these objections will be largely overcome by a plan proposed by the city for the widening of streets and the creation of a plaza adjacent to the station. The second can be corrected by the replacement of the present balloon shed by sheds of a Bush or umbrella type. The midway can be widened by taking away some of the space from the ends of the tracks. It is proposed to widen the track platforms by the acquisition of additional property to the west of the station.

The most formidable feature of the recommendation involves the lengthening of the track by moving the entire body of tracks in the Mill Creek Valley further south of the station. This plan also has the advantage that it would provide space that is urgently required for a passenger train yard immediately adjoining the station and the correction of the inadequacies in baggage, mail and express facilities, engine house facilities, etc.

The report goes into considerable discussion of the developments of suburban service which is now subject to a serious handicap because of the fact that the Union Station is a mile from the business district of the city. It is proposed to correct this by the construction of a suburban station fronting on Market street in the vicinity of Eighth street.

Elaborate Study of Freight Traffic

Probably the most important feature of the investigation made by the Engineers' committee was the exhaustive study made of a movement of carload freight through the St. Louis-East St. Louis terminals. In connection with this, more than 500,000 car records were consulted from which tables and graphic diagrams were prepared to show the

Summary of Average Number of Days Consumed in Handling Through Carload Freight via Terminal Lines from Arrival in to Departure from St. Louis District and Local Freight until Set at Industry.

Through Movement	Via Eads	Via Merchants	Via Wiggins
From east side lines to west side lines	3.1	2.6	2.8
From west side lines to east side lines	3.0	3.1	2.9
From east side lines to east side lines	.	3.1	3.3
From west side lines to west side lines	.	2.5	3.1
Average Through Movement About Three Days			
Local Delivery			
From east side lines to west side lines	3.6	3.1	3.5
From west side lines to east side lines	4.0	5.5	3.8
From west side lines to west side lines	3.8	3.8	3.9

Average local deliveries about four days.

freight routing for all the railroads. In addition, a time study was made of the car movement, a total of 3,548 cars being selected at random for the purpose of determining the time that was required for the cars to pass through the terminals. The results of these studies are given in the table at the bottom of the preceding page.

The freight traffic studies were made for the month of October, 1920, this being the last normal month prior to the commencement of the study. The volume of business handled that month is given in the table below:

NUMBER OF CARLOADS OF FREIGHT HANDLED IN OCTOBER, 1920

	East Side	West Side	Total
Through carload brought in by all lines for through movement	60,201	20,030	80,231
Cars loaded at freight houses	6,060	10,724	16,784
Cars loaded at industries and team tracks	15,356	13,827	29,183
Cars unloaded at freight houses	5,723	5,823	11,546
Cars unloaded at industries and team tracks	2,838	30,970	53,808
	110,178	80,374	190,552

NUMBER OF LOADED AND EMPTY FREIGHT CARS CROSSING MISSISSIPPI RIVER AT ST. LOUIS BASED ON OCTOBER, 1920, BUSINESS

	Carloads	Empty cars
Eastbound	41,584	31,832
Westbound	51,032	0,828
Total	92,616	52,660

Careful studies were made of the manner of handling cars which indicated that there was a large amount of lost motion and duplication of effort. Thus, except for freight handled over direct connections between railroads and live and perishable freight, all interchange freight handled by the intermediate switching agencies is classified at least three times. This work is done in over 40 freight yards which are so located that there is a great deal of excess engine and car mileage in back hauls and much delay on account of railroad grade crossings and interference with and by through movements, local switching and passenger trains.

In order to eliminate unnecessary classifications, and unnecessary mileage, and to minimize delays, the committee recommends that the present system, under which railroads classify cars in their own yards for direct connections and for clearing cars for other connections through the Madison yard, the Wiggins yard, and the East St. Louis yard of the Terminal Railroad Association, be changed and that there be substituted therefor direct transfer movement between outer classification yards and the individual railroads. As there is not a sufficient number of cars interchanged each day between each railroad and every other railroad to warrant a direct movement in every case, the committee recommends the assembling of interchange business in several outer group yards. All cars brought in by any road for delivery to any other road would be placed on the receiving tracks of the appropriate group yard.

The management of the group yard, which might be controlled by those roads using the group yard, would classify cars brought in by all roads on to classification tracks for direct delivery to every other railroad. By grouping roads conveniently located in group yards, interchange freight could be handled in solid transfer movements without going through intermediate clearing yards as at present, thus saving one interchange and one classification of a large portion of the cars now handled by the Terminal Railroad Association. It is thought that the present average time of three days for through cars and four days for local cars can be reduced to one-half this time by such grouping and direct delivery.

The committee does not propose that entirely new group yards be constructed. Locations have been suggested where railroads now have at least the nucleus of such yards, and in some cases nearly ample facilities. It is intended that present facilities shall be modified and developed to suit the proposed grouping, with such additions as may be necessary.

In the St. Louis-East St. Louis District less than carload freight is handled by 20 railroads in 25 l.c.l. railroad freight stations, some of which are located in St. Louis and others in East St. Louis. Nine east side lines have no freight stations in St. Louis, but handle l.c.l. freight in stations at the ends of their lines on the East St. Louis river front and in off-track stations in St. Louis. This latter is true of the four east side lines having freight houses on both sides of the river.

The amount of l.c.l. freight handled by the railroad freight houses during the week of October, 18 to 23, 1920, is given in the following table:

	Tons
St. Louis freight houses—inbound	4,[illegible]
St. Louis freight houses—outbound	1,932
East St. Louis freight houses—inbound	3,446
East St. Louis freight houses—outbound	7,792
Total l.c.l. freight	27,169

The chief problem with respect to l.c.l. freight in the St. Louis-East St. Louis District relates to the improvement of facilities for the business of the so-called East Side lines, having origin or destination on the west side of the river. This may be developed by various methods which together with others that have been considered are outlined as follows:

(1) Through the individual freight stations in East St. Louis or St. Louis as the case may be.
(2) Through universal on-track freight stations.
(3) Through individual on-track freight stations of each railroad to be provided on each side of the river at various locations, and immediately adjacent to the central business district.
(4) Through the present freight stations and individual on-track freight stations located in St. Louis as close to the business district as practicable, and so close together as to form practically a joint universal station, receiving and delivering freight at certain designated doors for each railroad.
(5) Through universal off-track freight stations of the various transfer companies.

It is apparent from a study of the present conditions that the first plan will not suffice and must be supplemented by other arrangements. The second plan is not recommended because of the experience with the Terminal Association freight house at Tenth street, St. Louis, which handles only a negligible percentage of the freight to and from the city.

The third plan, that of individual on-track freight stations of each railroad is dismissed because it would add an enormous overhead charge to the business handled. The same decision was reached with respect to the fourth plan after a detailed study for the development of an area between Broadway and the river providing for individual houses of each railroad in a sort of group terminal. The conclusion is that, under present conditions, there would not be sufficient economy nor advantage to the St. Louis shippers or to the east side railroads to justify the construction at this time of St. Louis freight houses for the east side lines. However, if it should be found in future that the development of air rights above freight stations in St. Louis by the construction of multiple story commercial buildings would carry all or a considerable portion of the fixed charges of the freight stations, less saving would be required to justify such a step than if the saving had to carry the entire fixed charges.

Off-Track Stations Recommended

The report draws particular attention to the popularity of the off-track freight station in St. Louis, Mo., to serve the railroads maintaining freight stations on the east side of the river. The east side railroads have arranged with the transfer companies to dray the freight across the river, absorbing their charges and recognizing their off-track stations as the St. Louis freight stations of the east side lines. There are about 20 public transfer companies whose charges between the east side freight houses and the west approach to Eads Bridge are absorbed by the railroads, but only three operate off-track freight stations and are recognized by the railroads in the application of rates to and from such stations.

In the committee's opinion the principle of off-track uni-

versal freight stations is correct, and the facilities should be developed in St. Louis. The system presents the necessary element of flexibility which lends itself to a city whose street traffic is congested and whose commercial industrial districts are widely distributed.

The system promotes the short haul of less than carload freight and the accumulation of such tonnage into lots which can be moved with greatest economy and dispatch to and from the rail haul.

The Engineers' committee responsible for this report consisted of the following: Harland Bartholomew, engineer, City Plan Commission of St. Louis; P. W. Coyle, traffic commissioner, St. Louis Chamber of Commerce; E. A. Hadley, chief engineer, Missouri Pacific; J. B. Hunley, engineer, bridges and structures, Cleveland, Cincinnati, Chicago & St. Louis; R. D. Sangster, industrial commissioner, St. Louis Chamber of Commerce; C. E. Smith, consulting engineer for City of St. Louis; F. J. Stimson, chief engineer maintenance of way, Southwestern region, Pennsylvania Lines; D. O. Thomas, consulting engineer for East St. Louis Chamber of Commerce; F. G. Jonah, chief engineer, St. Louis-San Francisco and Charles H. Diel, secretary, formerly secretary Municipal Development Bureau, St. Louis Chamber of Commerce.

Freight Car Loading

WASHINGTON, D. C.

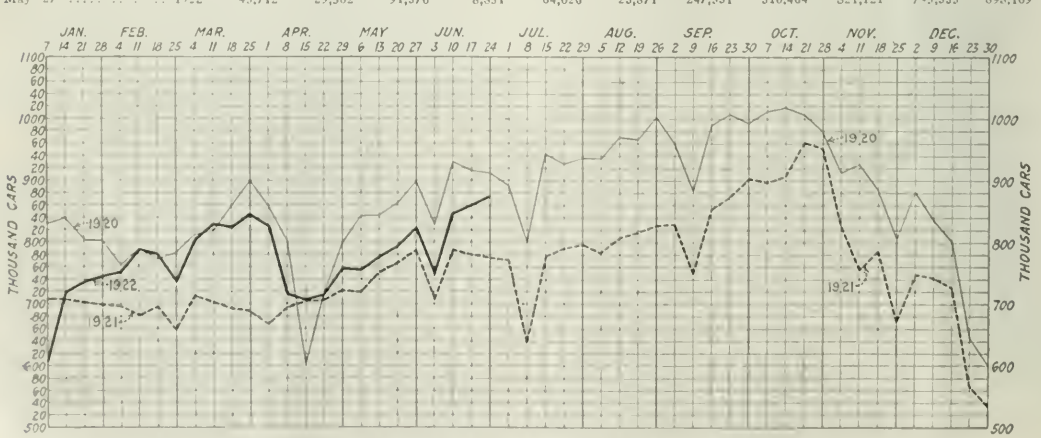
THE NUMBER OF CARS loaded with revenue freight showed another large gain during the week ended June 24 to a total of 877,856, as compared with 775,447 during the corresponding week of 1921 and 911,503 in the corresponding week of 1920. The gain over the preceding week was 17,084 cars and the fact that unusually large increases had been shown in earlier weeks indicates that instead of holding back freight to await the 10 per cent reductions in freight rates on July 1, as had been considered probable, some shippers may have hastened their shipments because of the threatened railroad strike. The loading of coal during the week of June 24 was 96,960 cars, which was the largest since the coal strike began on April 1, but the total car loading was 102,000 cars greater than during the corresponding week of last year and only 33,000 cars less than in 1920 in spite of the fact that coal loading was 59,061 cars less than in 1921 and 98,539 less than in 1920. Increases as compared with last year were shown in all districts and in all classes of commodities except grain and grain products.

The Car Service Division has published the accompanying chart comparing the cumulative car loading from January 1

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS. COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, JUNE 24, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	9,283	2,803	8,200	1,703	5,486	6,038	71,301	90,683	195,497	.....	.....
	1921	6,421	2,960	41,503	903	5,087	1,882	58,538	69,546	.....	186,840	223,782
Allegheny	1922	2,129	2,377	19,029	4,721	3,330	12,018	52,734	77,005	173,343	.....	.....
	1921	2,281	2,719	47,333	2,362	2,907	6,891	43,938	51,002	.....	159,428	182,399
Pocahontas	1922	183	129	31,460	260	1,680	25	6,357	4,021	44,115	.....	.....
	1921	140	148	25,237	144	1,259	23	5,336	3,882	.....	36,169	33,863
Southern	1922	3,370	2,385	24,117	836	19,839	1,152	37,475	41,262	130,436	.....	.....
	1921	2,935	2,112	19,342	449	14,421	460	35,746	36,308	.....	111,773	124,101
Northwestern	1922	9,325	8,473	6,940	1,538	19,192	41,826	31,354	40,298	158,046	.....	.....
	1921	11,067	8,007	5,239	560	13,819	18,172	27,656	31,651	.....	116,171	158,156
Central Western	1922	10,000	11,152	5,152	232	6,586	2,769	34,008	45,420	115,319	.....	.....
	1921	11,584	9,741	13,407	160	6,289	719	31,155	36,104	.....	109,159	127,885
Southwestern	1922	4,121	2,615	2,962	176	8,158	456	15,964	26,648	61,100	.....	.....
	1921	4,671	2,246	3,960	136	6,150	806	15,401	22,537	.....	55,907	61,317
Total Western districts	1922	23,446	22,240	14,154	1,946	33,936	45,351	81,326	112,366	334,465	.....	.....
	1921	27,322	19,994	22,606	856	26,258	19,697	74,212	90,292	.....	281,237	347,358
Total, all roads	1922	38,411	29,934	96,960	9,466	64,271	64,284	249,193	325,337	877,856	.....	.....
	1921	39,099	27,933	156,021	4,714	48,922	28,953	217,765	251,030	.....	775,447	.....
	1920	34,668	28,774	195,499	11,882	60,669	73,675	158,944	347,392	.....	.....	911,503
Increase compared	1921	.....	2,001	.....	4,752	15,349	35,331	31,428	74,307	102,409	.....	.....
Decrease compared	1921	688	.....	59,061	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1920	3,743	1,160	.....	.....	3,602	.....	90,249	.....	.....	.....	.....
Decrease compared	1920	.....	.....	98,539	2,416	.....	9,391	.....	22,055	33,647	.....	.....
June 24	1922	38,411	29,934	96,960	9,466	64,271	64,284	249,193	325,337	877,856	775,447	911,503
June 17	1922	39,333	29,151	92,136	9,302	64,032	53,822	248,044	324,902	860,772	775,328	915,736
June 10	1922	40,035	29,765	94,824	9,008	62,358	46,372	248,405	315,235	846,002	787,283	930,976
June 3	1922	37,931	27,792	86,626	8,927	58,923	31,552	217,254	281,640	750,645	693,903	828,907
May 27	1922	45,712	29,502	91,370	8,851	64,020	23,871	247,331	310,464	821,121	795,335	898,169



Revenue Freight Car Loadings Up to June 24, 1922

to June 17 this year with that for the preceding four years. This shows that the loading this year, nearly 18½ million cars, considerably exceeds that for last year or 1919, but, mainly owing to the light coal loading during the strike, is below that for 1918 or 1920. The year 1920 exceeded the

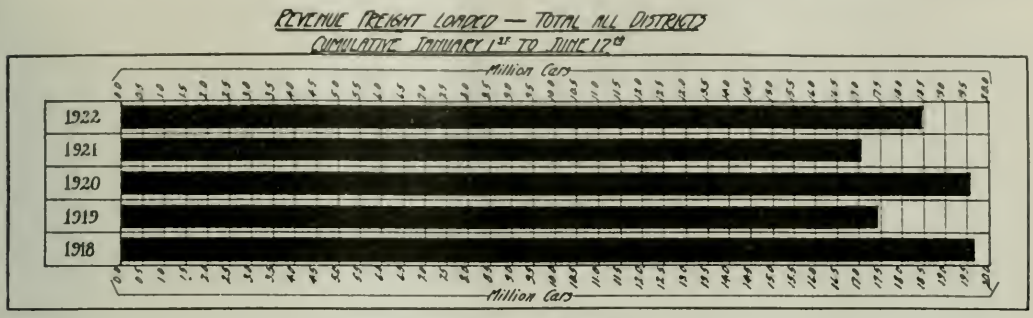


Chart Showing Increased Traffic in 1922

year 1918 but the loading for the first part of the year was somewhat less than that of 1918 because of the switchmen's strike. The Car Service Division is planning to issue a bulletin presenting such conclusions as may be safely approximated by way of estimates from the experience of previous years as to what the trend of car loading is likely to be for the balance of this year and what conditions may be expected in the way of car supply to meet the requirements.

The number of bad-order freight cars was reduced from 15 to 14.6 per cent of the total from June 1 to June 15, according to the semi-monthly report of the Car Service Division. The number was 332,681, of which 268,305 required heavy repairs.

Coal Loadings Elimination Fails to Hurt Big Four

Traffic Received from Connections Increases Sufficiently to Balance Effect of Strike

THERE ARE at present two factors of leading interest in Big Four operations. One is the gradually improving position of the property from a traffic and earnings standpoint. The other is the peculiar effect the coal strike is having on Big Four operations; in spite of the fact that not a single coal mine on its own lines is in operation, the road is benefiting from the shutdown of the union mines because of the volume of non-union coal which is being received from connections.

The improvement in the Big Four's position is one of the interesting developments in the New York Central System. The Big Four in recent years has been showing somewhat the same favorable results of the parent company; and its progress, except for the difference in degree, has not been unlike that of its sister company, the Michigan Central. The Big Four had a standard return for operations during federal control of approximately $10,000,000. In 1918 it earned for the government nearly $15,000,000; in 1919, about $13,000,000. In 1920 it did not do so well, but its net after rentals for the year of about $8,500,000, after charges made to maintenance equalization reserves, was not at all bad considering 1920 conditions. In 1920, also, the Big Four fared rather well during the last four months of the year, its net railway operating income for that period being over $5,000,000.

In 1921 the road's net after rentals was $10,000,000, thus putting the Big Four practically on a pre-war or standard return basis in spite of the falling off in traffic by which 1921 was unfortunately characterized. The Big Four's corporate net in 1921, according to the recently issued annual report, was $2,326,617; this compared with $5,323,339 in 1920.

The road pays five per cent on its preferred stock, the dividends amounting annually to $499,925. The figure of corporate net is after the deductions of these dividends. Under the conditions as a whole and even with the fact that the 1921 corporate results were not as good as the 1920, it is not to be wondered that the directors should have decided in May to declare a dividend on the common stock of two per cent. This is the first dividend disbursement on the common stock since September, 1910.

Only 4 Cars of Coal Reported Loaded Since April 1

Since the beginning of the coal strike the road has loaded only four cars of coal, one car being reported for the week ending April 8 and the other three for the week ended June 17. At this time last year the road was loading from 2,000 to 2,300 cars weekly. In spite of this fact, the Big Four has been showing improved results since the strike. In April, for instance, it handled 435,682,000 net ton-miles of freight (including revenue and non-revenue) as compared with 412,843,000 in April last year. For the first four months of 1922 its total net ton-miles were 2,065,554,000 as compared with 1,788,008,000 last year. Further, in April the road had a net after rentals of $1,016,441 as compared with $204,517 in April last year. For the first four months its total was $4,526,507 as compared with $1,290,215. It had an operating ratio in April of 73.90; for the four months of 74.60.

In March, when it was moving coal in anticipation of the strike, it got its ratio down to 66. The reason for these favorable figures in spite of the elimination of its coal loadings is to be attributed to the increase in the volume of other traffic due to reviving industrial conditions, but primarily to the large volume of coal traffic received from connections,

notably the Louisville & Nashville. For the purpose of putting this in more graphic form, the following figures of coal loadings, total loadings and cars received from connections are given. The figures selected are those of the third week in each of the last four months.

Week ending	Coal loadings		Total loadings		Received from connections	
	1922	1921	1922	1921	1922	1921
March 18.....	4,115	2,182	12,267	9,476	17,822	14,142
April 15.....	0	1,667	8,592	9,299	14,684	13,100
May 20.....	0	2,307	9,033	10,090	20,737	14,795
June 17.....	3	2,089	9,543	10,049	22,255	14,161

Coal from L. & N. Big Factor

The Louisville & Nashville is one of those roads which has benefited greatly from the coal strike, this being because it serves an extensive and as yet but partly developed non-union area in eastern Kentucky. Its loadings for the past several weeks have been running over 12,000 cars weekly. There have been one or two recent weeks that the loadings have run over 15,000 cars, whereas at this time last year Louisville & Nashville coal loadings were running less than 10,000 weekly. A large share of this traffic is turned over to the Big Four for movement northward from Cincinnati and from Louisville. The Big Four, therefore, in spite of the elimination of the coal mining on its own lines, is not being hurt by the strike, and in spite of the fact that it serves union fields, is being helped quite considerably by the movement from the non-union fields.

The Big Four has a rather diversified tonnage. There has been a tendency towards an increasing movement of coal and in recent years the proportion of coal has run about 50 per cent of the total tonnage. The road participates in the movement of perishable products eastbound from St. Louis and holds its own in this traffic. One of the characteristics of the road is its large amount of interchanged traffic which is a natural result of its location. The coal which the Big Four lines originate is received in Indiana and Illinois. The road serves 50 mines in Illinois and 25 in Indiana including 20 on the Evansville, Indianapolis & Terre Haute, a controlled property (since November 1, 1920) but separately operated. The coal which is received from the Louisville & Nashville reaches the Big Four at Cincinnati and Louisville. From Cincinnati the larger part of the movement is to the west and northwest to Chicago, or to Detroit, Toledo, Cleveland, etc. That received at Louisville is mainly destined to Chicago. The Big Four normally does not move a very large amount of coal to Lake Erie ports for lake movement.

The 1921 Results

In 1921, as was noted, the Big Four had a corporate net after the preferred dividends of $2,326,617. On December 31, 1921, it had a profit and loss credit balance of $18,885,959. The distinguishing features of operations during the year were not quite typical of those of most of the country's railroads. There was a reduction in revenue tons and a reduction in revenues, but the reduction in operating expenses was less than the reduction in revenues which is unusual as compared with the results shown in 1921 by most other lines.

The revenue tonnage in 1921 was 30,043,632 as compared with 38,513,685 in 1920, a reduction of 8,470,053. About one-half of the decrease was in the tonnage of bituminous coal. The freight revenue in 1921 was $56,289,898, a reduction of $4,535,557. The 1921 total operating revenues were $79,793,593. These compared with $88,862,078 in 1920, the reduction being $9,068,485. The Big Four in 1920 charged off certain sums for equalization of maintenance, the larger part of which is credited in 1921. It is not necessary to emphasize this factor particularly, because reference to similar procedure has already been made in the reviews which have appeared in these columns of the New York Central and Michigan Central annual reports. However, it should be noted that the charges made to equalization of maintenance of way in 1920 were $2,057,145, and to maintenance of equipment $658,740. Excluding these maintenance reserves and their credits in 1921, the operating expenses for the latter year were $66,597,189. This amount was $5,322,196 less than in 1920.

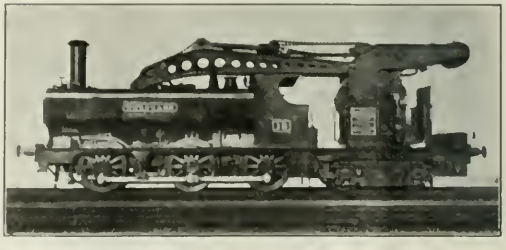
There was an actual increase of $1,398,578 in maintenance of way expenses. The reduction in maintenance of equipment was only $783,981, the 1921 figure being $18,513,988. The transportation expenses in 1921 were $33,005,071, a decrease of $6,025,788. The reason for the comparatively smaller decrease in expenses as compared with the decrease in revenues is not in evidence from the annual report. In-so-far as concerns maintenance of equipment, it to be noted that on June 15 the Big Four had a percentage of bad-order cars of 18.1, which appears to be rather high.

Big Four operating statistics naturally show the effect of the falling off in traffic. In 1921 the road's revenue train load was 707 tons as compared with 799 in 1920. Its average car load was 27.1 as compared with 28.8. The road in 1921 had an average haul of 177 miles, 1.5 miles less than in 1920. Its revenue traffic density in 1921 was 2,232,219 as compared with 2,871,527 in 1920.

Improvements

The Big Four, in common with the other parts of the New York Central, has in recent years made large expenditures for the physical improvement of the property. In 1921 it completed double tracking work as follows: Columbus, Ohio, to Avenue, 4.3 miles; Briar, Ind., to Beech Grove, 9 miles; Augusta, Ind., to Whitestown, 11 miles; Templeton, Ind., to Swanington, 6 miles; Winchester, Ind., to Farmland, 9 miles. Some of these projects are to assist in handling increased traffic, others include relocations and grade revisions to permit heavier tonnage. In one case the project permits adding 500 tons to the train load behind the heavy Mikados.

Work under way or contemplated includes a second track from Farmland to Muncie, 10 miles. At Delaware, Ohio, a 3½-mile single track cut-off is planned for the purpose of grade reduction and to save 2½ miles for through trains on the Cleveland division between Columbus and Galion. In connection with this grade revision work it is worth noting that the Big Four in the last 12 years has spent something like $60,000,000 to $70,000,000 for grade revision. Other Big Four projects include the grade separation and station work at Indianapolis, engine terminal facilities at Ansonia, Ohio, and Sheff, Ind. The road has recently installed automatic signals on the new double track line between Galion, Ohio, and Berea. It is hardly necessary to say much concerning the large increases made in recent years in the way of equipment. The New York Central Lines, as a whole, have accomplished a great deal in this respect and the Big Four has played its part in the whole situation.



A Combined Locomotive and Crane

Designed by C. b. Collett, chief mechanical engineer of the Great Western of England. Tractive effort 17,410 lb., lifting capacity 6 tons at 18-ft. radius, or 9 tons at 12-ft. radius.

Effect of Tonnage and Speed on Fuel Consumption*

Ton Miles Per Hour Affects Fuel Rate; Economical Tonnage For Various Speeds, Effect of Grade and Car Weight

By J. E. Davenport
Engineer, Dynamometer Tests, New York Central

THIS DISCUSSION touches the subject of the economic train load or train speed purely from the standpoint of fuel. Admitting that many times other operating conditions, or costs, or returns, finally settle the question of train load, it is altogether fitting that this association approach the discussion with entire attention directed toward the fuel consumption. The tonnages referred to herein are gross tons of 2,000 lb., not adjusted tons.

A train hauled by a locomotive is a unit made up of two components. The first component, the locomotive, is a machine capable of exerting a maximum drawbar pull at low speeds, and capable of producing a maximum dynamometer horsepower output at some higher speed dependent upon its dimensions (in the case of the modern Mikado this speed is around 30 miles an hour), but in terms of useful work per unit of fuel consumed the maximum efficiency is neither at the maximum dynamometer pull nor the maximum dynamometer horsepower. A modern Mikado type locomotive capable of exerting a dynamometer pull of some 60,000 lb. at speeds below eight or ten miles an hour, and a dynamometer horsepower of some 2,500 at speeds in the neighborhood of 30 miles per hour, shows its maximum efficiency from the fuel standpoint while producing a dynamometer horsepower output in the neighborhood of 1,400, and this output may be produced at any operating speed above approximately 10 miles per hour. The second component, the train, is a machine capable of being hauled most efficiently, as expressed in terms of resistance to hauling, at the lowest possible speeds and in car units of the highest possible weights which can be placed on four-wheel trucks. This statement may need modification when more knowledge is at hand concerning resistance of cars equipped with other than four-wheel trucks. The great number of variables entering into the makeup of the train unit indicates the reason that the question of economic train load is one so difficult of ready solution in all its phases, including the fuel rate. The most efficient fuel performance occurs somewhere between the most efficient locomotive performance and the most efficient train haulage performance.

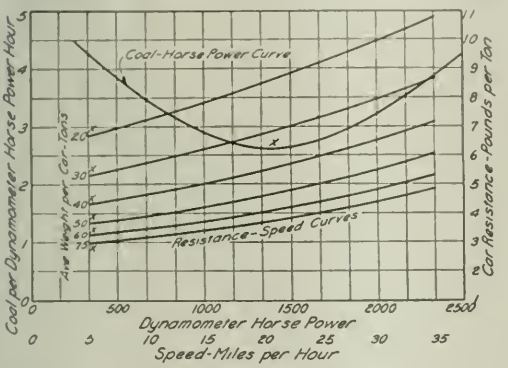


Fig. 1—Relation of Locomotive Fuel Consumption and Train Resistance to Train Speeds

The foregoing roughly expressed generalities are shown graphically in Fig. 1. That portion of each curve marked with an X indicates the most efficient point of operation as related to that component of the train unit.

There are, possibly, many methods of arriving at the relation of load and speed to fuel consumption of which the following is suggested for your consideration. Two commonly accepted principles form the foundation of this method: First, the locomotive component of the train unit develops useful power related definitely to the fuel consumed. Second, the train resists haulage in terms related definitely to the grade, including curvature, speed and weight of the individual cars.

The production of useful power and its relation to fuel consumption is shown in Fig. 2, wherein the dynamometer horsepower developed is plotted against the coal consumed per hour. The curves are plotted from figures developed at the Pennsylvania and University of Illinois locomotive testing plants and represent the most reliable information obtainable on locomotive performance. It will be noted that at the point of maximum horsepower output the coal consumption increases most rapidly with each unit of power produced. The resistance to haulage is shown in Fig. 1. These curves are reproduced from the University of Illinois studies on Freight Train Resistance. The values shown therein were substantially checked by the writer several years ago, and it is felt under average conditions these curves are entirely acceptable as a measure of car resistance.

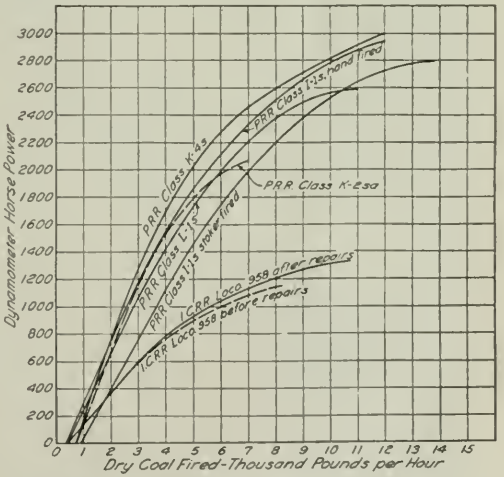


Fig. 2—Showing the Increasing Rate of Fuel Consumption in the High Ranges of Horsepower Output

Using the Pennsylvania Class L1s Mikado tests reported

*Abstract of a paper presented before the International Railway Fuel Association, Chicago, May 22, 1922.

in Bulletin No. 28. Figs. 4, 5, 6, 7 and 8 are submitted, showing in each case the consumption rates while the locomotive is working steam. Fig. 3 shows the relation between speed and coal as fired per thousand ton miles behind the tender with cars of 50 tons gross weight on tangent level track under the development of 40, 50, 60, 70 and 80 thousand ton miles per train hour, indicating a reduced fuel consumption at a set speed with increased ton mile production and a rapidly increasing consumption at a set ton mile production with an increase of speed.

Fig. 4 shows the relation between speed and coal as fired per thousand ton miles behind the tender with cars of 50 ton gross weight for trains of varying weight on tangent level track. These curves indicate that for each weight of train there is a speed of minimum fuel consumption; the lighter the train the higher this speed. Also they indicate the rapid increase of consumption with increase of speed beyond the point of minimum consumption; the heavier the train the more rapid the increase in consumption. It is interesting to note that the 2,000-ton train and the 8,000-ton train consume the same amount of fuel at 22 miles per hour, but by operating the 8,000-ton train at 11 miles per hour its coal consumption may be reduced to 75 per cent of the minimum possible with the 2,000-ton train.

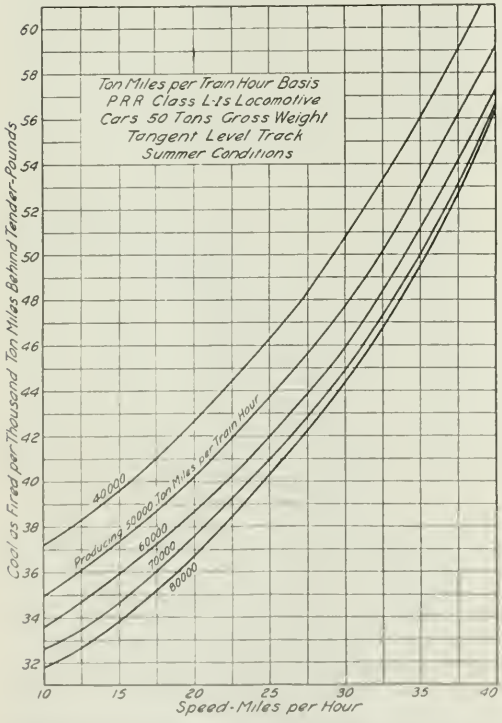


Fig. 3—Relation of Speed to the Ton-Mile Fuel Rate for Various Rates of Ton-Mile Output

Fig. 5 shows the relation between train load and coal as fired per thousand ton miles behind the tender with cars of 50 ton gross weight, operating at various speeds on tangent level track. These curves locate 20 miles per hour as the most economical speed for a train of from 2,000 tons to 2,500 tons, 15 miles per hour for trains from 2,500 to 6,000 tons and 10 miles per hour for trains from 6,000 to 8,000 tons, these economic speeds of course would be altered slightly had other individual speed lines been shown. These curves indicate that for 10 miles per hour operation the train tonnage should be over 8,000 tons for minimum consumption; for 15 miles per hour operation, between 7,000 and 8,000 tons; for 20 miles per hour operation, 4,500 to 5,500 tons; for 25 miles per hour operation, around 4,000 tons; for 30 miles per hour operation, slightly under 3,000 tons; for 35 miles per hour operation, slightly under 2,500 tons; and for 40 miles per hour operation, something less than 2,000 tons.

Fig. 6 shows the relation between speed and coal as fired per thousand ton miles behind the tender with 40 cars of 50 tons gross weight (2,000 ton train) on tangent level track and tangent grades of .1 per cent, .2 per cent, .3 per cent, .5 per cent, .8 per cent and 1 per cent. These curves emphasize the effect of speed and grade on fuel consumption and indicate that the heavier the grade, the less the speed at which minimum fuel consumption may be expected. For example, the minimum rate on a 1 per cent grade is 199 lb. per thousand ton miles at 8 miles per hour, and on level track 42 lb. at 18 miles per hour. Also it requires 10 per cent more fuel at 14 miles per hour on a 1 per cent grade than at 8 miles per hour.

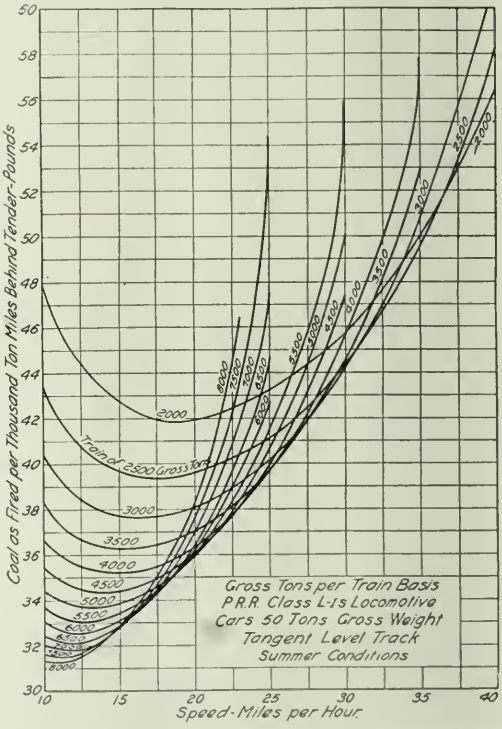


Fig 4—Speed-Fuel Rate Characteristics of Trains of Various Weights

The foregoing charts having dealt with cars of 50 tons gross weight, a figure close to the average for eastbound loads on trunk line roads, Fig. 7 is produced to indicate the relation between speed and coal as fired per thousand ton miles behind the tender for the empty car return movement, cars of 20 tons gross weight, on tangent level track. These curves indicate the same relation as with the loaded cars: a minimum consumption for each train weight at some definite

speed, the lighter the train the higher the speed. They also indicate that for operating speeds between 10 and 20 miles per hour a train of 150 cars shows the most economical performance, between 20 and 24 miles per hour, trains of 125 cars; between 24 and 30 miles, trains of 100 cars, between 30 and 36 miles, trains of 75 cars, and between 36 and 40 miles per hour, trains of 50 cars. Comparing the minimum consumption of 2,000 ton trains in Figs. 5 and 8, it is noted that the empty car train requires 60 per cent more fuel than the loaded train. This indicates the importance of the empty car movement in any fuel economy program.

Practical Application

Using recent dynamometer car tests with a 4-8-2 type locomotive, computing the train resistance established for level

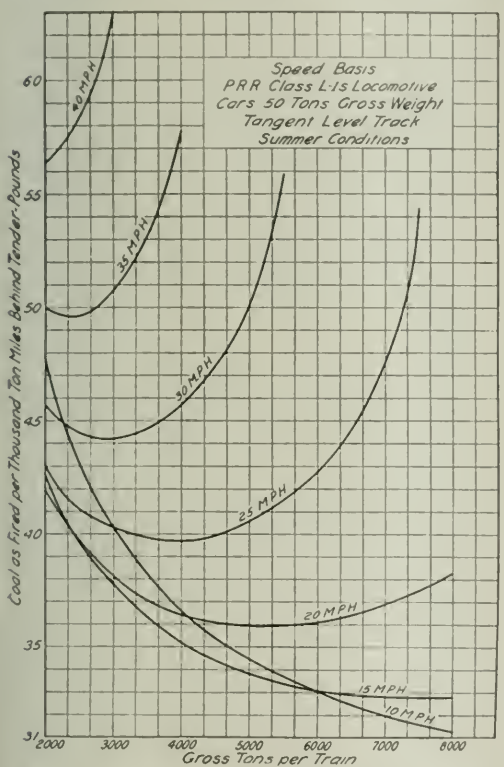


Fig. 5—Curves Showing the Economical Tonnages for Various Operating Speeds

tangent track and relating this figure to the actual average dynamometer pull recorded, there is located what might be termed the equivalent grade for this territory. In Fig. 8 there is plotted the relation between the coal as fired per thousand ton miles behind the tender and speed for trains of cars of 35 tons weight, and trains of cars of 55 tons weight, both sets of curves making use of the equivalent grade figure of .06 per cent. The trains shown in the upper group, i. e., of 35 ton car weight, represent trains falling in the fast freight service and trains in the lower group, i. e., of 55 ton car weight, represent trains falling in the slow freight service.

Analyzing the operation from the curves shown in Fig. 8 for the period of 1921, covering the five summer months, in the fast freight service an average load of 2,675 tons was handled at an average operating speed of 19½ miles per hour, and in the slow freight service an average load of 5,750 tons was handled at an operating speed of 15 miles per hour. This fast freight service from the foregoing analysis shows the coal consumption of 76.6 lb. per thousand ton miles and the slow freight service a coal consumption of 54 lb. per thousand ton miles, showing an increase of 41 per cent in fuel for the fast freight service over the slow freight. A

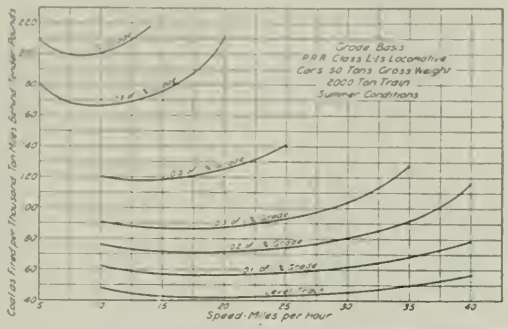


Fig. 6—How Grade Affects the Relation Between Speed and Unit Fuel Consumption

similar check of a different class of power in another territory, indicating an equivalent grade of .085 per cent, shows a coal consumption of 84 lb. per thousand ton miles in fast freight service and 63 lb. in slow freight, or an increase of 33 per cent in fuel in the handling of fast freights, which increase results from the combination of a higher speed, lighter train load and lighter individual car weight.

Many errors are made by the yard forces in computing the size of the individual train in both fast and slow freight trains. These errors in numerous cases on the slow freight side amount to as high as 20 per cent in the tonnage ordered and on the fast freight side running at times to 15 per cent.

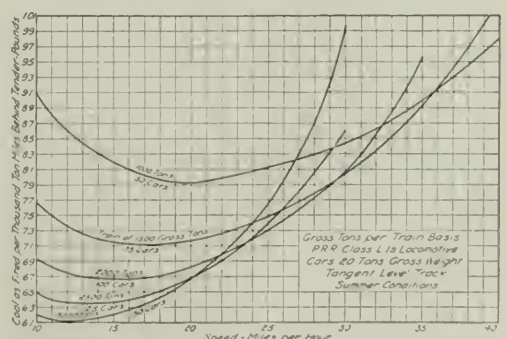


Fig. 7—Speed-Fuel Rate Characteristics of Trains of Light Weight Cars

When errors of this nature produce a train heavier than is ordered the resultant will produce a more economical coal consumption since the operating speed in this service is from 14 to 20 miles per hour. However, when the error results in an underload of from 10 to 15 per cent the increase in the operating speed of this particular unit will result in an increased coal consumption as high as 10 per cent or 12 per cent.

Conclusion

The method outlined herein for ascertaining the relation between train load, speed and fuel consumption is suggested as possible for practical application for use during that portion of freight train movement while the locomotive is using steam. The fuel consumption during that portion of the run while the locomotive is drifting and during the delay periods must be computed in a different manner, and from the locomotive test plant results will amount to from 300 to 900 lb. per hour, depending upon the class of locomotive and method of firing. It is evident that local operating conditions will in each case govern the ratio of the portions of the run during which the locomotive is using steam and hauling the train and during which the locomotive will be consuming coal at this lesser figure, or in other words the relation between train load, speed and fuel consumption varies in each territory and each direction and can best be solved by local studies. Assuming the foregoing proposed method as containing a fair amount of merit, the conclusion is reached that for each weight train in each direction there will be a definite speed at which the minimum coal consumption will result, and with speeds either higher or lower than this definite speed there will be an increase in coal consumption. Generally speaking the handling of heavier cars and heavier trains and operation at moderate speeds will greatly assist in reducing the fuel bills.

Fig. 8—Application to a Typical Operation on .06 Per Cent Equivalent Grade

The following is an abstract of a written discussion presented by E. E. Ramey (B. & O.):

As the subject indicates, the effect of train load and running speed on unit fuel consumption alone has been considered in the paper, and the conclusions are given in pounds of coal per 1,000 gross ton-miles. It is also fairly general practice to measure the wage performance in freight service on the basis of some such unit as gross ton-miles per hour of crew time or wage cost of train and engine crews per 1,000 gross ton-miles, and it is not inappropriate to attempt a combination of the fuel and wage costs, which are the controlling factors in the cost of producing ton mileage, and to use the combined fuel and wage cost as an indicator of the trend of the actual unit cost of the movement of traffic.

In practice this may be done currently by the compilation of a running daily and cumulative record of the performance of similar trains and groups of trains arranged as the particular operating conditions may render desirable. Comparison of the performance day by day of specific engine runs or operating divisions with good previous performances and with properly established standard performances will indicate the trend of the unit expense of moving the traffic.

To illustrate the position here taken, Table I has been prepared on the basis of Fig. 4 of Mr. Davenport's paper. In addition to these specified conditions, the following assumptions have been made in order to incorporate the wage factor:

(a) Locomotive run of 100 miles for mikado locomotives.
(b) Terminal and road delays amounting to a total of three hours per trip.
(c) Train and engine crew wages of $27.32 for eight hours or 100 miles with overtime at the rates generally in effect.
(d) Cost of coal on tenders, $5.00 per ton of 2,000 lb.
(e) Consumption of coal during the three hours of delay at the rate of 750 lb. per hour.
(f) Crew time used in estimating the wage and fuel expense.

The general indication of the table for the conditions assumed, is that the wage factor predominates to the extent that the running speed for the lowest unit cost of wages and fuel combined is practically identical with the running speed for the lowest unit cost of wages alone. This running speed is 20 miles per hour under these conditions.

The running speeds for the lowest unit cost of fuel under the specified conditions vary from 19 to 20 miles an hour for a train of 2,000 tons to 12 miles an hour for a train of 6,000 tons. This would indicate a material variation for the heavier trains between the running speed of lowest unit fuel cost and that of lowest unit cost of wages and fuel combined.

In a general way it would appear that for the trains of

TABLE I—COMBINED COST OF FUEL AND WAGES PER 1,000 Gross Ton-Miles for Trains of 2,000 tons to 6,000 Tons

Crew time, hours	Running Time, hours	Running Speed, m. p. h.	2,000-ton train Coal	2,000-ton train Wages	2,000-ton train Total	3,000-ton train Coal	3,000-ton train Wages	3,000-ton train Total	4,000-ton train Coal	4,000-ton train Wages	4,000-ton train Total	5,000-ton train Coal	5,000-ton train Wages	5,000-ton train Total	6,000-ton train Coal	6,000-ton train Wages	6,000-ton train Total
13.0	10.0	10	14.8	26.4	41.2	12.0	17.6	29.6	10.8	13.2	24.0	9.7	10.6	20.3	9.3	8.8	18.1
12.1	9.1	11	14.4	24.2	38.6	11.7	16.1	27.8	10.4	12.1	22.5	9.6	9.7	19.3	9.2	8.1	17.3
11.3	8.3	12	14.0	22.1	36.1	11.6	14.7	26.3	10.3	11.1	21.4	9.6	8.9	18.5	9.1	7.4	16.5
10.7	7.7	13	13.8	20.6	34.4	11.4	13.7	25.1	10.2	10.3	20.5	9.5	8.3	17.8	9.2	6.9	16.1
10.2	7.2	14	13.6	19.3	32.9	11.4	12.9	24.3	10.2	9.7	19.9	9.5	7.7	17.2	9.2	6.4	15.6
9.7	6.7	15	13.5	18.0	31.5	11.3	12.0	23.3	10.2	9.0	19.2	9.6	7.2	16.8	9.3	6.0	15.5
9.1	6.3	16	13.4	16.9	30.3	11.3	11.0	22.3	10.2	8.5	18.7	9.6	6.8	16.4	9.4	5.7	15.1
8.9	5.9	17	13.4	16.0	29.4	11.3	10.7	22.0	10.3	8.0	18.3	9.7	6.4	16.1	9.5	5.3	14.8
8.6	5.6	18	13.3	15.2	28.5	11.3	10.1	21.4	10.3	7.6	17.9	9.8	6.1	15.9	9.6	5.1	14.7
8.3	5.3	19	13.3	14.4	27.7	11.4	9.6	21.0	10.4	7.2	17.6	9.9	5.8	15.7	9.8	4.8	14.6
8.0	5.0	20	13.3	13.7	27.0	11.4	9.1	20.5	10.5	6.8	17.3	10.1	5.5	15.6	10.0	4.6	14.6
7.8	4.8	21	13.4	13.7	27.1	11.5	9.1	20.6	10.6	6.8	17.4	10.3	5.5	15.6	10.3	4.6	14.9
7.6	4.6	22	13.4	13.7	27.1	11.6	9.1	20.7	10.7	6.8	17.5	10.5	5.5	16.0	10.6	4.6	15.2
7.4	4.4	23	13.5	13.7	27.2	11.7	9.1	20.8	10.9	6.8	17.7	10.7	5.5	16.2	10.9	4.6	15.5
7.2	4.2	24	13.5	13.7	27.2	11.8	9.1	20.9	11.1	6.8	17.9	11.0	5.5	16.5	11.2	4.6	15.8
7.0	4.0	25	13.6	13.7	27.3	12.0	9.1	21.1	11.3	6.8	18.1	11.3	5.5	16.8	11.7	4.6	16.3
6.6	3.6	28	13.9	13.7	27.6	12.5	9.1	21.6	12.1	6.8	18.9	12.4	5.5	17.9	13.5	4.6	18.1
6.4	3.4	30	14.3	13.7	28.0	12.9	9.1	22.0	12.8	6.8	19.6	13.6	5.5	19.1	...	...	...
5.9	2.9	35	15.3	13.7	29.0	14.7	9.1	23.8	...	...	...	...	...	...	...	...	...
5.5	2.5	40	16.9	13.7	30.6	...	...	...	...	...	...	...	...	...	...	...	...

3,000 gross tons or more, reduction of delays will cause the running speed of lowest unit wage cost to approach the running speed of lowest unit fuel cost, resulting in a cumulative lowering of the combined unit cost. It appears that for the trains of less than 3,000 the running speed for the lowest possible combined unit cost is around 20 miles per hour. It should be kept in mind that the table and these conclusions are based upon the condition of tangent level track.

It appears to be entirely practicable for the interested local operating officer to advantageously apply the principle here outlined to the particular conditions surrounding his operation or at least to the portion covered by regular runs which vary only slightly in character. Such an application for use as a standard of performance for specific locomotive runs would only require the establishment of the so-called equivalent grade of the run and the stating of the other controlling conditions from observation of the possibilities of the particular operation.

Central of Georgia Perishable Traffic Big Factor

Corporate Deficit in 1921 of $979,814, Net Railway Operating Income $1,220,655

The Central of Georgia, all the common and preferred stock of which is owned by the Illinois Central, represents an extension of the latter's lines into Alabama and Georgia. As an Illinois Central property it reflects the same efficiency of operation which is characteristic of the parent company. One of the features of Illinois Central activity of late has been its work in the matter of public relations. The Central of Georgia has adopted similar plans in connection with this work. It has given it proportionately as great importance and it has been having marked success.

The Illinois Central and the Central of Georgia connect at Birmingham, Ala., but there is a large volume of traffic which moves through Atlanta, thence over the Nashville, Chattanooga & St. Louis, reaching the Illinois Central at Martin, Tenn. The Central of Georgia's traffic is rather diversified. About one-fourth its tonnage is bituminous coal, about 14 per cent lumber, and about 25 to 30 per cent, manufactures. The traffic of greatest interest, however, is perishables, notably peaches and watermelons. The company's lines serve the Georgia peach area and the company is said to be the largest originator of peach traffic of any road in the United States. The peaches originate in a restricted area, about 75 per cent being secured in a district of about 50 miles radius centering on Fort Valley or Marshallville. This area is gradually increasing in size. In June, 1921, there were on the Central of Georgia lines 7,443,000 peach trees of which 6,261,000 were bearing. The most important feature in connection with the peach traffic is the limited time in which it moves. It is confined to a 60-day period and the larger part of it to 30 days. During 1921 the Central of Georgia handled 8,170 cars of peaches moving under refrigeration. Of this it originated 7,619 cars and an indication of the restricted area from which the traffic is derived is given by the fact that of the total 7,192 cars moved from one division. The largest day's movement of peaches has been 544 cars.

The larger part of the peach traffic moves to Macon and thence to Atlanta. At the latter point it is delivered to the Nashville, Chattanooga & St. Louis for movement over that line to Martin, Tenn., where, as has been previously noted, it reaches Illinois Central rails. Some idea of the problem presented is conveyed by the fact that in the height of the season the company averages 41 trains daily, inclusive of passenger service, between Fort Valley and Macon. From Fort Valley to Atlanta is mostly single track protected by automatic block signals. The peach traffic is growing in volume and the estimates are that before many years it will exceed 10,000 cars a season.

The watermelon traffic is likewise heavy and much of it as well as other perishable traffic is received during the peach season. During the 1921 season the road originated 3,802 cars of watermelons and handled a total of 8,864 cars. The Central of Georgia also participates in the perishable traffic from Florida. It receives a large movement of pineapples from Cuba. Much of this traffic is received from the Atlantic Coast Line at Albany, Ga., and moves thence to Birmingham or Atlanta, where it is delivered to connections.

1921 Results

For the year ended December 31, 1921, the Central of Georgia reported a corporate deficit after fixed charges of $979,814. The five per cent dividends on its common stock and the six per cent on its preferred, all accruing to the Illinois Central, were paid, but from surplus. The 1921 deficit compared with a net income in 1920 of $1,516,707. The decrease was due to the fact that the road, operating on its own account, did not secure a net from operations as great as the corporation received in 1920 with the assistance of standard return for two months and guaranty for six. In 1920, also, it included in its income account an extra dividend of $40 per share amounting to $799,640 on the stock of its subsidiary company, the Ocean Steamship Company, whereas in 1921 it received from this source only the regular dividends.

The net railway operating income or net after rentals in 1921 was $1,220,655. This compared with a deficit after rentals in 1920 of $1,553,191. The standard return for the property was $3,408,809, so it will be seen that the road was unable to report its return to normalcy in spite of the marked improvement made in operating results.

The road at present, incidentally, is doing very much better than it did in the early part of 1921. Up to the end of April in 1921 it had reported a net after rentals of only $2,471. In the first four months of 1922 it had a net after rentals of $287,794. Its operating ratio for this period was 80.80. The improvement in net has not been due to increased traffic, as is indicated by the fact that in the first four months of this year it reported 401,121,000 net ton-miles (revenue and non-revenue freight) as compared with 452,990,000 net ton-miles in the first four months of last year. The road has been hurt to some extent by the coal strike, its coal loadings having fallen off from one-third to one-half. Coal, however, is not a very important factor on the Central of Georgia.

Referring again to the improvement in operating results in 1921 as compared with 1920, the facts are that the road suffered as between the two years a decrease of 13.3 per cent in revenue ton-miles. There was a decrease of 5.94 per cent in its freight revenues and a decrease of 12.06 per cent in its total operating revenues. The 1921 freight revenues were $13,565,644 as compared with $15,485,718 in 1920. The total revenues were $22,057,499 as against $25,082,288 in 1920, the decrease being $3,024,790. The decrease in operating expenses was $5,712,525 or 22.2 per cent, the

1921 figure being $20,020,845, and that for 1920, $25,733,367. In 1920 the road operated at a ratio of 102.6; in 1921 this was reduced to 90.77. In 1917, to take a pre-war example, the operating ratio was 68.93, all of which indicates that the Central of Georgia is not yet on a pre-war basis of earnings.

Analysis of the reductions in operating expenses shows that in 1921 as compared with 1920 maintenance of way expenses were reduced 30.22 per cent; maintenance of equipment, 23.56 per cent; and transportation, 22.3 per cent. The reasons for these decreases were the smaller amount of traffic, decreases in wages and material costs generally and in the case of maintenance, "to decreased expenditures for repairs," meaning presumably that there was less work done. A distinguishing feature was the saving in fuel due to an intensive campaign for fuel economy. The company estimates that by better performance it saved 91,265 tons or $350,999. Freight loss and damage was reduced $351,054 or 70.8 per cent.

Improvement in Physical Condition

Some interesting figures have been compiled relative to improvements in the Central of Georgia's physical characteristics in recent years. The road began the use of treated ties in 1912, having its own treating plant at Macon, Ga. By using creosoted ties it has reduced its annual tie renewals by 330,000. At present in main line and side tracks 55 per cent of the ties are treated. The road uses 90-lb. rail. In 1916 it had 121 miles of 90-lb. rail and in 1921, 354 miles. The improvement in rail condition is given in these figures: On December 31, 1916, there was in track 212,977 tons of rail with 1913.66 miles of line. On December 31, 1921, there were 227,556 tons of rail with 1914.4 miles of track, an increase of 14,579 tons in the five-year period. The improvement program has also included the replacement, insofar as possible, of timber trestles and there has been a large amount of ballasting. Another improvement is the new engine terminal at Columbus, Ga., costing about $750,000 which project has already been described in the *Railway Age*.

The Central of Georgia has made much out of the possibilities of public relations work. Its plan is patterned on that of the Illinois Central. The activities include contact with the employees through the magazine and through bulletin board announcements under the name of "talking points"; with the public through advertising; with the press by friendly contact. A great deal is done by means of personal contact with the shippers. The advertising deals with leading railway matters of interest to the public and the method followed is to have the advertising appear on the first day of the month in the case of all daily papers in the road's territory and in the first issue of the month for the weekly publications. The Central of Georgia has thus been able to tell the public its story forcefully and well and we understand that the resuts have been most favorable.

Iowa Withdraws High Tax Rail Valuation.—The state executive council of Iowa has announced that the $100,000,000 railroad tax case, involving all of the railroads operating in that state will be compromised out of court. Early last fall the railroads, believing that they were being taxed at from 79 to 84 per cent in excess of their actual value, brought injunction suits against the state executive council and 99 county auditors. Under the terms of the present agreement the state will rescind the valuation it placed upon the railroad properties and return to the taxation valuations used for the collection of the 1920 taxes. This agreement is $27,643,470 above that which was allowed by Federal Judge M. J. Wade who sustained the carriers injunctions restraining the state from taxing under its valuation.

Interchangeable Mileage Book Bill Passed by House

Washington, D. C.

The House of Representatives on June 29 passed the railroad mileage book bill which had previously passed the Senate, but with numerous amendments proposed by the committee on interstate and foreign commerce, and on July 1 the Senate concurred in the House amendments. The bill as passed by the House amends the interstate commerce act to direct the Interstate Commerce Commission to require, after notice and hearing, each carrier by rail subject to the act, to issue at such offices as may be prescribed by the commission, interchangeable mileage or scrip coupon tickets at just and reasonable rates, good for passenger carriage upon the passenger trains of all carriers by rail subject to the act.

However, the commission may, in its discretion, exempt from the provisions of this act, either in whole or in part, any carrier where the particular circumstances shown to the commission shall justify such exemption to be made. Such tickets may be required to be issued in such denominations as the commission may prescribe and before making any order the commission is directed to make and publish such reasonable rules and regulations for the issuance and use of the tickets as in its judgment the public interest demands; and especially it shall prescribe whether such tickets are transferable or non-transferable and, if the latter, what identification may be required, and especially also to what baggage privileges the lawful holders of such tickets are entitled. Any carrier which through the act of any agent or employee wilfully refuses to issue or accept any such ticket demanded or presented under the lawful requirements of the act or wilfully refuses to conform to the rules and regulations lawfully made and published by the commission thereunder or any person who shall wilfully offer for carriage any such ticket contrary to the rules and regulations shall be deemed guilty of a misdemeanor and upon conviction shall be fined not to exceed $1,000.

The Senate bill, passed some time ago, left the fixing of the rate to the commission, but provided for a ticket of not exceeding 5,000 miles nor less than 1,000 miles. The House bill inserted a provision for scrip coupon tickets which will represent amounts of money rather than miles, and also left the denomination to the commission. The House also inserted the provision for exempting particular carriers. This was to take care of such roads as now charge rates higher than the normal rate by reason of their sparsely settled territory or mountain grades. The House bill also omits the word "interstate" which was used in the Senate bill, so that any carrier subject to the interstate commerce act may be required to issue mileage books good for both state and interstate travel. This point raised some debate on the question of the constitutionality of the law. Some representatives also argued that the bill discriminated in favor of commercial travelers, but it was pointed out that though the bill had been passed largely at their request, mileage books would be available to all who may be willing to purchase a given amount of transportation at one time. In the Senate an effort had been made to provide in the law for a reduced rate, but it was decided to leave the matter of the rates to the judgment of the commission and in the House this question was not raised.

Senator Poindexter on June 30 made an unsuccessful effort to have the Senate accept the House amendments before the House adjourned to August 15, so that the bill might become law at an early date, but the bill was taken up again on the following day and, after some discussion of the constitutionality of omitting the restriction to interstate traffic, the Senate concurred in the House amendments.

Clearing Away the Wreckage (P. & A. Photo)

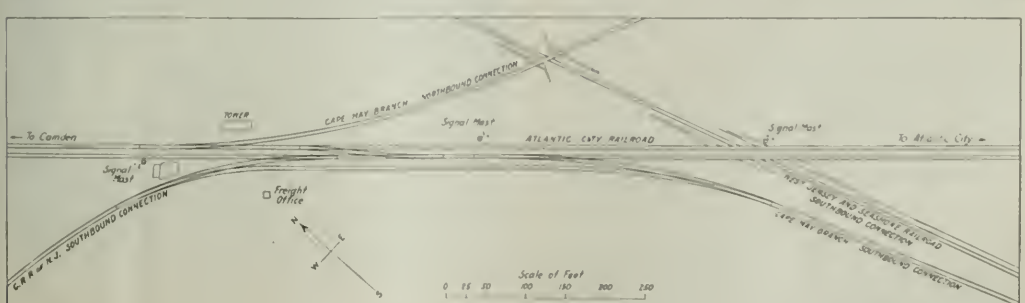
Disastrous Derailment at Winslow Junction, N. J.

Reading's Atlantic City Express Wrecked at Seventy Miles an Hour by Entering Turnout Too Fast

A DERAILMENT OF a fast passenger train of the Atlantic City Railroad of the Philadelphia & Reading carrying 90 passengers at Winslow Junction, N. J., at about 11:20 p. m. (Eastern Time) on July 2, resulted in the death of seven persons and the serious injury of 32 more. Train No. 33 running from Camden, N. J., to Atlantic City, a distance of 55.5 miles in a scheduled time of 1 hr. 5 min. with three stops, was about five minutes late and when running at about 70 to 75 miles an hour entered a diverging track, the switch being set for a branch in error, and was derailed with disastrous results. In the belief that a train of empty passenger coaches which passed a short time before was No. 33, the towerman had set the switch for the Cape May branch, expecting a freight train which follows No. 33 and which was at that time occupying a siding above the junction. Rain was falling at the time and the engineer of No. 33 evidently missed the distant signal. Train No. 33 consisted of one Pullman car, a combination baggage and day coach and four passenger coaches, all of which were, according to the statement of the railroad, of steel. The locomotive was a "camel-back" of the Atlantic type.

Winslow Junction is located 24.5 miles from Camden and is the point of divergence of the Cape May branch to the more southern Jersey seashore resorts. The Pennsylvania Railroad (West Jersey & Seashore) also operates over this branch reaching it through a connection mentioned later. From Camden to Atlantic City, the Reading's line is double track, rock ballasted, laid with 100-lb. rail, has but slight grades and maximum curvature of one degree. It has a complete installation of automatic block signals—enclosed disks.

The turnout for the Cape May branch is the Reading's



Track Layout at Winslow Junction

standard No. 15 turnout, the curve being extended for about 200 ft. beyond the frog after which the track is tangent for about 1,000 ft. to a point where the Pennsylvania connection joins it. The West Jersey & Seashore parallels the Reading in this section on the east or left side, the connection mentioned leaving the main line a little north of the tower at Winslow Junction. It is carried under the Reading and for the distance necessary to reach the grade of the Cape May branch, follows along the toe of the enbankment of that branch. At the undercrossing there is a difference in elevation of about 25 ft. This provides for southbound movements of the two roads over the Cape May branch without interference from grade crossings. A like arrangement farther to the south provides similarly for the northbound movements. All railroad crossings in the vicinity of Winslow Junction are at separate grades.

Practically all movements through Winslow Junction are through movements of passenger trains and fast freight, the passenger trains being chiefly fast expresses with a total number of approximately 50 trains daily each way. This includes traffic to and from Atlantic City and to and from the Cape May branch. Little or no switching as the term is commonly used, is done at the junction. The movements are controlled by a mechanically operated interlocking plant located about 300 ft. north of the Cape May turnout. The home signal is about 420 ft. and the distant signal about 3,200 ft. back of the turnout. The main track is tangent through this section for about five miles.

The tower was in charge of John F. De Walt, an experienced operator, said to be 60 years old, who entered the service of the Reading in November, 1898, and has been employed continuously since then at Winslow Junction.

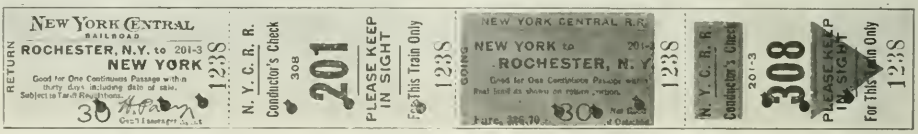
According to the information at hand at this writing, De Walt mistook the train of empty coaches for No. 33. Expecting No. 491, the fast freight, to follow immediately, he set the switch for a movement to the branch, having, of course, first set the distant signal against main line movements. The engineman, Walter Westcott, was among those killed in the wreck. The towerman discovered his error only when No. 33 passed him. The locomotive was derailed at or slightly beyond the point of the frog, plunged down the embankment and was piled up on the West Jersey & Seashore track. It turned over on its side, the cab was stripped off and the engine as a whole was badly smashed up. The Pullman which was next to the engine turned completely over and came to rest, bottom side up and seriously wrecked, on top of the locomotive. The remaining cars with the exception of the last, the combination car, were piled one after another upon the forward part of the wreck. The derailment was so close to the undercrossing that some of the cars rested against the outer end of one of the abutments. The engineman, the fireman, a porter and three passengers were killed, and the conductor died later from the injuries received. Thirty two passengers were injured seriously and sent to hospitals while numerous others were injured to varying degrees but were able to return to their homes. A steady rain was falling and to add to the unfortunate situation, the derailed cars broke down a pole supporting the lighting circuits of the town of Winslow and the vicinity. Rescue work was carried on under extreme difficulty owing to the lack of sufficient artificial light. No trouble, on the other hand, was experienced from fire.

The official investigation was begun on July 5, at Camden. Representatives of the Interstate Commerce Commission, of the New Jersey State Board of Public Utilities Commission and of the Camden county authorities were present, but no report of the findings has been made public as yet.

Tickets With Hat Checks Attached

The New York Central has adopted a new style of local card ticket, to be used on all divisions of the railroad, one of which, a round trip ticket from New York to Rochester, is shown in the illustration. The distinctive features are the provision of a conductor's check attached to the ticket, and the use of colors to distinguish one division of the road from another. The engraving is reduced nearly one-third, the actual length of the ticket shown being 9⅛ in. and the width about 1⅛ in.

The color of the going ticket, brown, indicates that the destination is on the Syracuse division. The return portion is uncolored, that being the standard for the Hudson-Electric division, on which New York is situated. The number, "308," represents the destination, Rochester; and "201" represents the destination of the return portion. On a ticket sold at the Grand Central terminal, New York, there would be a fifth coupon, or stub, which is detached by the ticket seller for use in making up his record of sales.



On through trains the conductor is able to distinguish the division to which a passenger is destined by the color of the hat check, the colors adopted being as follows: Hudson-Electric division, white; River division, pink; Mohawk division, blue; Syracuse division, brown; Erie division, purple; Cleveland division, red; Toledo division, green; Western division, gray. On minor divisions the tickets are white with a large colored letter to indicate the division; for example, the Harlem division ticket bears a red letter "H"; Adirondack division, "A D" in red. West of Buffalo minor divisions have blue letters.

Photo by International

When a Train of Perishable Freight Was Derailed Near Absecon, N. J., on the Pennsylvania

General News Department

To Insure Prompt Delivery of watermelons and other perishable freights at New York city the Pennsylvania Railroad, last week, was obliged to build about 1½ miles of wagon road, to enable consignees to reach the delivery tracks on Newark Meadows, five miles from New York, the destruction of a draw bridge by a steamer on June 22 having made the regular highway impassable. Heavy rains continued throughout the week, and the cost of the road building was about $15,000.

Passengers killed in collisions between railroad trains and street cars at crossings in the State of Pennsylvania, in a period of eight years and nine months, numbered only five. This fact is published as showing the value of the rule, prescribed by the Public Service Commission of the State, requiring that conductors of street cars shall go ahead of the car at crossings and give a hand signal to the motorman when it is safe to pass over the tracks. The number of crossings used by street cars in the State is 611, of which number 310 are on main lines.

"The Pennsylvania News"

On July 1 the Northwestern Region of the Pennsylvania issued the first number of its "Pennsylvania News." It is an eight-page tabloid size newspaper, four columns to the page. It will be published every two weeks and distributed to each of the 18,500 employees of that Region.

Ketchum Chosen Engineering Head of Illinois University

Prof. M. S. Ketchum, author of numerous works on engineering and member of the American Railway Engineering Association, has resigned his position as head of the department of civil engineering at the University of Pennsylvania to become dean of the college of engineering at the University of Illinois.

Floods on the Rio Grande

The recent floods on the Rio Grande washed out approximately 1,000 ft. of the Southern Pacific trestle between Del Rio and Sanderson, Tex., and three 230-ft. spans and one 120-ft. span of the International Bridge at Eagle Pass. Work of constructing a temporary trestle to restore traffic and to serve as falsework for the erection of a new steel bridge is under way. A new steel structure, designed for Cooper's E-50 loading will be erected for permanent use, and the grade line will be raised 5 ft. All of the work will be done by the Southern Pacific, the Mexican Lines sharing in the cost to the extent of 50 per cent.

To Investigate Automobile Accidents

The National Bureau of Casualty and Surety Underwriters is going to conduct an automobile accident prevention campaign. This bureau is the rate-making organization for automobile insurance against accidents, its members being 23 of the leading stock casualty insurance companies. During 1921 there were 12,500 deaths—one every 42 minutes night and day—and over 300,000 other injuries from automobiles in the United States; and the number of automobile accidents is increasing. The insurance companies are alarmed at the tendencies. This is the first organized effort on the part of insurance companies to deal with the automobile accident prevention problem.

The Bureau will make studies looking toward better control of traffic conditions, development of safety education in public schools and among drivers and stimulation of an intelligent treatment of the matter by local communities. Part of the money that has been appropriated will be expended through the National Safety Council. The secretary of the National Bureau is G. F. Michelbacher, 120 West 42d street, New York.

Black Tom Suits Settled

The suits of the governments of France and of Great Britain and the Aetna Explosive Company against the Lehigh Valley Railroad for losses caused by the great explosion at Black Tom, New York harbor, in July, 1916,—which suits were combined and tried together and which were appealed to the Supreme Court of the State of New Jersey and finally to the Court of Errors and Appeals, have finally been decided by the highest court

This litigation was begun in June, 1920. The verdict was for the defendant railroad company as to the claims of the British Government and that of Aetna Explosive Company, amounting in the aggregate to about $1,430,000; and the French Government won as regards an amount of $510,000, but the French claims to the amount of about $122,000 were allowed. The railroad company made its appeal as against this last item, but without success.

Accident Record to April 1, 1922

The Interstate Commerce Commission has issued an abstract of its quarterly record of railroad accidents for the months of January, February and March, 1922. Most of the totals vary but slightly from those of the same quarter in the preceding year. There is, however, a large decrease in the number of passengers killed—from 75 to 23—which is no doubt explainable largely by the fact that the disastrous collision at Porter, Ind., occurred in February, 1921. In the quarter now reported the total number of persons reported killed in train accidents and train service accidents was 1,154 and of injured 9,870. In train accidents 7 passengers, 42 employes and 11 other persons were killed and 311 passengers, 342 employes and 66 other persons were injured. In non-train accidents 83 persons were killed and 17,526 injured.

The Strike Situation on Western Roads

As indicating the effect of the walkout in Western territory the following reports of the situation on representative Western carriers are of interest:

The Chicago & North Western reported between 7,000 and 8,000 men out.

The Illinois Central reported approximately 60 per cent of its shop forces still at work.

Of a normal 15,000 shop employees the Santa Fe reported 3,500 still at work.

The Burlington reports that 1,400 men of a normal force of 15,000 are still at work.

On the Rock Island 8,000 men left their places.

The Southern Pacific has reported that less than 50 per cent of their shop forces have answered the strike call. Seventy-five per cent of the shop men on the Union Pacific are out, according to officers of that road.

Reports of the intimidation of shopmen remaining at work or new men hired to take the places of the strikers are beginning to be frequent. For instance at Slater, Mo., 18 new men were driven from the Chicago & Alton shops and at Bloomington, Ill., 300 strikers surrounded a truck laden with lumber with which it was intended to build a shelter for workmen. Similar occurances have been reported at many points but only in one or two cases has it been necessary to call upon the state for protection. At Bloomington it is reported that the sheriff has called upon the governor for troops.

M. & N. A. Bridges Damaged

The Missouri & North Arkansas bridge near Freeman, Ark., was damaged by fire on June 22, this being the third to be destroyed or seriously damaged by fire in five days. On June 18, a bridge near Fairview, Mo., was burned and on the following day one near North Lexa, Ark. Two men are awaiting preliminary hearings on arson charges for burning the bridge in

Missouri, but, although incendiarism is suspected in the case of the North Lexa and Freeman bridges, no arrests have been made at the time of this writing. Residents of Harrison, Ark., propose to offer a reward for the arrest and conviction of anyone guilty of setting fire to a bridge on this road. It is believed that the "bridge-burning campaign" is in reprisal of a meeting held at Wheaton, Mo., the week previous at which resolutions were adopted denouncing the strikers. Residents of Wheaton expressed their gratitude for the opening of the road 15 days sooner than had been anticipated and declared that they would tolerate no interference with the operation of the road. More than 100 cars of strawberries were shipped from Wheaton in May, and thousands of dollars was thereby saved to the growers. Regular passenger service was resumed on June 18, large crowds greeting the trains at each station and cheering the non-union crews in charge of them.

Shippers Urged to Support Railroads on Strike Issue

The National Industrial Traffic League has issued a circular to its members urging that they support the railroads in the recent wage reductions. This circular reads in part: "Even if the strike is a peaceable one, and without disturbance of any kind, it still will be highly expensive and costly to the companies. The resultant increases in expenses necessitating government loans, will be cast upon the shipping, traveling and tax-paying public." The carriers may be somewhat protected by the recent supreme court decision regarding property damage by members of labor unions; but, says the circular, "If property of shippers is destroyed in transit the carriers may resist claims on the ground that the losses were due to causes beyond their control. If they are unsuccessful and must pay judgments, they would undoubtedly have a further cause of action against the labor organizations. If the carriers successfully defend themselves, the shippers might well have causes of action against the unions, their officers and agents, who promoted the strikes." The circular concludes with an appeal to members of the League to suffer any and all inconvenience necessary to insure the award of the Labor Board being properly enforced. Any other stand by the shippers will weaken the carriers and give comfort to those who are about to defy the Board.

Disastrous Fire at Baltimore

A fire at the Locust Point terminal of the Baltimore & Ohio, Baltimore, Md., on the afternoon of July 2, caused by a stroke of lightning, damaged grain elevators and contents, and loaded freight cars, to an estimated total amount of more than $4,000,000. The fire was not got under control for about five hours; and besides large quantities of grain there were destroyed 60 loaded cars containing tobacco. The damage was mainly to Elevators B and C, Pier 2 and a warehouse on Pier 5. Large numbers of tugs were employed to remove shipping from points of danger, and about 1,000 freight cars had to be hauled away from the yard. From a military hospital, nearby, 500 patients, soldiers, were removed to a schoolhouse as a precaution against panic.

The estimated original cost of buildings and plant is about $2,500,000 covered to extent of insurable value. The grain destroyed was valued at about $1,000,000 fully covered by insurance. Grain shipments will continue to be moved over the B. & O. to Baltimore and taken care of temporarily at neighboring terminals. All other traffic will be handled without serious inconvenience, at the piers not touched by the fire.

A photograph of this terminal appeared in the *Railway Age* of July 1, on page 16.

British Committee Recommends Automatic Train Control

The committee of government and railway officers which was appointed by the British Government in 1920 to report on the subject of automatic train control, the chairman of which was Colonel J. W. Pringle, chief inspecting officer, has presented its report and it was published on June 20. It recommends the gradual adoption of automatic train control on British railways. The committee studied in detail the apparatus now in use on three roads, the Great Western, the North Eastern and the Great Central, and also examined devices which have been tried on the London & North Western, the Great Eastern and the London, Brighton & South Coast. The committee does not approve of continuous control, and it believes non-contact devices are too costly and too delicate; and it recommends the contact type.

The conclusions of the committee are summarized as follows:

1. The Committee are of opinion, after careful examination and analysis of statistics during the past ten years, that automatic train control presents the only reliable method of preventing a large proportion of train accidents directly occasioned by failures of enginemen to obey signals, which amount to about one-third of the total.

2. They consider, therefore, that a case for the installation of control upon British railways has been made out, and recommend its gradual adoption, in accordance with the list of requisites given.

3. They consider that the system likely to prove most suitable to prevailing conditions will be of the contact type, designed to operate in conjunction with existing methods of signalling.

4. They regard it as essential that the system of control should be uniform in character, and that all working parts should be of standard design in order to facilitate replacements and to ensure interchangeability.

5. They are of opinion that a complete system of automatic train control should include a train-stop device at selected stop signals, and train control generally at distant signals. They are satisfied from their investigations, however, that control at stop signals is of first importance, as a means for providing additional security.

6. If, therefore, owing to financial considerations the complete scheme cannot at present be entertained, the committee consider that the preliminary step should be the introduction of control at selected stop signals.

7. They recommend the immediate formation by the railway companies of a committee of experts to determine and standardize track and locomotive apparatus, having regard to differences in structural and loading gauges, and the position of conductor rails on electrified railways.

Holiday Travel

The exodus from the cities of New York and Philadelphia for the Fourth of July was this year the heaviest known, some business houses allowing a four-day vacation.

At the Grand Central Terminal, New York, on Saturday, July 1, the addition of extra sections to many trains failed to take away passengers as fast as they applied for passage and thousands of people were waiting in the station almost constantly throughout the day. The great concourse was, much of the time, densely packed, and at one time there was an estimated crowd of 10,000 people in the station. Some of the congestion was caused by the delays to outgoing trains, which delays were partly due to the strike of mechanics and inspectors in the yard where trains were made up. The management did not bring on its "strike breakers" until the inspectors actually left their jobs and this resulted in delays of an hour or two in a number of places, and these caused other delays. Departing trains had, however, mostly recovered their regularity by the middle of the afternoon.

It was estimated roughly that 150,000 passengers passed through the station in the course of the day.

The New York Central sent out that day a total of 25 extra sections of 22 passenger trains, and 20 extra cars on other trains. The total of extra sleepers sent out on Saturday was 54, of which 20 went to Montreal.

Trains on the River division of the New York Central were delayed in leaving Weehawken by a landslide near New Durham which blocked the road for two hours.

The total number of passengers passing through the Pennsylvania station, New York, on Saturday was estimated at 303,000. The two roads, the Pennsylvania and the Long Island, together, moved in and out of the station 5,006 passenger cars in 688 trains. On Tuesday, the 4th, the total number of trains was 900, made up of 6,500 cars.

From Philadelphia to New Jersey shore resorts both the Pennsylvania and the Philadelphia & Reading reported the heaviest holiday records in their history. Officers of the Reading estimated that in three days, Friday, Saturday and Sunday, they sent out 75,000 passengers.

The Pennsylvania, for the 30 hours ending at 6 o'clock on Sunday evening, estimated its movement to Atlantic City and other South Jersey resorts at 100,000 passengers.

Traffic News

"Rocky Mountains—Unlimited" is the title of an illustrated booklet just issued by the passenger department of the Chicago, Rock Island & Pacific. It contains a "human interest story" of a trip through the Colorado Rockies, written by a Chicago man who saw the Rockies for the first time on this trip.

The Northern Pacific will operate a new passenger train during July and August to be known as "The Yellowstone Special." Through sleeping cars will leave Chicago daily over the Burlington route. The train will leave St. Paul, Minn., at 10:50 p. m., and will arrive at Gardner, Mont., at 11:15 on the second morning. Also, through pullmans from Chicago have been added to the Pacific Express, this train now leaving St. Paul at 8:55 a. m. instead of 11:05 as formerly.

The Traffic Club of Cleveland, Ohio, held its annual meeting at Woodland Park, Ashtabula, Ohio, on June 26, and elected the following officers: President, H. N. Siblald, the National Lamp Works; vice-president, F. P. Barr, Wheeling & Lake Erie; second vice-president, A. Z. Baker, Cleveland Provision Company; secretary, F. A. Gideon, the American Steel & Wire Company; treasurer, M. J. Naughton, D. L. & W. Five new members for the board of governors were also elected.

Freight Rates to Be Reduced In Canada

The board of railway commissioners for Canada on June 30 announced its decision to order a general reduction, on August 1, in freight rates on forest products, building material, brick, cement, lime and plaster, potatoes, fertilizers other than chemicals, pig iron, billets, ores, wire rods and scrap iron. The reduction in general is 7½ per cent; so that the increase which was ordered in September, 1920, will now become 12½ per cent in Western Canada and 17½ per cent in Eastern Canada. The Commissioners have no jurisdiction over the government-owned railways and the present order has nothing to do with rates on grain and flour, which were reduced by Parliament. The principle of arbitraries from the Maritime Provinces to all points west of Port Arthur has been approved, the St. John arbitraries being on the basis of 24 cents per 100 lb., first class.

It has been estimated that the 7½ cent reduction, in addition to restoration of the rates of 1918 on grain and flour, may cost the Canadian roads $18,000,000 to $20,000,000. Government roads will be heaviest losers so far as grain is concerned as they are more dependent on the movement of grain than is the Canadian Pacific.

Coal Production

The thirteenth week of the coal strike has been marked by a recurrence of traffic congestion in certain of the non-union fields, and as there has been no compensating increase in the fields affected by the strike, production of bituminous coal will be slightly less than in the week preceding, according to the Geological Survey. Production of anthracite is still practically zero.

Complete returns for the twelfth week (June 19-24) show a production of 5,337,000 net tons of bituminous coal and 24,000 net tons of anthracite.

The thirteenth week opened with production at a high rate, but on Tuesday, and again on Wednesday, congestion on the railroads serving Southeastern Kentucky and parts of Southern West Virginia began to curtail production and loadings fell off 1,000 cars. By Thursday, however, the congestion was lessening and 16,411 cars were loaded. The decrease in loadings is not owing to scarcity of cars but to inability to move them faster than a certain limit set by the existing yard and track facilities. The railroads concerned are making new records in volume of traffic handled. Production in the non-union fields of the Middle Appalachians has reached a maximum and further gains in output are not to be expected at this time.

Commission and Court News

Interstate Commerce Commission

The commission has suspended until October 28 the operation of schedules which propose to increase the rates on iron and steel from Ohio and Mississippi river crossings to points in the southeast.

The commission has suspended until October 28 the operation of schedules which propose to readjust the rates on lumber from the lower peninsula of Michigan to Central Freight Association territory, resulting except in a few instances, in reductions.

The commission has suspended until October 29 the operation of schedules which propose to cancel proportional commodity rates on petroleum from Mississippi river points to various points in Canada, on traffic from points in Kansas, Louisiana, Oklahoma, Texas and Wyoming, class rates to apply in lieu thereof.

The commission on June 27 gave special permission to the railroads to make the 10 per cent reduction in freight rates effective on July 1 by filing tariffs on one day's notice. The carriers had stated to the commission that it would be impossible to file all the reductions prescribed in the time which had been allowed.

The commission has suspended from July 1 and July 12 to October 29, the operation of schedules which propose to cancel the present specific commodity rates on new iron and steel rails and new iron and steel cross ties from various points in Maryland, Pennsylvania and West Virginia, to points in Canada, and apply the sixth class rates in lieu thereof.

The commission has suspended until October 29 the operation of schedules which propose reductions in the rates on various commodities, carloads, from New York, piers of the Southern Pacific Steamship Lines (Morgan Line), to points in Arizona, Mexico and New Mexico when routed by water to Galveston, and the Southern Pacific beyond, to the same basis as in effect from Chicago, all-rail.

Freight Rates on the Denver & Salt Lake

The commission has reopened the general rate case for a hearing before Commissioner Hall at Denver on July 31 on the question as to whether the Denver & Salt Lake shall be excluded from the general 10 per cent reduction in rates. This road and the receivers in charge of it have represented to the commission that they are financially unable to make the rate reduction and that because of a fire and cave-in of a tunnel on the line on March 31 the road has not since transported any freight; and it does not contemplate the resumption of freight service before August 1.

Overcharge Claims by the Thousand

The recent amendment to the Transportation Act, 1920, which provides that complaints covering overcharges above the legal tariff charge may be filed with the commission within two years and six months after the termination of federal control, is now in effect and the commission has received approximately 100,000 claims. It is continuing to receive them at the rate of about 500 a day. These claims are being examined by the commission, recorded and returned to claimants for handling with the appropriate carrier as rapidly as the work of the commission permits. In view of the large number of claims received, the commission reminds claimants that it is not possible to dispose of these claims with the commission's usual promptness.

The commission has suspended until November 2 the operation of schedules contained in a supplement to a Chicago Great Western tariff changing the transit rules applicable on grain at Missouri river cities by changing the destination territory to read "Stations in Illinois, Iowa, Minnesota, Missouri, Michigan

and Wisconsin." While this change widens the destination territory within the states named it eliminates the provision for transit at the Missouri river cities on traffic destined beyond those states.

K. C. M. & O. in Straits

Chairman McChord of the Interstate Commerce Commission has sent telegrams to the governors of Oklahoma, Texas and Kansas, inviting them to a conference with the commission at Washington on July 12 to consider what steps may be taken to keep in operation the Kansas City, Mexico & Orient, which has stated that unless financial assistance is given it, it will be obliged to suspend service. In the telegram Chairman McChord said that the situation is so serious that vigorous steps must immediately be taken if the road is to be continued in operation. He said that if the governors desire to bring representatives of their state commissions or other representatives to the conference, the commission would be glad to have them do so.

Financial Decisions to Be Printed

The commission has in the past issued in mimeograph form a limited number of copies of its decisions in so-called "Finance Cases"—applications under paragraphs 18 to 20 of Section 1, Section 20a, etc., of the Interstate Commerce Act, and Sections 204 and 209 of the Transportation Act, 1920. This method of distribution has not proved satisfactory and, in future, decisions of this character will be printed in pamphlet form as issued, and made available at the Government Printing Office, on a subscription basis at the same cost as other pamphlet decisions, i. e., at the rate of one dollar a volume. These decisions will also be issued in bound volumes at the usual price.

Volume 65 of the Interstate Commerce Commission reports, which has recently been issued, is the first volume of finance decisions, and volumes 67, 70 and 71 have also been allotted for this purpose.

The plan of issuing copies in pamphlet form will begin with volume 72. Applications for pamphlet copies of these decisions together with remittances, should be made directly to the Superintendent of Documents, Government Printing Office, Washington, D. C.

Court News

Valuation of Capital Stock for Taxation

The Illinois Supreme Court holds that the mode of finding the share of a railroad's "capital stock" to be taxed is to take the value of all property, tangible or intangible, including the franchise granted by the state, and deduct from it the value of the tangible property to avoid double taxation; and this can only be done by the State Tax Commission if the property is assessable under the General Revenue Act and not a part of the charter lines.—Illinois Central v. Carr (Ill.), 134 N. E. 138.

Trainman Held Not to Assume Risk of Others' Violation of Rules

The Circuit Court of Appeals, Second Circuit, holds that a freight train conductor, properly on the adjoining track to see whether a defect in the engine of his train, which was just starting, had been removed, did not assume the risk of the violation by a train on the adjoining track of a rule that the engine bell should be rung while the engine was passing a train.—L. V. v. Mangan, 278 Fed. 85.

Live Stock Caretaker's Authority to Change Stopping Points

An attendant furnished by a shipper of livestock, under his contract, to care for lambs on the way, had no ostensible authority to change the contract by eliminating the provision as to unloading at an intermediate point, his own statement that he was the person in charge, or his possession of the bill of lading was not sufficient identification as a person authorized by the bill of lading to change stopping points.—Cook v. Northern Pacific (Mont.), 203 Pac. 512.

Foreign Railway News

French Road Seeks Loan in Switzerland

LONDON.

The French Paris-Orleans Railway Co., is negotiating with a group of Swiss banks with a view to the issue of a loan of 50,000,000 francs (about $4,100,000 at the present rate of exchange), paying interest at 6 per cent.

Brazil Gets $25,000,000 for Electrification

The Brazilian government has recently negotiated a loan of $25,000,000 in the New York market the proceeds of which will be devoted to electrification work on the Central of Brazil, a government-owned carrier.

Poland's Freight Car Requirements

Colonel A. B. Barber, American technical adviser to Poland, writing in "Poland," the journal of the American Polish Chamber of Commerce, estimates that the Polish railways will need to acquire between 110,000 and 120,000 freight cars during 1922.

New Lines in South Africa

LONDON.

The Minister of Railways and Harbors of the Union of South Africa has introduced a bill providing for the construction of 21 new railway lines, mostly in agricultural districts, with a total length of 851 miles and costing £4,087,620 (or $19,864,833 at the normal rate of exchange).

South American Railway Conference

The Second South American Railway Conference will be held in Rio de Janeiro, Brazil, during September. Chile has already appointed its delegation of six, headed by the assistant secretary of the Department of Railways, according to word received from the American embassy at Santiago.

A Central Purchasing Bureau for Polish Railways

LONDON.

A department called the "Centraine Biuro Zakupow" has been established at the Polish Ministry of Railways, which will be entrusted with the purchase for the railways in Poland of all material necessary for their operation. At the present moment orders for rolling stock and bridges, etc., will not be dealt with by this department, the activities of which will be limited to the purchase of rails, metals, lubricants, india rubber goods, asbestos, glass, and so forth. It is understood that the proposal is to extend this department gradually, and for it to undertake subsequently the purchase of all the requirements of the Ministry.

Information About Electrification in South Africa

The May issue of the South African Railways and Harbors Magazine is devoted to a full exposition of the subject of railway electrification, especially as it applies to South Africa. In addition, some valuable information is given about the railway situation in general in South Africa together with a map of the railways. This magazine is published by the publicity manager of the South African Railways at Doornfontein, Johannesburg.

Reductions in Freight Rates in Great Britain

The British railways which have been repeatedly requested by shippers to make general rate reductions have decided that this course of action is impossible at this time; but they have made important reductions in the case of certain basic commodities in England and Wales, according to the Railway Gazette (London). These reductions were effective on May 22. In the case of coal the basic percentage increase re-

mains at 75 per cent over the pre-war level but the flat rate per ton is reduced from 4d. per ton to 3d. and the maximum addition to this rate is reduced from 4s. to 3s. 6d. Iron ore, limestone and other raw materials for blast furnaces are decreased from 75 per cent over pre-war to 50 per cent. Other rather complicated reductions are made in iron and steel products and the cost of collection and delivery is reduced from 1s. 6d. per ton to 9d.

Electrification of the S. E. & C

LONDON

In connection with the electrification of certain suburban sections of the South Eastern & Chatham Railway, England, a meeting of the shareholders was held recently to approve the proposal. Altogether 220 miles of track extending to a distance of 16 miles out of London are to be converted for electric traction. The scheme having been approved, work is to commence immediately. At the end of May, a company known as the South Eastern & Chatham Construction & Power Company, with a nominal capital of £10,000 in shares of £10 each, was registered for the purpose of undertaking the electrification work and of erecting a generating station. The directors of this company are chosen from the directorates of the South Eastern and the London, Chatham & Dover companies, together with the managing committee's secretary and the general manager of the South Eastern & Chatham Railway.

China Notes

PEKING.

Prospects appear good, today, for a resumption of railway traffic in all directions during the coming week. Traffic has been suspended, actually or practically for three weeks, and seriously curtailed for a much longer period. During the fighting, the Tientsin-Pukow, the Peking-Hankow, and the Peking-Suiyuan lines have been cut, while for a few hours a rail was taken out of the main line between Peking and Tientsin,—this in violation of the Protocol of 1900. It is possible that traffic between Tientsin and Mukden will be impossible for a long time still. It is reported that a bridge north of the Great Wall has been destroyed, and that the Chang Tso-lin forces are, therefore, unable to retreat further than Shanhaikuan. At the same time it is known that Wu Pei-fu is urging the president to deprive Chang Tso-lin of his command,—which would have the result of giving legality to the desertion of Chang by some of his strongest commanders. This indicates that Wu Pei-fu is intent upon absolutely destroying the Manchurian war-lord's power, and leads to the belief in further hostilities on the Peking-Mukden line to the North.

The present disturbances evidence a growing appreciation on the part of the Chinese commanders of the part that railways play in warfare. Hitherto, when armed forces came on the line, their treatment of station and train forces was such that the railway employees deserted at the first opportunity, leaving the line to be operated at intermediate points by ignorant soldiery. This year stringent orders were given by commanders concerning the treatment to be accorded railway men, and as a result, the railway organization has continued to function,—under general orders from the military. Perhaps it would be fairer to say that this situation evidences growing discipline over military forces by the commanders than a change of attitude on the part of the latter.

The three war-lords of the North for two years, at least, have evidenced a keen appreciation of railway control, for Chang Tso-lin, immediately after the victory over the Anfuites, two years ago, insisted upon and secured the appointment of a personal confidant as managing director of the Peking-Mukden. Tsao Kun of Chihli already had a managing director satisfactory to him directing the Tientsin-Pukow line, and a few months ago soon after Wu Pei-fu began to collect the Peking-Hankow revenues at the stations, he appointed a managing director of that line, with jurisdiction over the section which Wu's troops occupied. The Peking appointee controlled only the 16 miles just to the south of Peking.

Indeed, many began to fear that the fading out of the authority of the Central Government had gone so far that the railways would become the property of the militarist who happened to be in control of the territory traversed, and the revenues would be collected at the stations everywhere, the same as on the Peking-Hankow by Wu Pei-fu's representatives. The result upon debts owed to foreign creditors appeared to be very serious. Certain interest and principal payments were already in default to British interests. The British, however, were in a fortunate position. The customs and the salt revenues are paid in to British banks as collected. Railway accounts as they became due were being paid, so it is asserted, on the authority of the British managers of these two services. This put the British creditor in a many more favorable position than those of any other nationality, and if the situation continued, would give British supply firms the entire market. Naturally, other nationalities have been protesting. But the victory of Wu Pei-fu, consolidating as it does all of the territory served by the railways, once more serves to unify the railway administration.

The first fruits of Wu's victory is a mandate depriving Yeh Kung Cho of all his offices, decorations and perquisites. Yeh Kung Cho is probably the ablest minister of communications that China has had. But he has been guilty of "picking the wrong horse" and assisting with all of the means at his command in Chang Tso-lin's effort to become the dictator of North China. It is said that the vice-minister of communications is to be arrested also, but that individual has returned to Peking in the face of this threat and assumed the work of the ministry, pending a re-organization of the cabinet. It is too early to predict the probable shifts in personnel which will follow this re-organization, but the shifting will affect practically all of the important lines, so far as managing directors are concerned, as well as the important bureau chiefs in the ministry. An effort will be made to oust the Chiaotung "clique," but the more professional members can not be discharged without seriously crippling the effectiveness of the ministry, as there are no others with the same professional training and experience.

The new appointees will have anything but a bed of roses, for the financial straits of the railways and the ministry are very shallow as well as narrow. Two years ago the Anfu club "swept the bin." Their successors authorized the building of an extension to the Peking-Suiyuan line, a branch to the Peking-Mukden line and double track between Tongshan and Chinwangtao. In addition heavy orders for rolling stock and other supplies were given. Much of the rolling stock is now laying at ports being held for payment of lighterage and wharfage dues. Salaries are in arrears and the best estimates by creditors place the current obligations of the railways as $55,000,000, whereas the yearly income of the railways,—if it could be collected—after operating expenses, fixed charges, etc., is only about $25,000,000 cash,—supposing that no improvements are made during the current year. Ordinarily, this sum would make very easy a simple funding scheme over a short period. But the Chinese bankers, who know their Government best, do not seem inclined to trust it with more funds at the present time. The Peking-Suiyuan, which is the only unpledged piece of rail, is held sacred from mortgages of any kind. And Chinese public opinion seems to be unalterably opposed not only to any dealings with, but even to the bare recognition of the consortium.

In its opposition to the consortium, the Chinese public is caught on the horns of dilemma. It does not trust the present militaristic forces with any loan funds unless there is a very strict foreign supervision. Strict foreign supervision is interpreted to mean foreign control, and foreign control is construed to constitute an infringement on China's sovereignty. "China's sovereignty" is now a cherished infant, a delicate subject. It must not be chastised even for its own moral upbringing. In order to clarify the ideas of what is probably the greatest force for public enlightenment in China at present, F. W. Stevens, the American representative of the consortium, has been making a series of speeches to the student bodies of North China, explaining the circumstances under which America's railways were financed principally by foreign money and denying that the consortium would constitute a monopoly. Whether or no there is any significance in the circumstance, the fact is than only the American representative of the consortium is taking any steps to create an impression favorable to the consortium.

All the Japanese forces are said to have been withdrawn from the Shantung Railway. The third and last contingent was delayed in its leaving by the fact that arms for the Chinese guard could not be transported by rail on account of the internal disturbances. But, with the assistance of the Japanese authorities, arrangements were made to bring them in by sea. Apparently nothing has been done by way of organizing the valuation forces, although the transfer date is less than six months distant and the line is 260 miles long.

Equipment and Supplies

Locomotives

THE INTERNATIONAL HARVESTER COMPANY is said to have ordered two six-wheel switching locomotives from the Baldwin Locomotive Works.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS, reported in the *Railway Age* of June 1 as inquiring for 5 Mountain type locomotives, has ordered 3 Mountain type locomotives from the Baldwin Locomotive Works.

THE CHICAGO & EASTERN ILLINOIS, reported in the *Railway Age* of July 1, as having placed an order for 10 Mikado type locomotives and about to place orders for the remainder of its inquiry consisting of six Pacific type locomotives, has ordered this latter equipment from the Lima Locomotive Works.

Freight Cars

THE ILLINOIS CENTRAL is receiving bids for from 500 to 1,000 gondola cars.

THE GREAT NORTHERN has ordered 300 underframes from the Minneapolis Steel & Machinery Company.

THE DETROIT EDISON COMPANY has ordered 6 gondola cars of 50 tons' capacity from the Pressed Steel Car Company.

THE VERDE COPPER COMPANY, Clarksdale, Arizona, has placed an order for 24 ore cars with the Western Steel Car & Foundry Company.

THE ALABAMA & VICKSBURG has ordered from the Kilbourne & Jacobs Manufacturing Company 25 all-steel automatic air dump cars of 40 tons' capacity.

THE WESTERN PACIFIC, reported in the *Railway Age* of June 24 as inquiring for 2,000 refrigerator cars, has ordered this equipment from the American Car & Foundry Company.

THE WESTERN PACIFIC, reported in the *Railway Age* of June 17 as inquiring for 2,000 refrigerator cars, has ordered this equipment from the American Car & Foundry Company.

THE UNITED VERDE COPPER COMPANY, reported in the *Railway Age* of May 6 as inquiring for 24 ore cars, has ordered this equipment from the Pressed Steel Car Company.

THE NORTHERN PACIFIC, reported in the *Railway Age* of July 1 as inquiring for 250 gondola cars, has ordered 250 general service gondola cars from the General American Car Company.

THE SOUTHERN PACIFIC has ordered from the Kilbourne & Jacobs Manufacturing Company 40 all-steel automatic air dump cars with improved apron attachment of 40 tons' capacity.

THE NORFOLK & WESTERN, reported in the *Railway Age* of July 1 as inquiring for 1,000 hopper cars, has divided an order for 2,000 hopper cars of 70 tons' capacity as follows: American Car & Foundry Company, 500 cars; Standard Steel Car Company, 500, and Pressed Steel Car Company, 1,000.

THE CHICAGO GREAT WESTERN, reported in the *Railway Age* of June 10 as inquiring for repairs to 527 miscellaneous type box cars, has placed orders for the repairing of 200 cars with the Pullman Company, 154 cars with the Sheffield Car & Equipment Company, Kansas City, Mo., and 173 cars with the Siems Stembel Company, St. Paul, Minn.

THE NORTHERN PACIFIC, reported in the *Railway Age* of July 1 as having placed orders for a large number of miscellaneous freight cars, has ordered in addition 250 gondola cars from the Standard Steel Car Company. This completes its large outstanding inquiry with the exception of 70 passenger refrigerator cars which the company has not decided whether it will purchase or not.

Passenger Cars

THE AURORA, ELGIN & CHICAGO is reported to be contemplating the purchase of new electric passenger cars.

THE WESTERN PACIFIC is reported to be considering the purchase of some passenger motor cars for short haul and branch line traffic.

Iron and Steel

THE WABASH is inquiring for 100 tons of tank plates.

THE MISSOURI PACIFIC is inquiring for 100 freight car axles.

THE ANN ARBOR has placed an order with the Midvale Steel & Ordnance Co. for 1,800 tons of steel rail.

THE MISSOURI PACIFIC has ordered three steel girder spans weighing 127 tons from the American Bridge Co.

THE ILLINOIS CENTRAL has placed an order with the United States Steel Corporation for 20,000 tons of rails.

THE LONG ISLAND will receive bids until 12 o'clock noon July 14 for 300 gross tons open hearth steel 100 lb. rails.

THE CANADIAN PACIFIC has placed an order for 48,000 tons of steel rail with the Algoma Steel Corporation, Sault Ste. Marie, Ont.

THE PITTSBURGH & LAKE ERIE will receive bids until 12 o'clock noon July 17 at Pittsburgh, Pa., for approximately 1,625 net tons of fabricated steel work.

Machinery and Tools

THE LONG ISLAND is inquiring for 2 axle lathes, a wheel press and some other machines.

THE BOSTON & ALBANY is inquiring for a 90-inch wheel lathe, also for a box facing and boring machine.

THE WAR DEPARTMENT is offering for sale a large list of commodities, including machine tools, shop equipment and supplies.

THE UNION PACIFIC has prepared a machine inquiry list consisting of 73 items which are as follows: 22 lathes of various types, 15 grinders of various types, 4 boring bars, 4 drills, 3 boring mills, 2 drill presses, 2 shapers, 2 forcing presses, 2 pneumatic flanging machines, 1 boring and turning machine, 1 disk sander, 1 flange clamp, 1 punch and shear, 1 riveting machine, 1 hammer, 1 boring machine, 1 centering machine, 1 slip roll forming machine, 1 pipe folder, 1 pneumatic flanging clamp, 1 pipe cutting and threading machine and 1 cutting off machine.

THE CHICAGO, BURLINGTON & QUINCY has issued a new machinery inquiry for its Denver shops covering 117 items which include 31 lathes of various types, 19 grinders of various types, 12 drills, 6 hammers, 5 presses, 5 crank shapers, 5 boring mills, 4 grindstones, 3 planers, 2 slotters, 2 turret screw machines, 2 bar iron shears, 2 combination punch and shears, 2 milling machines, 2 head bolt cutters, 2 pipe threading machines, 1 single end punch, 1 bolt centering machine, 1 bending roll, 1 pneumatic flanging machine, 1 pneumatic flanging clamp, 1 sheet metal cutter, 1 drill press, 1 forging machine, 1 staybolt and crownstay machine, 1 pipe bending machine and 1 horizontal boring machine.

Signaling

THE CITY OF PHILADELPHIA has ordered from the Union Switch & Signal Company apparatus for the complete installation of an automatic block signaling and interlocking system on the Frankford Elevated Railway, six miles in length, double track, from Philadelphia Rapid Transit line at Arch street, north to Bridge street. Electro-pneumatic interlockings, utilizing alternating current throughout, will be installed at Arch street, Girard avenue, Dauphin street, Torresdale avenue and Bridge street. There will be 50 automatic block sections with electro-pneumatic automatic train stops with three-indication color-light signals. The contractor will do the whole of the work and will use alternating current for control and operation of all the signals and interlocking.

Supply Trade News

J. D. Rogers, who has been representing the **Baldwin Locomotive Works** in South Africa, has been appointed manager of the company's office at Calcutta, India.

N. E. Gage, formerly connected with the Standard Tool Company, Cleveland, Ohio, has recently been appointed sales manager of the **National Tool Company** of that city.

Fay, Spofford & Thorndike, consulting engineers, recently removed their offices from 15 Beacon street to the Massachusetts Trust building, 200 Devonshire street, Boston, Mass.

The Kennedy Car Liner & Bag Company, Shelbyville, Ind., has received orders during the past month for Kennedy freight car liners aggregating about 50,000. These orders were placed by various grain carrying roads throughout the country.

The Wilson Welder & Metals Company, Inc., 132 King street, New York City, recently appointed the **King-Knight Company**, Underwood Building, San Francisco, Cal., exclusive representatives in central and northern California for Wilson plastic-arc welding machines and Wilson Color-Tipt metals.

C. C. Clark has been appointed assistant general sales manager of the **Pressed Steel Car Company** and the **Western Steel Car & Foundry Company**, in charge of sales matters in the central district, with headquarters in the Farmers Bank building, Pittsburgh, Pa., taking the place of K. C. Gardner, resigned.

A. R. Kipp, mechanical superintendent of the Minneapolis, St. Paul & Sault Ste. Marie with headquarters at Minneapolis, resigned effective June 30 to form a partnership with **F. L. Battey**, consulting engineer specializing in railroad shop and industrial plant design and construction shop operating problems, with offices in the Union Fuel Building 123 West Madison street, Chicago.

Anson W. Burchard, vice-chairman of the board of directors of the General Electric Company, Schenectady, N. Y., has been elected president and chairman of the board of the **International General Electric Company**, succeeding Gerard Swope, its former president, who was recently chosen president of the General Electric Company. He also succeeds Charles Neave, former chairman of the International Company, who has resigned.

W. H. White will in the future be in charge of the New York City business of the **Mahr Manufacturing Company**, Minneapolis, Minn., makers of Mahrvel oil burning equipment. Mr. White's headquarters will be at 56 Murray street, New York City. He has devoted all his time to mechanical work both in the shops and on the road, having served in the steel and iron business for the past 10 years. Until recently he was with B. M. Jones & Company, Inc., New York City.

Charles H. Bluske has been appointed district sales manager of the **Economy Fuse & Manufacturing Company**, Chicago, at its Los Angeles, Cal., office, 1304 Maltman avenue, succeeding George L. Davis. Mr. Bluske was formerly connected with the Pacific States Electric Company, Los Angeles. The Pittsburgh, Pa., sales office of the Economy Fuse & Manufacturing Company has been moved from 2223 Farmers Bank building to 1006 Peoples Bank building at Fourth avenue and Wood street.

Dwight P. Robinson & Company, engineers and constructors, New York City, have contracted with the Metropolitan Life Insurance Company for life insurance policies, to be given, without expense, to all members of the organization reporting to the central office, under a group insurance plan. All employees included in the plan are insured regardless of their age and condition of health and no medical or physical examination is required. The amount of insurance is increased $100 for each additional year of continuous employment, and provision for total and permanent disability before the age of sixty is also included.

O. R. Hildebrant will in future represent the railway sales department of the **U. S. Light & Heat Corporation**, Niagara Falls, N. Y., in the southeastern territory with headquarters at Norfolk, Va. Mr. Hildebrant began work in 1905 with the Pennsylvania at Jersey City, N. J. In 1909 he went to the Safety Car Heating & Lighting Company and later was with the Edison Storage Battery Company as chief inspector and sales engineer until February, 1918. He then entered the employ of the U. S. Light & Heat Corporation, as representative in the southeastern district, which position he held until November, 1920, when he again entered railroad work on the Florida East Coast. He now returns to the service of the U. S. Light & Heat Corporation as above noted.

American Car and Foundry Company

The annual report of the American Car & Foundry Company for the year ended April 30, 1922, showed the operation of drastic economies during the period of reduced railroad earnings which resulted in final net profits equivalent to $14.94 a share on the $30,000,000 of common stock, as compared with $21.50 in the preceding year. The company reduced its notes and accounts receivable from $20,002,355 to $8,399,478. Part of the proceeds of the liquidation was invested in United States war bonds and Treasury certificates, this account rising $13,518,974 to $18,527,824. Net earnings of the company after taxes declined $4,161,095, as compared with 1921; net profits $1,967,530, and the surplus after dividends $1,967,530. Cash decreased $4,663,080, accounts payable $13,239,510 and inventory $4,929,235.

President William H. Woodin, in his remarks to the shareholders, commented on the present unfortunate situation of the carriers, in which he stated that they are under-equipped to handle normal traffic and are in great need of rehabilitation. The present situation, he added, is the result of a lack of adustment of rates and wages as a result of incomplete co-ordination between two different government agencies. "The development of a fairer public attitude towards the problems of the railroads, however, will bring about a realization of the necessity of providing and maintaining equipment sufficient for all needs," he concluded. Details of the annual report for the year ended April 30 are as follows:

INCOME ACCOUNT

	1922
Net earnings after Federal taxes	$9,051,721
Renewals, replacements, etc	2,468,401
Net profits	6,583,320
Preferred dividend	2,100,000
Common dividend	3,600,000
Surplus for year	883,320
Previous surplus	35,276,568
Total surplus, April 30	36,159,888

ASSETS

Property and plant account	72,301,696
Materials	9,080,826
Accounts and notes receivable	8,399,478
U. S. securities	18,527,824
Stock and bonds	5,764,050
Cash	6,811,358
Total assets	$120,885,232

LIABILITIES

Preferred stock	$30,000,000
Common stock	30,000,000
Accounts payable	8,455,083
Federal taxes	1,119,785
Dividends declared	1,425,000
Reserve accounts—	
For insurance	1,500,000
For improvements, etc	1,196,778
For dividends on common stock	10,800,000
For employees	228,698
Surplus account	36,159,888
Total liabilities	$120,885,232

THE NEBRASKA STATE BOARD OF EQUALIZATION has fixed the taxable valuations of all railroads in Nebraska, except the Chicago & North Western, at $277,254,122, an increase of $9,788,540 over last year. The valuation of the North Western is withheld pending developments in a federal court injunction suit.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company, in conjunction with the city of Kansas City, Kan., is preparing plans for the south approach and main section of the Goddard avenue viaduct. The construction program for the north approach has not been completed, pending negotiations with other railroads.

CHICAGO, BURLINGTON & QUINCY.—This company is calling for bids for the construction of a two-story brick addition to a freight house at Burlington, Iowa.

CHICAGO, ROCK ISLAND & PACIFIC.—This company, which was reported in the *Railway Age* of February 25 as contemplating the construction of a one-story brick passenger station at Graham, Texas, estimated to cost $25,000, is now calling for bids on this work. This company has awarded a contract to the Gould Construction Company, Davenport, Iowa, for the construction of an 8-ft. by 9-ft. by 190-ft. reinforced concrete box at Pershing, Iowa, to replace a high trestle at that point; a 6-ft. by 6-ft. by 30-ft. reinforced concrete box near Eldon, Iowa, to replace a stone box at that point; two concrete and steel subways near Fairfield, Iowa, to replace existing structures, and a 12-ft. by 12-ft. by 25-ft. reinforced concrete box near Jamesport, Iowa, to replace a stone and steel structure at that point; this work to involve the expenditure of approximately $60,000.

ILLINOIS CENTRAL.—This company is calling for bids for the construction of interlocking plants at Peotone, Ill., and Manteno to involve a total expenditure in excess of $20,000.

MISSOURI PACIFIC.—This company is calling for bids for the construction of a considerable extension to its car repair shed at Sedalia, Mo.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—This company has begun and will complete by company forces improvements at Dickson, Tennessee, involving the construction of a $16,000 passenger station, the conversion of the present station into a freight house at a new location and the installation of a new turntable. The total estimated cost of this work is $40,000.

NATIONAL RAILWAYS OF MEXICO.—This company is undertaking extensive improvements on its Chihuahua division between Juarez and Jimenez, involving altering the existing line to cost in excess of $200,000.

NEW YORK CENTRAL.—On July 6 G. A. Harwood, assistant to the president; R. E. Dougherty, designing engineer; F. B. Hank, assistant engineer, and Alfred Fellheimer, consulting engineer, submitted a plan to the mayor and terminal commission of Buffalo, N. Y., for the construction by this company of a main passenger station at Clinton street, that city, and for a smaller station on the site of the present main station at Washington street and Exchange place. The plan also calls for necessary track changes.

PENNSYLVANIA.—This company is receiving bids for the construction of a double-track half-through girder bridge with reinforced concrete floor to carry two tracks of the Delaware divison over the state highway north of State Road Station, Del. Approximate quantities are about 960 cu. yd. of foundation and channel excavation, 1,200 cu. yd. concrete masonry, etc., 2,250 sq. ft. asphalt paint for waterproofing and 5,000 cu. yd. embankment removed. Work will be in charge of J. F. Cullen, assistant engineer, Philadelphia, Pa.

PORTLAND, ASTORIA & PACIFIC.—This company has awarded a contract to A. Guthrie & Co., Portland, Ore., for laying rails and ballasting of approximately 30 miles of new line, extending from Vernonia, Ore., on the Spokane, Portland & Seattle, to the timber properties of the Central Coal & Coke Co., in the Nehalem district. The work is now in progress.

WABASH.—This company is calling for bids for the converting of its combination freight and passenger station at Kirksville, Mo., into a passenger station, and for the construction of a one-story 27 ft. by 136-ft. frame freight house at that point.

Railway Financial News

CENTRAL OF GEORGIA.—*Annual Report.*—This company's annual report for 1921 is reviewed in an article on another page of this issue entitled "Central of Georgia Perishable Traffic Big Factor." See also excerpts from annual report on adjacent pages.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*Annual Report.*—This company's annual report for 1921 is reviewed in an article on another page of this issue entitled "Elimination of Coal Loadings Fails to Hurt Big Four." Se also excerpts from annual report on adjacent pages.

DAYTON-GOOSE CREEK.—*To be Purchased.*—See New Orleans, Texas & Mexico.

ERIE.—*Equipment Trust Certificates Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $4,500,000 of equipment trust certificates to be sold at not less than 96.94.

INTERNATIONAL & GREAT NORTHERN.—*To be Sold.*—This road, now in receivership, will be sold at public auction at noon July 28. L. McDaniel, special master appointed by Judge Hutchinson, will sell the road. An auction will be held to satisfy the claims of the bondholders, which amount to between $18,000,000 and $19,000,000, and will be made under the foreclosure decree signed by Judge Hutchinson on May 17, 1915. It is understood the bondholders have made plans to purchase the road unless a bidder appears who will offer enough to clear the indebtedness. They will then reorganize and terminate the present receivership.

Reorganization Plan Operative.—J. & W. Seligman & Co. and Speyer & Co., reorganization managers, announce that they have declared operative the plan and agreement of reorganization of the International & Great Northern. See article in *Railway Age* of June 10, 1922, page 1347.

INTERNATIONAL & GREAT NORTHERN.—*Annual Report.*—The annual report issued this week shows the following corporate income account for the year ended December 31, 1921:

	1921	1920
Net revenue from operations	$2,012,706	$2,129,697
Federal rental and guaranty	.....	1,416,854
Hire of equipment—credit	1,061,430	349,916
Other corporate income	145,932	200,801
Gross corporate income	3,220,068	4,097,268
Tax accruals	444,043	119,831
Hire of equipment—debit	2,217,348	779,155
Total deductions, inc. other	2,894,402	989,890
Net corporate income	325,666	3,107,379
Interest on funded debt	892,005	902,043
Interest on unfunded debt	916,704	874,149
Deficit or surplus, carried to profit and loss	Def. 1,483,043	1,331,187

MARSHALL & EAST TEXAS.—*Sale of Property Ordered.*—The United States District Court for the Eastern District of Texas on July 1 instructed Bryan Snyder, receiver of this road, to sell that part of the main line extending from Marshall, Tex., to Elysian Fields, about 18 miles. The property to be sold includes buildings and appurtenances located on the right-of-way. The sale will be held at the County Court House in Marshall on August 1, 1922.

The Marshall & East Texas was placed in the hands of receivers January 25, 1917, and operation was discontinued July 31 of the same year. Under court orders certain sections of the original 92-mile line were sold separately.

MISSOURI, KANSAS & TEXAS.—*Receivership Ended.*—Judge Sanborn in St. Louis on June 30 signed a decree authorizing the sale of this road for not less than $28,000,000. Byron F. Babbitt of St. Louis and Joseph F. Dobbyns of Oklahoma City have been appointed special masters to conduct the sale at public auction. The sale will be held at Colbert, Okla., in about six weeks.

NEW ORLEANS, TEXAS & MEXICO.—*Asks Authority to Purchase Dayton-Goose Creek Railroad.*—This company has applied to the Interstate Commerce Commission for approval of a contract entered into with the Dayton-Goose Creek Railroad Company for the purchase of the latter's property for $1,000,000, of which $750,000 will be paid in cash and the remainder in New

Orleans, Texas & Mexico five per cent adjustment bonds. The Dayton-Goose Creek was built three years ago by R. S. Sterling, of Houston, Texas. It extends 25 miles between Dayton, Texas, and Baytown, a connection being made with the Southern Pacific at the former place.

NEW YORK CENTRAL.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $25,000,000 of 5 per cent refunding and improvement mortgage bonds, series C to be sold at not less than 90. The proceeds are to be applied to the payment of a like amount of 10-year 7 per cent collateral trust bonds as the latter are called for redemption on September 1.

READING COMPANY.—*To Offer Modified Plan.*—The United States District Court at Philadelphia has ordered that the Reading Company, the Philadelphia & Reading Coal & Iron Company, and the general mortgage bondholders' committee, after a conference, formulate and submit to the court on or before October 30, a plan for a modification of the Reading dissolution decree to conform to the recent ruling of the United States Supreme Court in Justice Taft's opinion.

TOLEDO, ST. LOUIS & WESTERN.—*Stock Ruling.*—The United States District Court at Toledo has entered an order providing that all of the expenses and compensation of the stockholders' protective committee of the Toledo, St. Louis & Western be paid by the company and that the stock of the railroad company on deposit with the Empire Trust Company, New York City, be delivered upon the return of the outstanding certificates of deposit, as follows:

"B" certificates, upon the basis of share for share, and original certificates, upon the basis of ninety shares of railroad company stock for 100 shares of original certificates, free of all charges of the committee.

UTAH TERMINAL.—*Certificate Denied.*—The Interstate Commerce Commission has denied this company's application for a certificate authorizing the construction and operation of a line of 3.64 miles in Carbon County, Utah, as a spur into a mining district.

WABASH.—*Asks Authority to Issue Equipment Trusts.*—This company has applied to the Interstate Commerce Commission for authority to issue $4,245,000 of 5 per cent equipment trust certificates which had been conditionally sold to Kuhn, Loeb & Co. at 95¾.

Treasury Payments to Railroads

Since last announcement, dated June 1, 1922, payments under Sections 204, 209, 210 and 212 of the Transportation Act, 1920, as amended, have been made by the Treasury as follows:

Section 204:	
Apalachicola Northern Railroad Co.	$3,763.97
Arizona & Swansea Railroad Co.	15,296.34
Blytheville, Leachville & Arkansas Southern R. R. Co.	29,892.09
Bullfrog Goldfield Railroad Co.	15,144.79
Jefferson & Northwestern Railway Co.	4,983.55
Lawndale Railway & Industrial Co.	2,730.98
Leetonia Railway Co.	44,831.32
Millers Creek R. R. Co.	50,237.97
Ocean Shore Railroad Co.	63,322.30
Paris & Mt. Pleasant Railroad Co.	1,748.47
Raquette Lake Railway Co.	9,717.82
Silverton Northern Railroad Co.	20,845.16
South Buffalo Railway Co.	196,175.57
South San Francisco Belt Railway	29,590.87
United Verde & Pacific Railway Co.	34,533.15
Ventura County Railway Co.	17,456.32
Section 209:	
Apalachicola Northern Railroad Co.	14,802.29
Chicago & Eastern Illinois Railroad Co.	723,982.56
Chicago & North Western Railway Co.	3,733,520.55
Colorado Springs & Cripple Creek Ry. Co., Receiver	170,920.69
Duluth, South Shore & Atlantic Ry. Co.	178,459.94
El Paso & Southwestern Co.	691,408.32
Flint River & Northeastern Railroad Co.	1,238.91
Jefferson & Northwestern Railway	18,362.49
Mineral Range Railroad Co.	123,167.95
Minneapolis, St. Paul & Sault Ste. Marie Railway	592,467.82
Mississippi Eastern Railway Co.	4,494.77
New Orleans, Great Northern Railroad	131,055.93
Paris & Mt. Pleasant Railroad Co.	6,105.81
Peoria & Pekin Union Railway Co.	83,829.87
Rock Island Southern Railway Co.	58,711.84
The San Antonio & Arkansas Pass Railway Co.	81,354.39
Waterville Railway Co.	938.59
Section 210:	
Boston & Maine Railroad	5,000,000.00
Hocking Valley Railway Co.	612,000.00
New York, New Haven & Hartford R. R. Co.	300,000.00
Seaboard Air Line Company	1,100,000.00
Section 212	
Louisiana Railway & Navigation Co.	626.94
Paris & Mt. Pleasant Railroad Co.	[illegible]
Texas & Pacific Railway Co., Receiver	[illegible]
Total	$4,774,[illegible]

Total payments to June 30, 1922

(a) Under Section 204, as amended by Section 212, for reimbursement of deficits during Federal control:

(1) Final payments including partial payments previously made	$2,397,8[illegible]	
(2) Partial payments to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	1,456,226 51	
Total payments account reimbursement of deficits		3,854,047 50
(b) Under Section 209, as amended by Section 212 for guaranty in respect to railway operating income for first six months after Federal Control:		
(1) Final payments, including advances and partial payments previously made	70,243,57[illegible] 50	
(2) Advances to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	234,053,672 00	
(c) Partial payments to carriers as to which a certificate for final payment has not been received, as stated above	138,746,422 09	
Total payments account of said guaranty		443,043,666 59
(c) Under Section 210, for loans from the revolving fund of $300,000,000 therein provided		314,103,050.00
Total		$761,000,794.09

Repayments of loans have been made to the amount of $80,095,550.

Tentative Valuations

The Interstate Commerce Commission has issued a number of additional tentative valuations in which, as authorized by the recent amendment to the valuation law, it has omitted the report on the cost of acquisition of land in addition to its original cost or present value. The final values of the property owned and used are given as follows:

		Owned	Used
Sandersville	1916	$46,673	$57,392
Ashland Coal & Iron Railway	1916	1,447,448	1,445,436
New York & Fawn Grove	1916	106,026	....
Duluth, South Shore & Atlantic	1916	17,961,229	17,967,191
Cement, Tolenas & Tidewater	1916	112,002	.....
Craig Mountain Lumber Company's Railway	1917	116,017	.....
Oregeen, Pacific & Eastern	1917	321,117	328,217
Manistee & Repton	1917	75,000	117,500
Munising, Marquette & Southeastern	1916	2,999,784	3,009,889
Carlton & Coast	1917	348,603	373,603
Cincinnati, Flemingsburg & Southeastern	1917	151,397	155,497

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out or received from the several roads the following amounts:

Boston & Maine Railroad	$2,470,000.00
Philadelphia & Reading Railway Company, *paid Director General*	8,000,000.00
Sioux City Terminal Railway Company, *paid Director General*	60,000.00
Rock Island-Frisco Terminal Railway Company, *paid Director General*	21,800.00
Dayton & Union Railroad Company, *paid Director General*	1,000.00
SHORT LINES	
Raquette Lake Railway Company	4,000.00
Paris & Mt. Pleasant Railroad Company, *paid Director General*	100,747.17

Dividends Declared

Buffalo & Susquehanna.—Common, 1¼ per cent, quarterly, payable September 30 to holders of record September 15.

Delaware, Lackawanna & Western.—3 per cent, quarterly, payable July 20 to holders of record July 8.

Pere Marquette.—Preferred, 1¼ per cent, quarterly; preferred, on account of accumulated dividends, 1 per cent; prior preference, 1¼ per cent, quarterly, all payable August 1 to holders of record July 15.

Pittsburgh & West Virginia.—Preferred, 1½ per cent, quarterly, payable August 31 to holders of record August 1; preferred, 1½ per cent, quarterly, payable November 29 to holders of record November 1.

Trend of Railway Stock and Bonds Prices

	July 3	Last Week	Last Year
Average price of 20 representative railway stocks	65.91	64.91	54.43
Average price of 20 representative railway bonds	86.41	86.38	73.83

Annual Reports

Central of Georgia Railway Company — Twenty-seventh Annual Report.

Savannah, Ga., March 8, 1922.

To the Stockholders:

The Board of Directors herewith submits the following report of the operations and affairs of your company for the year ended December 31, 1921.

ACCOUNTS WITH DIRECTOR GENERAL

Final settlement with the United States Railroad Administration of accounts growing out of Federal Control (which are shown on the Balance Sheet of December 31, 1921, as due to and from your Company) was effected January 3, 1922.

GOVERNMENT GUARANTY

The amount accrued to your company by the Government under the six months' guaranty given by the Transportation Act, 1920, has not been ascertained and certified by the Interstate Commerce Commission, but final claim has been filed with the Commission under its Order, dated December 15, 1921.

INCOME

A summary of the income for the year ended December 31, 1921, as compared with the previous year is stated below.

	1921.	1920.	+Increase —Decrease
Average Miles Operated during year	1,913.63	1,913.63	.....
Operating Revenues	$22,057,498.58	$20,676,551.05	+$1,380,947.53
United States Government—Guaranty Period Claim	.....	3,111,965.51	— 3,111,965.51
Rental from United States Railroad Administration	.....	732,892.77	— 732,892.77
Total Operating Revenues	$22,057,498.58	$24,521,409.33	—$2,463,910.75
Operating Expenses	20,020,842.57	†21,102,368.50	— 1,081,525.93
Excess of Revenues over Expenses	$2,036,656.01	$3,419,040.83	—$1,382,384.82
Taxes	899,875.21	795,151.18	+ 104,724.03
Uncollectible Railway Revenues	46,588.39	5,584.69	+ 41,003.70
Operating Income	$1,090,192.41	$2,618,304.96	—$1,528,112.55
Equipment Rents—Net credit	235,176.69	167,337.00	+ 67,839.69
Joint Facility Rents — Net debit	104,713.76	83,581.37	+ 21,132.39
Net Operating Income	$1,220,655.34	$2,702,060.59	—$1,481,495.25
Non-operating Income	918,424.05	1,777,309.27	— 858,885.22
Gross Income	$2,139,079.39	$4,479,369.86	—$2,340,290.47
Deduction from Gross Income	3,118,893.01	2,962,662.41	+ 156,230.60
Net Income	*$979,813.62	$1,516,707.45	—$2,496,521.07

*Asterisk denotes deficit.

†Includes corporate operating expenses for the months of January and February, 1920, amounting to $12,592.52, not assumed by United States Railroad Administration.

During the current year your railroad was operated under corporate management. In the preceding year the property was under Federal control the first two months; under corporate management with a Federal guaranty the following six months; and under corporate management without guaranty the remaining four months. As a consequence, the only items which are comparable are "Non-operating Income" and "Deduction from Gross Income" as during the first two months of 1920, when the properties were under Federal control all "Net Railway Operating Income" items were borne by the Government and your company received a rental which, in the Income Accounts, is shown opposite "Rental from United States Railroad Administration," and, therefore, the operating accounts comprising "Net Railway Operating Income" include the results for ten months only, while the figures for 1921 are the totals for the year.

To afford a proper comparison of operating results for the two years there has been prepared and will be found below a table headed "Transportation Operations," which for 1920 combines the Federal operations for the first two months of the year and corporate operations for the balance of the year.

NON-OPERATING INCOME

"Non-operating Income" this year amounted to $918,424.05 as against $1,777,309.27 last year, a decrease of $858,885.22. The decrease was due to a reduction of $799,640.00 in dividends received from Ocean Steamship Company of Savannah; a reduction of $231,800.00 in dividends received from Atlantic Compress Company, and a net increase of $172,554.78 in other items comprising "Non-operating Income" of which $75,000.00 was due to an adjustment in December, 1920, of interest on open accounts with the United States Railroad Administration.

DEDUCTIONS FROM GROSS INCOME

"Deductions from Gross Income" amounted to $3,118,893.01, an increase of $156,230.60 over the previous year. This increase was due principally to interest of $18,377.00 on Equipment Trust "M" certificates issued in February, 1921, and to interest of $127,205.47 on advances from affiliated companies.

TRANSPORTATION OPERATIONS

The results of transportation operations this year, compared with last year, referred to above are as follows:

Railway Operating Revenues	1921.	1920.	+Increase —Decrease
Freight	$14,565,643.79	$15,485,717.56	—$920,073.77
Passenger	5,483,676.31	6,794,338.45	—1,310,662.14
Mail	154,847.87	917,380.09	—762,532.22
Express	459,989.01	591,324.55	—131,335.54
Other passenger train	228,379.16	291,956.17	—63,577.01
Other transportation	60,780.00	106,170.25	—45,390.25
Incidental and joint facility	604,182.41	695,201.82	—91,019.58
Total railway operating revenues	$22,057,498.58	$25,082,188.09	—$3,024,789.51
Railway Operating Expenses			
Maintenance of way and structures	$ 449,358.35	$ 1,942,898.11	—$1,493,539.98
Maintenance of equipment	1,711,701.60	6,164,735.93	—1,453,034.33
Traffic	778,475.70	673,246.65	+ 105,229.05
Transportation	10,052,517.47	12,908,739.14	— 2,856,221.67
Miscellaneous operations	87,677.55	64,426.70	+ 23,250.85
General	950,019.02	990,233.74	— 40,214.72
Transportation for investment—Cr.	8,907.12	9,913.02	— 1,005.90
Total railway operating expenses	$20,020,842.57	$25,733,367.47	—$5,712,524.90
Net revenue from railway operations	$2,036,656.01	*$651,079.38	+$2,687,735.39
Railway tax accruals	$899,875.21	$925,198.85	— $25,323.64
Uncollectible railway revenues	46,588.39	10,735.53	+ 35,852.86
Railway operating income	$1,090,192.41	*$1,587,013.76	+$2,677,206.17
Equipment rents—Net credit	235,176.69	148,611.13	+ 86,565.56
Joint facility rents—Net debit	104,713.76	114,788.83	— 10,075.07
Net railway operating income	$1,220,655.34	*$1,553,191.46	+$2,773,846.80

* Asterisk indicates deficit.

RAILWAY OPERATING REVENUES

"Railway Operating Revenues," amounted to $22,057,498.58 this year as compared with $25,082,288.09 last year, a decrease of $3,024,789.51, or 12.06%.

The decrease of $920,073.77 or 5.94% in "Freight Revenue" is due to a decline in the volume of traffic handled as a result of prevailing business depression. The tons of revenue freight carried one mile this year were 1,112,683,441, a decrease of 170,615,035 ton miles, or 13.30%, as compared with previous year.

The decrease of $1,310,662.14, or 19.29% in "Passenger Revenue" is due to the substantial falling off in passenger travel which was affected by the general depression in business existent throughout the year. The revenue passengers carried one mile decreased 65,982,673, or 27.37%. The decline in the volume of traffic was offset in part by increased rates which were in effect during the year as against only four months of the previous year. The average revenue per passenger per mile being 3.13%, an increase compared with last year of 0.31c., or 10.99%.

The decrease of $462,532.22, or 50.42% in "Mail Revenue" is due principally to the inclusion in "Mail Revenue" for 1920, of $329,638.00 for back mail pay applicable to the years 1918-1919, and to an adjustment this year of $40,176.27 covering back mail pay for the years 1916-1917.

The decrease of $131,335.54, or 22.21% in "Express Revenue" is due in part to a smaller volume of express traffic handled, but more largely to the inadequate proportion of the total express revenue received from the Express Company for the transportation of express.

The decrease in "Other Passenger Train Revenue," "Other Transportation Revenue" and "Incidental and Joint Facility Revenue" aggregating $200,-185.84, or 15.48% is due to the same causes as the decreases in "Freight Revenue" and "Passenger Revenue."

RAILWAY OPERATING EXPENSES

"Railway Operating Expenses" amounted to $20,020,842.57 this year as compared with $25,733,367.47 last year, a decrease of $5,712,524.90, or 22.20%.

The decrease of $1,493,539.98, or 30.22% in "Maintenance of Way and Structures Expenses" is due to the decreased expenditures for repairs; decrease in force and wages; decrease in number of locomotive hours worked; and a decrease in the cost of material and supplies used.

The decrease of $1,452,034.33, or 23.50+% in "Maintenance of Equipment Expenses" is due to decreased expenditures for repairs to equipment; decrease in force and wages; changes in working conditions; and a decrease in cost of materials and supplies. Charges to "Maintenance of Equipment Expenses" for depreciation were $617,951.55, an increase of $11,383.13, or 1.96%. The increase is due to an increase of depreciable equipment. The average miles per locomotive were 31,167, a decrease of 4,562 miles, or 12.77%. The average age of locomotives was 18.2 years as compared with 17.3 years for the preceding year.

The increase of $105,229.05, or 15.63% in "Traffic Expenses" is due in part to the reorganization of the Traffic Department and re-establishment of outside agencies after the termination of Federal control and partly to increased printing expenses on account of the numerous changes in rates and the necessary issue of voluminous tariffs in connection therewith.

The decrease of $2,856,221.67, or 22.13% in "Transportation Expenses" is due to a reduction in train service on account of the decline in the volume of business transported this year as compared with the previous year; reduction of wages; and greater efficiency in the operation of trains. Train loading increased 2.4% over the previous year. Fuel costs decreased $648,486.00. This saving was partly due to a decrease in the price of fuel, but principally to the fuel campaign carried on throughout the year which effected a saving of 91,265 tons of coal by better performance. There were also substantial decreases in the payments for casualty items this year, the result of special campaigns for the prevention of causes originating such claims.

The decrease of $40,214.72, or 4.06% in "General Expenses" is due principally to reduction in general office forces and wages.

The increase of $23,250.85, or 36.09% in "Miscellaneous Operations" is due to the decrease in passenger business.

RAILWAY TAX ACCRUALS

"Railway Tax Accruals" amounted to $899,875.21 this year as compared with $925,198.85 (the latter figure including taxes assumed by the United States Railroad Administration for the first two months of 1920) last year; a decrease of $25,323.64, or 2.74%, due to substantial decrease in Federal income tax on account of a reduction in taxable income.

FINANCIAL

Capital Stock.

There has been no change.

Funded Debt—Equipment Trust.

To aid in paying for the seven Mountain Type locomotives and seventeen passenger train steel cars acquired during the year, your Company on January 24, 1921, borrowed from United States Government $237,900.00 payable in fifteen annual installments, 1922 to 1936, inclusive, with interest at 6% per annum; and on February 1, 1921, issued its Equipment Trust M and sold $650,000.00 of Equipment Trust Certificates maturing in eleven

annual installments, 1926-1936, inclusive, with interest at 6½% per annum, payable semi-annually.

Other Indebtedness

Non-negotiable debt to affiliated companies increased $3,399,923.50, all due to Ocean Steamship Company of Savannah.

Loans and bills payable decreased $543,280.00.

Current Liabilities decreased $2,148,374.93.

Your Company has no floating debt.

Dividends

During the year preferred dividends Nos. 16 and 17 (total $900,000), at the stipulated rate of six per cent per annum, and common dividends Nos. 11 and 12 (total $250,000) at the rate of five per cent per annum, were declared and paid.

Valuation

Under the Valuation Act, the Interstate Commerce Commission has reported a tentative final value for the railway property operated by your company of $79,083,523.00. While this exceeds not only the capitalization but the book values, your directors, being of opinion that it is less than the actual value of the property, filed protests. Testimony and briefs have been submitted, and the question is now before the Commission for final action.

PHYSICAL CHANGES

Roadway and Structures

37.0572 miles of track were relaid with 90 pound new steel rail, of which 5.6186 miles were relaid with new steel rail of the same weight, 2.2588 miles of track relaid with second hand steel rail replacing rail of lighter patterns; and 3.6089 miles of track relaid with second hand steel rail replacing rail of same pattern; total mileage of track relaid with new and second hand steel rail was 42.9249.

Work was begun in the early part of the year on the construction in Jefferson County, Alabama of a line to be known as the Cahaba District, approximately seven miles in length, extending from McCombs, Alabama, in a southwesterly direction along the eastern slope of Shades Mountain. This line will serve the Bragg and Class Seams, situated in what is commonly known as the Waterworks Basin of the Lower Cahaba Coal Fields. Tipple layouts to serve both of these coal seams will be located near the Cahaba River. Work was started on April 7, 1921, and the line has been fully completed for a distance of four miles from McCombs.

Seven new Mountain Type locomotives were added during the year. One locomotive of an obsolete type was sold. Ten Mikado type locomotives were leased from the Illinois Central, making an increase of six locomotives owned and ten locomotives leased, with an increase of 845,770 pounds in tractive power.

Seventeen modern all steel passenger train cars were purchased from The Pullman Company consisting of four sleeping cars, five open coaches, four partition coaches and four baggage and express cars.

Superheaters, valve gears, piston valves and other improvements were applied to five locomotives.

There were no freight train cars acquired; 414 freight and work cars were sold, destroyed or retired, and four freight train cars were converted to work equipment. The average capacity of freight train cars at the close of the year was 38.8 tons, and the total capacity was 323,700 tons.

One consolidated locomotive was converted to Mikado type.

The Board takes pleasure in acknowledging the fidelity, efficiency and united efforts displayed by your officers and employees in the discharge of their duties.

By order of the Board of Directors.

CHARLES H. MARKHAM,
Chairman of Board.

CENTRAL OF GEORGIA RAILWAY COMPANY

Income Statement

Year Ended December 31

	1921	Per Cent of Total Operating Revenues	1920	+ Increase — Decrease
Aver. miles operated.	1,913.63	....	1,913.63	.....
Railw'y Operat. Revs.:				
I. Transportation — Rail Line				
101. Freight	$14,565,643.79	66.03	$12,930,928.57	+$1,634,715.22
102. Passenger	5,481,676.31	24.86	5,728,246.36	— 244,570.05
103. Excess baggage	38,117.94	.17	32,090.73	+ 6,027.21
104. Sleeping car...	147,828.28	.67	172,853.08	— 25,024.80
105. Par. and ch. car	16,844.24	.08	22,998.23	— 6,153.99
106. Mail	454,847.87	2.06	470,410.32	— 15,562.45
107. Express	459,989.01	2.09	489,307.26	— 29,318.25
108. Other pass. tr	6,433.40	.03	7,305.23	— 871.83
109. Milk	19,155.30	.09	15,813.97	+ 3,341.33
110. Switching	242,001 15	1.10	221,957.02	+ 20,044.13
111. Special serv. tr.	18,778.85	.08	28,648.75	— 9,869.90
Total	$21,453,316.14	97.26	$20,120,559.52	+$1,332,756.62
II. Incidental:				
131. Din. and buff.	$75,721.06	.34	$37,136.81	+ $38,584.25
132. Hotel and rest	4,239.96	02	2,893.39	+ 1,346.57
133. Station tr. and boat privileges.	44,628.96	.20	38,753.64	+ 5,875.32
134. Parcel room...	637.80	....	716.54	— 78.72
135. Storage—Fr't .	190,181.99	.86	151,505.89	+ 38,676.10
136. Stor.—baggage.	1,550.63	....	1,380.82	+ 169.81
137. Demurrage ...	62,796.02	.29	110,342.29	— 47,546.27
141. Power	3,878.53	.02	2,562.69	+ 1,315.84
142. Rents of bldgs. and other prop.	5,551.01	.03	1,305 88	+ 4,245.13
143. Miscellaneous .	181,019.47	.82	173,050.88	+ 7,968.59
Total	$570,205.43	2.58	$519,648.81	+ $50,556.62
IV. Joint Facility:				
151. Joint fac.—Cr.	$34,006.70	.16	$36,266.24	— $2,259.54
152. Joint fac.—Dr.	*29.69	....	76.48	— 106.17
Total	$33,977.01	.16	$36,342.72	— $2,365.71
Total railway operating revs.	$22,057,498.58	....	$20,676,551.05	+$1,380,947.53

Year Ended December 31

	1921	Per Cent of Total Operating Revenues	1920	+ Increase — Decrease
Railw'y Operat. Exp.:				
201-279. Maint'ce of way and struct.	$3,449,358.35	15.64	$4,105,356 85	— $655,998.50
301 337. Maint. of equipment ..	4,711,701 60	21 36	5,047,749.43	— 336,047.83
351 359. Traffic	778,475.70	3 53	550,925.44	+ 227,550.26
371-420. Transporta. —rail line	10,052,517.47	45.57	10,512,060.77	— 459,543.30
441-446. Misc. opera.	87,677.55	.40	41,877.59	+ 43,799.96
451-462 General	950,019.02	4.31	852,654.69	+ 97,364.33
471. Transp. for investment—Cr.	*8,907.12	*.04	*10,256.27	+ 1,349.15
Total railway operating exp..	$20,020,842.57	90.77	$21,102,368.50	—$1,081,525.93
Net revenue from railway operations.	$2,036,656.01	9.23	*$425,817.45	+$2,462,473.46
532. Rail tax accru.	$899,875.21	4.08	$795,151.18	+ $104,724.03
533. Uncl. rail. rev.	46,588.39	.21	5,584.69	+ 41,003.70
Rail. operat. income	$1,090,192.41	4.94	*$1,226,553.32	+$2,316,745.73

	1921	1920	+ Increase — Decrease
Railway operating income —brought forward..... ..	$1,090,192.41	*$1,226,553.32	+$2,316,745.73
Additions to Railway Operating Income:			
503. Hire of freight cars—credit balance	$235,492.89	$184,620.85	+ $50,872.04
504. Rent from locomotives	22,343.57	30,028.44	— 7,684.87
505. Rent from passenger train cars	90,954.64	21,684.33	+ 69,270.31
507. Rent from work equipment	9,416.05	6,972.04	+ 2,444.01
508. Joint facility rent income	50,321.75	36,250.26	+ 14,071.49
Total additions to railway operating income	$408,528.90	$279,555.92	+ $128,972.98
Deductions from Railway Operating Income:			
537. Rent for locomotives	$18,534.27	$24,017.32	— $5,483.05
538. Rent for passenger train cars	102,693.27	50,274.93	+ 52,418.34
540. Rent for work equipment	1,802.92	1,676.41	+ 126.51
541. Joint facility rents..	155,035.51	119,831.63	+ 35,203.88
Total deductions from railway operating income	$278,065.97	$195,800.29	+ $82,265.68
Net railway operating income ("Standard Return")	$1,220,655.34	*$1,142,797 69	+$2,363,453.03
Non-operating Income:			
502. Revenues from miscellaneous operations	$41,888.89	$51,914.33	— $10,025.44
509. Income from lease of road (Note 1).....	45,299.64	778,192.41	— 732,892.77
510. Miscellaneous rent income	107,062.11	104,003.65	+ 3,058.46
511. Miscellaneous non-operating physical property	25,968.43	18,850.22	+ 7,118.21
513. Dividend income ...	432,639.25	1,477,825.50	— 1,045,186.25
514. Income from funded securities	127,655.66	114,239.76	+ 13,415.90
515. Income from unfunded securities and accounts	36,413.32	*35,226.73	+ 71,640.05
519. Miscellaneous income, (Note 2)	101,496.75	3,112,368.41	— 3,010,871.66
Total non-operating income	$918,424.05	$5,622,167.55	—$4,703,743.50
Gross income	$2,139,079.39	$4,479,369.86	—$2,340,290.47
Deductions from Gross Income:			
534. Expenses of miscellaneous operations..	$37,444.68	$43,145.87	— $5,701.19
542. Rent for leased roads	371,432.47	370,283.66	+ 1,148.81
543. Miscellaneous rents.	135,887.49	135,827.81	+ 59.68
546 Interest on funded debt	2,329,290.09	2,286,333.75	+ 42,956.34
547. Interest on unfunded debt	151,029.28	80,413.01	+ 70,616.27
548. Amortization of discount on funded debt	33,891.31	31,570.39	+ 2,320.92
551. Miscellaneous income charges	59,927 69	15,087.92	+ 44,839.77
Total deductions from gross income	$3,118,893.01	$2,962,662.41	+ $156,230.60
Net income	*$979,813.62	$1,516,707.45	—$2,496,521.07

Note 1. 1920 figures include compensation from United States Railroad Administration for January and February, 1920.

Note 2. 1920 figures include claim against United States Government under Guaranty provision, Transportation Act, 1920.

*Denotes credit or deficit as may be appropriate.

Cleveland, Cincinnati, Chicago and St. Louis—Thirty-third Annual Report

To the Stockholders of

THE CLEVELAND, CINCINNATI, CHICAGO AND ST. LOUIS RAILWAY COMPANY:

The Board of Directors herewith submits its report for the year ended December 31, 1921, with statements showing the income account and the financial condition of the company.

Road operated

The mileage covered by this report is as follows:

	1921 Miles	1920 Miles	Decrease Miles
Main line and branches owned	1,691.78	1,693.03	1.25
Proprietary line	.....	.78	.78
Leased lines	205.10	205.10	.....
Lines operated under contract	326.68	326.68	.....
Lines operated under trackage rights	187.31	195.86	8.55
Total road operated	2,410.87	2,421.45	10.58

Traffic conditions

The year 1921 was one of business depression, reflected in the decreased freight and passenger traffic of the company. The tonnage fell off in volume 22 per cent and the passenger traffic 20.4 per cent, as compared with 1920. This situation was met by economies in operation.

In co-operation with the federal government in its effort to lower costs of foodstuffs, voluntary decreases in rates on certain agricultural products were put in effect during the year. There was no general reduction in other freight rates, but adjustments were made from time to time to remove inequalities. The company has co-operated with State authorities in a readjustment of rates on roadmaking material for the purpose of stimulating the building of good roads and to meet the unemployment situation.

There was no general readjustment of passenger rates, but the practice which obtained prior to federal control of putting into effect reduced excursion rates during the summer months was re-established to some extent.

Account with Railroad Administration

The company's account with the Railroad Administration covering the period of federal control will be completed in the early part of 1922.

Claim against United States upon the guaranty

The company's claim against the United States based upon its guaranty for the period March-August, 1920, is approaching completion. It has been necessary to restate this claim several times in accordance with tentative formulas. It will be ready for presentation in the early part of 1922.

Loans and bills payable

The following demand notes appear on the balance sheet:

The New York Central Railroad Company	$4,000,000
Director General of Railroads	3,500,000
Total	$7,500,000

The $4,000,000 demand note was given to The New York Central Railroad Company in 1920 in renewal of the unpaid balance of notes theretofore given to that company from time to time for money borrowed to provide additions and betterments. This note is secured by $4,189,000 of this company's refunding and improvement mortgage bonds, series A, issued (nominally) in 1920 for that purpose, the note, with such collateral, being pledged as part of the collateral security for the loan made to The New York Central Railroad Company by the United States under section 210 of the Transportation Act.

The indebtedness of $3,425,000 to banks and trust companies, included in the list of loans and bills payable in the annual report for 1920, was paid during 1921. During the year the company gave to the Director General of Railroads, in reduction of its indebtedness to him for additions and betterments during federal control, its demand note, above referred to, for $3,500,000, thereby correspondingly decreasing the amount due him for additions and betterments.

Issue and retirement of securities

Additional notes amounting to $65,800 were issued under the equipment trust known as Equipment Trust No. 44 and given to the Director General of Railroads in connection with final settlement for the equipment allocated to the company during the period of federal control and described in the annual report for 1920. The total cost of the equipment was $6,937,706.50, of which $5,195,800 was financed by equipment notes.

In June, 1921, the company issued $1,052,600 of its 20-year 6 per cent refunding and improvement mortgage bonds, series C, in the refunding of prior lien bonds, paid or acquired by the company, as follows:

$567,000, principal amount, of first consolidated mortgage bonds of the Cincinnati, Indianapolis, St. Louis and Chicago Railway Company due May 1, 1920;

$158,000, principal amount, of general first mortgage bonds of the Cincinnati, Indianapolis, St. Louis and Chicago Railway Company due August 1, 1936;

$327,600, principal amount, of 5 per cent general mortgage bonds of this company due June 1, 1993.

The disposition made of these bonds is stated on another page.

During the year the company's notes of a maturity of more than two years, equipment trust obligations and mortgage bonds were increased as follows:

Equipment Trust No. 44 of January 15, 1920, additional notes	$65,800.00	
Twenty year refunding and improvement mortgage bonds of the C. C. C. & St. L. Ry. Co., series C, 6 per cent	1,052,600.00	$1,118,400.00

The following bonds were retired during the year:

C. I., St. L. & C. Ry. Co., general first mortgage bonds retired	$77,000.00	
C. C. C. & St. L. Ry. Co. (St. Louis Division) first collateral trust mortgage bonds purchased for sinking fund	52,000.00	
Central Grain Elevator Co. bonds retired	25,000.00	154,000.00

Payments falling due during the year and on January 1, 1922, on the company's liability for principal installments under equipment trust agreements were made as follows:

N. Y. C. Lines Trust of 1907, installment due November, 1921	$245,689.81
N. Y. C. Lines Trust of 1911, installment due January, 1922	149,[illegible].82
N. Y. C. Lines Trust of 1912, installment due January, 1922	159,8[illegible].00
N. Y. C. Lines Trust of 1913, installment due January, 1922	116,7[illegible].71
Big Four Railway Trust of 1914, installment due June, 1921	373,000.00
Big Four Railway Trust of 1915, installment due June, 1921	115,000.00
Big Four Railway Trust of 1917, installment due June, 1921	237,000.00
Equipment Trust No. 44 of January 15, 1920, notes due January, 1921	342,000.00
C. C. C. & St. L. Ry. Co. proportion of N. Y. C. R. R. Co., Equipment Trust of April 15, 1920, certificates, due April, 1921	761,111.40
	2,551,050.94
Serial note of the C. C. C. & St. L. Ry. Co., given to the N. Y. C. R. R. Co., due December 23, 1921, paid at maturity	262,933.34

There were nominally issued during the year and pledged as collateral for a demand note for $3,500,000 given to the Director General of Railroads $3,500,000 of this company's refunding and improvement 6 per cent mortgage bonds, series A, $811,000; series B, $2,689,000.

Acquisition of European Loan Bonds

With additional purchases in 1921, the company's holdings of European Loan bonds at the end of the year amounted to 35,415,500 francs, equivalent at the normal rate of exchange (5.1813 francs to the dollar) to $6,835,253.70. The total cost of these bonds was $3,318,839.58.

Purchase of capital stock of the Evansville, Indianapolis and Terre Haute Railway Company

During the year this company exercised its option, referred to in the annual report for 1920, to acquire the entire capital stock of the Evansville, Indianapolis and Terre Haute Railway Company by paying therefor on June 14, 1921, $1,052,600 principal amount of its 6 per cent refunding and improvement mortgage bonds, series C, due 1941, carrying interest from January 1, 1921, these bonds being taken at 95, and $30 in cash. The settlement with the interests formerly controlling the Evansville, Indianapolis and Terre Haute Railway Company was made as of November 1, 1920, and since that date the road has been operated by that company in the interest of this company as sole stockowner.

Stock of the Cincinnati Northern Railroad Company

During the year the company acquired 700 shares, par value $70,000, of the capital stock of the Cincinnati Northern Railroad Company, making the total shares in that company now owned by this company 17,774, or 59.25 per cent of the total shares outstanding.

Proposed purchase of income bonds and capital stock of The Peoria and Eastern Railway Company

There are outstanding $4,000,000 of income mortgage 4 per cent non cumulative bonds of The Peoria and Eastern Railway Company, due April 1, 1990, and $9,994,200 of the capital stock of that company, not including $800 of such stock nominally issued, but held in that company's treasury, and $5,000 not issued, but reserved for exchange for the stock of The Ohio, Indiana and Western Railway Company, predecessor of the Peoria and Eastern Railway Company. By resolutions adopted by this company's Board of Directors on December 14, 1921, the company authorized an offer, subject to the approval of the Interstate Commerce Commission, to purchase income bonds and stock of The Peoria and Eastern Railway Company, paying therefor in 4½ per cent first mortgage bonds of The Evansville, Mt. Carmel and Northern Railway Company (of which $2,118,000 are now in the treasury of this company), to be guaranteed by this company, on the basis of one $1,000 Mt. Carmel bond for three $1,000 Peoria and Eastern income mortgage bonds, and one $1,000 Mt. Carmel bond for sixty shares (par value $100 each) of the capital stock of The Peoria and Eastern Railway Company. Applications for authority to acquire these Peoria and Eastern securities, or such part thereof as may be offered on the above terms, and to guarantee Mt. Carmel bonds to be used for that purpose are pending before the Interstate Commerce Commission.

SUMMARY OF FINANCIAL OPERATIONS AFFECTING INCOME

	Year ended Dec. 31, 1921 2,410.87 miles operated	Year ended Dec. 31, 1920 2,421.45 miles operated	Increase Decrease 10.58 miles
Operating Income—			
Railway Operations:			
Railway operating revenues	$79,793,503.13		
Railway operating expenses	64,406,122.34		
Net revenue from railway operations	$15,387,470.79		
Percentage of expenses to revenues	(80.72)	Items not shown are not	
Railway tax accruals	$3,982,289.42	Comparable. See note A	
Uncollectible railway revenues	6,475.11		
Railway operating income	$11,398,706.26		
Equipment rents, net debit	$723,356.65		
Joint facility rents, net debit	575,057.31		
Net railway operating income	$10,100,292.30	$11,829,375.54A	—$1,729,083.24
Miscellaneous Operations:			
Revenues	$29,703.42	$27,480.19	$2,223.23
Expenses and taxes	25,837.75	24,241.34	1,596.41
Miscellaneous operating income	$3,865.67	$3,238.85	$626.82
Total operating income	$10,104,157.97	$11,832,614.39	—$1,728,456.42
Other Income—			
Additional compensation under contract with Director General of Railroads for use of the company's railroad property during federal control	$117,693.70	.....	$117,693.70
Miscellaneous rent income	366,818.69	$257,544.45	109,274.24
Miscellaneous non operating physical property	188,411.82	157,995.48	30,416.34
Dividend income	112,883.00	70,705.00	42,148.00
Income from funded securities	346,311.00	318,492.54	27,819.08
Income from unfunded securities and accounts	325,676.98	810,281.07	—484,604.09
Release of premiums on funded debt	1,322.75	1,479.85	—157.10
Miscellaneous income	53,110.73*B	170,267.49c	—223,398.28
Total other income	$1,405,958.67	$1,786,766.78	—$380,808.11
Gross income	$11,510,116.64	$13,619,381.17	—$2,109,264.53

Deductions from Gross Income—			
Rent for leased roads	$465,283.70	$235,267.[illegible]8	$[illegible]016.63
Miscellaneous rents	434,192.13	146,[illegible]13.00	[illegible]7,56[illegible].13
War taxes accrued	0	164,[illegible].00	—164,[illegible].00
Miscellaneous tax accruals	14,400.00	25,[illegible].00	—11,[illegible].00
Separately operated properties—loss	236,7[illegible]9.48	5[illegible],566.[illegible]1	18[illegible],192.5[illegible]
Interest on funded debt	6,4[illegible],9[illegible]7.20	5,9[illegible],[illegible]16	464,[illegible]04.4
Interest on unfunded debt	1,119,8[illegible].21	6[illegible],8[illegible]	4[illegible],51[illegible]
Amortization of discount on funded debt	146,038.9[illegible]	128,6[illegible]	17,145.5[illegible]
Maintenance of investment organization	3,8[illegible].17	[illegible]54.[illegible]	[illegible]4.16
Corporate general expenses	[illegible]	[illegible]	[illegible]
Miscellaneous income charges	258,621.67†	[illegible]7c	—557,[illegible]4
Total deductions from gross income	$8,580,168.14	$7,730,[illegible]2.2	$[illegible],5[illegible]2
Net income	$2,929,948.[illegible]	$5,8[illegible],77[illegible]15	—$2,[illegible]5[illegible]5
Disposition of Net Income			
Dividends declared (5 per cent each year on preferred capital stock)	$499,925.00	$[illegible],92[illegible]	
Sinking funds	37,216.79	[illegible]5,174.[illegible]	$3,042.79
Investment in physical property	66,189.93	30,341.41	37,848.52
Total appropriation of income	$603,331.72	$565,440.41	$37,891.31
Surplus for the year carried to profit and loss	$2,3[illegible]6,616.78	$5,323,[illegible]8.74	—$2,[illegible]96,7[illegible]1.96

a—Includes compensation accrued under contract with Director General, January and February, Guaranty under Transportation Act, 1920, March to August, and net railway operating income—corporate—September to December.

b—Includes accrual account Guaranty under Transportation Act, 1920.

c—1920 figures revised to include revenues and expenses prior to January 1, 1918.

d—War taxes for 1921, included in Railway tax accruals.

*Debit. †Credit.

Profit and loss account

Balance to credit of Profit and Loss, December 31, 1920		$16,235,252.16
Additions:		
Surplus for the year 1921	$2,326,616.78	
Damage award in connection with the relocation of line between Dayton and Enon, Ohio-Miami Conservancy District	326,292.00	
Accumulated unrefundable overcharges	149,326.58	
Sales of land	44,607.81	
Reacquirement of securities below par	27,203.70	
Unclaimed wages and pensions, 1915	2,078.74	
		2,876,125.61
		$19,111,377.77
Deductions:		
Road property abandoned	$138,012.91	
Unaccrued depreciation prior to July 1, 1907 on equipment retired during 1921	70,686.25	
Adjustments of sundry accounts (net)	16,719.53	
		225,418.69
Balance to credit of Profit and Loss, December 31, 1921		$18,885,959.08

Operating expenses

In arriving at the railway operating income for the guaranty period, the Transportation Act required that the maintenance allowance should be fixed with reference to the standards and price levels of the test period. The company worked out a tentative factor which resulted in charges to maintenance in excess of actual expenditures and the carrying forward of a reserve at the end of 1920. This factor, however, has proved to be larger than the government is likely to accept. Therefore, entries were made in December, 1921, closing out balances in the maintenance reserves which had been accumulated in 1920; and as operating expenses for that year had been over-accrued by the amount of the reserves, it was necessary to adjust operating expenses in 1921 to offset the overcharge and preserve the continuity of the accounts. In making this adjustment the amount tentatively charged against the government for guaranty period operations was reduced, and a corresponding charge was made against non-operating income, as a result of which the net corporate income for 1921 was not affected.

The operating expenses for 1921, by groups, as compared with those for 1920, eliminating these adjustments, were as follows:

	Amount	Decrease
Maintenance of way and structures	$11,163,218.04	$1,198,577.74*
Maintenance of equipment	18,513,987.91	783,980.67
Traffic	1,276,151.28	4,029.34
Transportation	33,005,070.53	6,025,787.61
Miscellaneous operations	686,087.51	71,315.13
General	1,994,018.16	103,097.50*
Transportation for investment—Cr.	41,344.44	61,241.89*
	$66,597,188.99	$ 322,195.52

*Increase.

The decrease in operating expenses reflects the falling off in traffic, the economies effected by the company during the year, and the reduction in wages and in costs of material and fuel.

Changes in organization

On June 15, 1921, Mr. Albert H. Harris was elected a Director to fill the vacancy caused by the resignation on April 13, of Mr. William C. Brown.

On October 26, 1921, Mr. Frank J. Jerome was elected a Director to fill the vacancy caused by the resignation on February 9, of Mr. Samuel Mather.

Appreciative acknowledgment is made to all officers and employees of their loyal and efficient co-operation and service.

For the Board of Directors,

ALFRED H. SMITH, President.

Railway Officers

Executive

Stanton Ennes, vice-president and general manager of the Wheeling & Lake Erie, has been elected president and general manager, succeeding **W. M. Duncan** who has been elected chairman of the board of directors.

Financial, Legal and Accounting

W. E. Rodwell has been appointed car accountant of the Seaboard Air Line with headquarters at Portsmouth, Va.

James C. Rogers, general paymaster of the Pennsylvania and president of the Veteran Employees' Association of the general offices at Philadelphia, retired from service on June 30 after having served the company continuously for 52 years and 8 months.

H. A. Toland, a former assistant auditor of the Oregon Short Line at Salt Lake City, Utah, and engaged for the past two years in the New York office of the Union Pacific, has been appointed auditor of that road, with headquarters at Omaha, to succeed H. J. Sterling, resigned.

Operating

C. B. Packer, car accountant of the Seaboard Air Line with headquarters at Portsmouth, Va., has been appointed assistant superintendent of transportation.

O. F. Brookmeyer has been appointed superintendent of passenger transportation of the Cleveland, Cincinnati, Chicago & St. Louis and the Peoria & Eastern with headquarters at Indianapolis, Ind.

A. S. Payne has been appointed superintendent of the Shenandoah division of the Norfolk & Western with headquarters at Roanoke, Va., and **W. B. Houchins** has been appointed superintendent of terminals at Roanoke.

J. F. Lord, who was reported in the *Railway Age* of June 17, page 1514, as superintendent of safety and fire prevention of the Chicago Great Western pursuant to the abolishment of this title and his appointment to the newly created position of assistant to general manager, holds this position in the service of the Chicago & Eastern Illinois instead of the Chicago Great Western.

John J. Scully, general superintendent of the Algoma district of the Canadian Pacific with headquarters at North Bay, Ont., has been appointed general manager, Eastern lines, with headquarters at Montreal, succeeding **Alfred Price** who, after a service of more than 40 years has, at the advice of his physicians, been granted an indefinite leave of absence. **George Hodge**, assistant to the vice-president, Eastern lines, has been appointed assistant general manager. **W. M. Neal**, assistant general superintendent of the Ontario district with headquarters at Toronto, has been appointed general superintendent at North Bay.

W. M. Wardrop has been appointed general superintendent of the Southern division of the Pennsylvania with headquarters at Wilmington, Del., succeeding the late Gamble Latrobe. Mr. Wardrop has heretofore been general superintendent of the Michigan division (G. R. & I.) at Grand Rapids, Mich. **J. B. Hutchinson, Jr.**, has been appointed general superintendent of the Michigan division at Grand Rapids. Mr. Hutchinson has heretofore been general superintendent of the Toledo division, at Toledo, Ohio. **T. A. Roberts**, acting superintendent of the Ft. Wayne division, with headquarters at Ft. Wayne, Ind., has been appointed general agent at Detroit, Mich., and superintendent of the Toledo division, at Toledo, Ohio. **R. H. Pinkham** has been appointed superintendent of the Ft. Wayne division, at Ft.

Wayne, Ind. Mr. Pinkham has heretofore been superintendent of the Norfolk division, at Cape Charles, Va. **F. D. Davis,** division engineer of the New York division, has been appointed superintendent of the Norfolk division, with headquarters at Cape Charles, Va.

Traffic

George W. Koonce has been appointed division freight agent of the Pennsylvania, with headquarters at Canton, Ohio, and **Stephen T. Stackpole,** division freight agent at Buffalo, N. Y., has been transferred in the same capacity to Detroit, Mich.

J. A. Sullivan, division freight agent of the Wabash, with headquarters at Detroit, Mich., has been promoted to the newly created position of assistant general freight agent, with the same headquarters, pursuant to the establishment of general freight and passenger offices in that city.

Engineering, Maintenance of Way and Signaling

W. G. Morgan, assistant engineer of the Kansas City Southern with headquarters at Pittsburg, Kan., has been promoted to the re-established position of division engineer of the Kansas City Terminal division with headquarters at Kansas City, Mo., effective July 1.

J. G. Bloom, whose promotion to the newly created position of engineer, maintenance of way, system, of the Chicago, Rock Island & Pacific with headquarters at Chicago, was reported in the *Railway Age* of May 20, page 1204, was born in Ohio on November 25, 1869, and studied engineering at Ohio State University. Immediately following his graduation in 1889, he entered railway service as a chainman on the Pennsylvania at Cincinnati, Ohio. After a few months, he left railway service and in the spring of 1890 became associated with the Kenova Land Association as an assistant engineer at Kenova, W. Va., but re-entered railway service that fall as an assistant supervisor on the Norfolk & Western at Crewe, Va., where he remained until April, 1892. Becoming an assistant engineer on the Baltimore & Ohio Southwestern on the latter date with headquarters at Cincinnati, Ohio, he served consecutively in this capacity until November, 1895; as a division engineer at Flora, Ill., until June, 1896, as principal assistant engineer at Cincinnati, Ohio, until February, 1900, and thereafter as division engineer first at Chillicothe, Ohio, and later at New Castle, Pa., until June, 1903, when he entered the service of the Chicago, Rock Island & Pacific as district engineer, with headquarters at Topeka, Kan. Thereafter he served as district engineer until July, 1905, as engineer maintenance of way of the Southwestern & Choctaw district at Topeka until February, 1907, and again as district engineer until December, 1909, when he left railway service to become president of the Southern Ballast Company at Denison, Texas. He was engaged in this work until July, 1912, and then as superintendent of construction of the John F. Stevens Construction Company, New York, until October, 1914, when he re-entered the service of the Chicago, Rock Island & Pacific. Thereafter he was engaged in valuation work with headquarters at Chicago until July, 1916; as superintendent of the Amarillo division with headquarters at Amarillo, Texas, until August, 1918; as superintendent of the Louisiana division with headquarters at Eldorado, Ark., until May, 1921; and as division engineer of the Nebraska-Colorado division with headquarters at Fairbury, Neb., until May 15, 1922, when he was promoted to engineer maintenance of way, system.

J. G. Bloom

Obituary

S. B. Rice, engineer maintenance of way of the Richmond, Fredericksburg & Potomac, died on June 26.

Martin S. Decker, former public service commissioner of the State of New York, died in New York City on July 1 at the age of 60. Mr. Decker's home was in Albany, N. Y., and he was in New York City on a visit. He was born at Rosendale, N. Y., and in early life was a railroad telegraph operator. He was for many years assistant secretary of the Interstate Commerce Commission, at Washington. He was appointed a member of the Public Service Commission by Governor Charles E. Hughes when the commission was organized under the new law, in 1907, and continued a member of that board for six years. He served two terms as president of the National Association of Railway Commissioners.

William C. Arp, retired superintendent of motive power of the Vandalia (now a part of the Pennsylvania), whose death on June 16 was reported in the *Railway Age* of July 1, page 48, was born on June 30, 1848, near Williamsport, Pa., and entered railway service as a machinist's apprentice on the Northern Central (now a part of the Pennsylvania) at Williamsport. Following his apprenticeship he engaged in stationary engine and mill work at Williamsport until 1875, when he was advanced to roundhouse foreman. He continued thereafter as roundhouse foreman and as foreman of engines of the Middle division until 1883, when he was promoted to general foreman of shops of the Pennsylvania lines west of Pittsburgh, at Indianapolis, Ind. In 1886 he became roundhouse foreman of the Pennsylvania, at Columbus, Ohio, and a year later was promoted to master mechanic at Logansport, Ind. He served later in the same capacity at Dennison, Ohio, until January 15, 1896, when he was promoted to superintendent of motive power of the Terre Haute & Indianapolis, a position he continued to hold following the acquisition of this property by the Vandalia until the date of his retirement in 1918.

Cornelius P. Torrey, superintendent of freight transportation of the Hocking Valley, with headquarters at Columbus, Ohio, whose death on June 9 was reported in the *Railway Age* of June 24, was born on October 25, 1852, at Coshocton, Ohio. He completed his course of study in the high school of that city, following which he devoted some time to various occupations until December 1, 1885, when he entered railway service as a yard clerk for the Hocking Valley. From his initial position as yard clerk, Mr. Torrey worked his way consecutively through various other clerical and administrative positions in the operating and transportation departments of the Hocking Valley and on February 10, 1914, after 29 years of service was appointed acting superintendent of freight transportation to relieve T. R. Limer, granted a leave of absence on account of illness. Thereafter Mr. Torrey continued as acting superintendent of freight transportation until July 10, 1914, following Mr. Limer's death, when he was promoted to superintendent of freight transportation, the position in which he continued in an active capacity until the time of his death as noted above.

C. P. Torrey

EDITORIAL

Railway Age

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Manufacturers frequently complain, and with much justification, that it costs more to sell shop machinery and equipment to railroads than to other industries. In fairness, therefore, the railroads ought to be willing to pay more. One manufacturer writes as follows: "On many lines of machinery of a new or improved type, railways should properly pay a higher price than industries because, over a long period, it is necessary to spend far more time and money to introduce such machines than it requires with the general trade. Railways figure that they are competing with no one in shop work and, therefore, do not keep on their toes in trying to cut down shop costs." Even when manufacturers can prove an operating economy for a machine, the report is that they always secure a much larger percentage of orders from the general trade than it is possible to secure from the railways. This is a severe indictment of present railroad methods and to the extent to which it is true, present methods should be corrected. It has been suggested that valuable results would follow if the responsibility of the shop managements in the way of reducing costs could be increased, at the same time granting them more power in installing efficient equipment and methods. At present, railroad supply manufacturers are compelled to interest shop foremen, higher mechanical department officers and purchasing officers in all new equipment, convincing these officers that the advantages claimed for the equipment are actual. The cost of this educational and demonstration work is high and must come out of profits on the machines manufactured. In the long run increased selling costs are added to production costs and form a tax paid by all purchasers of machine tools.

Cost of Selling Machines to Railroads

Something of a precedent in safety campaigns was set recently by two trainmen at a road crossing in Ohio, according to one of our Columbus friends. Two youths, accompanied in an automobile by two girls, were racing a fast freight train for precedence at the highway crossing. The motor car won, but only by an instant, and one of the girls, frightened by the approaching train, jumped from the motor car and fell between the tracks. She, too, narrowly escaped death—indeed the engineman on the freight train thought that she had been run over and stopped the train.. Two members of the train crew came up to ascertain the cause of the sudden stop. The two young men, instead of showing a chastened spirit as a result of their narrow escape from death, demanded that the trainmen cut the crossing to allow the girl, who had rolled to safety on the opposite side of the train, to join them in their automobile. Instead of complying with their demands, the trainmen paired with the young men and proceeded to thrash them soundly, only desisting upon their promise never again to take such a chance with their own lives or with those of others. We cannot, of course, expect the railroads to instruct their trainmen to undertake any such extra-legal activities as the corporal punishment of those who take chances at highway crossings. The public would, however, we think, condone such actions occasionally when they are so eminently appropriate as in this case. A better plan would be for the public authorities, assisted in detection by vigilant railway employees, to undertake the punishment of these prisoners by fine and imprisonment. Racing with trains for highway crossings is a sport, with the exultation of winning and death as the two possible results. If the winning motorists were invariably punished, the race for grade crossings would cease to be such a sport. It would be a sure thing—a fine, prison or death for the reckless driver. Thus the grade crossing race would lose its glamor and such accidents would seldom occur.

Militant Safety Campaigners

One of the most marked developments in the design of railway buildings in the last decade is to be found in enginehouses. The average building of this character erected 15 or 20 years ago is a dark, gloomy structure with practically solid walls, small windows so begrimed with smoke as to afford little light and with little or no provision for ventilation other than for the removal of locomotive exhaust through the smoke jacks. As a result, smoke hangs so heavily in these buildings at all times that it is the common practice for the workmen to carry torches with them at all times to light their paths and to provide them with sufficient illumination to perform their work. In marked contrast with such construction is the Southern Pacific's enginehouses at Mojave, Calif., and Indio, which are described elsewhere in this issue. While some features of these houses are designed to meet the local conditions prevailing at these desert locations, the extensive provisions for ventilation and for light are in accordance with modern practice. It is coming to be recognized in industry that ample light and air are conducive to efficiency. Good light will not only increase the amount of work a mechanic will turn out, but it will reduce the number of mistakes and accidents. As a step in the modernization of old buildings to conform to this newer idea, a few roads have undertaken to whitewash the interiors of their enginehouses at frequent intervals with excellent results. Of more permanent benefit is the increased attention to the problems of light and air in the construction of new houses, a subject to which too much attention cannot be paid.

The Tendency in Engine-House Design

The spectacular and distressing disaster at Winslow Junction, New Jersey, reported last week, will tend powerfully to promote interest in "train control" as distinguished from the simple automatic stop with which we are familiar in the New York subways and the Pennsylvania Terminal. At Winslow Junction the main line is straight, and safe for 100 miles an hour, while movements to the branch must be limited

Where Speed Control Is Needed

to about 40 miles an hour. "Speed control" apparatus will provide for this condition; while, if only a simple stop were to be used, every branch train would have to be brought to a stop before passing over the switch. The practical operating officer—that is to say, the consensus of operating officers' opinion as expressed recently to the Interstate Commerce Commission, and noticed in the *Railway Age* last week, page 51—hesitates to use speed control apparatus extensively until it has been more thoroughly developed; and he would bridge this gap between ideal conditions and cold actuality by making his automatic stop as simple as possible and allowing the engineman to suspend its operation at a place like Winslow Junction. This privilege of suspension is held up by the extreme idealists as a large sized bugbear; but if the engineman is compelled to get the co-operation of the fireman in every operation—as may very simply be provided for—the argument against the permissive arrangement becomes pretty weak. The Automatic Train Control Committee of the Ministry of Transport of Great Britain in its recent report, while not recommending speed control for such conditions as at Winslow Junction, says that "such cases of accidents can be safeguarded if not entirely prevented by installing a train control device either of a permanent or temporary character, which would provide an audible indication as well as a brake application, to remind enginemen of the existence of a speed restriction over any curve, crossing, etc., in advance." The arguments, pro and con, on this important point, ought to be thoroughly thrashed out.

The Opening of Construction Work

Much has been said recently about the activity of the railways in the buying of equipment, while relatively little comment has been heard regarding the appropriations which have been made for improvements to roadway facilities. Yet the same tendency towards increased expansion of facilities is evident here. One index is the construction news columns of the *Railway Age*, which required more than twice the space during the first six months of this year than during the corresponding period of a year ago. Even more instructive is a comparison of the projects undertaken in the two years. Over 30 individual projects, each involving an expenditure of more than $1,000,000, have been undertaken in the first six months and more are being announced weekly. These include such work as the Atchison, Topeka & Santa Fe second track from Yampai, Ariz., to Griffith ($6,500,000) and the Ellinor, Kan., cutoff ($1,500,000); the Canadian Pacific pier at Vancouver, B. C. ($2,000,000); the Chicago, Burlington & Quincy shops at Denver ($2,000,000); the Great Northern terminal at Tenatche, Wash. ($1,500,000); the Illinois Central third track from Matteson, Ill., to Kankakee ($2,000,000); the Michigan Central bridge across Niagara river ($2,000,000); the Missouri, Kansas & Texas classification yard at Denison, Tex. ($3,000,000); the New York Central Castleton cutoff ($20,000,000); the Pennsylvania improvements at Pittsburgh ($8,000,000); the St. Paul Union Station 1922 program ($5,000,000); the St. Louis-San Francisco second track ($1,500,000); and the Union Pacific freight station and other improvements at Denver ($2,000,000). An even larger amount of work has been undertaken on projects of smaller magnitude. In the aggregate the improvement and betterment work already authorized and undertaken this year involves an expenditure of more than $150,000,000, exclusive of the passenger terminal at Cleveland and the Illinois Central terminal at Chicago which have been authorized and for which plans are being prepared, and the Union Station at Chicago, on which several million dollars will be spent this year.

Significance of the Shop Crafts Strike

The strike of railway shop employees is, we believe, unprecedented in one respect. It directly involves more employees than ever were previously involved in any railway strike in this country. There were about 475,000 employees in the shops when the strike order went into effect. Estimates of the number who quit work differ; but a large majority quit.

In other respects the strike is similar to those which have preceded it. Like most other strikes, it was the result of a difference of opinion between managements and employees concerning the rules under which the employees should work and the wages they should be paid. Unlike other strikes in this country, it disregards decisions made by a government arbitration body regarding the matters in controversy, but strikes in disregard of decisions of government arbitration bodies have not been unknown. Australia and New Zealand have tried compulsory arbitration. It has resulted in peaceful settlements when the decisions have been against the employers, but repeatedly has resulted in strikes when the decisions have been against the employees.

Differences of opinion between employers and employees regarding how much the latter should be paid have arisen throughout the history of the wage system. Innumerable plans for so settling them as to prevent resort to lockouts and strikes have been advocated and tried; but no such means has ever been successful long. The employer is prone to underestimate the amount he ought to pay; but public opinion and law can compel him either to pay what a government tribunal holds just or go out of business. Employees, individually and collectively, are equally disposed to overestimate what the employer can afford to pay; but up to the present time public opinion and law seldom have succeeded in forcing them peacefully to accept wages that they have really regarded as too low. They often have been forced to accept lower wages than they demanded, but the only really effective compulsion has been that of economic conditions.

Regardless of the employee's opinion of what he ought to have, he cannot by the strike or any other means long exact more than the employer can afford to pay. In the controversy preceding the present strike the labor leaders contended that the railways should be required to pay an average wage of $2,637 a year because the employees need this much to support their families according to a certain standard. But, hard as it may seem to say so, the wages any industry can afford to pay never have been and never will be determined by what its employees need. What any industry can afford to pay out is determined solely by what it can earn. A business concern can stop operating just as its employees can stop working. A business concern not only can but must stop operating if for any considerable time it is forced to incur expenses which exceed what it can earn. It is more difficult for a railway than any other kind of business concern to stop operating, because to do so is to forfeit its right ever to do business again. Already, however, many small railways in the United States have been forced to stop operating by inability to earn enough to pay their expenses.

If the demands made by the leaders of the railway labor unions should be complied with, either an enormous advance in rates would have to be made, or every railway company in the United States would have to stop operating. The public would not pay any such advance in rates. It has successfully insisted upon a reduction of rates. A reduction of wages was inevitable. The shop employees refused to accept it. There was presented such a situation as has developed in industry over and over again. It had the same result that it has so often had—a strike. The decisions and mediation of the Railroad Labor Board made no difference.

Will this always be the course of events in future? The

labor leaders doubtless will answer that it will be as long as the wage system exists. The more radical among them would avoid the development of similar irreconcilable differences, and the resulting lockouts and strikes, by abolishing "capitalism"—which is another name for private property—and the wage system with it. They would have all the means of production and distribution owned by the public and managed by the workers under some guild or soviet plan. But would that prevent the workers from demanding more than industry could produce? The soviet system has been adopted in Russia; but the workers in Russia still have to live on what industry can produce. It does not produce as much as it did before the hated capitalist and wage systems were abolished, and therefore the workers have to live on less. The proletariat are supreme in Russia, but the incomes of the workers are not based there any more than anywhere else on what the workers need or demand. They need and demand more than is required to keep them from starving; and yet thousands and even millions of them are starving. Economic laws cannot be repealed by strikes or revolutions, although many labor leaders convince their followers they can be. What men need and what they can get can be made equal only by increasing production enough to make what they can get equal to what they need.

There is being fought out in this strike not only the age long issue between employer and employee, but also the equally venerable issue of law and order versus violence. The law says that every man has the right to work without interference from other men. It is just as much a crime to threaten or assault or murder a man for the purpose of keeping him from working as it is to threaten or assault or murder him for the purpose of robbing him. Strikes such as this are accompanied by what is euphoniously called "peaceful picketing." The picketing is peaceful until some men try to work under the conditions or for the wages against which others have struck. Then the pickets usually begin to "persuade" them not to work by beating, stabbing, or killing them. The present strike has reached this stage. In every part of the country attacks by strikers upon men who have tried to work have been reported. The strike leaders constantly express pious hopes and wishes that there shall be no violence. Most of them are undoubtedly sincere; but the outrages continue. This raises squarely the question whether the public officials who have sworn to enforce the laws have the disposition and power to do so. It raises squarely the question whether the forces of law and order are stronger than the forces of lawlessness and disorder. Usually the forces of law and order have triumphed in this country. When violence begins in a strike it almost invariably indicates that the strikers are losing ground and know it. It began early in this strike.

The situation in many respects is tragic. It is depressing to realize that after all the progress which has been made in increasing the efficiency of industry it is still impossible to pay a large part of the workers wages sufficient to enable them to live in reasonable comfort. It is hardly less depressing to realize that most working men are so ignorant and badly led they are unaware that this condition is at least as much the fault of themselves and their leaders, as it is of the system of industry against which they inveigh and which many of them would like to overthrow. It is easily conceivable that with modern methods and machinery labor and capital could so co-operate as in a short time to secure an increase of production which would enable the average worker to receive the equivalent in necessaries, comforts and luxuries of the $2,637 a year of which the labor leaders talk. Shortcomings of human nature, which vitiate both labor and management, prevent it. If labor and capital would both use as much skill and energy in increasing production as they do in fighting over the division of what is produced, the problems of both would be largely solved.

It is also depressing to recall all the efforts that have been made to devise means of peacefully settling the differences that arise over the division of what is produced and then contemplate the situation now existing in the United States. Business conditions of other kinds have improved so much that, except for the coal strike and the railway strike, the total production of necessities, comforts and luxuries in the United States undoubtedly would be greater today than it ever was before. These two strikes, however, which are the results of efforts to settle by force what ought to have been settled by reason, already have prevented a normal and even more than normal increase of production.

Congress, in adopting the labor provisions of the Transportation Act, tried to establish a means of peacefully settling railway labor controversies and of substituting in this field, at least, the rule of reason for the rule of force. But human nature cannot be changed by legislative enactments; and the country has upon its hands this shop men's strike. But the laws of economics are still in operation and cannot be repealed either by statutes or by force. Increased efficiency in production can enable industry to pay wages of much greater purchasing power. Nothing else can. Strikes interfere with increased production, and, therefore, in the long run hinder increases in real wages. As long as there are labor unions that are led by and composed of men who would rather carry on propaganda and strikes than help increase the efficiency of production, we shall continue to have strikes and most labor unions will continue to be agencies not for enabling higher wages to be paid, but for making their payment more difficult.

Standardize Traffic Signals

THE "CAREFUL CROSSING CAMPAIGN" inaugurated by the American Railway Association should assist in reducing the heavy toll of life taken in highway crossing accidents, which are increasing so rapidly. The principal benefit from this campaign will be derived from educating the public through the intensive publicity campaign. However, the greatest benefits from such movements will not be derived until traffic signals are standardized nationally and a safety first movement is started by the various automotive societies along lines similar to those of the railroads. Such a movement means public education. The American Railway Association, through its Signal section, has yet to standardize the automatic highway crossing signal and this work is now well under way.

It will devolve upon automotive societies, the International Traffic Officers Association and other bodies to standardize or harmonize other traffic signals with long standing recognized practices. For example, red is universally recognized to represent "danger" in navigation and on the railroads, but it is also used to indicate "safety" in marking exits in public buildings and other places. The use of red in automobile tail lights has resulted in accidents (as pointed out editorially in the *Railway Age* for January 4, page 166) which otherwise would have been prevented if indiscriminate use had not been made of it. Therefore it is to be hoped that the meeting which was held in New York on May 23, under the auspices of the American Engineering Standards Committee, at the request of the Illuminating Engineering Society and International Traffic Officers Association, and looking to greater public safety through the standardization of colors for traffic signals, will produce results.

At this meeting A. H. Rudd, chief signal engineer of the Pennsylvania, representing the Signal section of the American Railway Association, recommended that (1) red be used for stop everywhere, such as at highway crossings with railroads, in fixed signals and in the hands of traffic officers at street intersections, at the ends of streets and possibly to

indicate excavations in the streets, unless qualified by a more favorable indication; (2) yellow for tail lights of automobiles, possibly for excavations in streets and for calling policemen or for any other purpose where caution is required, possibly at busy street intersections to indicate that the traffic lights will be changed from red to green or from green to red, and (3) green lights for fire escapes, for proceed at street intersections and other purposes to indicate the way is clear. These recommendations should form a good basis for the standardization of traffic signals. The sooner these signals are standardized and safety first campaigns for the public inaugurated the more quickly will regrettable highway crossing accidents be reduced to a minimum.

Freight Rates 6.9 Per Cent of Wholesale Value

ALTHOUGH THE arguments often used by shippers and politicians in demanding reductions in freight rates would seem to indicate an impression that rates are the most important factor affecting prices and the general state of prosperity or depression, the findings of the Joint Commission on Agricultural Inquiry just reported to Congress show the exact contrary as to rates in general.

For 1920 this report shows that the total freight revenue of all the railroads in the United States, $4,435,911,000, was only 6.9 per cent of the estimated wholesale or factory value of products of manufacture for that year, which was $62,500,000,000, and that "the freight revenue shown includes not only the transportation of raw materials of every kind handled but also the cost of transportation for final distribution to ultimate point of consumption." In other words, while the figure for the total retail value of the products of manufacture was not available, the total amount of the freight rates paid to the railroads was known and it constituted only 6.9 per cent of the wholesale or factory value. Therefore, it is plain that the freight rates must have been a still lower percentage of the prices paid by the public.

The freight revenues of the railroads in 1900, the report shows, amounted to $1,049,256,323, which was 9.2 per cent of the value of products of manufacture; in 1910 the freight revenues were $1,926,940,028, or 9.3 per cent. Therefore, the wholesale value of products in 1920 had experienced a much greater increase by 1920 than had the freight rates. The freight revenues for 1920, however, were the result of eight months under the rates as established by the Railroad Administration and four months under the advanced rates authorized by the Interstate Commerce Commission on August 26, 1920.

At another point in the report the proportion of freight to the value of goods transported is estimated at about 6.05 per cent, based on the census figures for 1914. In this calculation the total production of agricultural, manufactured and mineral products is added to the imports from which is made an estimated deduction of these same articles which do not move by railroad transportation. The estimated total value of $55,298,000,000 for that year, divided by the total railroad tonnage, 1,094,000,000, gives an average value of $30.40 per ton, while the average freight revenue per ton was $1.84.

The Congressional commission has compiled a large amount of data to show the economic relationship of freight rates to the prices of agricultural products and it urges reductions in these rates on the ground that they "bear a disproportionate relation to the prices of such commodities." Its comparisons of rates and prices for agricultural products, however, are based on the prices actually paid by the wholesaler and are more important in indicating the relation of the freight rate to the amount received by the farmer than the relation of the freight rate to the price paid by the public. The commission finds, however, that "reductions in rates upon the articles of higher value, or upon tonnage moving upon so-called class rates are not warranted, while the rates upon agricultural products and other basic commodities remain at their existing levels." It also finds that "freight rates on highly fabricated articles of wearing apparel, such as boots, shoes, dry goods, men's and women's suits, etc., are not a material factor in increasing or reducing prices of these commodities."

"Higher freight rates are not infrequently urged as an excuse for increases in prices without justification," the commission says. "While freight rates are often a considerable factor in the cost of distribution of low-priced, heavy tonnage commodities and may restrict the radius of distribution thereof and sometimes even prevent shipment altogether, as a rule freight rates have not kept pace with increases in the prices of such articles as dry goods, boots, shoes and other highly fabricated articles usually purchased in less than carload quantities and do not restrict or diminish the movement of such commodities. The amount of freight in the average purchase of dry goods is so small it is difficult to show it."

The report emphasizes the statement that because the prices of farm products had fallen after freight rates had been advanced, "the farmer is suffering from a 72-cent dollar," measured by its purchasing power in terms of transportation. But the same table in the report that is used to illustrate this shows that for seven years before the decline in prices of farm products the purchasing power of the farmer's dollar, measured by the amount of transportation it would buy, ranged from $1.01 to $1.89, so that for that period the railroad dollar would buy less of farm products.

Farmers and Railway Public Relations Work

EVERY RAILWAY EXECUTIVE in the country should read and reflect upon the letter from C. B. Hutchings, traffic manager of the American Farm Bureau Federation, which is published in the "Letters to the Editor" department of this issue of the *Railway Age*. This paper has often expressed the opinions, first, that the future of the railways will be determined by public sentiment, and, secondly, that the class of our people whose sentiment will play the greatest part in determining it are the farmers. While most business men will join in every agitation for reductions of rates, most of them are strongly opposed to every form of state socialism and will always be found arrayed against government ownership of railroads and measures which plainly tend to bring it about. On the other hand, there is a great deal of radical sentiment among the working men in cities largely because most of them are not property owners and do not clearly see how the overthrow of the institution of private property would be directly injurious to them. It is to be feared the resolutions adopted by the American Federation of Labor in favor of government ownership of railroads over the opposition of Samuel Gompers himself express the real attitude of most of the wage earning population.

The farmers are not only the largest single class of our people, but also much the largest class of property owners; they hold the balance of power. They have principally determined the policy of railway regulation followed in the past. The importance of securing a sentiment among them in favor of fair and reasonable regulation and against government ownership is, therefore, apparent.

How is this to be done? The answer may be inferred from Mr. Hutchings's letter. The managements of the rail-

ways must be made to understand better the farmers' problems and needs, and the farmers must be made to understand better the railways' problems and needs. Beyond any question there is great misunderstanding on both sides now. The welfare of the railways demands that their managements take the initiative in removing the causes of these misunderstandings. It is a most significant fact, as Mr. Hutchings points out, that when representatives of agriculture, industry and transportation, under the auspices of the Joint Commission of Agricultural Inquiry, sat down around a table and discussed matters of mutual interest they were able to reach agreements upon almost every question under consideration. This was the case because the facts about the situation of each interest were clearly and fully presented by its representatives to the representatives of each of the other interests. As Mr. Hutchings says, "reasonable-minded men will always conform to the facts."

If all the farmers, business men and railway men of the country could be made to know and understand the facts about one another's businesses a fairly harmonious sentiment among them could be secured. But the problem of placing needed information in the possession of all of them is vastly more difficult than that of placing it in the possession of a few men sitting around a table. And yet that is a problem which must be solved if the relations between the different industries and between each of them and the government are to be made satisfactory and healthy. The railways will never do the part of this work that they ought to do until they collectively and individually adopt and carry out plans as large in their scope as the importance of the object to be attained.

With respect especially to the relations of the farmers and the railways nothing could be more certain than that there is among the farmers a vast amount of hostile sentiment toward the railways. This is partly due to the fact that the railways never have done as much as they should have to help the farmers solve the farmers' problems. It is also due to the fact that for years interested persons have disseminated misleading and downright false propaganda against the railways among the farmers, and that railway officers have not done enough to nullify its effects by taking directly to the farmers the facts about the development and management of the railways. Every man who has thoroughly studied the history of and the current data regarding our railways knows it is not true that as a whole they are overcapitalized or inefficiently or dishonestly managed, that they are earning excessive returns, or are charging higher rates than their operating expenses make necessary. Nevertheless, there are literally millions of farmers who believe that not only some but most railways are grossly overcapitalized and inefficiently or dishonestly managed, that they are earning or are "guaranteed" excessive returns, and that their rates as a whole are higher than conditions warrant.

The *Railway Age* has no doubt that this sentiment among the farmers could be remedied by constant, simple, direct and adequate presentation of the facts about the railroad business to them. The railways should spare no effort to get the point of view of the farmers and their organizations and should be influenced by it. At the same time, they should spare no effort to give the farmers their point of view, and without any doubt the farmers will be influenced by it. Nothing would contribute more than this toward the solution of both the farmers' problem and the railroads' problem.

LAST YEAR the total value of supplies bought for Pullman cars was $1,310,283.34, or 4.11 cents for each passenger carried, according to recent figures compiled by that company. During the year 113,640 gal. of liquid soap and 2,531,808 cakes of soap, 1,035,925 towels, 2,587,536 boxes of matches and 64,755,000 drinking cups were used on the cars. Laundries washed 214,870,412 pieces of Pullman bed clothes, towels, etc., during 1921.

Letters to the Editor

[The RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]*

Farmers and Railway Public Relations Departments

CHICAGO, ILL.

TO THE EDITOR:

I have read with a great deal of pleasure Samuel O. Dunn's address on the Railway Situation, delivered at the annual meeting of the Railway Accounting Officers Association at Cleveland on June 7. The part of the address in which I am particularly interested is that in which he speaks of the necessity for public relations work on the part of the railroads.

The longer I have to do with the relations of railroads and their customers the more I am convinced that a large part of our difficulties consist in the fact that one side does not realize the conditions surrounding the other. The farmers today are grievously at sea in regard to the true facts of the railroad situation, and the railroads, in a very large measure have not realized how serious was the disease which had attacked agriculture and business. The plain truth of the matter seems to be that each party to the argument has failed to see the necessity for telling the other the real facts about his problem.

As you know, the Joint Commission of Agricultural Inquiry has approved the establishment of public relations divisions on the part of the railroads. Without considering where the fault lay in the past our present railroad difficulties can largely be solved if adequate work along this line is done. As one of the staff of the Joint Commission, I sat for weeks around a table where representatives of agriculture, industry and transportation met to discuss the report, and while some of our discussions were lengthy it is nevertheless a fact that upon only one subject did we fail to reach complete agreement. This agreement was possible because the facts had been fully told and reasonable minded men will always conform to the facts.

When this report was submitted to a second and wholly different body of representatives of agriculture, industry and transportation, an agreement was reached upon this problem although the second body was unable to agree upon two other questions, but when such an agreement can be reached upon 40 or 50 recommendations it is not too much to say that the solution of the whole problem lies in an adequate understanding of the facts.

I am vitally interested in this subject and hope that the *Railway Age* will continue to promote the establishment of such departments.

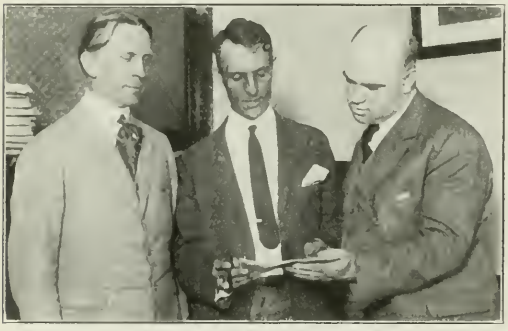
C. B. HUTCHINGS,
Traffic Manager, American Farm Bureau Federation.

THE STATE OF MICHIGAN has filed 31 suits against 11 railroads to recover $200,000 claimed to be due in fees and penalties for failure to pay the statutory fee for the right to issue securities. There is a law providing that utilities obtaining permission of the Michigan Utilities Commission to issue securities shall pay the State a fee of one-tenth of one per cent of the value of the securities to be issued. Certain railroads have gone to the Interstate Commerce Commission for the approval of their issues and have ignored the Public Utilities Commission.

Violence on Western Roads, Quiet in the East

Carriers Securing New Recruits to Take Place of Strikers— Serious Interruptions on But Few Roads

Reports of rioting, slugging, bombing, and arson have featured the past week in the shopmen's strike in the West. In six states it has been necessary to mobilize troops for the protection of property and employees who are remaining on duty or who have been recruited for service by the railroads. In many instances it has been necessary to dispatch these troops to points where civil authorities have confessed their inability to maintain peace. Injunctions restraining the strikers from interfering with the operation of railway shops or with the men obtained by the railroads to operate these properties have been issued by federal courts



P. & A. Photo

Signalmen Not to Strike—Their Chief, D. W. Helt (Center), Talking with Messrs. Hooper (Left) and McMenimen of the Labor Board

throughout the country. Innumerable instances of attempted intimidation have been reported, these attempts being directed not only at workmen but at the troops which have been called to protect various shops. Despite all of these developments, however, there has been a slow but steady resumption of repair work on many roads with the aid of loyal employees and new workers who have been brought into the shops, in several instances under the guard of troops, to take the places of the strikers.

Disturbances on the C. & A.

The walkout of the shop craft employees was, as a rule, conducted in an orderly manner and in the days immediately following there was little disorder. Sporadic outbursts occurred now and then but they were so isolated as to be negligible. Picketing was resorted to by the strikers at practically all points, but this too was, as a rule, orderly. The first serious disturbance was reported when the Chicago & Alton shops at Slater, Mo., were seized on July 5 by strikers who drove 25 non-union men from that town on July 4 and 18 on July 5. Union officials stated that the non-union men were placed on trains and sent from the town. Other reports declare that the non-union men were merely driven from the shops and that they left Slater voluntarily. Chicago & Alton officials stated that three guards employed by the railroads at the shops had been arrested by local authorities and placed in jail, and that the railway property was without protection of any sort. On July 6 the Chicago & Alton appealed to Governor Hyde for protection, and on July 7, state troops were mobilized and held ready for call.

Immediately following the Slater outbreak, strikers on the Chicago & Alton at Bloomington staged a demonstration. Little damage was done but the civil authorities found themselves unable to cope with the situation, and troops were requested by both city and state officers. Five units of state troops were later dispatched to Bloomington and had the situation in hand until the importation of strike breakers on July 11 occasioned another outbreak in which shooting and slugging played a large part.

The uprising spread rapidly through Illinois, and on July 7 a group of strikers in Aurora escorted a number of workers sent from Chicago to work in the Burlington shops at that point to the city limits. On July 6 a cordon of several hundred men surrounded the Wabash shops at Decatur, Ill., in violation of a restraining injunction, in an attempt to intimidate those still at work. Two guards at the shops were beaten when they attempted to prevent strikers from interfering with workers in the shops. Troops are still held in readiness to move there if further trouble breaks out.

On July 8, the importation of workmen led to a demonstration at Clinton, Ill., in which stones were thrown at the workmen by the striking Illinois Central shop men. Armed guards opened fire on the strikers. One striker was shot

P. & A. Photo

Troops Patrol Yards at Clinton, Ill.

and his son killed by a stray bullet. State troops were immediately requested.

Arson followed mob violence on July 7, in Chicago, when after a night of rioting at the Burnside yards of the Illinois Central, a box car was burned in the yards. Police report that the car had been soaked with oil and fired by strikers. Two attempts were made on the night before to set fire to the homes of workmen.

The hiring of men by the various roads to replace the strikers resulted in further outbreaks. On July 8 four men were reported killed in the disorders. By this time, the situation had become so serious in Illinois that the Chicago, Burlington & Quincy applied for injunctions to restrain picket-

ing by strikers at the various towns along its lines. This example was followed by the Chicago & North Western, the Chicago & Alton, the Illinois Central and numerous other roads. These injunctions were granted by the courts.

Curtailment of Service

Neither traffic disturbances nor curtailment of trains have been general. The Missouri, Kansas & Texas is reported as having discontinued the operation of 47 local trains in Missouri, Kansas, Oklahoma, and Texas. Lack of proper protection for workers, and the possibility of damage to equipment, was given as the cause. The Chicago & North Western has withdrawn 14 trains, it is reported.

A majority of the roads had issued ultimatums to their

P. & A. Phot.

Kitchen Cars to Feed New Employees

striking employees, setting a limit after which, if they did not return to work, they would lose their seniority and pension privileges. These were followed by a rather slow filtering back of strikers, but not to any appreciable extent.

The Situation on Individual Roads

The following reports of conditions on various western carriers are indicative of the strike situation in that territory:

Approximately 4,900 employees in the locomotive department and 3,138 employees in the car department of the Missouri Pacific are on strike, according to B. F. Bush, president of that road. A total of 522 men in the locomotive department and 450 in the car department—loyal employees and new men—are now in service. "So far traffic has not been affected," Mr. Bush reports. "Some disorders have been reported at smaller points but nothing serious has happened. Recent injunctions and other activities on the part of state officers should make the situation more favorable." Mr. Bush also reported that 15 foremen returned to work at the Little Rock shops of that road on July 11 and that more were expected later.

J. M. Kurn, president of the St. Louis-San Francisco, reports that the general shop labor situation on that carrier is very much improved. "We are hiring new men daily and a few old men are returning to service," Mr. Kurn said, "There has been no curtailment of passenger trains and none in contemplation. Our passenger trains are running practically on time and we are handling a heavy freight business without very serious delay. Our coal supply is adequate. We have secured an injunction in Missouri yesterday restraining strikers or their sympathizers from picketing or interfering in any way which might tend to hamper the operation of our trains."

On July 11, the situation is Bloomington, Ill., became more serious. In that city the enginemen, firemen and other train service employees became restive because of the patrolling of railway property by state troops and appealed to their organizations' leaders who in turn, it is reported, requested permission of their international president to refuse to operate all trains, with the exception of those carrying mail, in troop-patrolled territory.

Violence during the day was sporadic and in few cases of serious character. At Newcastle, Cal., several sticks of dynamite were used in an attempt to blow up a large water tank on the Southern Pacific and at scattered points throughout the country violence was used in driving replacement men from their work.

Of the roads centering in Chicago the Erie has filled its ranks and is hiring no more men. The Chicago, Milwaukee & St. Paul which lost approximately 16,000 men and has recruited 1200 men is operating full train service without disturbances.

The Chicago & Alton has recruited 300 men to take the place of the 2,500 who went out. It is operating trains with little difficulty although it has had much trouble with interference of strikers at various points in Illinois and Missouri. The Chicago, Burlington & Quincy has 1800 out of a normal complement of 14,000 shopmen at work.

The Illinois Central, has approximately 8,000 at work out of a pre-strike force of 12,000 men. Traffic is unaffected and no serious disorders have been reported up to the present.

The Chicago Great Western has 550 men out of a normal

P. & A. Photo

Military Supplies Ready for Shipment to Scenes of Violence

force of 2,100 at work and is having no difficulty in operating its trains.

The Santa Fe reports 1600 men at work at its Topeka shops on July 10, while 200 men returned to work on the following day.

Mobilization of Troops

Conditions became so serious throughout the country late last week that repeated calls for state troops led to mobilization in six states. The only troops on active duty, however, are those in Illinois and Missouri. State aid in Illinois has also been extended through the utilization of United States marshals and their forces. United States Marshal Levy of Chicago was given unlimited authority by Federal Judge Carpenter of the United States District Court at

Chicago to deal with the situation in Illinois. Marshal Levy has blanket authority to swear in as many deputies and to spend as much money as he considers necessary to maintain law and order.

Judge Carpenter pictured the federal court as the "last bulwark between the people and Communism, Bolshevism, and anarchy," in granting this authority for the swearing in of deputies by the marshal.

The Strike Situation in the East

While the shopmen's strike situation in the west has been somewhat complicated by acts of violence which in some cases have necessitated the calling out of state troops, in the east this has been a minor factor and only sporadic outbreaks of an unimportant nature have occurred. In general the situation in the east shows a progressive and material improvement. The railroads primarily by hiring new men have replaced the strikers to a considerable extent, some, of course, having had much better success than others. Few roads have been able to bring their forces entirely back to normal although some have had a large degree of success particularly insofar as concerns the men directly associated with the operation of trains. There has been in the east practically no interruption to either freight or passenger service. The Erie is the only large eastern road which has curtailed its service; it has annulled 20 suburban trains running out of Jersey City but even in this case the reason ascribed by the management was the fear of a possible fuel shortage.

Practically all the roads report that they have had good success in securing new men to take the places of the men who had answered the strike call. They have advertised for men and have continued to receive applications for employment in large number. The men are said to be competent and experienced to a far greater percentage than might have been expected under such circumstances. Many of them have been recruited from ship yards and similar employment. The New Haven has received the co-operation of manufacturing industries in its territory. New men, if competent, are guaranteed permanent jobs. A number of roads have sought to enlist college men who are now on their summer vacations.

Most of the roads have announced that the strikers have been taken off the payrolls and that they can return to work only as new men. Some put this announcement in the form of an ultimatum or invitation setting a certain date beyond which the men would lose their rights. Some of the roads have had a number of the strikers return and have taken them on as new men, this being the case particularly on the Pennsylvania and Long Island which two roads were not parties to the Labor Board's decision which resulted in the strike call

The strike, insofar as the eastern roads are concerned, has been comparatively free from violence of a serious nature. Guards are a familiar sight at all railroad centers. There have been instances of intimidation. Cases have been reported here and there of guards or strike-breakers being beaten up and occasionally rocks have been thrown at men and even at trains.

Another feature of the second week of the strike has been the contracting of locomotive and car repairs with outside shops. One instance is that of the Erie which has made a contract with the American Locomotive Company to have 25 locomotives repaired per month at the latter's Cooke Works at Paterson N. J. for a period of six months. The labor forces are at present trying to prevent the carrying out of the work

An order sent out by A. J. Berres, secretary-treasurer of the metal trades department of the American Federation of Labor, on July 12 instructed members of all unions affiliated with that department that no further repair work will be authorized on locomotives coming from railroads on which strikes are in progress to outside shops employing union labor

The following items give a résumé of the situation as it exists on a number of the eastern roads. Most of the roads, it will be noted, report an improving situation and practically all advise that passenger service continues to be operated on schedule and freight service without interruption:

Baltimore & Ohio

C. W. Galloway, vice-president in charge of operation advised under date of July 11 as follows:

"The strike situation on the Baltimore & Ohio today shows substantial improvement compared with July 1, when 73 per cent of the shop employees went on strike. Since the holidays many old employees have returned and including 2,000 new men employees 7,350 men are working, equal to 35 per cent of the force employed on June 30. It has not been necessary to close down the shops at any point except the big rebuilding shops at Cumberland and Pittsburgh which we have not tried to open.

"Only a few minor cases of strikers attacking workmen have occurred.

"There has been no curtailment to passenger train service, the performance gradually improving. There are no restrictions against the acceptance of freight of any class and perishable, live stock and food stuffs are moving according to schedule. There has been some slowing up in the movement of slow freight."

In his report Wednesday of the situation on the Baltimore & Ohio Mr. Galloway said:

"The only situation that is causing any trouble is in northern Ohio and northern Indiana, where the strikers have interfered with the operations at Willard and Garrett on account of the lack of protection on the part of the local authorities at these points, and in this particular section certain of the passenger service will be discontinued until the authorities can guarantee protection to our employees, who are willing and anxious to work.

"In some other sections passenger train service will be curtailed as a result of the acute coal shortage, but this will be minimized so as to create the least public inconvenience."

The Staten Island Rapid Transit, the Baltimore & Ohio's New York terminal and suburban line on Staten Island, reports that from 60 to 70 per cent of its shop employees are at work. The number is 260 men including 30 strikers who have returned and about 20 men who did not go out. The normal force is 340 men. It also reports that there has been no interruption to traffic.

Bangor & Aroostook

The chairman of the Federated Shop Crafts on this road was in Chicago all of the week before the strike at the same time that the road's general manager was there at the hearing before the Labor Board, and made several appeals to Mr. Jewell and Mr. Franklin not to call the strike on the Bangor & Aroostook because the men did not want to go out and were satisfied with conditions, but these appeals were made in vain and he was told that the men would either have to go out or lose their union cards.

About 80 per cent of the men affected answered the strike call. The road reports a steady improvement since the strike began. On Tuesday of this week 148 men were working or 38 per cent of the normal force; 11 strikers had returned. Passenger and freight service is normal.

Boston & Albany

Conditions are reported as improving each day. The road has had no interruption to freight or passenger service.

Boston & Maine

On July 10, 45 per cent of the men were working including new employees. Three of the shops were practically closed at the outset and the road concentrated its efforts on locomotive terminals and inspection points. Three important shops are now working with substantial forces. There have been some isolated cases of violence. Service is normal and the situation as a whole is reported by the company to be showing steady improvement.

Buffalo, Rochester & Pittsburgh

The number of men at work is 68 or 6 per cent at normal, and none of the strikers have returned. Service, however, has been handled without interruption and the situation is reported as improving.

Central of Georgia

The Central of Georgia has 652 men working or 30 per cent of its normal force. No strikers have returned to work nor have any more employees left service. The situation is reported as unchanged.

Central of New Jersey

This road on July 5 had 821 men at work which force it increased to 1,400 men on July 6. The latter figure is 30 per cent of the normal force of 4,746 men. On July 11 the percentage had risen to 35 per cent. Since the beginning of the strike the road has had 25 per cent of its strikers return. Service is reported as being handled without interruption.

Delaware, Lackawanna & Western

This road is operating its through and suburban passenger service as well as its manifest freight service on schedule and has suffered no interruptions to its other freight service. Its

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A Question Bound to Arise Sooner or Later

situation is reported as improving rapidly, large numbers of competent new employees being hired to fill the places of the strikers. The round-house forces at Hoboken, Secaucus and Port Morris are now filled out to normal. The walk-out at the Scranton locomotive shops, and the Kayser Valley car shops was complete and these shops are practically idle. The situation at the Kingsland, N. J., shop is in somewhat better shape.

Erie

The Erie is one of the few roads in the East which has had to curtail its train service. Effective July 10, 20 suburban trains operating out of Jersey City were annulled although the reason assigned was that the step was taken for fear of a possible fuel shortage. The Erie's contractors now have 41 per cent of their normal forces at work and 225 strikers have returned to duty. Among the several interesting features in the Erie situation is that it has made a contract with the American Locomotive Company for the repair at the latter's Cooke Works, Paterson, N. J., of 20 locomotives per month for a period of six months. The labor forces are now trying to effect a cessation of work at the locomotive plant insofar as repairs to these locomotives are concerned.

Lehigh & New England

On July 11, the Lehigh & New England had 44 shopmen and laborers or 13 per cent. There has been a gradual improvement in the situation due to the employment of new men.

Lehigh Valley

This company was operating on July 12 with shop crafts' forces about 28 per cent of normal, i. e., with 1,532 out of a pre-strike force of 5,573. The road has not suffered from violence and is moving its trains, passenger and freight, according to schedule and without interruption. None of its shops have been closed and 123 strikers have returned to their posts during the week ended July 12.

Maine Central

This company on July 12 had 462 shopmen at work, which represents 30 per cent of those at work on June 30. Of this total 252 were old employees and the remainder recent acquisitions. Since the beginning of the strike a few new employees and a few old employees who did not heed the strike call on July 1 have left the service. The road has closed none of its shops but work at Waterville is practically at a standstill. No violence has been reported and there has been no interruption to either passenger or freight traffic. The situation in general shows improvement over the preceding week.

New York, New Haven & Hartford

On the New Haven the number of men who went on strike totaled 6,139. The road has been able to report a progressive and steady improvement day by day since the beginning of the strike. A statement issued under date of July 7 said "Conditions have improved each day and skilled mechanics and others have been placed in the positions formerly occupied by men now on strike. Recruiting of desirable mechanical experts continues as rapidly as applicants can be examined and arrangements made for placing, and large numbers of applicants continue to appear. Manufacturers and other industries have patriotically proffered assistance in supplying men in the skilled trades. The company reiterates that qualified men of good habits and character who accept service at this time will be regarded and treated as permanent employees."

On June 11 the company reported that it had a force of 3,200 men or 50 per cent of its normal force. A statement issued by the management on the same day said in part:

"Conditions on the New York, New Haven & Hartford this morning have improved materially over any previous day.

"A large number of skilled mechanics and also a large number of laborers have been employed at the rates awarded by the Labor Board to permanently fill positions formerly occupied by mechanics and laborers on strike. The personnel of the mechanical department is, with the assistance of loyal and patriotic manufacturers and industries, being built up on a firm and lasting basis. There have also been a number of the men out on strike who have returned to duty as new men upon coming to a realization that the strike is not against the railroad individually but against the constituted government of the United States.

"This morning there is an increase of approximately 250 skilled mechanics over the force working on the first shift yesterday.

"There has been no interruption to freight or passenger service, which continue to be operated on a normal basis."

The New Haven reported on July 6 that it had closed a contract with the Keith Car & Manufacturing Company, Sagamore, Mass., for the rebuilding of 6,000 bad order freight cars. In explanation it further said: "At various times in past years when bad order cars have increased beyond normal, the excess have been sent to the Sagamore plant. There are a large number of additional cars awaiting repairs so that this arrangement will not affect the running of this company's shops on a normal basis and the giving of continuous employment to those now in or who may be taken into the employ of the company. It is the program of the company to give preference to its own shops in currently performing the normal amount of this work."

The New Haven also reported on Wednesday that "three trains of the larger locomotives have been forwarded to the shops of locomotive builders for general repairs and more are lined up

to follow so that there will be an adequate supply of power at all times to meet the requirements of the service."

New York, Ontario & Western

This road reports that it has had no interruption to train service either passenger or freight.

Norfolk & Western

The Norfolk & Western on Tuesday had 1,243 men at work, 12 per cent of its normal force. Since last week it has lost 76 additional men. The road has had no interruptions to passenger service. Freight service has been interrupted, but not to a substantial extent. The siuation as a whole is designated as "slightly improved."

Pennsylvania

On July 11 the Pennsylvania had 41,000 shopmen working out of an average week day force reporting in normal times of approximately 55,000. The road reported that it had gained 4,100 men actually working this week. It has no shops or enginehouses closed down anywhere on the system and has not had since the strike began. Nor has it had any interruption to its train service either passenger or freight. The general situation on the Pennsylvania has been showing material improvement every day.

On the New Jersey grand division the condition has improved to the extent whereas 2,000 men went out originally, 1,500 or 1,600 new men have been hired to take their places. The most essential classes are rapidly reaching normal. On the New York division, including Meadows shops, more than 1,000 new men have been taken on. One agency in New York hired 145 new men Tuesday morning.

The Pennsylvania's power house at Long Island City which supplies power to the Pennsylvania's New York electric zone and to the Long Island has been one of the central points of attack on the part of the labor forces, but thus far without success on their part. The first trick at the power house has a normal force of 90. On Tuesday morning the number of men at work was 122. The Long Island, like the Pennsylvania has had no interruptions to service.

Philadelphia & Reading

The Reading has not been affected by the strike.

Richmond, Fredericksburg & Potomac

Practically all of the shopmen who were members of the federated crafts ceased work on July 1. Up to the early part of this week the road had employed almost 150 new men or 20 per cent of its normal force. Traffic is being handled without interruption. As compared with last week the situation is reported as "stationary."

Seaboard Air Line

This road has only about two per cent of its men working. All its shops are closed. There has, however, been no interruption to passenger service. The situation continues about the same as in the early part of the strike.

Southern Railway and Other Southeastern Roads

In the Southeast some of the strikers have returned to work, but on most roads the percentage has not been very large and there was no general movement to return on Monday as had been expected in some quarters. As a result, there has been some slowing up of freight movement, but comparatively little interference with traffic. Some local trains have been withdrawn. The Southern Railway has not withdrawn any passenger trains and perishable freight trains are moving currently, while the movement through some of the principal terminals has been very large. The Southern has issued no ultimatum to the men setting a date by which they must return to work and it is understood has made no effort to replace those who went out for the present. On the Norfolk & Western about 700 clerks out of 3,000 went out on strike after the shop men went out. The Alabama & Vicksburg secured a restraining order against interference with its men at New Orleans. Some of the lodges of the trainmen's brotherhoods in the Southeast have notified men who have been promoted to official positions but who still retain their membership in the organizations that if they perform any of the work of the men out on strike they will lose their insurance, seniority and other rights in the organizations.

Washington Terminal

Officers of the Washington Terminal Company last week, when the semi-monthly pay day came around, indicated their attitude toward the strikers when they refused to accept payments to the employees' relief fund tendered by the men who had gone out on strike on July 1. They took the ground that since the men had left their jobs they were no longer to be considered employees of the terminal. Officers of the machinists' union said they had instructed their attorneys to make efforts to force the railroad authorities to accept the payments.

Photo by Keystone

Helping to Keep the Trains Running—a New Employee of the Pennsylvania

Western Maryland

The situation during the second week of the strike remains unchanged. The road advises that it has all the employees necessary. The Western Maryland has contracted all repair work and the contractors did not lose any men following the announcement of the strike call.

Developments at Chicago and Washington

D. W. Helt Agrees to Withhold Strike Order

Insofar as the Railroad Labor Board is concerned, two of its members, Ben. W. Hooper, chairman and one of the three public representatives, and W. L. McMenimen, one of the three representatives of labor on the Board, have devoted a good deal of their time during the past week to inducing the leaders of the other organizations which have threatened to strike to withhold their strike orders.

After conferences between these two members and D. W. Helt, president of the Brotherhood of Railroad Signalmen of America, the latter announced that he would withhold strike orders for the members of that organization pending the carrying out of a program being drafted by a committee of its officers. For the time being at least this action ends the possibility of the addition of signalmen to the ranks of the strikers.

The program determined upon by this committee was announced on July 11 by Mr. Helt and included the following provisions:

First: To instruct our general system committee on each carrier to take up promptly with the management all the grievances and controversies outstanding between the members of our organization and the carriers for the purpose of negotiating speedy adjustment, the matters to be taken up, among others, to embrace a revision of the recent-wage decision of the Labor Board, certain

changes in our rules, the elimination of the four cent inequality, and the method of determining rates of pay as applicable to signalmen and signal maintainers with less than four years' experience.

That the carriers could not well hesitate to consider a revision of the wage decision is indicated by the fact that some of them have already granted more favorable rates than those authorized by the Board in Decision 1074.

Second In case of a failure to secure from any carrier fair and reasonable concessions in regard to the various matters involved, to bring these matters before the Labor Board with the assurance that they shall be given the right of way for prompt consideration and decision.

Third: To continue work under the present wage decision of the Labor Board under protest pending the efforts to obtain a satisfactory adjustment.

Fourth To insist that any revision of wages obtained be made retroactive to July 1.

Fifth: To withhold strike order pending the carrying out of the foregoing program.

"With the best interests of the members of our organization at heart, we believe that this program should be followed prior to resorting to more drastic action," the announcement added.

The conferences which resulted in this action and in the similar action of E. F. Grable, president of the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers, reported in last week's *Railway Age*, have not been made public and the arguments by means of which these two labor leaders were induced to withhold their strike orders are not known.

Plans were made by these two members of the Board to hold similar conferences with E. H. Fitzgerald, president of the Brotherhood of Railway and Steamship Clerks, Express and Station Employees, but the latter declined to meet them and efforts to reach Mr. Fitzgerald were futile. This move on the part of the clerks' leader, together with the tenor of his remarks at the Board's inquiry on June 30, indicate according to observers of the strike, that on certain roads at least the clerical forces will soon join the striking shopmen in an effort to tie up transportation.

Board Upholds Right of Employees to Refuse to Do Strikers' Work

Two resolutions holding that the carriers have "no right to require an employee to perform work outside the scope of the existing agreement or decision of the Board covering the rules and working conditions of the class to which such employee belongs unless the employee performs such work voluntarily," were adopted by the Board during the past week. The first resolution refers to employees who are members of the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers and was handed down as the result of a protest by Mr. Grable, the president of that organization, who contended that members of his organization were being asked to perform the work of striking employees of other classes.

The second resolution referred to the employees who are members of the American Train Dispatchers' Association and the Railroad Yardmasters of America and was handed down as the result of protests registered by J. G. Luhrsen and J. L. Eldridge, presidents of these organizations.

"The observance of the policy here recommended will be conducive to the peaceful and uninterrupted operation of the carriers at this time and will enhance harmonious cooperation among all classes of employees after the strike is terminated," the last resolution of the Board added.

The Labor Board's Call for Conferences

On July 12 it became known that Mr. Hooper and Mr. Jewell and other leaders of the Six Shop Craft organizations now on strike had participated in a series of conferences, the first of which was held on July 8. Referring to these conferences Chairman Hooper said: "Too much significance need not be attached to the fact that I have held conferences with Mr. Jewell and the head of the several organizations. In the meantime I have also conferred with several railway executives. As a result of these conferences there are no optimistic predictions to make. My participation in the previous conferences has been personal rather than official and arose from a desire on our part to be as helpful as possible in the present situation."

Mr. Jewell also stated that: "A conference between certain members of the Labor Board and officers of the organizations of employees now on strike was held in which the issues involved were discussed. There are no optimistic or definitely hopeful results to announce at this time."

Reports being circulated as a result of these conferences indicate that the provisions under which it may be possible to end the present walkout include, first, an agreement to end the practice of contracting; second, an arrangement for modifying certain working rules which reduce the overtime pay of shopmen; third, the granting of assurances to Mr. Jewell that his organization will not be denied a re-hearing by the Labor Board on the wage issue, and, fourth, an agreement to establish the boards of adjustment provided for in the Transportation Act.

The report also indicates that Chairman Hooper has not receded from the Board's contention that the shopmen must return to work before they can expect further consideration before that body. It is questionable, according to observers, whether any "assurances" which might be given unofficially by Chairman Hooper would give Mr. Jewell material with which he could justify to his members a return to work. It is also pointed out that the contract "grievance" has already been practically eliminated through the statements of the carriers involved at the Board's hearing on June 30 and that the subject of wages and working rules can be brought before the Board by the employees involved at any time. Furthermore this situation has remained the same from the time the strike was called to the present.

The heads of the Train Service Brotherhoods asked for conference with the chairmen of the Regional committees created by the railways some months ago to deal with the Train Service organizations regarding working conditions. The chairmen of the Railway Regional committees are L. F. Loree, president, Delaware & Hudson, for the Eastern Region; S. M. Felton, president, Chicago Great Western, for the Western Region; W. R. Cole, president, Nashville, Chattanooga & St. Louis, for the Southeastern Region, and B. F. Bush, president, Missouri Pacific, for the Southwestern Region. This conference was held in Chicago on Wednesday and was understood to relate to charges made by men in train service that they had been asked by some railways to do work ordinarily performed by the striking shopmen.

The attempt of Chairman Hooper to bring about a conference between leaders of the striking employees came to nothing on July 12 when the Committee on Public Relations of the Association of Railway Executives virtually refused to meet the labor leaders at the present time.

President Calls for Law and Order

Washington, D. C.—Following the Cabinet meeting on Tuesday, at which the strike situation and its possible effects were thoroughly canvassed, President Harding took official action to strengthen the efforts of the railroads and of the Railroad Labor Board to preserve uninterrupted transportation service by issuing a formal proclamation, signed also by the Secretary of State, directing all persons to refrain from interference with the lawful efforts to maintain interstate transportation and the carrying of the United States mails and inviting the co-operation of all public authorities and the aid of all good citizens to uphold the laws and preserve the public peace. It is understood that the administration also stands ready to back up the words of the President by the use of troops if necessary.

While not gainsaying the right of any man to leave his work or denying the right to strike, the President emphasized the idea he has expressed in several recent speeches by saying that those who choose to accept employment under the terms of the decision of the Labor Board "have the same undisputable right to work that others have to decline to work."

The proclamation was not issued until a late hour on Tuesday evening and until after it had apparently been given careful consideration. It had been announced earlier in the day that the President would have an official statement on the strike situation but the proclamation came as somewhat of a surprise as it represents the first action of its kind by a President for many years and is in marked contrast with the practice so frequently followed in the case of railroad labor disputes in recent years of calling the parties to the White House for a conference leading to a compromise. In the case of the coal mining controversy President Harding had called such a conference because there was no public tribunal charged with the function of adjudicating it but in the case of the strike against a decision of the Labor Board he has made it clear from the outset that the board speaks with the authority of the government and there has been no suggestion of a thought of any one in Washington doing anything to weaken the position of the board.

Daily reports of the strike situation on the different roads are being received by administration officials and, with the coal strike on the way to a settlement, the railroad strike is regarded as constituting the most important barrier to a resumption of prosperity unless the men who are willing to go to work can be protected from the fear of violence. Secretaries Hoover, Davis and Weeks, Attorney General Daugherty and Postmaster General Work remained at the White House for further conference after the cabinet meeting. The Postmaster General had reports regarding interference with the mail and it is understood that the participation of the Secretary of War had to do with the use of federal troops. The text of the proclamation follows:

A Proclamation

WHEREAS, The United States Railroad Labor Board is an agency of the government, created by law, and charged with the duty of adjusting disputes between railroad operators and employees engaged in interstate commerce; and

WHEREAS, The United States Railroad Labor Board has recently handed down decisions, on affecting the wage of the Shop Craft employees, the other declaring the contract system of shop craft work with outside agencies to be contrary to the intent of the transportation act and, therefore, that such practice must be discontinued; and

WHEREAS, The Shop Craft employees have elected to discontinue their work, rather than abide by the decision rendered, and certain operators have ignored the decision ordering the abandonment of the contract shop practice; and

WHEREAS, The maintained operation of the railways in interstate commerce and the transportation of the United States mails have necessitated the employment of men who choose to accept employment under the terms of the decision, and who have the same indisputable right to work that others have to decline to work; and

WHEREAS, The peaceful settlement of controversies in accordance with law and due respect for the established agencies of such settlement are essential to the security and well-being of our people;

NOW, THEREFORE, I, WARREN G. HARDING, PRESIDENT OF THE UNITED STATES, Do hereby make proclamation, directing all persons to refrain from all interference with the lawful efforts to maintain interstate transportation and the carrying of the United States mails.

These activities and the maintained supremacy of the law are the first obligation of the government and all the citizenship of our country. Therefore, I invite the co-operation of all public authorities, state and municipal, and the aid of all good citizens to uphold the laws and to preserve the public peace, and to facilitate those operations in safety which are essential to life and liberty, and the security of property and our common public welfare.

IN WITNESS WHEREOF I have hereunto set my hand and caused the seal of the United States to be affixed. WARREN G. HARDING.

Reports of violence and interference with the mails at various points in connection with the shop men's strike caused the administration to take a more active interest in the strike situation following the return of the President and the Attorney General to Washington on Saturday and Monday. While the President had determined not to interfere with the strike itself, but to leave it to the Labor Board and the railroads, the reports of rioting and interference with mails created a situation requiring action from Washington and a formal statement indicating that the government intends to use its resources to preserve law and order was given out by Attorney General Daugherty on his return to Washington on Monday, with the approval of the President. After a conference with Alfred P. Thom, general counsel of the Association of Railway Executives, Mr. Daugherty went to the White House for a conference with the President.

Disorders and interference with mail trains by striking railroad men have resulted in several appeals to the government to afford protection. Serious charges of interference and assault and, in one case, of forcible seizure of railway employees, have caused the Post Office Department to lay the complaints before President Harding and Attorney General Daugherty. Passenger trains carrying mails have been discontinued in some instances.

According to telegrams to the superintendent of the railway mail service at Fort Worth, Tex., 26 trains have been withdrawn on different branches of the M. K. & T. All of them are railway post office trains with the exception of two, which carry closed pouches.

Z. V. Rawis, attorney for Pamlico County, North Carolina, telegraphed the Post Office Department from Bayboro that the Norfolk & Western had discontinued two passenger trains from Newbern to Oriental and that the mail service was completely paralyzed. A large portion of the mail, Mr. Rawis said, must be held over in Newbern from 16 to 40 hours, and mail on the Oriental section must lie over from 24 to 48 hours.

Mr. Rawis requested a prompt investigation and post office officials at Newbern and Oriental have been directed by the Post Office Department to report on the feasibility of installing temporary mail service between the two places, 30 miles apart.

The Post Office Department had announced on July 7 that only two cases of actual interference with the mails had been reported thus far, one at Marshall, Texas, and one at De Quincey, La. These cases were placed with the Department of Justice for prosecution. It was stated that the trouble at Chaffee and Slater, Mo., had been cleared up, according to advices received after President Kurn of the St. Louis-San Francisco appealed to the governor of Missouri and the sheriff of the county. The Brotherhood of Railroad Trainmen lodge at Chaffee wired the Post Office Department denying delay of mails at that town. Reports of delays of mails in Mississippi towns due to general strike conditions had also been sent in.

Later, on July 10, Postmaster General Work was notified by President Taussig of the Wabash of serious interference with the movement of mails, at Moberly, Mo., on Saturday night by strikers who stopped a mail train, cut the air hose and threw stones through the car windows. Eighteen railway mail clerks were taken from a train and marched to a strikers' hall and several engines at Hannibal, Mo., were put out of service by the strikers. Mr. Taussig said he had received no reply to his telegrams to the governor of the state of Missouri.

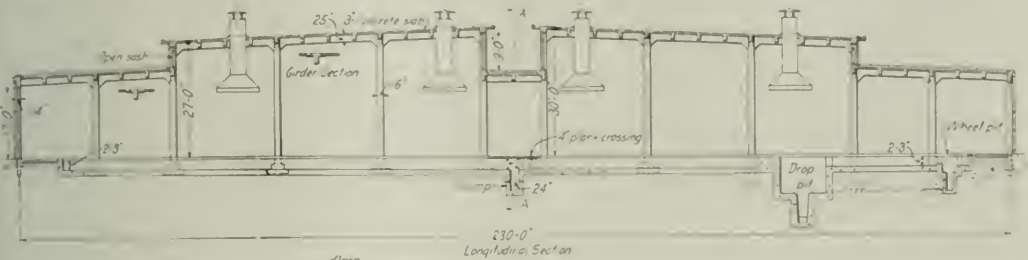
The Postmaster General issued a notice to all postmasters directing them to report to the divisional superintendent of railway mail service any acts of interference with mail movements. He also instructed the superintendent of railway mail service at Washington to have divisional inspectors sent to all points where railroads had reported disorders by strikers.

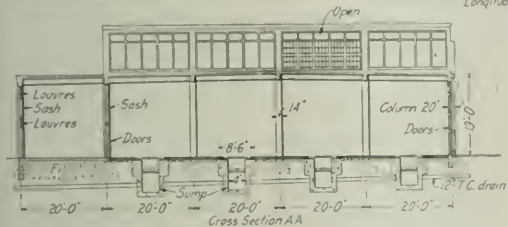
Southern Pacific Builds Unique Engine Houses

Rectangular Concrete Structures Are Provided With Lead Tracks at Each End to Expedite Use

THE SOUTHERN PACIFIC Coast Line recently completed two concrete engine houses at Mojave, Cal., and at Indio, which embody some interesting departures from the usual types of locomotive terminal facilities. Both the houses are rectangular in plan and similar in construction but differ in length, being planned to accommodate the types of engines in use on the divisions served. In both cases four tracks are provided, spaced 20 ft. center to center with adequate length for two engines on each track so that the house will accommodate eight engines in all. By providing lead tracks at each end of the house with connections to the main line, the movement of a locomotive into or out of the house interferes in no way with the other locomotives. The layout of the engine house site is such that space is provided for future enlargements by adding additional tracks.

The house at Indio is 206 ft. long by 80 ft. wide and has an annex of 110 ft. by 20 ft. to house a machine shop, foreman's office and engine crew's room. The house at Mojave is of the same dimensions except that the engine house proper is 230 ft. long instead of 206 ft.

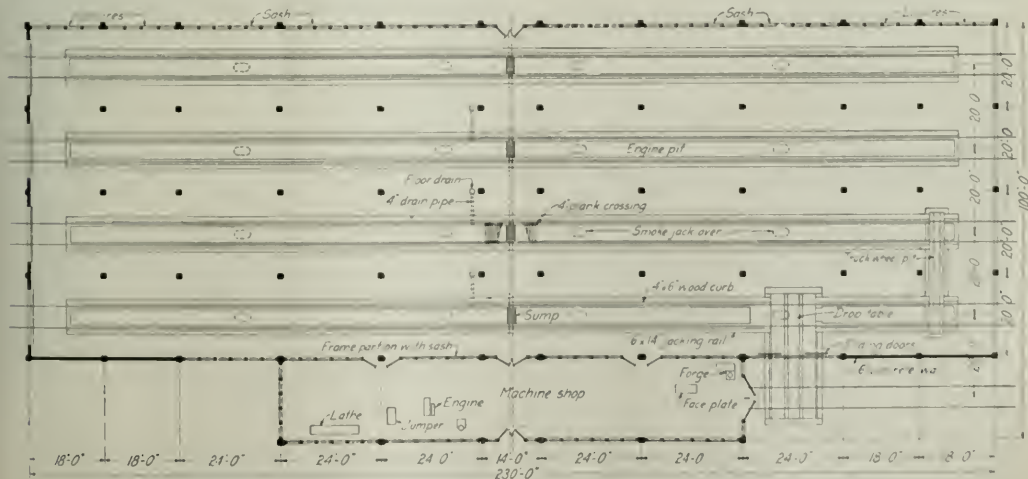




Longitudinal and Cross Sections of the House

The engine pits are 210 ft. in length, and slope from the outer ends toward sumps in the center of building. From these sumps the drainage is conveyed through 12-in. pipes by gravity to a concrete oil trap where, by a system of weirs, the oil is separated and stored in a compartment until a sufficient quantity has accumulated, when it is pumped into the fuel oil tanks. This oil separator also acts as a sludge trap. Transversely of the building at the center is a 14-ft. wide gangway opposite the entrance to the machine shop. Where this gangway crosses the engine pits, heavy plank crossings are laid.

In addition to the engine pits, a truck-wheel pit and a drop-table pit are provided. The drop-table pit is arranged on No. 1 track and extends outside of the building to a



The Arrangement of the Engine House Is Simple Yet Convenient

wheel storage track. This arrangement prevents the blocking of two tracks when wheels are being removed from an engine and brings the wheels to a point immediately adjacent to the machine shop.

Smoke jacks are provided as shown in the drawings. The two outer jacks shown are for the accommodation of the Mallet locomotives operated with the tender at the front end, a practice peculiar to certain portions of the Southern Pacific. The building has been completely piped for air, steam, hot and cold water. Blow-off steam from engines is conveyed to a large tank outside of the building where it is used to heat water for washing and filling of boilers.

The building is of reinforced concrete construction throughout, including the roof slab which is carried on a series of beams, girders and columns. The columns are spaced 20 ft. center to center across the building and 24 ft. on centers lengthwise of the building, except at the ends and in the center where the spacing has been reduced to 18 ft. and 14 ft., respectively, to suit the planning.

The lighting of the building is unusually good, sash being used in practically the whole wall area between columns with the exception of ventilation openings near the roof and necessary low spandrel walls below the sill line. In addition to the sash in the side walls, sash area has been obtained by breaking the plane of the roof to form clerestories. An unusual arrangement has been adopted in the center of the building above the transverse gangway, where the clerestory has been formed by depressing the roof line in place of raising it. This arrangement gives a large sash area and still preserves sufficient head clearance for engines to pass under and is one which has no disadvantage since the house is located in a region where snowfall is a rarity.

The floors are of paving brick set on edge on a concrete base and between engine pits are laid with a crown to drain to the pits. The engine doors at ends of building are made to slide on parallel tracks, the tracks being arranged so that the last door turns back against the side walls of the building.

These buildings were designed and erected under the supervision of W. H. Kirkbride, engineer maintenance of way and structures, Southern Pacific, and W. M. Jaekle, assistant engineer maintenance of way and structures, Southern Pacific System, at San Francisco, Cal.

Ambiguity of Recapture Provisions Caused Speculation

Washington, D. C

An apparent ambiguity in the language of different paragraphs of Section 15-a of the Transportation Act has aroused a discussion in some quarters as to whether the so-called "recapture" of one-half of the excess net railway operating income of a carrier begins at 6 per cent, as commonly understood, or at 5¾ per cent, the rate which the Interstate Commerce Commission in its recent general rate reduction order, fixed as the rate of fair return for the period beginning March 1, 1922.

While paragraph 6 of Section 15-a specifically provides for the payment to the government of one-half of the excess above 6 per cent, the preceding paragraph 5 declares that "any carrier which receives such an income so in excess of a *fair return*, shall hold such part of the excess, as hereinafter prescribed, as trustee for and shall pay it to, the United States." The word "so", under the ordinary construction given to the English language, refers back to the sentence in the same paragraph, which states the impossibility (without regulation and control) of establishing uniform rates upon competitive traffic which will adequately sustain all the carriers without enabling some of such carriers to receive a net railway operating income "substantially and unreasonably in excess of a fair return" upon their value. Although the commission, under the provisions of paragraph 3 of the section has prescribed 5¾ per cent as constituting a fair return, there would seem to be no conflict between these two paragraphs 5 and 6, unless the difference between 5¾ per cent and 6 per cent be considered enough to represent a substantial and unreasonable excess.

However, paragraph 9 of Section 15-a, which directs the commission to prescribe rules and regulations for the determination and recovery of the excess income, says that "the commission shall make proper adjustments to provide for a computation of excess income for a portion of a year, *and for a year in which a change in the percentage constituting a fair return* or in the value of a carrier's railway property *becomes effective.*"

The commission was required to make adjustments for that portion of the year 1920 after this part of the Transportation Act became effective, but, it is argued that there would be no occasion to make adjustments to provide for the computation of excess income for a year in which a change in the percentage constituting a fair return unless the point at which recapture begins is to fluctuate with changes in the percentage declared to represent a fair return.

On the other hand, the general impression that Congress intended to allow an individual carrier or system 6 per cent before recapturing any excess is strengthened by paragraph 7 of Section 15-a, which provides that a carrier may draw from the reserve fund, to be established with its half of its excess, "to the extent that its net railway operating income for any year is less than a sum equal to 6 per centum" of the value, for the purpose of paying dividends, interest or rents. It would be a rather strange procedure to require a carrier which earned, for example, 6¼ per cent in one year, to pay ¼ per cent to the government and put another ¼ per cent in a reserve fund, and at the same time to permit it to draw from the reserve fund in the next year enough to make up a sum equal to 6 per cent, which it might then pay out in interest and dividends. This would restrict a road from paying out more than 5¾ per cent in a so-called "good" year but would let it pay out as much as 6 per cent in the "lean" year following.

Some confusion between 6 per cent and a fair return has been caused because paragraph 2 of Section 15-a directs the commission to make rates in an effort to produce a net railway operating income equal as nearly as may be to a fair return, and for the two years beginning March 1, 1920, directed the commission to take as such fair return 5½ per cent plus, in its discretion, not to exceed ½ per cent, and the commission in Ex Parte 74 did add the ½ per cent. At the present time, however, 5¾ per cent is officially presumed to be a fair return.

The commission has as yet made no ruling and placed no interpretation upon the recapture provisions because the question will not become a practical one for it until at least the end of this year.

The commission is still struggling with the returns of the carriers to show which of them earned an excess over 6 per cent for that part of 1920 during which they were not under guaranty and also for the year 1921. The returns are naturally based on the railroads' own claims as to their value and while the commission has received a few small checks representing half of the admitted excess, it is understood it is somewhat at a loss as to what to do with them until it has ascertained the value of the roads that have sent the checks and thus put itself in a position to be able to say whether the checks are sufficient.

Purchase by the Federal Government of the Cape Cod and Dismal Swamp canals would be authorized by an amendment to the rivers and harbors bill which has been adopted by the Senate committee on commerce.

Relations of Transportation to Agriculture

Congressional Commission Makes Report Containing Valuable Data on Relations of Rates and Prices

WASHINGTON, D. C.

THE JOINT Commission of Agricultural Inquiry has made public recently a voluminous report to Congress of the results of an exhaustive investigation of the relations between transportation and agriculture which contains much valuable data in the form of charts and tables regarding comparisons of freight rates and the other factors entering into the wholesale prices of agricultural products and of articles purchased by the farmer. The commission has not, however, found it possible to carry its data so far as to show the relations between rates and retail prices, on account of the difficulty of tracing commodities through because of mixing of grades and for other reasons. Some of the findings and recommendations of the commission have already been published in the form of advance statements by the chairman of the commission, Representative Sydney Anderson of Minnesota. This investigation is somewhat unique among congressional committee inquiries for the reason that it was conducted entirely without public hearings, but by the process of direct investigation and study in which a number of prominent railroad officials, as well as representatives of agriculture and industry, participated and assisted. The present report dealing with transportation is Part III of the complete report of the commission.

A large part of the report is devoted to a study of the history and development of the nation's transportation system, including its finances, organization, plant, methods of operation, etc.

An interesting feature is an estimate that freight charges in 1920 represented 6.9 per cent of the wholesale or factory value of products of manufacture, including raw materials of every kind and also the transportation for final distribution to ultimate point of consumption.

How the Inquiry was Conducted

The commission, in order to secure the material for this report, established a transportation division on August 1, 1921. This division organized throughout the United States committees representative of agriculture, industry, and transportation, which, through specific questionnaires, obtained the statistical data upon which the conclusions of the commission primarily rest.

One hundred and fifteen general committees, representing agriculture and industry, were established, and these in turn appointed subcommittees in the different sections, numbering approximately 200. The appointees to these committees were those whose knowledge and experience qualified them particularly to analyze the conditions of the phase which was assigned to them. In like manner executive committees of transportation were formed, and in turn, appointed subcommittees throughout the country.

In co-operation with the transportation division, the executive committees in charge of railroad, electric, motor, and other branches of transportation worked out the questionnaires forwarded them by the commission and analyzed in minute detail the pertinent facts in their relation to agriculture and industry and transportation. The committees representing agriculture, industry and transportation, correlated their efforts where possible and at all times co-operated in the endeavor to arrive at the basic data called for by the commission.

The transportation division opened offices in Washington for the assembling and analysis of the data procured by this comprehensive field organization. It also called to Washington accredited representatives of agriculture, industry, and transportation to confer upon the details of the inquiry, to effect a better understanding of the relation of transportation to agriculture and industry, and to obtain an initial agreement as to the basic facts developed by the field organization

The body of the report having been tentatively set up, a further analysis of the data and the findings was undertaken by an advisory board to the transportation division, which was called to Washington and requested to study a summary of the work accomplished thus far as presented in an agenda and working outline. This method was pursued in order that the commission might have the benefit of the views of accredited representatives of these three great branches of our economic life. The collection and assembling of the data in this report represent the combined efforts of over 1,600 people and the circulation of more than 250,000 questionnaires.

The commission did not undertake an investigation of the labor problem as effecting transportation, in so far as that problem involves the question of proper wages, for it felt that was outside of the scope of its inquiry. It does present the facts, however, as to labor costs in transportation, gathered from official reports, and it makes certain recommendations concerning the adjustment of labor disputes.

Summary of Recommendations

The commission makes the following recommendations:

1. That the transportation rates on many commodities, more especially the products of agriculture, bear a disproportionate relation to the prices of such commodities; that there should be immediate reductions in transportation rates applied to farm products and other basic commodities; and that reductions in rates upon the articles of higher value, or upon tonnage moving upon so-called "class rates," are not warranted, while the rates upon agricultural products and other basic commodities remain at their existing levels; that greater consideration should be given in the future by public rate-making authorities and by the railroads in the making of transportation rates to the relative value of commodities and existing and prospective economic conditions.

2. That the pyramided per cent advances in rates which have been authorized by the Interstate Commerce Commission or made by the United States Railroad Administration caused the dislocation of long-standing rate relationships between rates upon agricultural and industrial products between competitive enterprises and competitive sections of the country; that the railroads and the public rate-making bodies should seek to readjust rates of the country so as to preserve so far as practicable the general relationship of rates existing prior to 1918, with due regard to present and future changes in economic conditions.

3. That in establishing the general level of rates and commodity and class rates the federal and state regulatory bodies give greater consideration to existing and prospective economic conditions and to the relationships existing between the price level of commodities and the level of transportation rates as well as the relationship existing between the price of different commodities, the weight of such commodities, and the space required for their transportation.

4 That regional agencies of the Interstate Commerce Commission be established whose duty it shall be to consider and adjudicate questions of regional application and to co-operate with the state commissions with a view to minimizing conflicts between state and federal regulations as to rates, facilities, and practices; that the state commissions have representation in such regional agencies in all cases in which intrastate rates, facilities, and practices over which the state commission has jurisdiction may be affected.

5. In view of the conclusion of the International Joint Commission, this commission recommends that the government enter into immediate negotiations with the Dominion of Canada for the conclusion of a treaty for the improvement of the St.

Lawrence River, through a commission directed to make the further study suggested by the International Joint Commission, and authorized to proceed with the work if its plans, including a plan of financing, shall be approved by Congress and the Dominion of Canada.

6. Complete standardization as rapidly as possible of all freight equipment, except with respect to cubical and weight-carrying capacity.

7. The unification and joint operation of facilities at terminals wherever such unification and joint operation will result in economy and better service.

8. Prompt consideration and adoption of a comprehensive plan for central control and distribution of freight cars.

9. That railroads and shippers co-operate to secure the full utilization of the carrying capacity of cars wherever possible.

10. That the supply of box cars, coal cars, stock cars, and refrigerator cars is inadequate to meet the demand during normal periods of activity and should be rapidly augmented.

11. That special consideration should be given to increasing the available number and efficiency of refrigerator cars. Older and inefficient types of refrigerator and heater cars should be progressively retired.

12. That the number of cars in bad order exceeds all previous records, and unless bad-order cars are promptly repaired, the supply of serviceable cars will be materially impaired.

13. That a large proportion of the cars being used in interline movement are box cars and should be made fit for bulk grain loading; and all other classes of freight equipment should be promptly made suitable for all requirements, including general interchange throughout the country.

14. That the number of locomotives operating and owned by some railroads is inadequate to meet the need during business activity and it should be augmented.

15. That there is need for increase in terminal facilities generally, and that special consideration should be given to an increase in facilities at ports, including facilities for handling coal at tidewater.

16. That there should be complete correlation of ore and coal facilities at Lake Erie ports.

17. That permanent joint railroad and shippers' committees be organized to co-operate in carrying on a nation-wide campaign to reduce loss and damage of goods in transit.

18. That freight-revenue divisions should be promptly revised to the basis of two-figure percentages.

19. That regional clearing houses be established for the current settlement of debits and credits growing out of rate divisions.

20. That the railroads should adopt universal through way-billing of interline freight.

21. That the railroads be required to maintain complete cost data covering each item of expense with particular reference to the maintenance of equipment.

22. That the railroads be required to adopt better systems for checking the extent and value of repairs to equipment when made by lines other than the line owning the car.

23. That the railroads of the country establish regional traffic executives.

Better Relations With Public Needed

24. That the relations between the public and the railroads be improved, and a closer contact and better understanding established through the organization by the railroads of public relations departments, so that wherever possible conflicts between persons, industries, or localities and the railroads with respect to rates, facilities, and practices be settled by informal negotiation, with a view of reducing the necessity of resort to formal complaint and adjudication before the Interstate Commerce Commission.

25. That the Interstate Commerce Commission be directed by Congress as a part of its continuing duties to investigate the development and correlation of the various systems of transportation and their relation to agriculture, industry, trade, and commerce, and report to Congress from time to time as to the correlation of such transportation facilities and their better relation to agriculture, industry, trade, and commerce.

26. That the bill "To provide for classification of civilian positions within the District of Columbia and field service" (H. R. 8928) shall not apply to the employees of the Interstate Commerce Commission, but if the Interstate Commerce Commission employees are included under the classification bill, due regard shall be given to the peculiar character of the organization of the commission and the classification and duties of its employees.

27. That Congress continue to promote an adequate program of highway construction and maintenance, directed to the more effective correlation of highway transportation with rail and water transportation.

28. That the program of highway construction and the maintenance by states and counties be continued under the direction of skilled experts with particular reference to the construction and maintenance of farm-to-market roads. That the program of appropriations for research into methods of road construction and maintenance, density, character, and the effect of traffic be continued and regulation of traffic based upon the facts ascertained by such research.

29. That the several states co-operate in effecting a uniform basis for taxing motor trucks and other motor vehicles which shall fairly represent the reasonable proportion of the cost of highway construction and maintenance chargeable to such vehicles.

30. That a study be made of postal rates with a view of a readjustment of charges and the removal of present rate inconsistencies.

31. The commission makes no recommendation with respect to government aid to American shipping, but if government aid is given to American shipping it ought to be given in such a way that the amount of such aid may be definitely known, and should be limited to such aid as will fairly represent the difference in capital and operating cost required by higher American standards and more burdensome navigation regulations, compared with foreign capital and operating costs and foreign navigation regulations.

Rates and Prices

The commission makes the following findings:

1. That freight rates upon perishables normally take about one-third of the selling price, frequently running as high as two-thirds; that these rates in periods of low-price levels and slight demand constitute a very heavy burden upon this traffic. This is especially true, owing to the average length of haul of these commodities, which was shown to be more than 1,400 miles in a study of 9,476 shipments.

2. Prices of canned goods are practically back to pre-war levels.

The existing freight cost per case is substantially lower in relationship to value of the product than the freight cost of the so-called basic commodities, including grains.

3. That rates and sales margins on hay have been abnormally high in recent months and have greatly restricted its distribution.

4. That freight rates on highly fabricated articles of wearing apparel, such as boots, shoes, dry goods, men's and women's suits, etc., are not a material factor in increasing or reducing prices of these commodities.

5. That imperative need exists for the organization of the statistics and knowledge of transportation and its relation to agriculture, industry, trade, and commerce through the establishment of private research and educational institutions under disinterested auspices for the purpose of promoting education in the principles, operations, and practices incident to transportation.

6. That greater uniformity is desirable in the requirements of state legislation and state regulatory bodies in regard to the length of trains and crews required to man trains of different lengths and similar requirements affecting operation of railway systems.

7. The aggregate compensation paid to railway employees increased 151 per cent in 1920 over 1916 and 90.7 per cent in 1921 over 1916; the number of employees increased 384,830 in 1920 over 1916, or 23.3 per cent; and 14,204 in 1921 over 1916, or eight-tenths of 1 per cent. In most cases the aggregate number of hours worked increased in lower ratio than the aggregate compensation and the number of employees.

8. That the increase in efficiency of operation of transportation is shown by the fact that in 1890, the first year for which statistics were available, for every $100 investment in property 983 tons of freight were carried 1 mile and 163 passengers carried 1 mile; whereas in 1920 for every $100 investment in property 2,063 tons of freight were carried 1 mile and 231 passengers were carried 1 mile, an increase of 110 per cent in freight and 50 per cent in passenger traffic for each $100 of property investment. Property investment as reported to the Interstate Commerce Commission has increased 155.82 per cent, the tons carried 1 mile 438 per cent, and the passengers carried 1 mile 295 per cent in the same period.

9. That in 1921, for each 100 ton-miles yielding revenue the railroads produced 147.6 nonrevenue and tare ton miles. The revenue producing ton-miles, constituting 40.3 per cent of the total, is therefore supporting nonproductive ton-miles equaling 59.7 per cent of the total. That the expense incident to the transportation of the nonproductive tonnage must be met either by higher freight rates or a reduced return to the railroad companies.

That the significance of this is not generally understood by railroad officials and the public. That economical transportation of the products of agriculture and industry require a reduction in the tare or waste ton-miles.

10. That the revenue return to the railroads should be sufficient to enable them to sustain the value of their properties put to public use and to attract the capital required for the expansion and improvement of property, facilities, and service.

11. That sound railroad finance requires that a larger part of the capital necessary for railway development and equipment be secured by stock issues instead of by bond issues.

12. That the issuance of tax free securities by federal, state and municipal government should be reduced to the lowest possible limits, so that taxation can be reduced and capital be allowed to accumulate for use at fair interest rates by agriculture, industry, and the railroads.

13. That a comparison of the operation of the railroads during the period of federal control and under competitive management in the post-war period affords no conclusive basis as to the relative efficiency of government and private operation. The conditions existing in both periods have been too abnormal to permit of sound comparison or accurate measurement of the relative efficiency in either. An examination of the operation of government-owned railroads in foreign countries both before and after the war, however, does afford some basis for an estimate as to the relative efficiency with which private management in this country and government management in foreign countries have withstood and surmounted the difficulties attendant upon the dislocations and the abnormal conditions which followed the war period. It may be said that, measured by the relative performance and cost of service, private management in this country is more efficient at less cost than foreign governmental management.

14. That the daily, weekly, monthly, and yearly fluctuations in shipments of live stock are very marked. Railroads, shippers, and stockyards should co-operate to bring about a more even distribution of shipments at the live-stock markets.

15. That mine prices, freight rates, and sales margins on both bituminous and anthracite coal have very greatly increased since 1913. There has been practically no deflation in this industry, although prices were somewhat lower in 1921 than in 1920. Coal is an element in the cost of production of a very wide range of manufactured products, and increases in coal prices are promptly reflected and often multiplied in the final price of highly fabricated articles. A reduction in mine prices, freight rates, and sales margins on coal, especially bituminous coal, would probably be promptly reflected in improved business conditions.

16. That fertilizer and phosphate prices are now close to the pre-war basis, except for the higher freight costs now prevailing.

17. That the weighted average of farm implement factory prices shows these prices, exclusive of power, equipment, and twine, to be 41 per cent above 1913; inclusive of power, equipment, and twine, these prices are now approximately 20 per cent above 1913.

Relation of Freight to Farm Prices

The course of the relationship of freight charges to farm prices from 1909 to 1921, inclusive, is shown in tables given in the report. The five-year average from August 1, 1909, to July 31, 1914, is used as 100 per cent of the average price of farm products, and the railroad revenue per net ton-mile from July 1, 1909, to June 30, 1914; the nearest comparable figure in the statistics of the Interstate Commerce Commission, is used as 100 per cent of the railroad charges. From 1910 to 1916 the two lines moved side by side in very close relationship to each other. Then began a tremendous increase in the price of farm products, until in June, 1920, it reached the maximum of 246. Railroad freight rates from 1916 to 1917 show practically no increase. From 1917 to 1920 they increased more slowly than did the price of farm products.

In July, 1920, the slump began, which brought the index figure for farm products down from 246 in June, 1920, to 106 in June 1921. In the same period railroad charges went up from 127 in July, 1920, to 171 in June, 1921. On the basis of the last monthly figures available, in October, 1921, farm products show an index figure of 102 and railroad rates of 169. "In this period of falling prices for farm products the increased freight charges made the farmer feel more keenly the relationship of freight charges to the prices obtained for his products." The report says: "On the basis of this a table has been constructed to show the purchasing power of farm products in terms of transportation. This figure is obtained by dividing the index figures for farm products by the corresponding index figure for freight changes. While the purchasing power was about 100 in the previous years, it was in November, 1921, only 72. So far as transportation is concerned the farmer is suffering from a 72-cent dollar.

Purchasing Power of Farm Products in Terms of Transportation

Year and month	Per-centage	Year and month	Per-centage	Year and month	Per-centage
1909	[illegible]	1920—Continued		1921—Continued	
1910	[illegible]	March	[illegible]	February	[illegible]
1911	[illegible]	April	[illegible]	March	[illegible]
1912	[illegible]	May	[illegible]	April	[illegible]
1913	[illegible]	June	[illegible]	May	[illegible]
1914	[illegible]	July	[illegible]	June	[illegible]
1915	[illegible]	August	[illegible]	July	[illegible]
1916	1 36	September	[illegible]	August	[illegible]
1917	[illegible]	October	[illegible]	September	[illegible]
1918	[illegible]	November	[illegible]	October	[illegible]
1919		December	[illegible]	November	[illegible]
January	[illegible]	1921		December	[illegible]
February	1 75	January	[illegible]		

One table in the report indicates the estimated value of commodities transported in the United States in accordance with the United States census of 1914. The total production of agriculture, manufactured, and mineral products is added to the imports, from which is made an estimated deduction of these same articles which do not move by railroad transportation. The estimated total value of $33,298,000,000 divided by the total tonnage of railroads, 1,094,000,000, gives an average value of $30.40 per ton. The average revenue per ton for the same period was $1.84; the proportion of freight to the value of goods transported as estimated is about 6.05 per cent.

Value of Commodities Transported in United States, 1914

[000,000 Omitted]

Production:		
Products of agriculture		$9,849
Manufactures		24,246
Minerals		2,394
Total		$36,489
Imports		1,894
Total		$38,383
Deductions for local use		
Products of agriculture	$2,202	
Manufactures	2,023	
Minerals	[illegible]	
Imports	[illegible]	
Total		[illegible]
Total amount transported		$33,298
Total tonnage carried by railroad		1,094
Value per ton		$30.40
Freight revenue (Class I and II roads)		[illegible]
Revenue per ton		$1.84
Per cent freight to value of goods transported		6.05
Per cent freight to total production plus imports		5.26

This commission has compiled a large amount of data to show the economic relationship of freight rates to the prices of agricultural products. In compilation of such information data was secured from the various market points showing the prices actually paid by the wholesaler for these farm products as near as possible to the third Tuesday of each month during the seasons of 1913, 1916, and 1921. Similar information was then secured from the country shipping points showing the prices a few days earlier, in order to allow for the time in transit. An addition of the freight rate to this country price would show the margin or spread upon which the city dealer operated.

This method of making comparisons is, of course, subject to various objections, the report says. The commission met a great deal of difficulty in matching grades, particularly in the case of wool and fruits and vegetables. In other cases it was impossible to secure data throughout the years. Furthermore, it was impossible in every case to secure a weighted average of prices either at the market or on the farm, and it has been necessary to use a mean between the high and low point in the construction of the economic relationship charts.

Some extracts from the report follow:

It is obvious that freight costs distributed over the unit of sale will always be greater upon the bulky, heavy-loading commodities, whose original value is comparatively low, than on the higher class of articles, such as finished food products, clothing, high-

grade furniture, etc. It must be expected that the percentage of freight costs to the prices of these low-grade commodities can not be as low as those for the higher-valued articles, as these commodities, with the other so-called low-grade commodities of heavy tonnage, represent the great factors in the earning capacity of our railroads.

Rates on Basic and High Grade Commodities

Higher freight rates are not infrequently urged as an excuse for increases in prices without justification. While freight rates are often a considerable factor in the cost of distribution of low price heavy-tonnage commodities, and may restrict the radius of distribution thereof and sometimes even prevent shipment altogether, as a rule freight rates have not kept pace with increases in prices of such articles as dry goods, boots, shoes, and other highly fabricated articles usually purchased in less than carload quantities and do not restrict or diminish the movement of such commodities. The influence of freight rates upon basic commodities is increased by the fact that such increases usually become a part of the dealer's cost and the basis of profit additions, and are thus multiplied in the final price paid by the consumer. Upon the higher cost and more highly fabricated articles the freight charges are sometimes absorbed by dealers, and even where they are a part of the basis cost upon which profits are figured, are not multiplied to the same extent as freight rates upon high tonnage, lower-priced commodities.

Adequacy of Equipment

The adequacy of the present railroad freight-car equipment is dependent to a large extent upon the efficiency with which cars are handled with respect to their proper maintenance, distribution, and movement. The question of car distribution will be discussed later. It is the desire at this point to consider the increase in the number and capacity of cars available during the past several years in its relation to the amount of tonnage transported.

The number of cars owned and operated by the railroads has increased 6.7 per cent over 1911. The aggregate capacity has increased 18.2 per cent. The net ton-mileage for 1920 shows an increase of 62.4 per cent over 1911. The traffic handled during 1920 was greater than in any previous year. It appears fair to assume that the increase in car supply must be based upon the increase in the volume of traffic offered, with due consideration for efficiency of handling. The necessity for a greater number of freight cars during periods of maximum movement is in part the result of light loading, bad-order cars and slow movement on congested railroads or in terminals. The purchase of the necessary new freight-car equipment by the railroads depends upon their financial condition. There appears to be in this question a much more important principle; and while it is desirable to prevent any unnecessary outlay of money, we have here a situation of vital interest, not only to the investor in railroad securities but in a much larger degree to the shipping public, and, in fact, to our entire economic structure. Carriers feel that the supply of cars should be adjusted fairly and equitably as between supply and demand. In other words, it is felt by the railroads that they can not be expected to meet a short peak demand. They take the position that they must guard against the acquirement of cars to serve only during short peak periods and which must necessarily lie idle at all other times, thus creating an economic waste.

The commission feels that transportation should be made an incident to trade and should not restrict commerce. If the carriers do not supply sufficient equipment to reasonably meet the demands, an artificial situation economically unsound is created. Failure to supply cars in adequate numbers during any considerable period usually results in an inflation of prices. During times of general business activity as well as at other times there are a large number of individuals throughout the country striving to make a living through the purchase and sale of goods, each transaction dependent upon transportation by railroad. It does not seem right or proper to deny them the opportunity which should be extended to every shipper. The commission is of the opinion that a sufficient number of cars should be added to the supply to meet the demand for cars wherever ordered and in whatever quantity they may be required.

The major trend of freight traffic is from west to east, and it is largely moved in box-car equipment. The return movement of empty box cars from the East to the West must be made in heavy volume to meet the needs of originating territory. The supply of box cars is insufficient to meet the peak demands, and it should be augmented by additional cars.

The supply of stock cars does not fully meet the requirements of the peak demand, which in the case of stock is especially urgent. The number available should be augmented by new construction.

The present number of coal cars is insufficient to meet the peak demands of the basic industry requiring such equipment, and should be augmented by new construction.

The present supply of refrigerator cars is insufficient to meet the peak demands for perishable loading and should be rapidly augmented by new construction.

Although an advance has been made in the standardization of freight car equipment, there is room for still further improvement. Types of freight cars have been developed ostensibly to serve the shipper along a particular railroad to better advantage, but which in reality represent the personal views of some executive, and in most cases cost more money. The eastern lines generally have adopted the 36-foot box car as standard while the standard of the western lines is a 40-foot car. When it is understood that a very great proportion of the loading must be moved in cars foreign to the originating line, the folly of such a course will be appreciated.

Car Service

This commission is of the opinion that the public welfare requires the adoption of a comprehensive system for the control of freight-car equipment which will make possible the reduction and the elimination of the waste at present incurred by the unnecessary haul of empty cars and which will prevent the development of emergency conditions. The country needs uninterrupted transportation service. It is all very well to prepare for emergency conditions. It is, however, clearly apparent that with respect to freight-car control and distribution, and the co-ordination and unification of terminal facilities, the carriers have not progressed. In fact, there is a strong tendency toward reaction in this important matter, and unless prompt and adequate action is taken, emergency conditions with all of the attendant harassments to business will certainly result.

It would seem impossible to intelligently handle the car distribution of the country without current information as to the flow of traffic throughout the country. One plan has been suggested which contemplates the subdivision of the railroad mileage into districts of comparatively small extent, each division thus formed to include, so far as possible, distinct producing territories but not necessarily to include all lines of any particular railroad. The points of contact with other districts would be fixed at railroad division terminals or at junction points, each district placed in charge of a supervisory officer who would secure daily passing reports from each point of contact with the adjoining districts. These reports would indicate the volume of loaded and empty cars moving in each direction, classified as to type of car. This plan would make possible a daily balanced movement and the fuller utilization of power. Heavy loaded movements in one direction could, where desirable, be instantly met with a movement of empty cars in the opposite direction. Whatever plan is adopted must be based upon the premise that each individual shipper, each group of shippers, and each of the several producing or originating districts throughout the country must be fully supplied with freight equipment at all times. Shippers in one section of the country should be wholly dependent upon the voluntary action of railroad officers in another section of the country who are only concerned with the requirements of shippers in the district served by them and who may hold and use cars belonging to other railroads serving other districts.

Increased Terminal Facilities and Equipment Needed

Although operating efficiency shows a steady improvement, the lack of terminal tracks and facilities and of a sufficient number of freight cars has, during periods of business prosperity, proved to be a severe handicap to the business of the country, influencing as it does the processes of inflation at the outset and later the reaction by the stagnation it has induced.

The necessity for the increase and improvement of railroad facilities must be measured not by the volume of traffic moving presently nor in previous years on the average, but by the amount moved during the years of greatest business activity plus the annual increase produced by the steady growth of the country and the expectancy of the continuance of such normal growth. Increases in efficiency made possible by improved devices will in some degree modify these requirements. It is essential, however, and the country demands that there shall be a margin in the transportation facilities in excess of what are termed "normal requirements," so that any expansion of business activity may proceed unhampered.

The car supply must at all times meet every reasonable demand. The terminal facilities must be improved to handle adequately all traffic seeking an outlet through the ports or inland termini, either by the unification and joint operation of existing terminal facilities or by the addition of new trackage and other facilities, or by both.

The transportation facilities of the country must be placed upon a solid foundation. It will not do to make up deficits by appropriations of public funds. The railroad companies must be operated with the expectation that the gross revenues will be sufficient to cover operating expenses and leave a reasonable return

upon the investment. It is of paramount importance to the public welfare that the transportation companies be made going concerns; that they be placed upon a substantial foundation in every respect; and that the operating expenses be reduced by careful and efficient management.

During the period of federal control terminal facilities in many of the larger cities of the United States were consolidated. These consolidations have been largely abandoned under private control. This commission believes that the unification and joint operation of terminals affords an opportunity for very large savings in operating costs, and will also contribute to the efficiency of the operation of the railroads as a whole, and that such unification and joint operation of railroad terminals should be accomplished wherever better service and more efficient operation can be secured at less cost.

There is an excessive duplication of tracks to parallel construction which should be eliminated by appropriate traffic arrangements between the railroads concerned. This commission believes such arrangements should be consummated wherever they can be in keeping with the maintenance of reasonable competition between the railroads, in order to avoid the unnecessary expense of operation which this parallel construction involves.

Relation of Railroad Credit to Industry

The railroads are one of the largest consumers, taxpayers, and employers of labor, but these low returns prevent them from promoting prosperity and providing adequate facilities, improvements, and equipment until that situation is improved.

Considering the present obligations resting upon the government and upon the country at large, and as a matter of economic policy, new money for railroad improvement should not be raised through constant government aid. In the public interest the railroad industry must rest upon its own foundations, and its revenues must be so constructively regulated that their operations will produce enough to pay fair wages, cost of materials, taxes, meet the fixed charges, pay a fair dividend, and leave a small margin to attract investors of new capital. In other words, to obtain new railroad capital, the opportunities to earn and pay regular returns must exist, and railroad managements must be encouraged to exercise the greatest initiative in improving and extending transportation facilities. Furthermore, conditions should be created whereby the sale of capital stock by the principal roads will become possible and the continued increase in funded debt will be minimized.

Railroads can not go on constantly increasing their indebtedness and not building up an equity in their properties underlying their debt. When the investor thinks that too large a percentage of the value of the property of a given company is represented by debt and not enough by stock, he will decline to buy further bonds of that company, or if he takes them it will be only at an unduly high interest rate. It is important, therefore, that railroad credit should be so strengthened as to enable a properly capitalized, well-managed company with adequate traffic to do its financing through issues of stock. Stock, being junior to debt, and having no lien on the property or equipment, naturally must bring a larger return in order to be attractive.

In considering the financial aspects of the transportation industry, it is recognized that the cost of capital is a part of the cost of transportation and enters into the rate charged for transportation. An investment which commands public confidence and brings an assured return is more freely made and on a lower basis of cost than one which is subject to uncertainty and possible attack. It is therefore of great importance that the earnings of well-managed and properly capitalized railroads should be such as will protect their securities outstanding and attract, on reasonable terms, the new money needed for additional facilities. While there has been more general public discussion of, and inquiry into, the cost of sustaining railroad investment, yet the return paid thereon requires a much smaller outlay than for most of the other important railroad costs.

Railway Expansion Necessary

The transportation systems must be continually improved to keep pace with industrial progress. It is possible to cheapen transportation through intensive development such as electrification, improvement of rolling stock and other equipment, and the use of the most modern methods in the loading of trains. This country has enjoyed railroad transportation on a cheaper basis than practically any other civilized country in the world, but can not continue to do so by restricting initiative or by undue limitation of railroad profits earned under uniform and reasonable rates.

The production of the principal products of the country increases on an average from 3.6 to 4 per cent per annum, and the traffic units consisting of the combined ton mileage and passenger mileage of the railroads increased on the average between 6 and 7 per cent per annum since 1908. In periods of prosperity these increases are substantially exceeded, but the transportation service of the country needs an increased yearly investment to finance additional tracks, stations, equipment, and facilities to take care of this growth. While it is generally stated that a billion dollars a year ought to be provided to finance railroad extensions, new equipment and improvements, the actual experience since 1908 is that the property investment of the railroads has increased on an average of only $540,000,000 per annum. However, in view of the fact that prices of material and labor have increased and that increased railroad property investment has been restricted for several years, at least $750,000,000 per annum should be spent for several years for the foregoing purposes.

An important consideration in this connection is that the capital funds of the country loaned by the investors and the banks is the surplus derived from the enterprise, thrift, and sacrifices of all hard working, prudent citizens and conservatively managed corporations, and is a species of general reservoir from which all forms of industry must draw. It is important to the agricultural industry, which depends on that reservoir in the same way as the railroad industry, that the rate of interest should not be unduly raised to the railways because of reduced net earnings, nor because of large issues of tax-free securities. If the interest rate to the railways rises, the interest rate to the farmer will also increase, for the capital market is on a competitive basis, and what effects the interest rate for one industry affects the rate for all industries. In this emphatic way does the independence of all industry, in our highly complex economic system disclose itself.

National Character of Commerce

The national character of commerce is becoming more and more apparent, and nothing has been made more evident through the investigations of this commission than this fact. It is witnessed by an increase in the average haul of commodities, by the wide distribution of many commodities, the production of which is centralized in a few localities, and by the competition of far-distant communities centralizing at points of concentrated use and consumption. All of this emphasizes the wisdom of the recognition and assertion of the paramount authority of the federal government in the control of interstate transportation. On the other hand, the widely differing conditions found in different states and communities emphasizes the importance of state control of such matters as are of local concern, including the rates and regulations local and only statewide in application. No centralized authority, however efficient or democratic, can with reasonable dispatch and with due regard for local requirements consider and finally determine the vast number of questions of rates, regulations, practices, and facilities which properly and inevitably arise in connection with concerns wholly within a state; and the held of regulation of state legislatures and of state commissions ought and will continue to be a very wide one. It is probable that no court will ever be able to lay down a rule eliminating the respective federal and state powers with respect to transportation with sufficient definiteness to avoid conflicts in the future in the exercise of their representative powers.

All of these considerations, it seems to us, lead logically to the conclusion that there is need for the establishment of regional agencies of the Interstate Commerce Commission to consider and adjudicate questions of regional application and to co-operate with the state commissions with a view of minimizing conflicts between state and federal regulations as to rates, facilities, and practices, and in order that these conflicts may be disposed of in larger measure by consultation and co-operation between state and national authorities, thus limiting the range and number of cases to be judicially determined by the federal authorities. In such regional agencies the state commission should have authoritative representation in all cases involving intrastate rates, facilities, and practices in which the state commission is interested.

Chairman Anderson has received the following letter from President Harding with respect to the proposed National Transportation Institute:

"I want to thank you for your communications, both personal and otherwise, concerning the program for organizing a National Transportation Institute. I was much impressed with your statement of the purpose of such an organization and am convinced that it would be of great practical usefulness. The broad and outstanding study of the entire transportation problem is unquestionably a serious national matter—indeed I think I may well say a serious world necessity, at this time. Such an organization as you are proposing ought to become a power in connection with the nation-wide consideration of these problems and a useful directing force in connection with the determination of public policy."

In the *Railway Age* of July 1 a letter to Mr. Anderson

regarding the proposed Transportation Institute which was written by Representative Webster of Washington was erroneously attributed to Chairman Winslow, chairman of the House committee on interstate and foreign commerce.

Contract for Exchange of Materials Held Not to Constitute Control

WASHINGTON, D. C.

THE INTERSTATE COMMERCE COMMISSION has dismissed the joint application of the New York, Chicago & St. Louis and the Lake Erie & Western for approval of a contract for the exchange of materials and supplies between the two companies, which was filed on the theory that such a contract might come within the provisions of paragraph 2 of Section 5 of the interstate commerce act, which provides for the acquisition of control of one carrier by another to the extent authorized by the commission. The application was filed for the two roads by W. A. Colston, vice-president, who was recently director of the Bureau of Finance of the Interstate Commerce Commission, but the commission holds that the proposed contract does not constitute a means of acquiring control within the meaning of the paragraph of the law referred to.

The contract provides, in effect, that whenever either company shall have, or may conveniently obtain, any materials or supplies not needed for its own immediate purposes, it shall, when desired by the other company, furnish such materials or supplies to the other at not more than cost, plus 10 per cent of cost, freight charges, and the cost of labor employed in handling, applying or fabricating any such materials and supplies; that the officers of said companies may purchase or obtain any necessary materials and supplies on joint account and when so obtained they may be furnished when desired to either of the companies, and when so furnished shall be accounted for in all respects in conformity with the assumption that the lines of said companies form one operating system under common control and management, irrespective of separate ownership and accounting; and that, so far as transactions between said companies are involved, the agreement shall apply to all dealings in supplies or other articles of commerce and all contracts for construction or maintenance, or other matters contemplated by section 10 of the so-called Clayton Anti-trust act.

The applicants stated that the object of the agreement is to relieve the companies of the necessity of complying with this provision of the Clayton act to the extent that it may be involved in transactions between them, thereby avoiding inconvenience and delay and permitting more efficient and economical operation. The applicants have certain common directors and officers, the holding of such positions having been authorized by the commission, and the same interests own a majority of the out-standing capital stock of both companies.

The commission says in its report:

"The proposed contract may be said to give each company a certain measure of control over specific transactions and contracts of the other and to facilitate the establishment of a relation that will make possible a closer union for operation and management. The applicants contend that common control of two or more corporations by means of common directors and officers is one of the means of control which is recognized by the act, and that the additional measure of control afforded by this contract is supplementary thereto, and simply carries the common control one step farther towards an ultimate complete unification of operation and management without resulting in any corresponding unity of ownership.

"The control provided for by this paragraph, however, is control over one or more carriers by another carrier and not mutual control by the two carriers over the same subject-matter. Moreover, we think the 'control' that the framers of the act had in mind is the full and complete control which may be exercised by the owner of the majority of the capital stock of a carrier, or by the lessee of the property, and not the control which might be exercised by one carrier in the purchase of materials and supplies for another carrier. It is obvious that, unless the paragraph gives us authority to make an order approving this contract, no expression of approval on our part would have the effect of relieving the applicants from the possible application of restrictive laws. Inasmuch as we are of the opinion that paragraph (2) has no application to the transaction involved herein, it follows that the application must be dismissed."

Novel Form of Highway Crossing Protection

AN INTERESTING type of highway crossing protection, designed to retard the speed of automobiles when approaching railway tracks, has been installed recently on the Eastern division of the Chicago & North Western about two miles west of Meadow Grove, Neb. This consists of the construction of a mound of stone in a conspicuous position in the center of the highway 100 ft. on each side, or 50 ft. beyond the limits of the right-of-way. Being located in the center of the highway these mounds are in the most conspicuous position possible. Automobile drivers are made aware of the fact that they are approaching a railroad crossing and must put forth physical effort to retard fast moving cars

A View of the Crossing

and steer them around the mound. If they then find a train approaching they still have nearly 100 ft. in which to stop, which distance is sufficient for speeds up to 30 to 35 miles per hour. This type of "retard" avoids the objection to the "humps" on account of the danger of damaging automobiles, whose drivers might not know of their presence and who might overlook or disregard the advance warning signs. In this instance the county did the grading and the railway furnished the signs and the riprap.

We are indebted for the above information to C. F. Womeldorf, division engineer, Chicago & North Western, under whose direction the crossing was built.

THE CONSTRUCTION ACTIVITY in the United States is having its effect in Quebec. The mills are kept busy on lumber for shipment to the New England and middle states. During the second week of May one company shipped 70 carloads of lumber to New York.

Operating Characteristics of Missouri Pacific

Good Progress Made in Rehabilitation and Financial Reconstruction of This Property

THE MISSOURI PACIFIC'S corporate net after fixed charges for the year 1921 was $3,537,010 as compared with $5,033,075 in 1920 and with $4,240,859 in 1919. However, the relative magnitude of these figures affords no adequate index of the results secured during the past year since the above figures for the years 1919 and 1920 take into account the compensation received from the government under the regime of the Railroad Administration and also of the six months' guarantee period immediately following. The road did not earn its rental during federal control.

A somewhat better measure of the operating results for 1920 is obtained by comparing the net after rental for the last four years. This was $11,821,976 in 1918 and $4,563,698 in 1919. It represented a deficit of $4,617,009 in 1920, which was changed to a net of $10,230,848 in 1921. In other words, the result in 1921 was an improvement as compared with the previous year of $14,853,857.

In making this improvement in 1921 over the results for 1920, the Missouri Pacific had the advantage of a rather minor decrease in operating revenues as compared with that experienced by many other railroads, namely, 7½ per cent. Therefore, by effecting a reduction of 18.78 per cent in operating expenses as compared with 1920, it was possible to obtain a net revenue from railway operations of $18,092,094 as compared with $3,284,672 in 1920.

The 1921 Results

In 1921 the Missouri Pacific carried 27,045,102 tons of freight. This compared with 33,960,017 tons in 1920 and was a reduction of 20.36 per cent. Of this total traffic, 24.37 per cent was in products of agriculture; 2.93 per cent, products of animals; 35.38 per cent, products of mines; 14.89 per cent, products of forests, and 18.92, manufactures and miscellaneous. In 1921, as against 1920, there were increases of 7.74 per cent in agricultural and 5.25 per cent in animal products. There were decreases of 25.46 per cent in products of mines; of 30.24 per cent in lumber and of 27.91 per cent in manufactures.

The freight revenues totaled $81,660,401 or 5.64 per cent less than in 1920. The total operating revenues were $109,745,075 as compared with $118,721,428 in 1920, a reduction of $8,976,350 or 7.56 per cent. The Missouri Pacific's characteristics are reflected in an average haul for the year 1921 of 238 miles. The average receipts per ton-mile in 1921 were 1.27 cents as compared with 1.07 in 1920, an increase of 18.03 per cent.

As already indicated, the system in 1921 made a reduction of 18.78 per cent in operating expenses. It operated at a ratio of 83.87 in 1921, which is considerably better than the figure of 95.45 for 1920. The operating expenses for 1921 were actually $92,042,456 as compared with $113,319,940 in 1920. In maintenance of equipment, the reduction was $6,827,400 or 22.94 per cent, despite the fact that the Missouri Pacific reported only 8.2 per cent bad order cars on May 1. In maintenance of way, the reduction in expenses was $6,617,802 or 26.74 per cent. A reduction of this proportion in the maintenance of way expenditures of any railroad always raises the question as to the possibility of some deferred maintenance.

The Missouri Pacific has a rather different position among railroads today from that which it had when it was the central link and most important part of a nearly completed transcontinental system. The intervening period, to put it in its briefest terms, has been devoted to rehabilitation and to financial reconstruction. The Missouri Pacific has made good progress in overcoming the difficulties arising from the failure of the transcontinental project.

The Missouri Pacific System's operated mileage totals 7,500. Of this it owns 6,783 and operates 517 miles under lease or trackage rights. Its lines reach 10 states and serve a very productive territory. The main lines of the system are in two groups—the group of the original Missouri Pacific and those of the former St. Louis, Iron Mountain & Southern. The former includes the lines from St. Louis to Kansas City, from Kansas City to Omaha and from Kansas City to Pueblo, Colo. The main stem of the Iron Mountain extends from St. Louis to Texarkana, Ark., and is supplemented by the lines to Alexandria, La., from which trackage rights over the Texas & Pacific bring the Missouri Pacific into New Orleans. The line from St. Louis to Kansas City receives its importance because it is the main stem of that part of the Missouri Pacific System. From Omaha to Kansas City is a good territory because of the large livestock and dressed meat business. The line from Kansas City to Pueblo gives the system a large grain business, and a connection with the Denver & Rio Grande Western.

The Iron Mountain section is the most productive part of the system. Its Illinois division serves the coal districts of Southern Illinois, the Missouri Pacific being well situated in this field and one of the leading carriers. The Missouri Pacific also serves coal fields in Arkansas and Kansas but these are of less importance than the Illinois fields. Bituminous coal constitutes about 20 per cent of its total tonnage. The Iron Mountain line also serves a lumber territory in Arkansas and Louisiana. About 15 per cent of the total tonnage on the whole system is products of forests. A third factor in the traffic of the southern lines is agriculture—important on this line now and rapidly expanding.

The line from St. Louis to Texarkana, Ark., as already noted, is the main stem of the Iron Mountain. It is over this line that the Missouri Pacific operates its best passenger train—the Sunshine Special. This train runs from St. Louis to San Antonio, Tex., over the Missouri Pacific to Texarkana, Texas & Pacific to Longview, thence via the International & Great Northern. The line as thus mapped out is likewise an important freight route. Because of the International & Great Northern's position at Laredo, as the road which has the largest interchange business with the Mexican lines of any of the United States carriers, the route has great potential value, which should be realized when conditions in Mexico again become normal. The Missouri Pacific also operates another through freight line to the south. This uses the Illinois division to Thebes, thence by means of trackage rights over the St. Louis Southwestern tracks to Paragould and from there on it uses the Missouri Pacific rails to Alexandria, La., reaching New Orleans over the Texas & Pacific.

Not the least among the physical advantages of the Missouri Pacific is its strategic position in the St. Louis terminals, whereby it is in large measure independent of the St. Louis Terminal Railroad Association so necessary to practically all of the other trunk lines that serve the St. Louis-East St. Louis Terminal area. The Missouri Pacific, through the possession of a car ferry with convenient connections, is the only road that has its own independent river crossing at that point. It has independent trackage to a large proportion of the industries. As a result of these advantages the Missouri Pacific with a main line mileage of only about nine per cent of the aggregate main line mileage

of all the railroads entering the "Mound City," according to comparisons made late in 1920, handled nearly 20 per cent of all the carload freight and 15 per cent of l.c.l. freight in the St. Louis terminals.

The Missouri Pacific's main lines are probably as good as those of any line occupying the same territory. They are laid with 85-lb. rail, or heavier. The company's standard is 90-lb., although there is some 100-lb. rail—242 miles between Poplar Bluff, Mo., and Little Rock, Ark., on the main line to Texarkana. The remainder of this line is laid with 90-lb. rail. Rail of this weight is also laid on the larger part of the line between St. Louis and Kansas City and for a distance out of Kansas City on the lines to Omaha and Pueblo. The mileage of 90-lb. rail totals 838 and that of 85-lb. rail, 2,717. Of the system's total mileage of running tracks, 3.39 per cent is laid with 100-lb. rail; 11.74 per cent with 90-lb. and 38.08 per cent with 85-lb. Of the total mileage, 80.39 per cent is ballasted: 2,185 miles, or 30.62 per cent, with gravel; 1,350 miles, or 18.92 per cent, with cinders and slag; 1,913 miles, or 26.81 per cent, with zinc, chatts, etc. White oak and red oak ties are used. More recently a larger percentage of treated ties is being applied The system has 358 miles of automatic block signals from St. Louis to Jefferson City and from St. Louis to Poplar Bluff. Manual block signals are used on most of the other main lines, the mileage of these signals totaling 2,210. Telephone dispatching is the rule on the main lines and the system has 2,909 miles of it.

Some Operating Details

The Missouri Pacific compiles some extremely complete statistics and it is from some of these figures covering the months from September, 1920, to December, 1921, that the following details were obtained:

The highest "out-of-pocket" cost per 1,000 gross ton-miles for the period in question was in December, 1920, when it amounted to 119.6 cents. In October, 1920, it was 99.9 cents. In October, 1921, however, it had been reduced to 81.5 cents and in December, 1921, it was 87.7 cents. The December, 1920, figure included wages amounting to 47.6. In October, 1921, this item had been reduced to 34.6 and in December, 1921, it was 35.1. There was a wage reduction effective July 1, 1921, which must be taken into consideration. In the period, however, there was a steady decrease in train service overtime. The cost per train mile for September, 1920, was 14.20 cents and for October, 1920, it was 13.89 cents. There was a gradual improvement throughout the entire year 1921, when in October of that year it had reached the low average of 9.04 cents, the marked improvement being made particularly in through freight service. Average overtime expenditure per freight train mile for the calendar year 1920 was 11.66 cents, compared with an average of 8.17 cents for the calendar year 1921. The 1920 figure for overtime per 1,000 gross ton-miles was 9.02 cents; in 1921, but 6.34 cents.

In the case of fuel, the cost per 1,000 gross ton-miles in December, 1920, was 47.8; in October, 1921, 31.3 cents and in December, 1921, 34.7 cents. This reflected a decrease in cost of coal from $4.12 per ton in October, 1920, to $3.50 in October, 1921. There was also a reduction in consumption by reason of greater economy for the year 1921, compared with the year 1920, based upon the unit of measure—per ton-mile—the saving in reduced consumption measured by the work performed was 128,234 tons, or $446,000.

The unit of efficiency in yard operations is the average number of cars handled per switch engine hour. This increased from 12.5 cars in September, 1920, to 15.9 cars in October, 1921. The average for November, 1921, was 15 cars and the average for December, 1921, was 14.8 cars. The labor cost per car handled decreased from 47.4 cents in September, 1920, to 33 cents in October, 1921. The average for December, 1921, was only 35.9 cents. While a portion of this decrease was due to the reduction in wages, the substantial increase in the number of cars handled per engine hour indicates that the larger portion of the reduced cost was obtained through greater efficiency.

The unit of measure in handling merchandise in the warehouses is the average number of tons handled per man hour. In September, 1920, tons handled per man hour (truck-loaders, stowers and truckers) amounted to 0.79, while for December, 1921, the average had increased to 1.22 tons per man hour, or 54.4 per cent. The average labor cost per ton in September, 1921, was 103.2 cents. This average had decreased to 68.6 cents in December, 1921, and measuring the results for each month since September, 1920, making proper allowance for the decreased wages effective July 1, 1921, the saving for the 15 months' period amounted to $314,000.

Transportation enginehouse expense likewise showed a marked improvement. The unit of measure in this case is man hours per engine handled. Prior to April, 1921, the Missouri Pacific statistics included both mechanical and transportation. Subsequent to April, 1921, the mechanical time was excluded, consequently the first month of exclusive transportation handling susceptible of comparison is April. The average for that month was 12.72 man hours per engine. This had decreased to 11.32 in October, 1921, the average for November and December being 11.95 and 12.00 man hours, respectively. The average labor cost decreased from $7.47 per engine to $5.62 per engine.

1922 Improvement Program

The Missouri Pacific for 1922 has an improvement program which calls for about $8,000,000. In this total the most important item is a $2,000,000 double track project on the eastern division (St. Louis to Kansas City). This includes 30 miles of double track extending westward from Kirkwood, a short distance out of St. Louis. This work is required to overcome traffic congestion between St. Louis and Jefferson City, Mo. Other items in the program include a new bridge, built in connection with a levee project, at Corning, $220,000; river protection, $100,000; 14th Street viaduct in St. Louis, Missouri Pacific share, $115,000; new bridge over the Osage river, $220,000; water projects at Hoisington, Kan., $250,000 (total cost to be $500,000); filling in bridges on the White River division (in southwest Missouri), $215,000; work equipment, $325,000, etc. About 20,000 tons of new rail are to be laid.

Photo by Keystone

Railroads Play Important Part in Recent Fighting Between Wu-Pei-fu and Chang Tso-lin in China

Factors Underlying Primacy of American Railways

Importance of Developing and Maintaining the Right Relationships Between Managements and Men

THE FIFTIETH anniversary of the Railroad Y.M.C.A. was celebrated widely throughout the United States during the week beginning June 11. At the celebration in St. Louis, which included a luncheon at the Statler Hotel on June 12 and a program during the evening of the same day at the Association building, the following message was read from President Harding.

President Harding Commends Railroad Y. M. C. A.

"The half century of progress which has characterized the work of the Railroad Department of the Young Men's Christian Association is of distinct national significance. The 125,000 members, or the approximately $9,000,000 in buildings and equipment, or the $6,500,000 annual expenditure, indicative as they are, do not adequately measure either the service which has been rendered in the lives, character, and efficiency of the men or the safety of life and property upon the railroads. It is a privilege to express the deep interest I have in the welfare of the great work which is done in St. Louis as well as in all parts of the United States."

On the same day a luncheon was held at the Hotel Commodore, New York, presided over by President Truesdale of the Delaware, Lackawanna & Western, and including a large gathering of railway executives and representative railway men. Addresses were made by President J. H. Hustis of the Boston & Maine; Samuel Rea, president of the Pennsylvania Lines; Dr. John R. Mott, general secretary of the International Committee of the Y.M.C.A.; L. J. Tate, conductor on the Long Island Railroad; Fred Ferguson, a trainman on the New York Central, and Ward W. Adair, secretary of the New York City Railroad Y.M.C.A.

At the close of his address Mr. Hustis said: "We recognize, too, that the old order of things has passed away and we believe that while conditions and the viewpoint of all has changed, human nature is very much as it has always been. The solution is in the restoration of confidence between men and management. The duty of finding the methods by which this can be accomplished is quite, if not more, incumbent on those managing the railroad properties than on any other agency. But whatever the method or the organization used, it must, if it is to be successful, be based on the principle for which the Railroad Association stands—that of service."

Doctor Mott's Address

Doctor Mott spoke on the factors underlying the leadership of the railways of America, as follows:

It has been my lot to devote much of my life abroad as well as here in America to travelling work. I find myself, therefore, always at home in the midst of railway men, having spent nearly 35 years in almost incessant travel among the nations. I am prepared to appreciate sympathetically as well as with my whole mind's assent the finer aspects of this work in honor of which we meet to-day, and also lying back of that, the work of the railways themselves. Every time I come back from a foreign journey, whether from the Orient, or from the western nations, or from those that lie south of us, I have a deepened sense of appreciation of the unique and stupendous service rendered by the railways of America to the upbuilding of the life of our nation.

It is due to the railways that we have had the almost unbelievable development of the vast material resources of the American continent. It is due to the railway service, and this is often overlooked, that there has been facilitated so largely the nation-wide dissemination of intelligence as well as the physical and social well-being of the American people. Likewise, the railways have done more than any other one factor to promote the unity of the nation. Just as the Civil War fused together forever the American states politically, so the ceaseless shuttling of the railways has made possible and done much to realize the social unification and the real spiritual solidarity of our strongly sectional and markedly cosmopolitan population. How much that means only those of us fully appreciate who travel widely over the land. Moreover, the American people do not realize the great contribution of our railways in preventing some of the great ills and perils that have well nigh undone other nations and have actually brought on some of the greatest calamities of mankind.

Importance of Adequate Transportation

When on my recent visit to China I heard of the terrible havoc and suffering caused by the famine, I said, "How much of this might have been prevented by an adequate railway service." When in India I have found, even under the matchless administration of Britain, how great famines at times still obtain among the three hundred millions of Hindustan, and have said, "What would not be the situation were it not for the railways they have, and what is not a widely extending country saved by having an adequate railway system?" When I was in Russia in the summer of 1917 with my good friend, General Scott, sent by the President as members of the Root Mission, and we saw the crumbling of the Russian Army and the rise of Bolshevism, we recognized that the principal thing which made this great catastrophe possible was the breakdown of the means of communication. The reason why we have had to pour tens of millions of dollars worth of provisions into Russia this year to save them from starvation, and the reason why the great political distemper of Bolshevism, like a malignant disease, still eats its way into the heart of Russia, is because of insufficient transportation.

Think also of the great contribution of American railways in opening in the railway service boundless opportunity to successive millions of men for useful work and for advancement. Our railways constitute one of the greatest, if not the greatest, school of democracy we have.

Why is it that the American railways hold the primacy among the railroad systems of the nations? It is a fact familiar to those present that America has practically one-half of the railway mileage of the entire world. That, however, is not what impresses us so much as the causes which have given the railways of America their unique distinction and great achieving power.

What are some of the factors which have made the American railways great and given them leadership among the railway systems of the world? I may be far afield but I think one of the factors has been the spaciousness of the opportunity. They had a vast continent thrust upon them to be opened, settled, subdued and developed. There was something about this which appealed powerfully to the imagination and also to the adventurous and heroic in strong men. It served to call out the best that was in them. Someone might say: "Is there not a great continent in Africa? What about Siberia which is nearly three times the size of Canada or the United States?" Yes, their day will come, and I predict that the very spaciousness of those vast areas, which grew upon me as I made my long journeys over them, will

yet challenge some of the greatest minds and release the latent energies not only of the Russian people but also of other nations whose co-operation they must have.

Why America's Railways Excel

The admitted leadership of American railways may also be explained by the freedom which they have had to evolve plans and project them through the decades, notwithstanding embarrassing and harassing restrictive legislation—legislation which in its practical effects or outworking has often proved to have been unpatriotic. When we contrast the developments on this side of the Atlantic with those in the European nations, and even more with those in Latin America, we recognize that we have had a measure of liberty that has made possible our showing what railways can do and how they can serve the interests of a great people.

Another factor that explains the greatness of our railways has been the eminent leadership which these enterprises have had. I make bold to say that there is no work in America or in any other country, which has called out among men more power of vision, more capacity for initiative, more organizing ability, that is, the ability to wield and combine men, than has the leadership of the railway systems of this country. Undoubtedly another cause has been not only the power of mentality and personality to which I have called attention, but likewise the money power. What undertaking in America or in any other nation has had so largely poured out upon it the great energies of capital, not only of the rich but also of what we might call associated poverty. What project have we today that is more truly American?

Then I like to add another factor that has made us forge to the front. That has been our power to co-operate. I remember the discerning remark of Senator Root, "You may judge the degree of advancement of a nation's civilization by its ability to co-operate with other nations." This is just as true of companies as it is of nations. Judging by this test, the railway companies of this country have evolved into a high stage of advancement and present an example of which we may be proud. We all remember the days of keen and remorseless competition, even unto warfare. It sometimes had its advantages in calling out the latent capacities of men and companies; but we have evolved, I repeat, into that state where railways, notwithstanding centrifugal energies, have shown their ability to co-operate with one another, and, what I sometimes think is even more striking, have developed unusual capacities of co-operation internally. When we think of troubles between companies and men we may at times feel depressed, and wonder whether or not this point is true, but if we contrast what we have here with what they have in certain other nations, we shall find abundant ground for encouragement and hope.

Establishing Right Relationships

Were I to mention another factor, it would be to emphasize the general character and spirit of the men in the service from top to bottom. I do not wonder that you are proud of this service. Nor do I wonder that the thing that causes us most solicitude is the fact that at times we are conscious that there is not the desired solidarity, or the sense of the solidarity that does exist. This leads us right into the heart of what has brought us here to-day.

Among the influences that have made possible the remarkable personnel of the American railway systems is the work of the Railroad Y.M.C.A. It deserves to be ranked very high indeed if we may judge by the testimony of the railway officials. What agency has begun to do as much to promote right character, right relationships and right spirit among the men in the varied services as has the Y.M.C.A.?

The word that I suppose we heard most frequently in the war was the word "morale." You will remember the dictum of Napoleon that morale is to other factors in war as three to one. The World War was a war of morales. You will recall that Hindenburg in the early days of the war said that the victory would ultimately be achieved by the nation that had the strongest nerves. I do not like that word as well as I like the word "morale," which represents, as I see it, the spirit of men.

It will be interesting to remind ourselves of what it was that at times tended to destroy the morale of men in the armies. War-tiredness in some cases was the cause; again it was idleness; at other times it was uncertainty or doubt; and not infrequently it was what we called enemy propaganda. These were among the principal influences. On the other hand, what were the causes that contributed most powerfully to the building up and maintaining of high morale? As I answer this question my answer will constitute in some respects the best outline I could give of the work of the Railroad Y.M.C.A., because of what this organization is striving to do along railway lines of the country is to promote the right morale, that is right the character, attitude and spirit of the men. I would, therefore, ask the question again: What were the factors in the war that did most to maintain and strengthen morale? One of them undoubtedly was the promotion of the physical comfort of the men. That is one of the great objects of the Railroad Y.M.C.A. When you think what it does with its dormitories, restaurants, rest rooms, athletic features, its homelike lounges, you understand what we mean by the physical comfort of the men. A second factor that contributed to morale was the mental and heart contentment of the men. Again you will recall vividly the entertainments, the lectures, the reading rooms of the Army Y. huts and of the Railroad Y. buildings at terminal and division points, and you recognize the full force of this point.

The right use of the leisure hours had very much to do with preserving and strengthening morale. I trace nineteen-twentieths of the troubles among young men to unaccounted-for hours—sometimes an evening off, sometimes a day, sometimes a week-end. It is to these vacant hours that I trace the lapses and falls of men. We cannot well overstate the importance of a program such as that of the Association to occupy usefully the vacant spaces in the time of men.

Another thing that contributed much to feeding the morale of men in the war was the opportunity the Association afforded them to change their minds. After spending long days and nights in the trenches, or after being on the battlefield where they witnessed scenes and had experiences which they would fain forget, or after the irksome routine of camp life, to be able to go into a bright and cheerful room and mingle with their fellows and converse with the men and women workers in charge and enjoy the diverting games and uplifting ministries to mind and spirit, was the means of transforming their whole mental outlook.

Another influence that made for morale was the consciousness the men had that they were not forgotten, that the people back at home—the citizens of their native land—believed in them, were indeed interested in them, and followed them, not simply through government taxes but through such welfare organizations as the Y.M.C.A. Tens of millions were contributed for Y huts, equipment and facilities. The same influence is exerted by the Railroad Y. with its generous backing from the companies and their stockholders and friends.

The secretarial leadership of this work has also had a profound influence. I can speak freely on this point because I am not known technically as a Railroad Y.M.C.A. secretary. But I know these secretaries and how they have spent themselves and how they count it a high honor to be of service to the railway men. They have helped immeasurably, in my judgment, to keep alive the ideals that have done so much to feed the spirit and maintain the morale of the men.

Let me emphasize as a chief factor the ministry of pure religion, the religion that St. James spoke of as pure and undefiled, which is being exemplified, lived and communicated in the religious program of these Associations. What did this not mean to men going into battle; what has it not meant to men since in the more difficult period following the armistice; what has it not meant to millions of men in the railroad service, who through these Associations have come under the wonderful, superhuman influence of Jesus Christ.

The Railroad Y. M. C. A.

Well, therefore, may we today, on the turning of the fiftieth milestone of the work of the Railroad Y.M.C.A., pay our tribute to this nation-wide, beneficent, efficient and fruitful organization. It has accomplished a great work. With its hundreds of Associations, with its scores of thousands of members, with its large property interests of many millions, with the backing of nearly every railway company of importance in the land, with the wise outreach of its influence to other lands, it is on the threshold of vastly greater achievements.

If I were to mention another great result that has been achieved and is being increasingly achieved, next to its influence on the character and spirit of the men, I would speak of the unifying power of the Railroad Y.M.C.A. In these recent fateful and tragic years we have witnessed an alarming development and manifestation of the divisive forces of mankind. I sometimes think the greatest problem before us for the next 15 years is the racial problem. Not only the divisive tendencies among the races but among the nations. Nor would I overlook another great divisive tendency—that in the social and industrial order. The conflict is on. What does it not mean that we have an organization which for 50 years has shown its ability, as no other society with which I am familiar, to unite in one membership, one program and one objective, the employers and employees, and this in a voluntary and not an obligatory way, with the largest possible freedom of expression and action, and, therefore, ensuring the finest and most effective cooperation? What has it not meant?

I am not surprised that the other great industries of the world have finally been convinced after watching for years this practice game of the Railway Y., and now we cannot keep up with their demand for the extension of the Y.M.C.A. work on the railway Association model to their industries. Nor should we wonder that industrial leaders in Europe and in Asia have requested that we send experts to study their fields at first hand, and to plan agencies and facilities for their service. Discerning observers recognize afresh the stabilizing and steady guiding power of this great work.

In a time of strain like the present, it assumes added meaning and importance. To my mind, we are summoned at a moment like this to expand greatly our plans. There are some things on which we have to call time, but this is not one of them. This is one of the projects from the nature of the case that should be expanded until the [illegible]ful network of the organization is spread much more intimately over all classes of men throughout all the railways of America. We want to keep in mind what the French call "grand strategy." By grand strategy they mean that which takes in the whole map—all the fronts.

As I look over our great American Republic and notice the spaces that are without these facilities and without the helpful working of these vital and steadying processes, I say let us have grand strategy that takes in every railway system in its entirety. To this end we must expand greatly the resources for this work. So far as I can see there is no more higher multiplying use of money right now than that of relating it to these plans, to influence aright the ideals, the character, the spirit, the efficiency, the relationships, the output of the men to whom we commit such unparalleled interests of property and of human life.

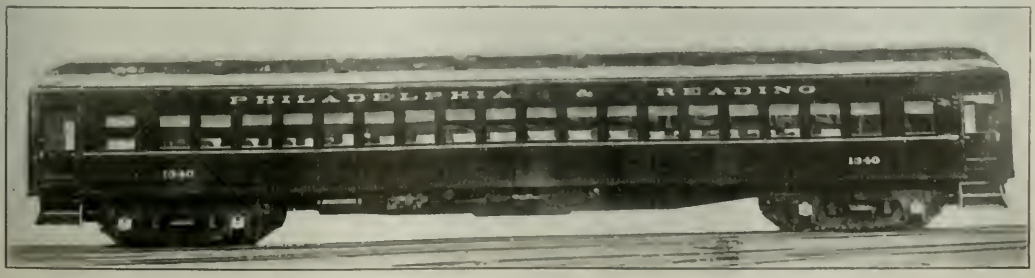
New Steel Passenger Cars for the Philadelphia & Reading

THE FIRST deliveries of cars for the Philadelphia & Reading on an order for 55 main line all-steel passenger equipment cars have been made recently by the Harlan plant, Wilmington, Del., of the Bethlehem Shipbuilding Corporation, Ltd. Thirty of the main line cars ordered from the

Interior of the Coach

Bethlehem Company are all-steel passenger coaches and five are all-steel combination passenger and baggage cars.

These cars are all 63 ft. in length, the coaches being of the wide vestibule type with a seating capacity of 78; the



New 63-ft. Steel Coaches for the Philadelphia & Reading

combination passenger and baggage cars have a seating capacity of 51. Hale & Kilburn Walkover design seats upholstered in Philadelphia & Reading standard blue plush are used in the coaches, and black fabricoid is used in the combination cars. Safety Car Heating and Lighting Company body hung electric light equipment of the latest type is installed in each car, and the same company's Thermo-Jet heating system is used. Current for lighting is furnished by the Electric Storage Battery Company's 300 ampere hour, type No. 13 batteries. Gould buffers and draft gear, Pitt couplers and Westinghouse universal control air brakes are part of each car's equipment.

The interiors of both coaches and passenger compartments of the combination cars are plain steel finished in imitation mahogany, and the baggage compartments are painted and enameled buff color on the side walls with the upper and lower decks painted and enameled white. The interiors of all cars are insulated with three-ply Salamander, and the headlining is of fire-proof agasote painted to harmonize with the interiors. The exteriors are painted Philadelphia & Reading standard body color with gold lettering. Each car is equipped with four-wheel Commonwealth cast steel trucks with 36 in. forged steel wheels and clasp brakes designed by the builder.

In addition to the above order the Harlan plant also has under construction for the Philadelphia & Reading 50 all-steel cars for suburban traffic, 45 of these being passenger cars and five combination passenger and baggage. These cars are designed to have strength equal to the main line cars and are in every respect high grade cars for suburban traffic.

President Asks Arbitration of Coal Strike

WASHINGTON, D. C.

A PLAN FOR a settlement of the coal strike by arbitration and an immediate resumption of mining was proposed by President Harding on Monday, July 10, to the conference of coal operators and union leaders which he had summoned to Washington and which had been in a state of deadlock for the week during which they had been holding meetings among themselves and in the presence of Secretaries Hoover, Davis and Fall. The plan was not immediately accepted, however. The mine union leaders said it would be necessary to first hold a meeting of their policy committee, which was called for Saturday, and the representatives of the operators also asked for further time for consideration.

The President proposed that the mine workers return to work on the scale of wages which expired last March 31 and which would be continued in effect until August 10. A coal commission would be created at once, consisting of three members selected by the mine workers, three selected by the mine operators and five to be named by the President, all decisions of the commission to be accepted as final. This commission would determine, if possible, within 30 days a temporary basic wage scale for the miners on strike, which would be effective until March 1, 1923. In event that the commission is unable to report this scale by August 10, it would have power to direct continued work on the 1922 scale until the superseding scale is ready. The commission would also investigate exhaustively every phase of the coal industry, and the President promised to ask Congress to confer authority for the most thorough investigation and make appropriations necessary for the work. The commission would be asked to make recommendations looking to the establishment and maintenance of industrial peace in the coal industry, the elimination of waste due to intermittency and instability, and suggest plans for a dependable fuel supply.

The President in addressing the conference said that the government required the parties to the dispute to settle it among themselves. The government could not settle it for them and it will force no man to work against his free will, nor force men to employ men against the free exercise of an employer's rights.

The operators in a statement to the press pointed out that they had already proposed that a committee of operators and miners be charged with the grouping of the districts where possible and mutually agreeable, and that a board of arbitration be set up by the President in each group or district to report on or before August 1. They also suggested that a board be appointed by the President to state the fundamental problem of the bituminous coal industry and to make recommendations. The proposals of the operators, however, were promptly rejected by the union.

Pere Marquette Valuation

WASHINGTON, D. C.

THE INTERSTATE Commerce Commission in its tentative valuation report on the Pere Marquette, as of June 30, 1915, finds a final value of $63,309,242 for the property used, including the leased lines, the Grand Rapids, Kalkaska & Southeastern, Huron & Western and Chicago & West Michigan, and $60,522,576 for the property owned. The used property covers 1,829.99 miles of first main track and 2,613.97 miles of all tracks. Lines operated in Canada are excluded.

The outstanding capitalization on the valuation date was $108,837,176 of which the report says $7,125,790 is only a nominal liability due to securities held by or for the carrier and $101,711,386 constituted the actual liability to the public. The investment in road and equipment, including land, was stated by the carrier to be $87,100,296 but the report says that if certain readjustments were made the balance in this account would be decreased to $80,179,569.

The original cost to date cannot be fully ascertained, the report says, and no data supported by accounting records are obtainable as to the cost to predecessors of the carrier in creating and improving 838 miles of road now owned by the carrier. For creating the remaining 951 miles of road owned by the carrier on the date of valuation and for improving all the property owned, the report gives the recorded money outlay as $38,272,894 and the outlay in securities as $14,542,499, but says that from these items should be deducted certain amounts not definitely ascertainable representing expenditures on lines not now owned. The cost of reproduction new of the common carrier property other than land used is given as $66,730,170 and the cost of reproduction less depreciation as $50,103,559. The present value of the carrier lands is given as $7,511,047 and the value of materials and supplies on hand as $1,196,533.

ECONOMIC ASPECT OF POOR VISION.—In the examination of more than 10,000 employees in factories and commercial houses, 53 per cent were found with uncorrected faulty vision and 13 per cent had defects which were corrected, making a total of 66 per cent with defective eyes. This is the summary of a report of studies made by the Eye Sight Conservation Council of America, headquarters Times Building, New York city. In one manufacturing establishment over 70 per cent were found with eye defects. As an example of inefficiency and resulting waste, 20 per cent of the inspectors in a large factory were found to be unable to see sufficiently well to detect defects in the product they were inspecting. More attention has been given to the perfecting of machinery than to the correcting of physical defects in the workman. Every manager should see to it that the eyes of all associated with him are corrected to compensate for defects. It will pay from a purely business standpoint.

Freight Car Loading

WASHINGTON, D. C.

THE NUMBER of cars loaded with revenue freight for the week ended July 1, which was the last week before the 10 per cent reduction in freight rates took effect, as well as the last week before the shopmen's strike, was 876,896, or 960 less than the total for the preceding week. This was, however, an increase of over 100,000 as compared with the corresponding week of 1921, when the loading was 776,079 and only 14,725 less than the loading for the corresponding week of 1920, which was 891,621, although the coal loading was 62,365 cars less than in 1921 and 98,286 less than in 1920. Coal loading showed a decrease of over 2,000 cars as compared with the week before. There were increases as compared with the last year in all classes of commodities except coal, but there were decreases as compared with the week before in grain and grain products, live stock, coal, forest products and merchandise l.c.l. Increases as compared with 1920 were shown in the Pocahontas, Southern and North Western districts. The summary as compiled by the Car Service Division of the American Railway Association is given in the table below.

The freight car surplus for the period June 15 to 23 showed a further reduction to 255,685, which included 160,733 surplus coal cars and 62,577 box cars and for the period June 23 to 30 there was a further reduction to 239,225, which included 60,101 box cars and 147,558 coal cars. There were also scattering shortages amounting to some 4,803 cars.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS COMPARISON—TOTAL—THIS YEAR, LAST YEAR, TWO YEARS AGO—WEEK ENDED SATURDAY, JULY 1, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Misc. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	10,006	2,796	7,856	2,084	5,437	7,125	70,441	93,993	199,738	.....	.....
	1921	6,585	2,509	43,021	866	4,867	2,522	57,694	70,334	.....	188,398	218,267
Allegheny	1922	2,271	2,651	18,630	4,753	3,164	11,113	51,675	75,683	170,040	.....	.....
	1921	2,115	2,087	47,288	2,223	2,591	6,711	43,602	49,042	.....	155,659	172,073
Pocahontas	1922	169	145	31,331	254	1,489	29	6,165	4,111	43,993	.....	.....
	1921	119	116	24,681	167	1,309	14	4,883	3,965	.....	35,294	35,263
Southern	1922	3,734	2,126	23,167	1,281	19,349	1,264	37,598	40,031	128,550	.....	.....
	1921	3,018	1,597	19,120	382	14,902	495	35,546	37,102	.....	112,152	121,836
Northwestern	1922	10,093	8,189	5,415	1,567	16,816	41,893	30,817	40,451	156,041	.....	.....
	1921	10,143	6,961	5,677	490	11,574	39,513	28,439	32,538	.....	114,935	153,875
Central Western	1922	10,628	10,297	5,279	256	6,559	2,073	34,199	48,430	117,695	.....	.....
	1921	13,277	9,364	13,754	178	6,067	729	31,810	37,707	.....	112,886	128,272
Southwestern	1922	5,001	2,342	3,070	166	8,608	399	15,916	25,337	60,839	.....	.....
	1921	5,437	1,890	3,572	145	6,257	772	14,645	24,019	.....	56,755	62,035
Total Western districts	1922	25,717	20,828	13,764	1,989	31,983	45,145	80,932	114,217	334,575	.....	.....
	1921	28,857	18,215	23,003	813	23,896	41,034	74,894	94,064	.....	284,576	344,182
Total, all roads	1922	41,897	28,546	94,748	10,361	61,422	64,776	247,111	328,035	876,896	.....	.....
	1921	40,694	24,524	157,113	4,391	47,565	30,766	216,516	254,507	.....	776,079	.....
	1920	34,051	27,063	193,034	9,657	55,665	71,472	157,651	342,528	.....	.....	891,621
Increase compared with 1921		1,203	4,022	.....	5,970	13,857	34,010	30,592	73,528	100,817	.....	.....
Decrease compared with 1921		.....	.....	62,365	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared with 1920		7,846	1,483	.....	704	5,757	.....	89,460	.....	.....	.....	.....
Decrease compared with 1920		.....	.....	98,286	.....	.....	6,896	.....	14,793	14,725	.....	.....
July 1	1922	41,897	28,546	94,748	10,361	61,422	64,776	247,111	328,035	876,896	776,079	891,621
June 24	1922	38,411	29,934	96,960	9,466	64,271	64,294	249,193	325,337	877,856	775,447	911,503
June 17	1922	39,333	29,151	92,136	9,302	61,082	53,822	248,044	324,902	860,772	775,328	916,736
June 10	1922	40,035	29,765	94,824	9,008	62,358	46,372	248,405	315,235	846,002	787,283	930,976
June 3	1922	37,931	27,792	86,626	8,927	58,923	31,552	217,284	281,640	750,645	693,903	828,907

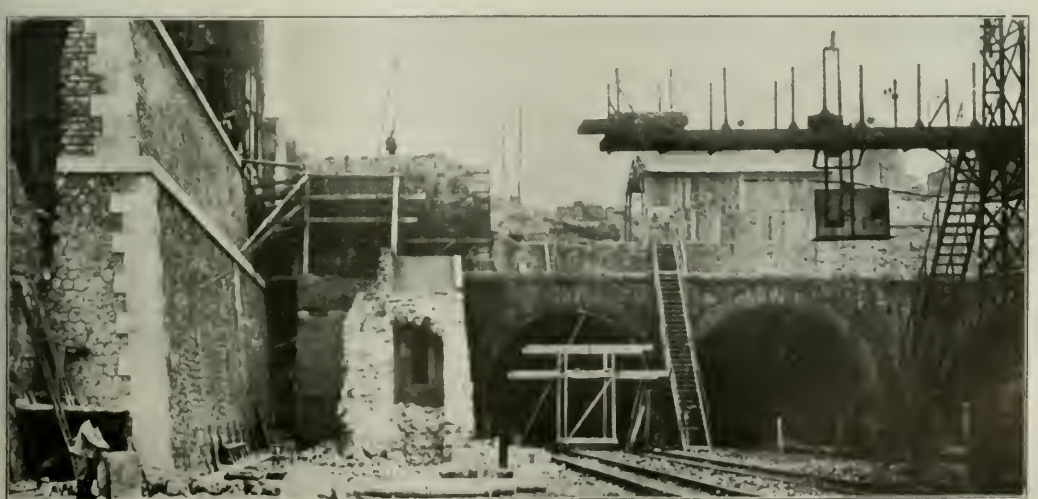


Photo by Kodel & Herbert

Batignolles Tunnel, Paris, the Scene of Disastrous Accidents, Being Converted into an Open Cut

General News Department

The Missouri Pacific "Scenic Limited," westbound from St. Louis to California, collided head-on with a local freight train near Kansas City, Mo., resulting in the death of five persons and the injury of forty.

The Delaware & Hudson and the New York, Ontario & Western railroads were on July 2 blocked by a flood between Carbondale, Pa., and Jermyn, 4 miles, for the fourth time within four weeks. The total damage done by this latest flood is estimated at more than $1,000,000.

The feasibility of motion pictures on a moving train was demonstrated on June 17 on train No. 3 of the Illinois Central, operating between Chicago and New Orleans. A curtain was hung at one end of the dining car with the chairs rearranged to face it. The passengers were then invited to the diner and a three-reel film was shown. The current for the projector was taken from the regular lighting circuit.

Members of Congress have received complaints from commercial organizations on the Pacific Coast and from other parts of the country against the alleged activity of the officials of the Southern Pacific regarding the Supreme Court decision ordering the merger of the Southern Pacific and the Central Pacific dissolved. The Peninsula Bureau of Chambers of Commerce and Associations, which met at Redwood City, California, petitioned members of Congress outlining the attitude of those commercial bodies against any reversal of the Supreme Court ruling in the dissolution case. Another petition was received from the Omaha Chamber of Commerce in which it is charged that "the Southern Pacific Company is making a determined effort, by appeals to senators and members of Congress, to nullify the effect of the decision of the Supreme Court in the Central Pacific case, requiring a separation of the Central Pacific Railroad from the Southern Pacific Company."

General Foremen's Convention

The International Railway General Foremen's Association has announced a tentative program for its convention to be held in Chicago, September 5-8 as follows: Repairs to Steel Cars and Appliances for Doing the Work; Labor Saving Devices in the Locomotive and Car Departments; Methods of Increasing Shop Output, and Engine Failures and Their Remedies.

A Correction

In an article entitled, "Large Size Boiler Plates," published on page 1620 of the *Railway Age* of June 20, 1922, the size of the boiler plates for the Southern Pacific 2-10-2 type locomotives was incorrectly stated as 223 in. by 150 in. by $\frac{3}{8}$ in. The actual sizes of the plates for the crown and side sheets were 247½ in. by 195½ in. by $\frac{3}{8}$ in. and for the wrapper sheets, 291 in. by 149 in. by $\frac{5}{8}$ in.

Quarterly Circular on Loss and Damage

The freight claim division of the American Railway Association has recently issued its quarterly circular on freight loss and damage expenditures as divided among the principal causes and commodities for the three months ending March 31. This statement shows a decrease of 49.2 per cent in the amount charged to loss and damage as compared to the same period in 1921. Members are urged to study their own cause and commodity ratios as they fluctuate from month to month, for the reason that an increase in the ratio, as compared to previous months, is indicative that decreases in that cause or commodity are not keeping pace with the list as a whole. The total loss and damage expenditure recorded for this three-month period is $14,852,103.

Interesting Colored Firemen in Fuel Economy

In connection with the fuel economy campaign on the Central of Georgia a meeting of colored firemen was recently held at Columbus, Ga., at which an address was delivered by Dr. M. L. Taylor. Dr. Taylor is a physician, one of the prominent colored citizens of Columbus and one who exerts a great deal of influence with the members of his race. It is sometimes difficult to secure the interest of colored firemen and Dr. Taylor's talk, which was widely commented on and was published in the Right Way Magazine, has served as a further encouragement to these employees in the efforts to save fuel.

Electric Power for the Pennsylvania

Electric energy, purchased from the Philadelphia Electric Company, will be used for the operation of the West Jersey and Seashore Electric line which runs between Camden and Atlantic City. An agreement has been reached between the Pennsylvania, which controls the West Jersey, with the electric company for the necessary work of building a connecting line. The power now used is generated by the railroad at its Westville plant. It has not been decided whether this plant will be abandoned or maintained for auxiliary and emergency purposes.

To obtain power from the new source, the Pennsylvania will run a line across its Delaware river bridge and connect with the West Jersey at Westville. The power line after reaching Delair, N. J., across the river from Bridesburg, will follow the old Haddonfield-Westville cut-off to Westville.

Annual Safety Congress Next Month

The Eleventh Annual Safety Congress will be held in Detroit, Mich., from August 28 to September 1. In the past this conference, which is promoted by the National Safety Council, a co-operative non-commercial organization of men, industries and communities interested in the prevention of accidents, has annually brought together 3,000 or more persons who are actively engaged in safety work in both the United States and Canada. This year invitations will be sent to 15,000 executives and safety workers and a large attendance is expected. Complete discussions of the various phases of industrial and public safety will be conducted at the meetings of the 20 different sections into which the council's activities are divided. These meetings will cover safety problems in a wide variety of fields. The steam railroad section will hold sessions on Tuesday and Wednesday, August 28 and 29. The subjects covered will include "Safety and Publicity," "Accident Prevention from the Standpoint of the Operating Department," "Report of Progress—Careful Crossing Campaign" and "Safety as Seen from the Pulpit."

Train Control on the Pennsylvania

The Pennsylvania Railroad has arranged with the Union Switch & Signal Company for the installation of continuous induction, full-speed train control system on 45 miles of single track and five miles of double track between Lewistown, Pa., and Sunbury. Alternating current track circuits and position light signals will be installed at the same time. This will require that a 4,400-volt, single-phase, 60-cycle transmission line be built. Speed control apparatus is being applied to eight freight and four passenger locomotives. It is expected that the installation will be completed and in full operation before fall.

This will be the first extensive installation working on the continuous induction principle. This system requires that a signal be transmitted to a train to permit it to proceed, while non-receipt of a signal results in stopping of the train. As continuous track circuit protection is installed, this provides that the train will be under control at all times, occupying or entering the main track

equipped with the installation. No apparatus is required along the roadway, as rails are used to conduct the [illegible] current which operates the engine apparatus, and the switch ahead of the train or another train backing into the block will cause the apparatus to be applied immediately. This system will provide against excessive and dangerous speed being attained and is designed with the intention of at no time relieving the engineman of responsibility for proper handling of his train.

Thirty-One Cars of Chocolate

The Pennsylvania Railroad calls attention to a second "Prosperity Special" which passed over its lines this week, a train-load of chocolate. It is said to be the largest single shipment of chocolate ever made by rail in the history of the candy-making industry, 1,250,000 lb. chiefly of what is known as confectioners' "covering" chocolate, in 10-pound cakes. It completely fills 31 box cars. The train left the works of the Stollwerck Chocolate Company at Stamford, Conn., on July 1, and moved by way of the Hellgate bridge to Greenville, N. J., Philadelphia and Pittsburgh. The western candy trade feels the revival of business. Five of the cars go to Denver, Col., three each to Cincinnati, O., and Portland, Oregon; two each to St. Paul, Minn., and Sioux City, Iowa; and one each to Newark, O., Dayton, O., Muskegon, Mich., Galesburg, Ill., Freeport, Ill., St. Louis, Mo., St. Joseph, Mo., La Crosse, Wis., Fond du Lac, Wis., Minneapolis, Minn., Burlington, Iowa, Sioux Falls, S. D., Ottumwa, Iowa, Pueblo, Col., Pennsylvania Railroad estimates that the candy of which this a pound box to each one of five million American girls. Cleveland, O., and Milwaukee, Wis. The statistician of the chocolate will become a constituent will be sufficient to furnish

Wage Statistics, April, 1922

For April, 1922, the number of employees reported by Class I railroads was 1,578,133, an increase of 7,975, or 0.5 per cent over the number reported for the preceding month, according to the monthly bulletin of the Interstate Commerce Commission. Owing to a decrease in the number of the higher paid employees, the total compensation decreased $13,291,337, or 6.1 per cent.

Compared with those for March, 1922, the returns for April, 1922, indicate the following increases or decreases (D) by groups of employees:

Executive officials, and staff assistants	21
Professional, clerical, and general	101,170
Maintenance of way and structures	31,045
Maintenance of equipment and stores	D8,394
Transportation (other than train, engine, and yard)	11789
Transportation (yardmasters, switch tenders, and hostlers)	11688
Transportation (train and engine service)	D12,070
Net increase	7,975

A comparison of the number of employees and their compensation, by months, for the period covered by the new classification follows:

Month	Number of employees	Total compensation
July, 1921	1,634,872	$214,339,385
August, 1921[1]	1,679,927	227,745,895
September, 1921[1]	1,718,330	223,972,822
October, 1921[1]	1,754,136	237,602,959
November, 1921[1]	1,732,353	225,304,006
December, 1921[1]	1,637,151	214,921,396
January, 1922[1]	1,552,014	205,178,639
February, 1922[1]	1,545,040	194,523,427
March, 1922[1]	1,570,158	216,704,408
April, 1922	1,578,133	203,413,071

[1] Excludes Detroit, Toledo & Ironton Railroad.

The N. Y. C.'s "Canned" Safety Speech

The New York Central is circulating a "canned speech" which is being read before all kinds of public gatherings, in furtherance of the "Cross Crossings Cautiously," campaign.

This speech, which takes four minutes to deliver, already has been read at sessions of commercial organizations, Rotary clubs, automobile clubs, in motion picture theaters and even to church congregations assembled at their worship. The speech was written by Marcus A. Dow, general safety agent of the New York Central. The address follows in part:

"Approximately 1,800 persons are killed on railroad grade crossings throughout the country each year and about 5,000 sustain painful and crippling injuries. In the last 30 years the country's population has increased only 68 per cent, while fatal crossing accidents have increased 345 per cent and injury cases have increased 62 per cent. Most 75 per cent of the persons killed and injured in these deplorable railway crossing accidents are occupants of automobiles.

"There are at present over 251,000 railroad grade crossings in the United States. To eliminate all of these crossings by grade separation would require a sum of money in excess of $12,500,000,000. Constant work is being done in this direction, and 300 grade crossings were eliminated in 1919, but even at this rate it would take 629 years to abolish all the crossings of the country.

"The only solution of the problem is in safety education. A railroad crossing, no matter whether or not it is protected, is a place of danger where no chances must be taken. If you are driving a car, slow down approaching every railroad crossing, look carefully both ways before entering upon the tracks, and do not proceed until you have made sure that no train is approaching from either direction. If a train is coming—*WAIT*. Do not attempt to cross ahead of it. Many lives have been snuffed out because the driver of a car thought he could beat the train to the crossing and the race was a tie.

"To 'stop, look and listen' is about the best piece of advice that was ever written. This remedy for crossing accidents is sure and is within the reach of everyone. It takes only a little thought, a little care, and perhaps a moment's time to use it."

Railway Returns for May

The Class I railroads of the United States in May had a net operating income of $61,980,600, which on an annual basis represented a return of 4.36 per cent on their tentative valuation. In May last year their net operating income amounted to $36,943,248, or at the annual rate of return of 2.60 per cent, while in April this year it was $50,271,865, or 3.93 per cent. The net operating income fell $19,680,500 below a return of 5¾ per cent, the figure fixed by the Interstate Commerce Commission in its recent rate decision as representing a fair return.

Operating revenues in May totaled $448,947,900, an increase of nine-tenths of 1 per cent over the same month last year, while operating expenses totaled $355,588,800, a decrease of 0.4 per cent.

Fifty-six railroads—27 in the Eastern, 2 in the Southern and 27 in the Western district—had operating deficits in May, compared with 59 in April.

For the first five months this year the net operating income of the railroads totaled $273,259,000, compared with $94,417,907 during the same period last year. This is at the annual rate of return of 4.36 per cent (the same as for the month of May) compared with 1.51 per cent during the first five months in 1921. The operating revenues for the five months period totaled $2,137,339,700, a decrease of 3½ per cent compared with the corresponding period last year, while operating expenses totaled $1,714,688,900, a decrease of 13½ per cent.

The railroads in the Eastern district had operating revenues in May of $218,955,300, a reduction of 1 per cent, while the operating expenses totaled $173,147,700, which was a reduction of 7.4 per cent. Their net operating income was $31,752,380, compared with $20,801,715 in May the year before. The net operating income for the month was at the annual rate of return of 4.57 per cent.

The railroads in the Southern district had operating revenues of $61,778,800, an increase of 12.6 per cent compared with May, 1921. Operating expenses totaled $46,257,700, a reduction of 6.7 per cent, while their net operating income was $11,304,700, compared with $2,064,841 during the same month last year. This was at the annual rate of return of 6.63 per cent.

The operating revenues for the carriers in the Western district totaled $168,213,700, a decrease of three-tenths of 1 per cent compared with the same month last year, while their operating expenses totaled $136,183,360, a decrease of 5 per cent. Their net operating income totaled $18,923,500, compared with $14,076,692 in May, 1921. This is at the annual rate of 3.41 per cent.

There was an increase of approximately 3½ per cent in the number of freight cars loaded with all commodities in May, compared with the same month in 1921. Because of the coal strike coal loading fell off 47.4 per cent, but there was an increase in the loading of all commodities other than coal of 16.8 per cent. Measured by net ton miles there was a decrease in freight traffic in May of eight-tenths of 1 per cent compared with the same month last year.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MAY AND FIVE MONTHS OF CALENDAR YEAR 1922

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Akron, Canton & Youngstown	May	170	$190,527	$1,325	$199,626	$21,376	$16,710	$6,465	$53,129	$9,066	$106,759	53.50	$92,867	$81,867	$49,562	$18,818
	5 mos.	170	829,545	7,112	872,766	85,024	90,892	27,553	229,200	43,392	475,634	54.50	397,132	350,045	229,275	—23,370
Alabama & Vicksburg	May	141	216,048	57,200	290,679	57,162	61,616	8,847	89,711	11,771	230,526	79.30	60,153	37,574	37,819	—40,411
	5 mos.	141	937,196	268,594	1,293,355	227,478	255,228	43,474	471,371	59,297	1,065,753	82.40	227,602	122,439	137,534	—92,576
Vicksburg, Shreveport & Pacific	May	171	242,393	92,656	327,890	117,949	13,758	10,017	114,642	13,860	271,849	82.90	56,041	37,173	24,355	37,381
	5 mos.	171	984,030	441,873	1,530,974	300,455	239,740	51,844	596,407	66,731	1,265,852	82.70	265,122	168,771	126,646	14,546
Ann Arbor	May	203	373,252	37,765	448,640	47,855	82,535	10,362	167,647	13,120	321,531	75.00	107,109	84,309	61,181	15,013
	5 mos.	203	1,701,719	204,222	1,977,722	224,735	334,326	47,293	888,045	64,864	1,559,331	78.80	418,391	315,066	204,076	—11,992
Atchison, Topeka & Santa Fe	May	8,855	10,316,987	3,514,489	15,073,948	3,358,063	3,462,904	275,645	4,665,260	327,780	12,100,704	80.30	2,973,244	1,896,766	2,025,978	4,503,341
	5 mos.	8,857	45,195,108	16,571,095	67,877,744	11,611,666	17,315,657	1,307,623	22,669,892	1,680,663	54,559,477	80.40	13,318,267	8,161,200	8,796,847	9,802,349
Gulf, Colorado & Santa Fe	May	1,007	1,189,555	329,637	1,653,075	393,847	441,280	47,788	598,961	64,749	1,544,632	93.40	108,443	22,360	—43,785	846,548
	5 mos.	1,007	6,021,915	1,474,203	8,101,558	2,012,614	2,286,483	209,064	2,908,242	345,309	7,758,909	95.80	342,649	20,456	—302,086	884,028
Panhandle & Santa Fe	May	857	446,043	115,605	599,999	199,133	230,146	7,871	203,330	19,430	659,924	110.00	—59,925	—82,733	—116,251	64,585
	5 mos.	857	2,193,122	511,508	2,896,345	709,669	1,009,569	33,558	1,019,490	95,393	2,862,780	98.80	33,565	—80,955	—239,560	—48,892
Atlanta & West Point	May	93	107,435	69,032	206,079	23,944	45,223	7,979	81,946	10,662	173,118	84.00	32,961	22,507	15,289	20,403
	5 mos.	93	476,752	334,284	939,869	113,923	209,688	38,453	377,750	51,167	808,126	86.00	131,743	82,829	45,195	36,338
Western of Alabama	May	133	132,494	66,311	223,465	23,946	47,806	8,669	64,021	10,486	156,759	70.10	66,706	53,283	54,528	28,516
	5 mos.	133	562,369	305,054	981,351	123,230	236,716	42,267	333,286	54,107	803,690	81.90	177,661	133,957	133,628	42,867
Atlanta, Birmingham & Atlantic	May	639	268,251	32,053	330,541	63,505	89,407	22,731	154,293	15,852	345,939	104.60	—15,398	—8,758	—14,935	—182,278
	5 mos.	639	1,348,703	155,741	1,530,329	291,266	441,377	106,319	782,223	79,339	1,701,007	111.10	—170,678	—245,243	—307,219	—833,276
Atlantic Coast Line	May	4,523	4,728,003	1,128,786	6,386,035	768,537	1,250,936	102,453	2,129,773	139,429	4,410,457	69.10	1,975,578	1,703,262	1,537,558	—11,606
	5 mos.	4,523	21,698,454	7,364,794	31,524,544	3,429,430	5,770,003	549,311	11,024,464	693,512	21,650,887	68.70	9,873,657	8,537,036	7,889,105	3,195,198
Charleston & Western Carolina	May	342	50,535	36,845	105,538	54,151	36,283	6,287	110,659	7,137	214,517	70.20	91,021	79,889	68,118	—30,350
	5 mos.	342	1,202,229	179,495	1,452,751	227,582	189,509	33,452	584,985	32,643	1,068,171	73.50	384,580	328,965	281,052	—128,395
Baltimore & Ohio	May	5,235	13,387,564	2,180,939	16,861,752	1,900,791	4,009,596	299,066	6,303,847	477,793	13,144,894	78.00	3,716,858	2,984,053	2,504,487	1,685,449
	5 mos.	5,235	65,454,980	10,460,982	81,098,644	9,803,328	18,037,858	1,477,280	31,494,643	2,393,187	63,922,017	78.80	17,176,627	13,627,890	11,913,963	7,309,331
Balti. & Ohio Chicago Term	May	91	.....	.....	270,654	46,587	30,865	2,014	135,580	9,125	227,798	84.20	42,856	—8,541	101,406	834
	5 mos.	91	.....	.....	1,187,211	166,841	157,645	9,787	675,790	50,137	1,079,861	91.00	107,350	—123,859	469,411	136,172
Staten Isl. Rapid Transit	May	23	78,387	111,315	215,258	68,114	25,530	2,657	117,552	12,741	226,594	105.30	—11,336	—29,659	—42,356	—14,999
	5 mos.	23	412,533	448,579	949,542	235,243	157,781	9,822	559,284	68,774	1,030,904	108.60	—81,362	—165,889	—235,111	—187,533
Bangor & Aroostook	May	625	720,449	67,723	821,001	143,833	130,760	4,703	195,784	18,386	495,537	60.40	325,464	261,190	265,111	22,926
	5 mos.	625	3,430,656	381,978	3,925,715	563,775	617,937	20,865	1,034,226	93,098	2,332,985	59.40	1,592,730	1,291,827	1,296,440	319,749
Belt Ry. of Chicago	May	32	.....	.....	482,697	52,509	48,750	2,131	198,130	9,325	310,845	64.40	171,852	138,474	134,664	142,315
	5 mos.	32	.....	.....	2,388,946	200,109	263,795	9,612	1,060,328	49,501	1,583,345	66.30	805,601	626,691	697,027	671,266
Bessemer & Lake Erie	May	225	534,661	26,610	585,270	159,305	279,143	14,684	230,856	23,911	713,242	121.90	—127,972	—160,673	—128,806	63,799
	5 mos.	225	3,031,406	150,373	3,275,607	503,423	1,401,293	76,822	1,230,607	126,042	3,363,304	102.70	—87,697	—251,428	—96,011	—670,524
Bingham & Garfield	May	34	15,710	.....	15,971	14,619	4,178	1,291	4,194	4,059	28,394	177.80	—12,423	—16,662	—1,572	—28,556
	5 mos.	34	58,545	6	58,755	86,521	17,667	6,393	22,253	21,411	154,380	262.80	—95,625	—122,448	—79,997	—84,286
Boston & Maine	May	2,287	4,093,889	1,726,319	6,545,487	1,080,096	1,212,123	70,807	2,842,187	225,756	5,451,608	83.30	1,093,879	860,666	555,352	—228,429
	5 mos.	2,287	19,596,373	8,520,415	31,325,380	4,702,934	6,009,407	280,650	14,878,624	1,117,543	27,113,017	86.60	4,212,363	3,276,867	2,008,258	—4,326,017
Brooklyn Eastern Dist. Term	May	9	523,213	.....	129,672	4,021	19,780	150	46,847	4,450	75,248	58.00	54,424	47,836	47,836	30,656
	5 mos.	9	632,093	.....	669,697	24,699	99,594	807	249,945	24,467	399,512	59.70	270,185	238,201	238,201	127,382
Buffalo & Susquehanna	May	253	50,955	4,985	60,098	33,257	27,500	1,861	29,683	9,471	101,772	169.30	—41,674	—44,924	—36,120	—3,001
	5 mos.	253	609,299	37,342	663,125	152,276	204,909	10,747	237,591	45,089	650,612	98.10	12,513	—3,774	91,622	—15,086
Buffalo, Rochester & Pittsburgh	May	589	710,722	124,163	891,524	162,775	342,925	19,714	380,692	39,580	948,140	106.40	—56,616	—91,783	—56,527	84,902
	5 mos.	589	5,096,933	660,375	5,997,250	618,908	2,128,594	84,811	2,320,736	187,713	5,351,659	89.20	645,591	466,339	593,416	302,011
Canadian Pacific Lines in Me	May	233	124,339	25,309	163,415	64,858	34,368	4,250	89,854	4,009	197,330	120.80	—33,924	—49,924	—62,512	—65,453
	5 mos.	233	1,055,442	169,080	1,306,857	175,591	244,683	21,231	632,783	18,483	1,092,771	83.60	214,086	134,086	70,790	45,585
Carolina, Clinchfield & Ohio	May	295	619,662	40,457	671,786	86,587	162,117	26,323	146,527	18,980	439,763	65.50	232,023	191,906	288,057	206,487
	5 mos.	295	2,928,734	186,559	3,164,035	379,294	744,372	117,610	800,807	87,632	2,127,983	67.30	1,036,052	835,584	1,184,500	776,138
Central of Georgia	May	1,920	1,264,868	392,574	1,859,850	273,937	375,591	73,572	684,631	72,782	1,500,094	80.70	359,756	278,917	296,429	95,184
	5 mos.	1,916	5,963,410	1,983,034	8,754,902	1,158,705	1,721,789	338,273	3,452,910	371,182	7,073,527	80.80	1,681,375	1,256,103	1,344,697	—55,713
Central of New Jersey	May	688	2,403,397	755,840	3,429,173	483,994	1,007,157	46,001	1,547,967	106,498	3,209,056	93.59	220,117	—40,134	—93,532	484,118
	5 mos.	688	15,128,785	3,352,127	19,756,575	2,013,481	5,559,745	174,404	8,127,780	523,989	16,479,511	83.40	3,277,064	1,977,000	1,794,240	2,385,227
Central Vermont	May	407	459,629	75,387	588,448	116,170	71,102	10,217	267,309	17,408	483,673	82.20	104,775	87,148	64,185	202,871
	5 mos.	407	1,936,682	415,383	2,626,195	535,768	481,967	56,332	1,388,276	117,924	2,387,594	90.90	238,601	153,047	23,452	—732,598
Chesapeake & Ohio	May	2,547	6,416,481	904,891	7,657,318	949,940	2,042,837	78,774	2,620,066	169,160	5,879,217	76.80	1,778,101	1,508,752	1,573,436	1,587,163
	5 mos.	2,547	29,782,264	3,929,841	35,302,745	3,958,179	9,132,316	375,423	12,715,397	808,473	27,081,649	76.70	8,221,096	6,878,229	7,192,118	3,096,565
Chicago & Alton	May	1,050	1,386,271	533,934	2,136,783	380,201	687,025	56,222	830,695	54,101	2,021,208	94.60	115,575	37,248	—73,821	185,826
	5 mos.	1,050	8,519,008	2,415,909	11,826,590	1,212,627	3,262,477	277,800	4,570,277	288,532	9,669,729	81.80	2,156,861	1,780,027	1,065,745	—56,560
Chicago & Eastern Illinois	May	945	1,338,345	364,095	1,818,545	233,471	510,836	39,266	805,865	59,892	1,660,563	89.80	187,982	102,584	49,452	—64,284
	5 mos.	945	7,394,162	1,793,332	9,892,732	1,072,201	2,550,267	209,066	4,065,447	330,850	8,290,094	83.80	1,602,638	1,175,124	1,058,680	—474,099
Chicago & Northwestern	May	8,402	8,178,811	2,336,928	11,758,933	2,070,466	2,452,961	126,935	4,851,663	314,326	9,803,580	84.10	1,865,353	1,133,971	1,218,966	—1,981,336
	5 mos.	8,402	36,671,403	11,495,605	53,995,307	6,633,015	11,909,276	722,192	25,045,837	1,562,748	46,200,922	85.60	7,794,385	4,129,819	3,942,672	—4,461,094
Chicago, Burlington & Quincy	May	9,393	9,003,917	2,187,488	12,401,625	1,919,171	2,292,656	204,554	4,287,085	334,154	9,105,585	73.40	3,296,040	2,356,753	2,231,975	1,754,142
	5 mos.	9,393	45,625,592	10,391,377	61,551,197	7,350,329	13,194,339	902,612	22,906,156	1,691,947	46,518,023	75.60	15,033,174	10,424,712	9,883,033	8,332,193

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MAY AND FIVE MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues — Freight.	Operating revenues — Passenger	Operating revenues — Total (inc. misc.)	Operating expenses — Maintenance of — Way and structures.	Operating expenses — Maintenance of — Equipment.	Operating expenses — Traffic.	Operating expenses — Transportation.	Operating expenses — General.	Operating expenses — Total.	Operating ratio.	Net from railway operations	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Chicago Great Western	May	1,496	$1,470,537	$337,037	$1,978,569	$405,937	$466,169	$61,707	$811,711	$60,311	$1,818,874	91.90	$1[illegible]	$81,137	$54,210	$57,540
	5 mos.	1,496	6,713,809	1,089,451	9,284,854	1,222,427	2,333,797	316,758	4,149,724	286,021	8,375,013	90.20	[illegible]	[illegible]	—134,522	113,629
Chicago, Ind. & Louisville	May	634	936,767	288,392	1,352,925	160,756	311,903	29,674	479,439	36,183	1,029,187	76.10	324,738	260,261	160,335	—11,549
	5 mos.	634	4,578,[illegible]35	1,204,750	6,399,265	667,098	1,427,901	159,828	2,356,078	176,629	4,851,[illegible]	75.80	1,548,243	1,215,064	725,916	58,525
*Chicago Junction	May	12	......	......	292,669	36,667	18,518	590	123,330	8,811	187,916	64.20	104,752	59,[illegible]97	106,[illegible]70	.....
	5 mos.	12	......	......	2,045,955	213,250	169,873	3,292	939,654	48,530	1,374,599	67.20	671,355	4[illegible]3,398	771,782	..
Chicago River & Indiana	May	38	......	......	197,269	23,885	22,579	223	84,995	3,027	134,709	68.[illegible]0	62,560	48,137	78,4[illegible]	90,922
	5 mos.	....	......	......	......	......	......	......	......	......	......	....	....	....		
Chicago, Milwaukee & St. Paul	May	11,030	9,954,033	1,872,315	12,249,791	2,003,616	3,266,189	183,397	4,770,947	325,021	10,604,213	86.60	1,645,578	841,012	473,318	—441,258
	5 mos.	11,030	42,394,571	9,166,438	57,643,221	7,114,326	15,957,315	909,313	25,467,178	1,635,265	51,369,206	89.10	6,274,015	2,256,699	402,050	—3,622,814
Chicago, Peoria & St. Louis	May	246	171,497	15,359	199,355	47,043	35,584	4,084	111,384	10,384	208,479	104.60	—9,124	—18,664	—35,385	—68,599
	5 mos.	246	802,808	101,975	965,092	152,178	208,301	21,168	555,893	53,392	990,732	102.70	—25,640	—73,213	—181,608	—344,864
Chicago, Rock Island & Pacific	May	7,661	6,691,638	2,177,864	9,632,956	1,239,370	2,226,231	181,964	3,905,252	226,637	7,834,633	81.30	1,798,323	1,260,776	1,010,909	666,448
	5 mos.	7,661	31,736,818	10,134,864	45,319,924	5,860,822	10,365,423	867,043	19,846,510	1,174,770	38,280,608	84.50	7,039,316	4,391,714	3,187,957	3,432,710
Chicago, Rock Island & Gulf	May	461	293,759	77,849	422,592	82,235	79,182	14,296	198,154	14,128	388,777	92.00	33,815	22,877	5,443	110,105
	5 mos.	461	1,617,325	371,958	2,199,791	294,465	428,718	67,928	1,046,893	69,839	1,912,703	86.90	287,088	2[illegible]8,146	141,[illegible]	270,067
Chic., St. Paul, Minn. & Omaha	May	1,749	1,574,947	404,915	2,206,981	290,050	467,340	31,769	985,683	73,191	1,856,577	84.10	350,404	209,468	170,6[illegible]	—452,[illegible]19
	5 mos.	1,749	7,406,183	2,432,965	10,589,618	1,319,555	2,087,768	163,124	5,158,677	361,598	9,136,492	86.30	1,453,126	794,4[illegible]8	6[illegible],472	—21,3[illegible]
Cincinnati, Indianapolis & Western	May	347	282,630	51,836	356,479	45,309	79,189	10,360	149,834	18,559	305,66[illegible]	85.70	50,819	[illegible]	1[illegible]9	—93,113
	5 mos.	347	1,333,257	24[illegible],043	1,666,827	209,621	377,673	54,560	763,208	99,597	1,516,625	91.00	150,[illegible]	[illegible]	—27,6[illegible]	—185,3[illegible]
Colorado & Southern	May	1,099	741,591	15[illegible],369	982,303	192,334	240,850	9,333	379,666	45,485	874,713	89.10	107,[illegible]	41,416	[illegible]	113,473
	5 mos.	1,099	3,833,558	700,768	4,903,260	561,617	1,133,327	64,730	1,850,966	223,720	3,897,133	79.50	1,006,127	674,4[illegible]8	564,5[illegible]	8[illegible]2,14[illegible]
Ft. Worth & Denver City	May	456	534,359	174,774	754,789	58,746	132,523	14,427	227,238	34,812	47[illegible]	6[illegible]	[illegible]317	2[illegible]	2[illegible]1[illegible]	[illegible]7,41[illegible]
	5 mos.	456	2,[illegible]57,[illegible]95	807,496	3,577,494	328,457	689,282	56,762	1,209,187	183,451	2,483,6[illegible]	69.43	1,09[illegible],812	897,4[illegible]	916,21[illegible]	1,0[illegible]6,513
Wichita Valley	May	256	57,639	23,[illegible]21	88,317	25,684	5,388	54	38,037	1,575	70,7[illegible]4	80.10	17,5[illegible]3	11,[illegible]	1,[illegible]10	2,[illegible]1
	5 mos.	256	343,962	102,757	481,666	107,398	41,621	254	209,604	7,641	363,5[illegible]	75.50	11[illegible],139	89,0[illegible]2	41,[illegible]	78,5[illegible]3
Columbus & Greenville	May	2[illegible]0	93,121	25,419	125,834	23,273	12,271	2,750	44,960	7,889	91,143	72.40	34,691	29,116	19,610	—42,377
	5 mos.	225	418,509	136,611	588,475	136,202	64,143	16,852	236,085	42,216	495,453	84.20	9[illegible]022	71,51[illegible]	9,625	—9,1[illegible]6
Delaware & Hudson	May	887	1,900,480	247,533	2,483,720	524,745	669,182	43,978	1,093,505	145,766	2,584,149	104.[illegible]	—100,429	—186,[illegible]74	—11[illegible],6[illegible]4	6[illegible]8,[illegible]52
	5 mos.	887	13,706,645	1,335,301	16,570,412	2,363,134	4,271,726	216,632	6,559,297	738,189	14,419,263	87.00	2,151,149	1,710,11[illegible]	1,766,[illegible]33	1,616,187
Delaware, Lack. & Western	May	994	3,617,662	1,126,000	5,516,145	809,576	1,145,455	121,967	2,550,394	157,951	4,836,163	87.70	679,982	31[illegible]1	4[illegible]2,532	1,04[illegible]3
	5 mos.	994	21,539,443	5,236,266	30,381,541	3,033,692	6,536,027	549,219	12,949,479	798,421	24,112,013	79.40	6,269,5[illegible]	4,0[illegible]3,[illegible]94	4,314,325	3,[illegible]67,3[illegible]
Denver & Rio Grande Western	May	2,593	1,831,536	399,630	2,424,366	408,089	642,586	47,365	768,049	83,189	1,991,428	82.10	4[illegible]918	[illegible]7,674	[illegible]576	3[illegible]
	5 mos.	2,593	8,975,293	1,854,566	11,718,984	1,630,299	2,470,106	222,169	4,050,026	415,749	8,971,750	76.60	2,747,[illegible]34	1,[illegible]71,[illegible]6	2,1[illegible],849	1,7[illegible]
Denver & Salt Lake	May	255	18,324	13,178	36,748	47,781	12,751	911	16,994	5,675	84,112	228.90	—47,364	—56,364	—5[illegible],613	—[illegible]3,4[illegible]
	5 mos	255	405,337	70,972	513,860	160,547	138,486	4,700	197,578	30,820	532,131	103.60	—18,271	—63,2[illegible]1	—45,3[illegible]6	245,8[illegible]
Detroit & Mackinac	May	385	115,995	25,113	154,726	39,584	51,868	2,366	55,413	5,106	154,237	99.70	489	—10,83[illegible]	—9,7[illegible]8	—1,[illegible]
	5 mos.	385	443,687	136,460	629,776	125,058	250,602	10,570	286,727	27,720	700,365	111.20	—70,589	—123,9[illegible]8	—111,5[illegible]3	—[illegible]7[illegible]
Detroit & Toledo Shore Line	May	61	256,266	....	258,639	39,601	22,039	2,338	68,866	9,474	142,318	55.10	116,321	102,321	4[illegible]6	14,345
	5 mos.	61	1,486,875	....	1,499,106	140,725	104,077	10,833	418,828	36,966	711,429	47.40	787,677	717,636	388,179	57,418
Detroit, Toledo & Ironton	May	454	868,661	9,239	889,503	133,003	213,539	5,553	265,756	20,332	638,182	71.70	251,321	236,421	106,6[illegible]0	17[illegible],551
	5 mos.	454	3,475,204	47,534	3,573,291	454,915	725,787	29,271	1,203,952	89,876	2,503,781	70.10	1,069,510	996,382	5[illegible]2,109	64,1[illegible]5
Duluth & Iron Range	May	294	315,922	13,713	362,132	124,868	91,776	1,236	124,899	16,438	359,244	99.20	2,888	—19,804	—35,414	74,4[illegible]1
	5 mos.	294	673,945	78,912	859,399	323,124	435,489	5,638	556,595	81,632	1,402,505	163.20	—543,106	—617,114	—608,4[illegible]	734,13[illegible]
Duluth, Missabe & Northern	May	309	521,790	37,565	600,500	250,888	126,844	2,679	184,886	19,450	586,376	97.60	14,124	—164,966	—168,855	6[illegible],511
	5 mos.	306	863,216	195,968	1,165,660	635,015	659,862	15,551	800,534	98,381	2,217,893	190.30	—1,052,233	—1,451,456	—1,459,0[illegible]0	—1,941,814
Duluth, South Shore & Atlantic	May	591	244,317	83,983	357,928	97,616	72,978	6,311	174,924	10,541	367,808	102.80	—9,880	—42,886	—44,685	—126,036
	5 mos.	591	998,221	387,2[illegible]	1,523,116	281,743	335,566	32,609	918,031	57,933	1,651,353	108.40	—128,237	—281,507	—299,[illegible]	—401,[illegible]
Duluth, Winnipeg & Pacific	May	178	128,011	18,312	151,357	33,396	36,713	4,331	63,916	5,320	143,653	94.90	7,704	1,629	5,9[illegible]	—40,[illegible]5
	5 mos.	178	653,347	95,998	777,755	126,239	198,642	23,224	367,874	27,894	743,849	95.60	33,906	—10,[illegible]97	—21,75[illegible]	64,03[illegible]
Elgin, Joliet & Eastern	May	459	1,709,994	1	1,925,601	169,919	402,899	11,119	546,337	34,315	164,541	60.50	761,060	658,379	485,658	91,530
	5 mos.	459	7,946,794	1[illegible]	8,775,390	676,852	1,747,282	60,938	2,562,058	169,059	5,205,6[illegible]3	59.30	3,569,797	3,139,0[illegible]4	2,537,421	1,13[illegible]91[illegible]
El Paso & Southwestern	May	1,139	673,217	146,4[illegible]	870,370	150,748	158,009	26,410	252,465	40,670	636,407	73.10	233,963	137,8[illegible]7	[illegible]467	[illegible]1,7[illegible]7
	5 mos	1,139	3,[illegible]59,857	791,[illegible]	4,143,356	750,888	708,031	137,181	1,142,030	201,872	2,977,670	71.90	1,165,68[illegible]	685,173	[illegible]63,857	178,[illegible]
Erie	May	2,039	5,291,346	1,085,798	7,035,924	867,668	2,104,577	138,279	3,071,702	271,193	6,495,336	92.32	540,588	247,053	439,772	1,310,532
	5 mos.	2,039	29,5[illegible]3,730	5,1[illegible]	27,523,439	3,658,020	10,424,193	678,721	16,365,945	1,426,471	22,757,831	87.30	4,765,608	3,446,968	4,113,958	1,954,195
Chicago & Erie	May	269	852,316	54,576	974,823	108,789	119,203	21,087	358,920	30,834	639,432	65.59	335,391	[illegible]80,391	—103	—137,376
	5 mos.	269	4,013,393	245,6[illegible]	4,589,274	468,883	657,483	99,672	2,023,904	172,456	3,422,288	74.57	1,166,986	9[illegible]3,703	—471,282	—1,742,576
New Jersey & New York	May	45	17,741	104,256	126,456	16,373	17,578	1,461	65,020	3,174	103,606	81.93	22,850	19,850	6,667	—7,860
	5 mos.	45	[illegible]02,856	478,734	605,347	69,043	88,698	6,495	334,165	17,228	515,629	85.18	89,718	74,496	50,[illegible]4	—1[illegible]0,09[illegible]
New York, Susq. & Western	May	135	195,512	61,50[illegible]	301,612	53,557	66,133	4,239	178,258	9,205	311,692	103.30	—10,080	—15,615	—48,[illegible]85	—17,03[illegible]
	5 mos.	135	1,129,754	294,660	1,650,808	204,963	280,013	18,212	925,917	49,070	1,478,158	89.50	172,650	46,749	—15,430	—189,8[illegible]1
Florida East Coast	May	764	897,571	244,199	1,306,104	158,026	190,042	8,790	358,280	26,842	742,937	56.90	563,167	499,593	415,718	[illegible]5,4[illegible]9
	5 mos.	764	4,232,590	2,208,346	7,352,100	874,736	988,315	75,913	2,009,487	133,670	4,155,106	57.30	3,096,994	2,793,812	2,509,150	1,704,941

*The property of the Chicago Junction Ry. Co. was leased to the Chicago River & Indiana R. R. Co. May 19, 1922. The report for the Chicago Junction Ry. Co. covers operations to that date only.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MAY AND FIVE MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road		Average mileage operated during period	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Fort Smith & Western	May	249	$92,464	$24,776	$128,952	$23,437	$23,346	$4,968	$44,887	$7,031	$104,627	81.70	$24,325	$17,575	$9,221	$4,629
	5 mos.	249	439,230	103,083	588,536	122,659	124,761	24,343	228,812	34,525	539,551	91.70	48,985	19,784	—20,266	—71,091
Galveston Wharf	May	13	.....	.....	111,202	58,608	3,683	620	28,205	3,225	110,445	99.30	757	16,245	—16,601	88,657
	5 mos.	13	.....	.....	608,252	291,390	21,735	3,917	148,431	18,701	572,708	94.20	35,544	51,492	—51,296	390,310
Georgia	May	328	289,527	94,232	417,341	40,171	68,554	19,432	185,728	17,880	341,995	79.60	85,346	77,995	78,590	15,953
	5 mos.	328	1,349,432	449,386	1,946,239	194,239	348,003	97,497	954,322	94,284	1,689,371	86.80	257,007	220,933	231,527	—81,570
Georgia & Florida	May	405	86,752	11,436	104,754	13,641	14,327	8,283	39,461	6,271	82,196	78.50	22,558	16,166	11,621	—29,233
	5 mos.	405	431,347	57,609	527,054	84,187	91,735	41,735	212,399	32,036	463,161	87.90	63,893	32,334	—1,713	—122,608
Grand Trunk Western	May	346	1,077,738	129,910	1,286,828	125,741	268,142	25,076	554,401	47,087	1,026,539	79.80	260,289	198,310	28,298	29,545
	5 mos.	346	4,617,326	692,253	5,660,110	473,817	1,335,885	138,619	2,699,880	253,165	4,932,788	87.20	727,322	412,899	—504,342	—830,588
Atlantic & St Lawrence	May	166	107,710	30,270	153,392	69,740	22,657	5,738	109,649	14,237	224,922	146.60	—71,535	—88,435	—103,897	—10,923
	5 mos.	166	960,490	164,841	1,200,037	189,517	194,704	21,934	686,027	62,630	1,164,798	97.10	35,239	—49,305	—422,674	450,484
Chic., Det. & Canada Gr. Tr. Jct	May	59	132,876	9,622	158,455	19,434	5,284	3,182	64,099	3,212	95,191	60.10	63,264	55,998	68,332	19,597
	5 mos.	59	856,252	44,060	968,928	64,700	60,646	17,754	328,621	18,472	489,514	50.50	479,414	443,191	355,900	167,776
Det., Gr. Haven & Milwaukee	May	189	457,371	40,175	532,797	51,351	45,637	7,823	217,973	16,690	339,801	63.80	192,996	185,834	165,314	—120,215
	5 mos.	189	1,648,531	194,849	1,982,190	190,636	225,355	43,461	1,025,043	85,063	1,571,384	79.30	410,806	375,386	67,338	513,337
Great Northern	May	8,265	5,792,778	1,092,442	7,690,262	1,398,305	1,516,740	136,946	2,939,190	214,612	6,250,212	81.30	1,440,050	754,891	900,345	179,313
	5 mos.	8,265	24,528,093	5,365,006	33,487,954	4,569,133	7,459,040	650,256	14,929,391	1,067,924	28,973,099	86.50	4,514,855	1,548,377	2,208,792	—2,799,115
Green Bay & Western	May	262	90,931	12,894	110,558	24,425	19,028	2,621	38,385	2,879	87,328	79.00	23,230	15,230	13,839	4,883
	5 mos.	262	441,664	88,986	561,655	101,263	92,762	11,805	213,691	13,911	433,412	77.10	128,243	88,243	65,494	64,645
Gulf & Ship Island	May	307	210,100	40,753	267,859	46,767	37,091	9,447	75,965	11,105	180,740	67.50	87,119	68,975	63,584	17,955
	5 mos.	307	932,130	181,750	1,178,676	220,867	186,484	38,944	357,465	57,669	863,225	73.20	315,451	225,928	199,066	53,889
Gulf, Mobile & Northern	May	436	361,643	35,224	413,753	58,086	74,162	15,992	135,047	14,853	294,658	71.20	119,095	101,838	85,550	—31,608
	5 mos.	436	1,594,737	173,763	1,841,545	274,001	308,559	69,704	617,050	79,208	1,344,152	73.00	497,393	411,244	346,458	—38,726
Hocking Valley	May	348	799,201	79,314	1,019,599	103,516	232,347	11,479	330,398	32,393	705,277	69.20	314,322	223,525	221,988	17,215
	5 mos.	349	4,303,216	406,612	5,172,392	495,759	1,096,447	59,967	1,748,325	154,695	3,548,834	68.60	1,623,558	1,170,143	1,189,662	618,010
Illinois Central	May	4,784	9,244,039	1,859,026	12,081,678	1,497,015	2,790,737	172,954	4,432,690	302,308	9,244,534	76.50	2,837,144	1,867,998	1,933,655	964,069
	5 mos.	4,784	43,786,595	9,315,021	57,417,376	6,873,143	12,541,984	931,044	21,213,613	1,561,281	43,351,516	75.50	14,065,860	9,172,013	9,479,846	7,730,964
Yazoo & Miss. Valley	May	1,381	1,056,644	267,943	1,422,841	359,005	264,158	25,643	554,249	46,467	1,248,288	87.70	174,553	55,922	67,732	73,692
	5 mos.	1,381	5,348,401	1,492,269	7,303,643	1,659,504	1,418,869	129,141	3,077,836	251,533	6,526,654	89.40	776,989	184,072	169,877	238,534
International & Great Northern	May	1,159	933,124	203,810	1,286,549	153,556	300,457	28,394	476,809	48,072	1,016,380	79.00	270,169	246,445	185,118	138,665
	5 mos.	1,159	4,056,069	951,222	5,651,483	788,743	1,096,405	132,332	2,482,176	242,199	4,768,964	84.40	882,519	713,113	412,953	—370,165
Kansas City, Mexico & Orient	May	272	84,876	11,988	103,563	28,483	29,570	4,980	57,996	6,624	127,662	123.30	—24,099	—32,419	—33,999	—36,334
	5 mos.	272	452,886	50,122	542,131	123,954	145,300	23,164	307,921	33,938	634,277	116.30	—92,146	—133,772	—131,261	200,059
Kan. City, Mex. & Orient of Tex.	May	465	102,518	12,256	121,927	27,097	35,577	5,024	73,135	6,690	147,523	120.90	—25,596	—41,596	—46,562	—54,122
	5 mos.	465	515,574	51,278	604,911	139,926	198,898	23,186	398,885	32,808	793,763	131.20	—188,792	—219,103	—289,906	—375,218
Kansas City Southern	May	767	1,197,825	169,733	1,511,184	226,838	272,881	40,945	553,089	69,286	1,163,064	77.00	348,120	260,241	235,895	426,527
	5 mos.	767	5,709,941	781,814	7,214,417	910,561	1,379,901	184,076	2,651,996	341,310	5,462,050	75.70	1,752,367	1,261,798	1,260,260	1,751,109
Texarkana & Ft. Smith	May	81	136,392	15,044	167,394	24,416	33,943	5,153	44,466	8,502	116,480	69.60	50,914	43,134	18,071	39,669
	5 mos.	81	655,428	70,781	794,396	98,236	133,801	25,046	246,341	42,827	545,296	68.60	249,100	198,456	118,187	152,719
Kansas City Terminal	May	27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27,710	200,663	189,115
	5 mos.	27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	—17	139,741	990,085	928,092
Kansas, Okla. & Gulf	May	314	291,458	12,514	323,047	48,634	25,026	5,377	76,711	9,644	165,647	74.30	57,400	46,644	35,591	24,390
	5 mos.	314	989,154	61,134	1,090,815	213,846	118,313	26,348	397,863	48,481	805,940	73.90	284,875	235,709	181,889	—98,896
Lake Superior & Ishpeming	May	33	49,339	36	58,230	16,664	10,271	205	15,382	2,355	44,877	77.10	13,353	7,867	7,446	30,277
	5 mos.	33	59,667	443	69,701	96,106	46,752	1,040	50,254	13,261	207,413	297.60	—137,712	—165,142	—165,203	—241,065
Lake Terminal	May	13	.....	.....	105,234	14,019	10,648	.....	44,459	1,523	70,649	67.10	34,585	28,248	43,696	9,898
	5 mos.	13	.....	.....	467,293	46,822	45,198	.....	203,551	7,850	303,421	64.90	163,872	132,189	185,028	—5,073
Lehigh & Hudson River	May	96	141,609	2,964	155,952	34,326	25,626	1,540	74,755	9,068	145,315	93.20	10,637	—5,641	—18,119	45,402
	5 mos.	96	970,735	18,863	1,040,110	135,599	196,383	7,524	415,930	37,227	792,663	76.20	247,447	184,357	90,502	138,285
Lehigh & New England	May	236	274,577	1,661	284,453	50,989	69,843	6,804	91,235	17,736	176,592	83.70	47,871	41,236	39,424	49,219
	5 mos.	236	1,698,084	10,131	1,747,247	194,027	655,824	41,943	615,787	84,745	1,592,290	91.10	154,957	98,731	162,492	334,643
Lehigh Valley	May	1,134	3,685,899	526,886	4,609,888	526,732	1,464,638	114,663	2,245,791	148,172	4,521,515	98.10	85,473	105,190	154,384	76,927
	5 mos.	1,134	21,861,530	2,549,044	26,259,029	2,710,453	7,544,624	523,965	11,761,563	663,294	23,314,878	88.80	2,944,151	1,891,720	1,697,737	—1,371,044
Los Angeles & Salt Lake	May	1,137	1,081,100	446,651	1,682,664	460,118	360,770	45,818	531,561	42,180	1,184,319	88.20	198,345	87,049	49,794	71,365
	5 mos.	1,142	5,000,454	1,914,609	7,605,025	1,676,139	1,757,642	226,255	2,634,493	210,734	6,714,247	88.30	890,778	340,222	195,308	446,102
Louisiana & Arkansas	May	307	238,506	31,369	276,896	47,646	41,974	7,829	83,325	8,123	188,874	68.20	88,022	68,611	67,978	48,515
	5 mos.	302	1,116,644	162,686	1,312,943	256,166	235,048	37,711	427,039	41,556	995,459	75.80	317,484	220,577	211,128	90,596
Louisiana Ry & Nav Co	May	343	244,247	21,331	271,890	81,688	71,065	8,373	115,883	11,780	288,764	106.20	—16,874	—33,932	—61,924	40,147
	5 mos.	343	1,116,701	143,280	1,326,140	320,640	218,530	50,472	561,988	59,256	1,210,220	91.20	115,920	34,017	—83,021	1,653
Louisville & Nashville	May	5,038	9,221,367	1,886,433	11,925,415	1,462,884	2,579,112	201,576	4,011,109	226,521	8,531,173	71.50	3,394,242	2,820,739	2,814,565	111,333
	5 mos.	5,038	38,373,813	8,618,101	50,167,156	7,277,838	12,254,299	1,053,286	19,287,858	1,168,732	41,248,575	82.20	8,918,581	7,130,385	7,220,037	—2,114,443
Louisville, Henderson & St. L.	May	199	233,087	63,974	316,039	53,732	50,890	7,041	95,396	7,948	215,007	68.00	101,032	92,281	75,009	987
	5 mos.	199	877,983	280,101	1,233,652	241,812	209,782	30,730	415,374	42,208	929,906	75.40	303,746	259,965	195,223	80,773
Maine Central	May	1,194	1,387,565	347,843	1,864,850	313,230	418,261	13,370	710,457	44,339	1,503,313	80.60	361,537	262,032	271,498	241,621
	5 mos.	1,194	6,189,438	1,648,032	8,427,104	1,292,474	1,830,233	61,223	3,737,662	236,271	7,162,719	85.00	1,264,385	767,964	720,199	—765,876
Midland Valley	May	383	350,376	76,925	441,835	63,189	48,678	4,919	115,905	14,260	247,151	55.90	194,684	177,875	166,563	48,599
	5 mos.	383	1,410,330	434,869	1,847,302	247,955	234,869	23,244	560,595	73,616	1,131,654	61.30	715,648	651,194	617,086	220,375

REVENUES AND EXPENSES OF RAILWAYS

Month of May and Five Months of Calendar Year 1922—Continued

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of— Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Minneapolis & St. Louis	May	1,649	$921,599	$133,468	$1,127,650	$182,644	$246,205	$26,967	$556,918	$42,709	$1,054,75[illegible]	93.50	$72,[illegible]	$[illegible]	—$4[illegible]478	$286,181
	5 mos.	1,649	5,142,452	774,560	6,237,447	884,125	1,279,116	121,998	2,959,992	202,201	5,445,774	87.30	791,673	476,781	188,217	[illegible]
Minn., St. P. & S. S. Marie	May	4,383	2,684,234	502,745	3,530,286	634,220	817,888	67,108	1,512,758	103,689	3,147,831	89.20	382,455	12[illegible],898	65,693	3[illegible]7,[illegible]
	5 mos.	4,383	11,021,[illegible]02	2,568,276	15,050,597	2,407,291	3,199,155	289,085	7,555,280	513,128	13,983,157	92.90	1,067,44[illegible]	—199,181	—334,[illegible]	—2,707,666
Mississippi Central	May	258	109,461	15119	130,188	23,141	41,411	5,669	41,637	7,140	118,998	91.40	11,190	4,872	4,[illegible]87	[illegible],667
	5 mos.	260	510,695	77,897	610,530	86,519	173,599	28,103	205,730	35,027	528,978	86.60	81,552	50,183	4[illegible],[illegible]03	54,688
Missouri, Kansas & Texas	May	1,670	2,044,466	496,634	276,426	267,342	579,870	45,474	721,999	84,782	1,702,962	61.70	1,057,464	853,[illegible]9	899,679	309,813
	5 mos.	1,670	8,502,239	2,302,455	11,951,866	1,190,276	2,341,078	234,430	3,531,567	477,219	7,808,418	65.30	4,143,448	3,110,064	3,56[illegible],814	1,7[illegible]
Mo., Kans. & Tex. of Texas	May	1,737	1,133,121	446,628	1,737,838	314,959	210,666	41,550	656,639	67,809	1,296,182	74.60	441,656	189,262	[illegible]3,800	81,17[illegible]
	5 mos.	1,737	5,393,234	2,054,633	8,191,958	1,169,817	1,088,719	208,532	3,327,585	405,924	6,224,908	76.00	1,967,050	1,708,084	849,[illegible]86	31[illegible]7[illegible]1
Wichita Falls & Northwestern	May	329	66,573	23,036	98,352	27,252	15,886	650	49,570	6,834	99,863	101.50	1,511	13,575	7,[illegible]13	30,3[illegible]1
	5 mos.	329	427,631	106,702	578,280	114,627	105,186	4,946	259,331	49,098	531,313	91.90	46,967	14,140	[illegible]	71,7[illegible]4
Missouri Pacific	May	7,342	6,435,022	1,426,771	8,633,943	1,675,786	1,979,384	151,994	3,221,513	261,610	7,319,468	84.80	1,314,4[illegible]5	913,668	60[illegible],4[illegible]3	711,[illegible]45
	5 mos.	7,325	29,846,541	6,609,396	39,861,400	6,689,606	8,742,618	760,207	16,384,786	1,319,310	34,019,224	85.30	5,842,176	3,935,113	2,441,[illegible]	1,81[illegible]
Mobile & Ohio	May	1,165	1,261,348	139,685	1,475,395	173,627	288,568	45,906	553,557	48,617	1,111,408	75.30	363,987	[illegible]	[illegible]	[illegible]
	5 mos.	1,165	6,013,002	672,697	7,042,652	863,029	1,381,650	226,339	2,737,898	242,649	5,457,348	77.50	1,585,304	1,[illegible]912	1,0[illegible]	3[illegible]
Monongahela	May	106	58,666	26,136	89,141	36,530	32,781	923	45,618	8,369	121,221	139.40	[illegible]080	43,[illegible]	[illegible]	[illegible]
	5 mos.	106	1,428,605	150,376	1,801,032	199,652	230,595	6,210	402,503	48,859	887,819	55.10	[illegible]	[illegible]	[illegible]	[illegible]
Monongahela Connecting	May	7	.....	.....	179,537	16,061	26,626	540	7[illegible],[illegible]12	4,656	120,095	66.90	[illegible]9,44[illegible]	[illegible]	[illegible]	[illegible]
	5 mo.	7	.....	.....	677,556	67,168	110,502	2,674	278,434	36,8[illegible]8	495,616	73.10	181,[illegible]40	[illegible]	[illegible]	[illegible]
Montour	May	56	18,[illegible]27	697	20,218	12,173	22,031	910	10,342	6,455	51,911	[illegible]	—[illegible]	[illegible]	[illegible]	[illegible]
	5 mos.	56	318,032	3,861	32[illegible],[illegible]04	80,485	141,827	4,800	102,624	31,10[illegible]	360,838	11[illegible]	[illegible]	—[illegible]	[illegible]	[illegible]
Nashville, Chattanooga & St. Louis	May	1,[illegible]58	1,364,[illegible]75	378,016	1,880,791	323,851	457,546	69,405	658,7[illegible]5	55,605	1,567,773	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	5 mos.	1,[illegible]58	5,972,409	1,800,288	8,391,524	1,323,912	2,310,591	353,797	3,296,574	293,9[illegible]	7,605,763	90.60	785,761	[illegible]	[illegible]	—4[illegible]
Nevada Northern	May	165	40,698	3,810	47,676	6,938	4,334	424	8,478	2,586	22,760	4[illegible].70	24,[illegible]	1[illegible]	[illegible]	[illegible]
	5 mos.	165	101,594	16,638	140,072	44,823	16,506	2,101	35,599	14,012	113,641	81.10	26,431	4,140	[illegible]	[illegible]
Newburgh & South Shore	May	7	.....	.....	206,639	14,175	37,819	.....	68,494	3,618	124,056	60.00	82,583	69,[illegible]	[illegible]	[illegible]
	5 mos.	7	.....	.....	818,608	41,181	166,695	.....	306,863	18,027	53[illegible],79[illegible]	6[illegible].10	[illegible]	[illegible]	[illegible]	[illegible]
New Orleans Great Northern	May	274	171,678	34,329	215,607	38,675	16,692	5,804	58,458	11,454	131,179	60.80	84,428	[illegible]	[illegible]	[illegible]
	5 mos.	272	841,011	169,707	1,053,495	168,005	219,307	25,355	328,137	51,852	791,760	75.40	[illegible]735	18[illegible]	14[illegible]	84,[illegible]
New York Central	May	6,098	15,736,127	7,307,906	26,526,625	3,500,674	7,306,957	281,316	9,222,841	737,557	21,349,137	80.40	5,177,488	3,564,036	3,8[illegible]3	4,534,[illegible]63
	5 mos.	6,098	80,270,278	33,113,148	129,095,375	14,547,638	32,812,545	1,543,796	47,445,493	3,858,711	101,789,397	78.80	27,305,[illegible]78	19,[illegible]874	[illegible]	11,7[illegible]
Cincinnati Northern	May	244	[illegible]30,465	14,037	251,441	64,740	58,625	4,099	88,111	8,734	225,442	88.90	[illegible]	[illegible]	[illegible]	[illegible]
	5 mos.	244	1,374,558	73,918	1,432,557	273,950	250,973	23,643	468,800	42,018	1,058,787	73.90	374,[illegible]	[illegible]	[illegible]	[illegible]
Cleve., Cin., Chic., & St. Louis	May	2,415	5,208,619	1,339,554	7,102,263	820,180	800,575	107,123	2,451,786	172,953	4,409,658	62.10	2,692,605	[illegible]	[illegible]	[illegible]
	5 mos.	2,415	24,539,194	6,123,007	33,215,768	3,375,677	6,492,151	522,482	12,405,445	846,214	23,885,309	71.90	9,330,459	7,[illegible]	6,5[illegible]	[illegible]44[illegible]
Indiana Harbor Belt	May	119	.....	.....	810,039	127,527	73,510	4,109	296,290	18,618	520,054	64.20	289,985	24[illegible]	[illegible]	[illegible]
	5 mos.	119	.....	.....	3,816,433	426,879	326,548	19,106	1,580,705	95,116	2,448,351	64.10	1,368,079	1,179,[illegible]	[illegible]	—164,[illegible]
Kanawha & Michigan	May	176	123,[illegible]84	42,947	191,923	76,572	105,718	4,195	83,258	10,768	280,114	146.00	88,191	114,612	[illegible]	[illegible]
	5 mos.	176	1,069,720	221,604	1,356,703	296,492	470,131	21,457	528,793	54,750	1,371,190	101.10	—14,487	[illegible]	[illegible]	[illegible]
Lake Erie & Western	May	718	758,804	31,114	827,917	167,903	215,869	17,027	297,763	28,944	727,309	87.80	100,608	16,5[illegible]	[illegible]	[illegible]
	5 mos.	718	3,412,680	172,139	3,732,016	624,363	850,114	90,473	1,481,821	154,485	3,200,822	85.80	531,194	331,9[illegible]	[illegible]	—17[illegible]
Michigan Central	May	1,862	4,601,817	1,516,694	6,740,054	721,495	1,271,073	86,712	2,149,394	136,334	4,425,493	65.70	2,314,561	1,[illegible]165	1,7[illegible]	1,031,[illegible]54
	5 mos.	1,862	20,647,753	6,577,003	30,213,621	3,218,379	6,924,108	458,922	10,960,493	721,785	22,599,191	74.80	7,61[illegible],430	[illegible]	[illegible]	[illegible]
Pittsburgh & Lake Erie	May	227	1,590,679	213,516	1,905,271	261,597	927,451	18,738	640,744	62,[illegible]85	1,912,454	100.30	—7,183	—8[illegible],482	[illegible]	[illegible]
	5 mos.	227	8,313,395	1,025,839	9,739,033	1,159,272	5,119,081	98,741	3,343,833	316,785	10,047,538	103.20	—308,505	—708,[illegible]	—1[illegible]	1,0[illegible]
Toledo & Ohio Central	May	503	[illegible]70,205	56,906	358,915	113,092	182,078	10,691	230,097	23,878	562,643	156.80	—203,7[illegible]8	—2[illegible]8,754	—4[illegible]	1[illegible]
	5 mos.	503	2,849,767	302,323	3,283,361	624,240	1,006,051	54,588	1,440,880	124,278	3,264,406	99.40	19,955	—256,174	—17[illegible]	[illegible]
New York, Chicago & St. Louis	May	523	2,340,763	107,175	2,512,529	249,803	479,781	64,002	847,076	[illegible]6,145	1,743,054	69.40	76[illegible],475	645,981	611,[illegible]	[illegible]
	5 mos.	523	10,918,884	428,024	11,615,691	1,091,192	2,078,818	284,015	4,266,2[illegible]9	403,424	8,147,789	70.10	3,467,902	[illegible]815,707	2,[illegible]	1,[illegible]44[illegible]
N. Y., New Haven & Hartford	May	1,986	5,291,802	3,965,249	10,423,384	1,733,987	2,220,794	55,687	3,906,172	289,281	8,354,870	80.20	2,068,514	1,681,505	1,[illegible]	—[illegible]
	5 mos.	1,986	23,489,551	18,824,967	47,597,890	5,996,412	9,295,309	267,602	19,737,250	1,461,363	37,494,907	78.80	10,10[illegible],983	8,165,846	6,[illegible]61	—4,[illegible]47
Central New England	May	295	484,591	16,550	523,019	160,118	86,182	4,106	163,504	10,777	424,681	81.20	98,338	73,368	44,[illegible]	[illegible]
	5 mos.	295	2,808,345	99,212	3,052,572	523,250	429,357	20,895	1,014,960	59,379	2,047,668	67.10	1,004,904	80[illegible]	643,[illegible]	4[illegible]
New York, Ontario & Western	May	569	4[illegible]5,177	[illegible]3,217	887,320	121,024	148,710	16,052	418,679	29,353	733,818	82.70	153,502	115,[illegible]	[illegible]	116,[illegible]14
	5 mos.	569	3,193,135	73[illegible],[illegible]96	1,702,903	574,063	919,886	73,600	2,324,417	149,706	1,041,672	8[illegible].90	661,231	47[illegible]	47,066	115,[illegible]
Norfolk & Western	May	2,237	7,988,469	728,516	8,994,145	997,094	1,835,224	79,951	2,336,729	141,118	5,389,596	[illegible]	3,60[illegible],549	3,15[illegible]	1,41[illegible]741	8[illegible]7
	5 mos.	2,237	31,908,646	3,329,806	36,538,260	4,561,926	8,511,695	372,230	11,030,899	745,513	25,272,343	69.20	11,265,917	9,011,864	10,1[illegible]	[illegible]
Norfolk Southern	May	930	566,041	11[illegible],679	719,969	108,623	128,407	22,365	305,308	31,695	596,886	82.90	123,083	90,7[illegible]	6[illegible]	[illegible]8,617
	5 mos.	930	2,716,673	54[illegible],569	3,447,257	506,579	568,014	109,525	1,474,733	153,182	2,814,053	81.60	633,204	484,[illegible]	40,[illegible]	[illegible]47
Northern Pacific	May	6,646	5,488,917	1,180,[illegible]13	7,378,960	1,526,296	1,934,249	177,919	2,808,802	215,652	6,747,705	91.40	631,[illegible]	120,136	[illegible]	[illegible]
	5 mos.	6,653	24,71[illegible],746	5,749,292	33,621,547	4,666,338	9,100,237	691,174	14,071,079	1,105,365	30,051,659	89.40	3,569,8[illegible]	196,141	1,1[illegible]78	1,11[illegible]
Northwestern Pacific	May	496	339,630	[illegible]2,10[illegible]	692,495	156,043	73,714	9,663	256,088	13,934	510,773	73.80	181,722	1[illegible]8,086	111,99[illegible]	1[illegible]4,44[illegible]
	5 mos.	505	1,500,581	947,497	2,838,227	556,105	367,800	34,781	1,207,366	72,929	2,240,049	79.10	59[illegible],178	117,[illegible]	91,443	1[illegible]541
Pennsylvania	May	7,314	27,409,740	9,679,[illegible]04	40,634,489	5,795,658	9,959,550	437,672	14,173,178	1,082,983	32,104,8[illegible]	79.00	8,529,668	6,69[illegible]	6,39[illegible]	[illegible]
	5 mos.	7,314	136,346,738	47,317,138	199,900,816	22,587,739	51,461,112	2,176,568	73,326,334	5,514,826	158,371,949	79.[illegible]	41,528,867	14,885,788	12,87[illegible]	8,18[illegible]
Balti., Chesa. & Atlantic	May	87	106,501	32,444	144,443	20,415	62,760	2,108	79,4[illegible]0	3,828	168,531	116.70	—24,088	—[illegible]8,96[illegible]	—[illegible]6,0[illegible]	17,5[illegible]
	5 mos.	87	372,637	126,926	518,792	61,892	211,852	7,369	328,241	17,984	627,343	120.90	—108,551	—114,7[illegible]9	—111,3[illegible]	—97,[illegible]10
Cin., Lebanon & Northern	May	76	83,543	8,681	99,996	14,196	17,121	1,741	56,925	2,022	92,005	92.00	7,991	18	4[illegible]8	—40,8[illegible]
	5 mos.	76	335,600	37,504	419,029	65,941	79,199	8,566	276,784	11,116	441,606	105.40	—22,577	—55,16[illegible]	—49,146	—145,[illegible]

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF MAY AND FIVE MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues			Operating expenses					Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
			Freight.	Passenger.	Total (inc. misc.)	Maintenance of—Way and structures.	Maintenance of—Equipment.	Traffic.	Transportation.	General.	Total.				
Cumberland Valley & Mart.	May	33	$37,916	$5,783	$47,739	$10,628	$15,745	$1,172	$27,802	$3,643	$58,990	123.60	—$11,251	—$18,150	—$22,199	$55,403
	5 mos.	33	346,594	29,431	393,107	42,302	90,288	4,287	152,096	12,607	301,580	76.70	91,527	66,153	43,108	139,657
Grand Rapids & Indiana	May	575	513,561	131,123	705,424	146,550	212,048	14,315	358,708	17,402	749,153	106.20	—43,729	—72,791	—81,732	—32,748
	5 mos.	575	2,414,207	729,112	3,413,207	481,526	965,477	68,882	1,809,304	121,298	3,447,850	101.00	—34,643	—157,134	—241,978	—123,719
Long Island	May	398	724,399	1,687,638	2,666,564	334,221	459,784	13,060	1,067,908	63,610	1,958,474	73.40	708,090	530,700	474,757	174,331
	5 mos.	398	3,611,982	9,424,975	11,047,338	1,337,851	2,079,135	69,849	5,198,178	290,731	9,064,967	82.10	1,982,371	1,585,222	1,235,226	—500,924
Md., Del. & Va.	May	82	72,001	20,567	95,417	12,890	34,678	1,513	67,335	2,571	118,987	124.70	—23,570	—25,365	—26,667	—6,636
	5 mos.	82	278,909	81,876	375,846	43,554	137,084	4,990	270,775	11,741	468,144	124.60	—92,298	—95,316	—100,210	—49,462
N. Y., Phila. & Norfolk	May	122	555,319	80,675	699,632	65,002	142,796	7,079	322,562	12,739	558,560	79.80	141,072	121,557	98,621	—155,477
	5 mos.	122	2,741,522	335,526	3,523,543	277,527	764,649	38,176	1,431,384	69,169	2,623,456	74.40	900,087	834,710	694,933	—452,854
Pitts., Cin., Chic. & St. Louis.	May	2,435	6,137,568	1,530,064	8,642,305	927,366	2,244,190	119,037	3,302,751	201,317	6,856,050	79.30	1,786,255	1,429,695	1,246,413	—533,665
	5 mos.	2,435	26,936,892	7,640,001	38,610,668	3,616,653	10,486,592	555,287	15,745,061	1,023,567	31,746,762	82.20	6,863,906	5,310,131	4,353,189	—2,516,484
West Jersey & Seashore	May	359	430,791	561,136	1,080,086	154,771	192,116	14,632	456,343	25,015	853,987	79.10	226,099	162,418	144,227	37,135
	5 mos.	359	1,835,374	2,407,446	4,635,746	756,994	986,099	72,460	2,272,443	130,095	4,273,451	92.20	362,295	271,461	192,284	—490,719
Peoria & Pekin Union	May	19	8,263	5,599	130,617	56,400	13,733	105	52,523	9,107	131,868	101.00	—1,251	—16,251	4,996	21,337
	5 mos.	19	68,115	21,421	761,207	124,453	90,869	579	311,661	45,717	573,279	75.30	187,928	116,428	231,565	13,746
Pere Marquette	May	2,222	2,687,793	372,587	3,400,302	580,980	759,174	49,093	1,166,024	117,398	2,677,712	78.70	722,590	567,820	451,032	154,229
	5 mos.	2,222	11,789,188	1,844,153	14,902,983	1,607,858	3,119,363	261,789	6,005,964	531,430	11,569,471	77.60	3,333,512	2,605,539	1,917,236	1,066,946
Philadelphia & Reading	May	1,127	4,128,078	822,846	5,335,018	831,803	1,729,127	64,883	1,580,428	148,835	4,368,980	81.90	966,038	754,186	491,813	786,274
	5 mos.	1,127	27,050,717	3,953,163	32,586,628	3,744,372	8,519,988	296,717	11,614,976	738,028	24,987,742	76.70	7,598,886	6,587,491	5,459,281	1,869,043
Atlantic City	May	176	129,057	225,874	363,596	52,413	42,788	3,781	193,990	4,232	297,239	81.70	66,357	47,006	—4,898	49,888
	5 mos.	176	583,124	784,477	1,407,375	270,809	132,487	19,562	902,755	20,655	1,345,136	95.60	62,237	—39,684	—161,146	—365,815
Perkiomen	May	41	89,366	7,743	101,245	7,410	4,220	107	45,375	852	58,022	57.30	43,223	38,352	31,282	27,956
	5 mos.	41	409,396	36,529	463,350	34,467	20,897	537	217,376	4,450	277,920	60.00	185,430	157,922	129,515	246,692
Port Reading	May	21	29,018	.....	83,350	24,086	3,387	229	36,726	1,233	65,659	78.80	17,691	2,938	3,186	24,131
	5 mos.	21	626,083	.....	906,333	94,226	26,594	1,145	295,052	8,944	425,959	47.00	480,374	405,827	108,261	136,689
Pittsburg & Shawmut	May	102	32,878	4,333	38,911	24,687	33,822	1,320	20,189	6,510	86,528	227.40	—47,617	—47,730	—40,871	—5,470
	5 mos.	102	417,315	30,238	454,722	133,470	162,523	7,319	151,086	35,689	490,087	107.80	—35,365	—35,986	17,532	80,266
Pittsburgh & West Virginia	May	85	163,014	8,556	202,356	31,127	49,190	3,841	45,871	14,266	152,739	75.40	49,817	24,921	43,762	—5,743
	5 mos.	85	960,339	46,498	1,162,800	128,932	358,361	17,167	279,972	80,686	908,203	78.10	254,597	127,342	312,617	—55,617
Pittsburgh, Shawmut & Northern	May	210	63,508	5,633	72,625	19,303	47,864	1,697	33,742	6,316	108,925	150.00	—36,300	—38,506	—44,080	—32,993
	5 mos.	210	401,407	35,747	451,477	80,539	221,934	7,830	202,748	36,609	549,680	121.70	—98,203	—109,337	—108,411	—97,110
Quincy, Omaha & Kansas City	May	252	63,438	23,096	95,741	28,055	14,135	575	45,453	3,744	91,567	95.60	4,174	248	—5,091	—20,020
	5 mos.	252	273,277	117,836	431,814	147,089	82,051	4,063	215,046	11,839	459,084	106.30	—27,270	—46,918	—69,490	—83,139
Rich., Fredericksburg & Potomac	May	117	598,630	256,062	1,010,806	129,490	138,890	11,029	335,375	25,759	660,425	65.30	350,381	294,756	246,560	95,621
	5 mos.	117	2,190,352	1,534,338	4,447,303	458,348	623,034	40,444	1,593,875	132,150	2,949,145	66.30	1,498,158	1,256,622	979,418	444,487
Rutland	May	415	257,197	105,577	461,728	86,975	99,815	7,935	212,412	13,031	421,760	91.30	39,968	19,284	15,410	57,739
	5 mos.	415	1,283,353	563,069	2,271,914	437,694	459,904	41,252	1,073,634	65,022	2,084,408	91.70	187,506	85,314	109,633	—23,219
St. Louis-San Francisco	May	4,760	5,106,603	1,610,107	7,228,542	1,362,100	1,357,894	82,006	2,344,506	188,486	5,317,418	73.60	1,911,124	1,542,245	1,511,849	1,259,172
	5 mos.	4,760	22,455,644	7,059,359	31,853,830	4,534,708	6,174,716	412,019	11,748,332	949,151	23,715,573	74.50	8,138,257	6,488,857	6,607,488	6,514,797
Ft. Worth & Rio Grande	May	235	52,376	32,570	96,256	54,117	22,248	2,861	48,033	5,535	132,696	137.90	—36,440	—39,979	—45,209	—5,669
	5 mos.	235	303,246	136,179	490,628	218,723	110,878	13,608	253,333	28,318	622,650	126.90	—132,022	—151,443	—176,693	—173,676
St. Louis, San Fran. & Tex.	May	134	109,188	15,007	132,187	30,335	24,868	3,869	53,185	6,941	119,198	90.20	12,989	11,125	—9,231	—37,646
	5 mos.	134	533,518	73,074	639,337	156,076	123,189	18,141	278,262	33,991	608,807	95.20	30,530	20,665	—83,255	—351,471
St. Louis Southwestern	May	968	1,214,260	125,005	1,404,548	189,971	220,308	38,877	356,875	52,691	863,713	61.50	540,835	473,491	460,293	408,090
	5 mos.	968	5,985,649	629,589	6,901,604	1,048,563	1,094,186	217,548	1,815,169	266,524	4,467,256	64.70	2,434,348	2,142,711	1,956,339	1,806,051
St. Louis Southwestern of Tex.	May	897	460,211	83,266	579,131	218,416	161,920	18,959	293,392	29,754	719,283	124.20	—140,152	—164,169	—150,465	—121,155
	5 mos.	897	2,206,515	419,741	2,803,441	954,490	823,987	98,173	1,501,267	152,719	3,526,479	125.80	—723,038	—843,219	—813,112	—655,253
San Antonio & Aransas Pass.	May	739	359,235	64,643	461,254	98,122	110,879	9,657	198,789	26,399	443,409	96.10	17,845	4,195	—11,710	—58,202
	5 mos.	739	1,627,798	300,223	2,067,602	467,427	584,371	47,436	1,020,634	127,444	2,244,188	108.50	—176,586	—246,960	—313,907	—398,044
San Antonio, Uvalde & Gulf.	May	317	74,675	17,847	102,831	15,114	13,300	2,515	37,810	6,376	75,078	73.00	27,753	24,779	8,684	18,562
	5 mos.	317	311,557	81,965	445,438	71,069	60,072	14,207	174,450	32,327	350,909	78.80	94,529	79,775	23,887	26,513
Seaboard	May	3,563	2,855,411	625,938	3,889,589	448,702	643,130	124,125	1,578,386	163,168	2,984,998	76.70	904,591	729,113	450,624	—67,058
	5 mos.	3,563	13,061,524	3,900,049	18,826,308	2,045,657	3,241,754	622,834	8,106,378	764,841	14,958,354	79.50	3,867,954	3,010,945	1,581,427	852,326
Southern	May	6,971	7,656,637	2,414,882	10,842,694	1,534,725	2,110,842	217,812	4,031,553	312,631	8,285,303	76.40	2,557,391	2,058,032	1,648,355	1,013,063
	5 mos.	6,971	25,465,200	11,417,491	50,609,671	7,258,120	9,492,499	1,038,237	20,368,404	1,625,130	40,167,284	79.40	10,442,387	8,135,278	6,456,690	1,044,990
Alabama Great Southern	May	318	702,626	153,256	903,475	78,724	150,105	17,680	312,203	25,353	588,426	65.10	315,049	260,888	264,691	17,989
	5 mos.	318	2,989,664	672,147	3,850,440	408,847	736,538	89,386	1,467,521	124,397	2,853,641	74.10	996,799	791,608	803,174	130,312
Cin., New Orleans & Tex. Pac.	May	338	1,451,731	251,372	1,777,368	189,534	472,740	28,958	584,855	44,291	1,329,980	74.80	447,388	346,852	304,355	277,503
	5 mos.	338	5,694,318	1,293,928	7,297,741	785,528	1,914,050	135,647	2,524,285	211,572	5,622,935	77.10	1,674,806	1,323,898	1,291,096	510,257
Georgia Southern & Florida	May	402	273,816	102,113	404,562	55,694	77,590	8,705	169,208	12,325	326,406	80.70	78,156	57,921	44,887	—65,513
	5 mos.	402	1,311,196	508,342	1,964,203	316,289	350,500	44,243	852,500	62,240	1,640,463	83.50	323,740	240,395	137,636	—415,826
New Orleans & Northeastern	May	207	398,530	78,046	538,324	73,145	115,373	10,169	218,016	17,309	437,403	81.30	100,921	64,549	70,016	—6,957
	5 mos.	207	1,934,435	375,481	2,562,252	346,816	521,511	55,150	1,141,576	87,174	2,169,826	84.70	392,426	295,716	162,669	—138,115
Northern Alabama	May	110	113,139	13,351	129,194	17,412	6,012	1,223	48,672	4,004	77,324	59.90	51,870	47,815	18,732	—13,284
	5 mos.	110	534,705	54,320	596,931	81,686	26,138	6,592	191,761	15,560	321,732	63.50	185,199	164,905	63,992	—53,311
Southern Pacific	May	7,119	9,831,873	3,550,657	14,939,705	1,985,921	2,661,983	223,199	4,945,172	434,928	10,512,642	70.40	4,427,093	3,085,234	2,999,867	2,073,733
	5 mos.	7,117	42,961,345	16,997,753	66,464,936	9,677,139	12,494,475	1,147,772	23,691,042	2,115,257	50,404,342	75.80	16,060,594	9,293,871	9,167,649	10,219,494

REVENUES AND EXPENSES OF RAILWAYS

Month of May and Five Months of Calendar Year 1922—Continued

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Arizona Eastern	May	382	$284,602	$27,640	$328,158	$30,399	$33,840	$3,399	$85,441	$17,983	$172,004	52.40	$156,154	$132,433	$113,139	—$34,9[illegible]8
	5 mos.	382	1,016,539	140,936	1,213,049	140,206	139,634	14,777	350,140	96,658	744,649	61.40	468,400	346,9[illegible]8	284,300	54,885
Atlantic S. S. Lines	May	....	858,832	47,600	959,186	14,046	204,225	25,433	521,788	26,416	791,908	82.60	167,278	152,936	15[illegible],971	—[illegible]8,592
	5 mos.	....	4,250,835	261,116	4,752,101	61,128	791,979	94,088	2,712,646	129,823	3,789,664	79.70	962,437	89[illegible],605	960,610	187,870
Galveston, Harris. & S. Ant.	May	1,379	1,357,871	371,823	1,787,795	341,242	373,965	34,133	707,034	67,879	1,535,327	85.90	252,468	201,320	188,661	—15,648
	5 mos.	1,379	6,359,602	1,799,501	8,645,729	1,626,968	1,767,173	186,579	3,497,905	363,851	7,471,213	86.40	1,174,516	917,[illegible]5	663,275	652,471
Houston & Texas Central	May	923	762,584	271,551	1,119,213	203,323	223,686	24,033	423,265	40,149	912,709	81.50	206,504	162,8[illegible]	137,506	—51,3[illegible]9
	5 mos.	923	4,000,603	1,440,308	5,809,452	1,043,370	1,136,569	117,226	2,168,810	208,274	4,665,866	80.30	1,143,586	922,488	736,301	—105,8[illegible]3
Houston, East & West Texas	May	191	188,299	41,469	242,783	50,706	48,322	3,317	90,028	7,759	198,550	81.80	44,233	36,474	26,668	—560
	5 mos.	191	883,176	190,239	1,131,071	243,477	242,089	16,570	486,904	41,163	1,024,836	90.60	106,235	74,293	14,138	—65,023
Louisiana Western	May	207	220,838	80,790	325,564	68,046	72,331	8,342	96,976	17,837	267,283	82.10	58,[illegible]1	39,256	41,617	76,[illegible]
	5 mos.	207	1,256,835	420,833	1,797,492	327,164	343,597	44,731	531,751	91,060	1,358,083	75.60	439,409	302,440	295,141	206,495
Morgan's La. & Tex. R. R. & S. S.	May	400	438,186	129,663	635,975	142,721	141,245	16,169	260,900	36,555	601,830	94.60	34,145	—13,768	—8,0[illegible]8	—4,[illegible]92
	5 mos.	400	2,227,840	728,318	3,222,773	703,467	725,781	83,259	1,334,952	170,879	3,041,194	94.40	181,579	—53,175	—1[illegible]9,103	—3[illegible]7,54[illegible]
Texas & New Orleans	May	507	463,046	156,555	667,929	138,369	183,276	10,319	255,584	24,131	616,104	92.20	51,825	—29,616	5,692	—[illegible]1,1[illegible]8
	5 mos.	507	2,687,122	757,864	3,660,476	703,151	904,519	55,127	1,338,303	132,041	3,159,215	86.30	501,261	384,988	227,[illegible]8	—564,678
Spokane International	May	165	67,983	11,458	84,582	17,610	8,545	2,724	32,771	5,743	68,193	80.60	16,389	11,[illegible]4	4,1[illegible]9	17,913
	5 mos.	165	371,218	52,944	444,787	70,351	39,366	14,592	175,368	30,610	334,183	75.10	110,6[illegible]4	8[illegible],1[illegible]	49,492	89,5[illegible]7
Spokane, Portland & Seattle	May	549	421,773	138,605	607,265	63,609	89,367	9,894	194,792	20,272	385,903	63.[illegible]0	[illegible]	1[illegible],[illegible]5	1[illegible],[illegible]48	1[illegible],94[illegible]
	5 mos.	549	1,888,326	616,275	2,743,576	288,422	426,690	46,289	946,342	99,378	1,844,731	67.20	8[illegible]8,845	477,711	41[illegible],[illegible]4[illegible]	30[illegible],[illegible]67
Tennessee Central	May	292	159,892	45,372	216,048	35,809	37,837	4,605	175,254	14,361	267,866	123.90	—51,818	—56,40[illegible]	—7[illegible],4[illegible]5	—71,[illegible]30
	5 mos.	292	704,569	157,480	974,667	161,225	168,869	25,310	533,077	54,702	943,144	96.80	31,[illegible]3	9,[illegible]98	—78,7[illegible]2	—[illegible]5[illegible]6
Term. R. R. Assn. of St. Louis	May	37	.....	.....	381,204	88,465	37,281	1,078	116,034	7,086	253,327	66.50	1[illegible]7,877	69,651	1[illegible],711	193,144
	5 mos.	37	.	....	1,900,451	360,688	182,114	5,604	623,512	34,086	1,223,556	64.40	676,[illegible]5	414,611	[illegible],176	7[illegible]7,009
East St. Louis Connecting	May	1	..	. .	179,640	13,793	7,840	306	55,901	2,720	80,560	44.80	99,080	90,973	80,[illegible]1	34,933
	5 mos.	1	.....	......	837,789	64,377	35,630	1,646	285,644	14,225	401,52[illegible]	47.90	436,267	371,752	3[illegible]0,381	116,313
St. Louis Mchts. Br. Term.	May	9	.....	.....	281,595	43,240	31,841	952	132,887	3,970	21[illegible],890	75.[illegible]0	6[illegible],7[illegible]5	51,1[illegible]5	76,[illegible]61	[illegible]2,8[illegible]7
	5 mos.	9	......	......	1,503,237	196,908	122,637	4,999	718,099	23,851	1,066,4[illegible]4	70.[illegible]0	436,743	3[illegible]8,165	443,7[illegible]8	1[illegible],[illegible]13
St. Louis Transfer Ry.	May	6	......	......	62,820	10,954	4,954	176	33,187	1,793	51,064	81.30	11,7[illegible]	11,769	3,45[illegible]	3[illegible],617
	5 mos.	6	. ..	....	308,119	48,354	20,786	953	164,488	8,789	243,370	79.[illegible]0	64,74[illegible]	6[illegible],[illegible]3	[illegible]3,1[illegible]5	177,675
Texas & Pacific	May	1,952	1,60[illegible],390	577,7[illegible]5	2,378,881	460,419	345,005	46,803	894,754	80,537	1,845,762	77.6[illegible]	[illegible]33,119	4[illegible]2,5[illegible]7	3[illegible]9,[illegible]8	[illegible]27,[illegible]8
	5 mos.	1,952	8,109,153	2,777,850	11,803,964	2,218,215	2,439,096	233,049	4,682,221	444,719	10,099,756	85.60	1,704,[illegible]	1,1[illegible]7,6[illegible]4	7[illegible],41[illegible]	542,4[illegible]1
Toledo, Peoria & Western	May	247	69,251	43,509	122,872	25,173	34,387	2,460	64,[illegible]28	7,803	134,051	109.10	—11,17[illegible]	—[illegible]	[illegible]7	—[illegible]
	5 mos.	247	363,617	233,279	645,512	112,525	173,947	14,262	335,799	39,047	675,508	104.60	—[illegible],9[illegible]6	—[illegible]5,3[illegible]6	—1[illegible]5,066	—3[illegible],[illegible]18
Toledo, St. Louis & Western	May	451	830,508	26,019	908,051	108,179	149,494	20,155	261,672	26,070	565,570	63.30	34[illegible],481	294,036	252,6[illegible]	8[illegible],0[illegible]4
	5 mos.	454	3,677,768	125,127	3,988,650	490,681	676,971	108,450	1,301,020	129,735	2,706,857	67.90	1,[illegible]81,7[illegible]3	1,046,72[illegible]	955,510	2[illegible]4,534
Trinity & Brazos Valley	May	368	139,721	18,555	164,761	48,113	34,733	3,136	75,522	10,911	171,795	104.30	—7,034	—14,0[illegible]5	—[illegible],5[illegible]	7,55[illegible]
	5 mos.	368	1,282,996	104,929	1,440,273	351,167	307,285	16,285	524,478	60,126	1,256,057	87.20	1[illegible]4,[illegible]6	14[illegible],[illegible]	1[illegible]1[illegible]3	—11[illegible],16[illegible]
Ulster & Delaware	May	128	59,680	31,281	131,069	22,450	23,216	3,471	65,075	7,941	122,699	93.60	8,370	[illegible],367	—1,719	—36,[illegible]52
	5 mos.	128	289,643	111,356	559,037	88,442	105,498	10,884	290,236	38,843	536,880	96.00	2,157	—8,106	—26,348	—1[illegible]1,41[illegible]
Union	May	45	......	......	1,015,672	74,613	193,896	195	390,901	6,859	666,464	65.60	349,[illegible]08	335,378	393,4[illegible]1	14[illegible],146
	5 mos.	45	....	.. ...	3,879,149	303,711	[illegible]03,472	1,031	1,682,483	34,833	2,925,530	75.40	953,619	886,959	1,176,[illegible]1	516,875
Union Pacific	May	3,707	5,746,757	1,466,591	7,985,410	1,207,390	1,790,743	165,630	2,066,630	318,194	5,720,928	71.60	2,264,482	1,697,389	1,67[illegible],6[illegible]	2,1[illegible]8,68[illegible]
	5 mos.	3,673	27,161,756	6,392,010	37,000,258	3,775,254	8,358,739	655,638	11,314,412	1,560,141	26,370,368	71.30	10,629,890	7,790,759	7,618,411	7,845,1[illegible]5
Oregon Short Line	May	2,359	2,035,308	426,231	2,678,967	565,489	638,340	46,873	822,787	119,550	2,251,556	84.00	427,411	153,[illegible]13	135,819	1[illegible]0,065
	5 mos.	2,359	10,556,235	2,022,476	13,576,279	1,891,733	2,819,037	223,205	4,389,238	600,358	10,185,712	75.00	3,300,567	2,014,875	1,906,34[illegible]	75[illegible],3[illegible]7
Oregon Wash. R. R. & Nav.	May	2,247	1,526,495	447,461	2,197,756	613,186	443,023	59,405	952,717	125,856	2,225,492	101.30	—[illegible]7,736	—208,713	—2[illegible]1,531	28,461
	5 mos.	2,[illegible]22	7,359,966	2,066,271	10,355,677	2,111,608	2,056,640	291,551	4,767,434	624,418	9,985,268	96.40	370,409	—535,[illegible]94	—917,584	—851,831
St. Joseph & Grand Isl.	May	258	274,684	28,317	270,306	59,880	56,403	2,333	106,782	11,739	237,137	87.70	33,169	15,454	3,433	—21,903
	5 mos.	258	1,072,272	126,932	1,270,701	191,707	239,797	12,821	556,766	60,400	1,061,491	83.50	209,[illegible]10	1[illegible]0,383	78,8[illegible]3	—28,[illegible]54
Utah	May	102	117,043	546	120,460	26,540	35,893	622	25,838	4,484	93,377	77.50	27,083	[illegible]0,927	5,6[illegible]1	—15,786
	5 mos.	102	588,256	4,151	601,498	74,936	181,327	1,811	141,910	23,024	423,008	70.30	178,490	144,793	89,500	1[illegible],863
Virginian	May	526	1,802,279	63,425	1,993,707	192,493	428,100	12,328	401,974	31,346	1,062,058	53.30	931,649	812,923	819,[illegible]1	8[illegible]6,071
	5 mos.	526	7,573,457	308,325	8,415,944	905,084	2,080,137	58,685	1,805,394	153,032	5,001,905	59.40	3,414,039	2,885,417	2,949,007	2,1[illegible]4,788
Wabash	May	2,47[illegible]	3,730,811	808,742	4,900,012	713,645	1,062,193	119,267	1,932,241	148,828	4,003,201	81.70	896,811	705,367	432,659	[illegible]4,[illegible]36
	5 mos.	[illegible]472	18,289,571	3,510,231	23,268,213	3,189,846	4,785,494	579,688	9,922,114	765,255	19,357,[illegible]32	83.20	3,910,[illegible]1	[illegible],959,981	1,6[illegible]9,491	8[illegible],1[illegible]9
Western Maryland	May	[illegible]04	1,107,758	71,845	1,271,816	158,835	258,036	32,116	445,406	47,805	960,736	75.50	311,081	[illegible]71,0[illegible]1	[illegible]9,189	24[illegible],012
	5 mos.	894	6,302,278	358,361	6,972,468	893,733	1,405,026	154,317	2,460,488	225,865	5,241,094	75.20	1,7[illegible]8,374	1,498,374	1,304,907	1,214,589
Western Pacific	May	1,045	608,522	185,196	866,010	196,057	170,622	36,293	318,768	34,622	775,880	89.60	90,130	3,451	36,903	3,667
	5 mos.	1,013	3,026,609	708,643	4,025,499	692,748	810,919	158,784	1,700,004	193,412	3,612,315	90.50	383,164	—48,963	105,[illegible]34	114,066
Wheeling & Lake Erie	May	511	1,033,021	70,760	1,190,790	212,445	236,969	19,231	398,665	33,552	904,362	75.90	286,428	168,465	16[illegible],341	[illegible]82,516
	5 mos.	511	4,782,491	345,871	5,476,278	787,566	1,133,439	88,394	1,962,669	172,167	4,161,628	76.00	1,314,650	765,589	664,857	90,92[illegible]

Conference on Help for K. C. M. & O.

An effort to find ways for extending help to the Kansas City, Mexico & Orient, whose receiver has stated that the road cannot continue operation much longer without assistance, was made at a conference between Chairman McChord and Commissioners Meyer and Potter, of the Interstate Commerce Commission, Receiver Kemper, traffic officers of connecting roads and representatives of the state commissions of Kansas, Texas and Oklahoma at Washington on July 12, but without definite result. Another conference will be held in Chicago on July 18. Various possible ways of tiding over the road until it can recover from the effect of three drought years, high prices, etc., were discussed, ranging from the remission of taxes and the hope of discovering oil along its line to an increase in its divisions and the diversion of traffic from other lines. A formal complaint asking an order extending the latter forms of relief is now before the commission and a hearing has been held but it was represented that the condition of the road was such that it could not await the outcome of these cases. One of the traffic officers brought out that shippers have something to say about the routing and that one shipper of live-stock would not allow the Orient to be used for his shipments for fear that he could not collect in case of loss or damage. The question of increased divisions was considered at length and a committee was appointed to examine the figures of revenues and divisions. The conference was called by Chairman McChord, who had invited the governors of the states through which the road operates, but they sent representatives.

Commissioner Meyer, in a letter to two Texas Congressmen who had asked for an investigation, discussed the situation of the Orient as follows:

"You suggest 'an immediate investigation.' The Orient Railroad has been and still is under investigation in the sense that many months ago, prior to the making of a loan, we investigated its financial, traffic, and operating conditions. We now have pending before us two proceedings relating to routing of traffic and divisions, respectively, which have recently been heard and which will be disposed of at the earliest possible date.

"We are fully conscious of the dependence of thousands of people upon this railroad. The situation in which many may find themselves is tragical. We have been and are doing everything within our power under the law to be of assistance in working out this extremely difficult situation. However, Congress has not authorized us to make donations to a railroad company which may be in severe financial distress. We have made the Orient a loan under section 210 of the transportation act. We are not authorized by law to reach into the public treasury to relieve suffering, no matter how acute it may be. We will soon have exhausted all our resources under the law. Furthermore, we have conferred with other departments of the government in the hope of finding a way of rendering still further financial assistance. Thus far we have been unable to find it.

"This leads me to inquire whether the communities served by the Orient and the thousands of people dependent upon it have exhausted all their resources in rendering assistance to this railroad with a view of keeping it permanently in operation. The states, the counties, and the municipalities in which it operates have an immediate and direct interest in this property and it may be that it is possible for those authorities to render assistance in ways that have not thus far been considered and resorted to.

"We are advised that the Director General has made final settlement with the Orient Under the provisions of the transportation act we made partial payments to the Orient on April 7, June 12, August 4, August 25, and October 21, 1920, respectively. These payments aggregated $916,000. They were made as large as we could lawfully make them. Since these partial payments were made, representatives of the carrier and of this commission have at various times conferred with respect to the determination of the amount due in final settlement of the guaranty provisions of the transportation act under which the above-mentioned partial payments were made. The carrier is now in default of interest on the government loan of $2,500,000 by $75,000. The maximum amount which we may be able to certify to the Treasury as payable to the carrier in final settlement will probably not exceed the amount of the interest in default by more than about $40,000. A certificate for whatever amount may be determined as due will be issued in the immediate future.

"What, if anything, can be accomplished in the two other proceedings pending remains to be seen, although it is safe to assume that no substantial financial assistance may emanate from that source in the immediate future or before July 1.

"Whether Congress can devise ways and means of keeping this railroad in operation in the event that the receiver should be unable to do so, is for you gentlemen who constitute Congress to decide.

"My official contact with the Orient has created in me the impression that its original construction was spectacularly speculative and an invitation to disaster. I am losing no sympathy over the speculators who prematurely created this railroad and those who personally and officially encouraged them to do so. However, I have the most profound sympathy for the people who have built their homes, schools, churches, and places of business along the line and who are dependent upon it. If there is a way to save and protect them, that way should be found.

"In this connection I can not refrain from remarking that in spite of tragedies like those of the Orient, which may be found in every part of this country, we are constantly being appealed to and importuned to authorize the construction of certain new railroads which in all probability, if constructed, would end in disaster. If such disaster should strike only those who are clamoring to be permitted to take the risk, authority might conceivably be granted; but the real sufferers will be the people, largely innocently persuaded, who may make their home in localities dependent upon the success of the enterprise.

"Please regard this letter as my individual expression. I sincerely hope the Orient will continue to operate."

"The Railroad and the Auto Truck"

An evolution is taking place in the transportation of the country that does not seem to be attracting the attention which it deserves. The automobile is elbowing the railroad out of service in many respects. Railroad officials and investors do not seem to realize and legislators do not seem to understand that it is useless to make appropriations for hard roads and have them smashed to pieces by heavy trucks that are transporting freight between industrial points. Millions and millions of tons of freight which formerly went by rail are now transported by automobiles. The highways are sustained at public expense. The railroad is compelled to build its own thoroughfare, buy its own right of way and, in cases where it occupies a public street, pay compensation. Is the competition between the two modes fair?

A great deal of dissatisfaction is manifested toward the railroad and many people are wondering why it is that its returns are so small as compared with what they were years ago when there was less freight to transport and millions of dollars were paid in rebates. Now no money is returned to the shipper by the railroad and all shippers are supposedly treated alike. Why should the state build a hard road costing as much per mile as a great steel thoroughfare and not compel the motor truck transportation company to pay a proper remuneration for the use of it? Why should thousands of citizens be compelled to pay special assessments to have the street in the front of their residences pounded to pieces by those who aimlessly chase about in automobiles, hardly knowing where they are going and knowing less about how to operate the cars, to say nothing of the business vehicle? One reason why there are so many automobile accidents is because so many people are operating cars who have not the experience necessary for the protection of their own lives and their own property or the lives and property of others who are using the streets.

Something ought to be done. Many railroads are slipping financially. Vast sums are being expended in hard roads without proper provision being made for keeping these roads in repair. The glamour of the railroad has disappeared and the enthusiasm now centers around the automobile. The average citizen has his mind on a new form of transportation and the public through its officials and legislative bodies should recognize this sentiment and prepare to meet new conditions.

The railroad cannot be obliterated on account of its ability to compete for the long-haul business and something should be done to dovetail the two forms of transportation, one dealing with long hauls and the other with short hauls. One is as important as the other and it seems that the transportation company which will bring these two methods of transportation into juxtaposition will have solved the question. Either the automobile companies should own the railroads or the railroads should control transportation. *Manufacturers' News.*

Traffic News

The Cleveland, Cincinnati, Chicago & St. Louis on June 25 put on a new passenger train each way between Chicago and Indianapolis, Ind. The new trains will leave each city at 5 p. m. and arrive at the opposite terminal at 10 p. m.

On July 1 the Texas & Pacific inaugurated double dining car service on its "Sunshine Special" operating between El Paso, Tex., and Memphis, Tenn. It is said that two diners were necessary during the heavy summer travel in order that the passengers would not be delayed in getting their meals.

On July 10, the Wabash and the Delaware, Lackawanna & Western inaugurated additional sleeping car service between Chicago and Scranton, Pa., operating eastbound on Wabash train No. 6 and Lackawanna train No. 2, and westbound on Lackwanna No. 5 and Wabash train No. 1. This arrangement also gives the Wabash through sleeping-car service on train No. 3, leaving Buffalo at 7:45 a. m. and arriving at Detroit at 1:45 p. m., and Chicago at 9:50 p. m.

Coal Production

Production during the fourteenth week of the strike was interrupted by the Independence Day Holiday. The total output of bituminous coal will probably fall between 3,500,000 and 4,000,000 tons, and even the average production per working day will show a decrease, according to the Geological Survey bulletin. Production of anthracite remains practically zero.

Complete returns for the thirteenth week (June 26-July 1) indicate an output of 5,207,000 tons of bituminous coal and 25,000 tons of anthracite, a total of 5,232,000 tons, of all coal. In the corresponding week of 1921 bituminous mines produced 7,660,000 tons and the anthracite mines 1,870,000 tons, a total of 9,530,000 tons. In 1920, a year of active business, the total coal raised was 12,064,000 tons. Considering anthracite and bituminous coal as a common source of supply, it will be seen that present production is running from 5,000,000 to 6,000,000 tons behind normal.

The record of daily loadings of cars of bituminous coal clearly discloses the effect of the Fourth of July holiday. On Saturday, July 1, 12,614 cars were loaded as against 13,593 cars on the preceding Saturday. On Monday only 11,165 cars were loaded. On Independence Day itself production ceased almost entirely, and the recovery thereafter was slow. By Thursday, July 6, loadings had reached 14,000 cars but were still running 2,000 cars below the level of the week preceding. Even allowing for full recovery on Friday and Saturday, it does not appear likely that the week's production can pass 3,900,000 tons. Contributing to the decrease in output was a recurrence of traffic congestion on the railroads of Southeastern Kentucky and parts of West Virginia.

The quantity of unbilled coal at the mines has now fallen to small proportions and continues to decline. In the week ended July 1 the average daily number of unconsigned carloads of bituminous coal was 2,898, equivalent to 145,000 tons. This includes all the unbilled coal held by all carriers.

The mine reports for the week ended June 24—the twelfth of the strike—show conditions during the period of highest production since the strike began.

The traffic congestion in Southeastern Kentucky which had been the immediate cause of the decrease in output in the eleventh week, was materially relieved. Losses ascribed to transportation disability in the Harlan field declined from 49.4 per cent of full time to 21.3 per cent, and in the Southern Appalachian field also the placement of cars at the mines was better. This improvement more than offset an increase in transportation disability in the Hazard district and in Northeastern Kentucky. The only other field to report significant loss through transportation was Winding Gulf. The report of transportation disability for Colorado was confined to the Routt County field, the peculiar situation of which has been referred to in these reports. No great change in the number of men on strike is indicated by the mine reports. Production in non-union Pennsylvania continued to increase slowly, but the mines operating had less than their normal working force and shipments were still below those just before the strike.

Commission and Court News

Interstate Commerce Commission

The commission has suspended from July 10 until November 7, the operation of schedules published by the Buffalo, Rochester & Pittsburgh, which propose to cancel the specific commodity rates on brick from New York and Pennsylvania points to Norfolk & Western stations and apply class rates in lieu thereof.

A hearing before the Interstate Commerce Commission on its Docket No. 13896, in re rules governing ratings of coal mines, other than anthracite, and the distribution of cars to such mines, consolidated with the commission's Docket No. 12530, in re distribution among coal mines of privately owned cars and cars for railroad fuel, will be held at 9 a. m. on July 17, at Washington, D. C. The committee which will handle this matter on behalf of the American Railway Association is prepared to offer testimony on behalf of all the railroads with respect to both general subjects. Individual railroads are not, however, precluded from offering any testimony through their own witnesses and counsel with respect to the matters under consideration on behalf of their individual lines.

Express Rates to Be Investigated

The Interstate Commerce Commission has ordered an investigation, upon its own motion, into the interstate rates and charges of express carriers subject to the Interstate Commerce Act for the transportation of express traffic in and between the several zones as defined in *In Re Express Rates, Practices, Accounts, and Revenues*, for the purpose of determining whether such rates and charges, or any of them, are unreasonable or otherwise in contravention of the provisions of the Interstate Commerce Act, and of making such findings and entering such orders as may be necessary to remove any unlawfulness which may be found to exist.

All express companies and common carriers by rail subject to the provisions of the Interstate Commerce Act engaged in the transportation of express traffic between points in the United States and between such points and points in adjacent foreign countries be, and they are made respondents to this proceeding.

Joint Rates Must Not Be Increased or Cancelled Because of Disagreement

The Interstate Commerce Commission in a notice to carriers says it frequently occurs that carriers, unable to agree among themselves upon the division of joint through rates, propose cancellation or increase of such joint rates as a means of adjusting their differences. Almost invariably when no substantial justification for the proposed increase other than dissatisfaction with division is offered, the commission suspends such cancellation or increase and after hearing, requires that the schedules under suspension be cancelled, continuing the joint rates in effect.

"Section 15 of the Interstate Commerce Act places upon the carrier the burden of proof to show that a rate, fare or charge increased after January 1, 1910, is just and reasonable. Disagreement over divisions is not considered by the commission as justification for increases in or cancellation of joint rates or charges, and therefore, as it construes the law, it has no option other than to condemn such changes unless substantial justification other than dissatisfaction with divisions is submitted. The commission is authorized by the same section of the act to prescribe just, reasonable and equitable divisions to be received by the several carriers parties to joint rates and therefore, if unable to obtain equitable divisions from its connections, a carrier should bring the situation to the attention of the commission in an appropriate proceeding rather than without justification attempt to increase or cancel joint rates. Ordinarily the commission will not undertake in investigation and suspension proceedings to pass upon the reasonableness of divisions of joint rates involved therein.

"The attention of carriers is called to the fact that the only

result of attempting to cancel or increase joint rates, which in themselves are reasonable, because of disagreement over divisions, has been waste of time and added expense to shippers, the commission and themselves. Therefore such practice should be discontinued."

Switching Charges at Boston Reduced

The Interstate Commerce Commission has issued a decision finding unjust and unreasonable the switching charges, rates and practices at Boston, Mass., and vicinity and prescribing enlarged switching limits and a uniform basis of switching charges and absorptions, effective on October 2. The case is that of the Boston Wool Trade Association vs. the director general and the various railroads and has been under consideration by the commission since the period of federal control. Various other shippers and receivers of freight intervened and the case was submitted to the commission finally on May 11, 1921. The decision reviews at length the evidence submitted in the case, including a study of the cost of switching service. The order provides for a rate of $10 per car for interchange switching, $15 per car for intra-terminal switching and $20 per car for inter-terminal switching, as defined in the report. The railroads were also ordered to establish between points outside and points inside the switching limits of Boston a rate that does not exceed the rate or charge contemporaneously maintained and applied on like traffic between the same outside point and any other point within the future switching limits. They are also required to maintain through routes between local points outside the switching limits and points within the limits and to apply to transportation over such through routes rates which shall not exceed the rates applied on like shipments from and to the same points to or from Boston by more than $5 a car, provided that these provisions shall not apply to the extent that the defendants accomplish similar results by the partial absorption of switching charges. In view of the intricacy of the situation and the somewhat fragmentary character of the evidence, the report says it is not an easy matter to determine just where the limits of the Boston switching district should be placed nor what the switching charges or absorptions should be. For this reason its conclusions with respect to these matters must be regarded as in a measure tentative or experimental. Applications of the shippers for reparation and of the carriers for fourth section relief were denied.

Court News

Nonmineral Character of Railroad Grant Lands

The Circuit Court of Appeals, Ninth Circuit, holds that, while the act of 1886 making a grant of lands to the Southern Pacific excluded mineral lands, it was intended that the character of the lands should be determined by the Interior Department before the issue of patents, and after a patent issued under the grant, it must be accepted, in a suit where the attack is collateral, as conclusively showing the nonmineral character of the land and the regularity of the proceedings.—People's Development Co. v. Southern Pacific, 277 Fed. 794.

Decisions Under Federal Employers' Liability Act

The Illinois Supreme Court holds that an employee engaged in interstate commerce work, killed in a collision while going from the yard to his home on a hand-car provided by the railroad and under the direction of a foreman, was within the act.—Ramsay v. B. & O. (Ill.), 133 N. E. 703.

A blacksmith, injured while carrying a drawbar belonging to an engine used in interstate traffic, was held within the act.—Gladewell v. Quincey, O. & K. C. (Mo. App.), 236 S. W. 677.

The Wisconsin Supreme Court holds that an employee sent from one town to another to make repairs on cars being used in interstate commerce, was engaged in interstate commerce when killed, on his way back, by a train engaged purely in interstate commerce.—Richter v. Chicago, M. & St. P. (Wis.), 186 N. W. 616.

The Iowa Supreme Court holds that a switchman of a terminal company moving an empty tank car having its origin out of the state to the track of the owner, was engaged in interstate commerce precluding recovery under the Workmen's Compensation Act.—O'Neill v. Sioux City Terminal (Iowa), 186 N. W. 633.

Foreign Railway News

Reserved Seats in British Coaches

LONDON.

Owing to the increasing popularity of the system of reserving seats on express trains, the Great Western Railway (England) is extending and improving this facility on the principal trains during the summer months, commencing in July. The registration of seats will be based on the system adopted by theatres, plans of the trains being provided at the railway stations concerned, showing intended travellers the exact position of every seat, and its number in the train, smoking compartments being indicated. The registration fee will be one shilling (about 25 cents at the normal rate of exchange). The tickets for first and third class seats will be distinguished by different colors and will show the date on which the passenger will travel and the time of the train. Arrangements are also being made for reserving seats by mail.

Forty Die in German Railway Accident

LONDON.

A serious railway accident occurred on June 27 on the Berlin Metropolitan Circle Line. The number of dead is 40 and injured 30. The accident is explained by the extraordinary traffic conditions which were created by the stoppage of work as a tribute to Dr. Rathenau, who was murdered, supposedly by monarchist sympathizers. At noon work in all factories and most shops ceased, but at the same time, tramcars and motor omnibuses were withdrawn from the streets and for thousands of people the metropolitan trains were the only means left of getting anywhere near their homes.

The accident occurred between the two stations of Gesundbrunnen and Schonhauser Alle. A coach door on the near side of one of the trains was left open, swinging outward. It seems that this door caught the projecting ends of a number of planks which a workman standing on the footboard of a car on a passing train was carrying in a bag on his back. Practically all the people who were on the footboards of the rear portions of both trains were brushed off.

Electrification at Bombay, India

Approximately 40,000,000 rupees (about $13,000,000) will be spent in the next five years in the electrification of railways around Bombay, according to Commerce Reports. The first of this work will be on the Harbor Branch of the Great Indian Peninsula Railway and bids on this will soon be asked. This line is about seven miles long, half of which is double-tracked. The Tata Hydroelectric Power Company will furnish the power from existing power houses and sub-stations. It is estimated that the electrification of the Harbor Branch will represent about one-thirteenth of the total program.

The second step on the program will be the electrification of the Great Indian Peninsula's double-tracked main line from Victoria terminus to Kurla. Bids for this will be called for in about six months. Other projects are for the electrification of the G. I. P. line from Kurla to Thana, 14 miles, and from Thanan to Kalyan. Kalyan is 34 miles from Bombay. Meantime the Bombay, Baroda & Central India proposes electrifying its double-tracked line from Colaba station to Virar, a distance of approximately 39 miles. It is understood that the government of India will advance the funds necessary for this work.

The English Engineering Trades Lock-out Settled

LONDON

The great engineering lock-out in Great Britain which has lasted for three months has at last been settled. The result of the ballot which was taken shows that 75,478 members were in favor of a settlement and 39,423 against, leaving a majority of 36,055 in favor of settlement.

From the outset the employers were unanimous in their decision not to give way on any matter of principle. They felt that the time had come when it must be decided once for all whether management of the works was to be in the hands of the owners or in those of

representatives of the employees. That was the real point at issue and a great many employers declared that sooner than give way they would close their businesses. However, although the men have obtained certain concessions, the principle that the management shall be vested in the employer has been maintained, and it only remains for the whole community, which has suffered severely from the effects of the struggle, to deplore the necessity for a fight of this character before a decision that was inevitable could be reached.

The end of this lock-out, however, does not mean that the unemployment in the metal trades will immediately cease. On the contrary there is reason to believe that the proportion of unemployed in the engineering unions will be large for some time to come.

K. C. M. & O. in Trouble in Mexico Too

It is authoritatively stated in advices from Monterey, Mexico, that unless immediate steps are taken by the Kansas City, Mexico & Orient to rehabilitate and connect up its broken stretches of track in that country the Government may take over the property under forfeiture of the company's concession. No public announcement has been made as to what status the Mexican lines of the Kansas City, Mexico & Orient occupies with regard to the possible abandonment of that part of the system which lies in the United States. It is explained, however, that from a financial standpoint, the Mexican divisions are in as bad shape as those across the Rio Grande. It was recently reported that the Southern Pacific of Mexico was negotiating for the purchase of the Kansas City, Mexico & Orient of Mexico, with the view of connecting up the different links in the system and thus forming a new route from the port of Topolobampo to Alpine, Texas, where connection would be made with the transcontinental line of the Southern Pacific. If this pending deal is not made, the government will probably take over the property and merge it with the National Railways of Mexico.

The route across Mexico as laid out for the Kansas City, Mexico & Orient is 633 miles from the Rio Grande crossing, three miles below Presidio, Texas, to Topolobampo. Of this mileage there is completed three stretches of track, operated as separate divisions, aggregating 227 miles, leaving gaps aggregating 406 miles yet to be built. The first division runs from Marquez, State of Chihuahua, to the city of Chihuahua, 91 miles. The second division runs from Minaca to Sanchez, 74 miles, and the third division from Fuerte to Topolobampo, 62 miles. The latter crosses the main line of the Southern Pacific of Mexico at San Blas.

The distance from Alpine to the proposed Rio Grande crossing is 83 miles, and from there to Marquez, 165 miles. For several years preceding the revolutionary period the Kansas City, Mexico & Orient operated its trains west from Chihuahua over the track of the Mexico & Northwestern to Minaca, thence over its own track to Sanchez. From Chihuahua to Minaca is 122 miles. The unfinished gap between Sanchez and Fuerte is 209 miles, and this part of the route is said to be through a mountainous region that offers great engineering and construction difficulties to the building of the proposed railroad.

It is pointed out that the rounding out of the Kansas City, Mexico & Orient in Mexico as originally planned would give an enormous scope of rich territory of this country a transportation outlet to the United States. The Conchos river valley in the State of Chihuahua, which the line already penetrates, is capable of being irrigated and made very productive, while the western part of that state has mineral resources almost unequalled anywhere in the world, it is asserted. The Pacific Coast region is being rapidly developed agriculturally and much of its products are finding a market in the Western part of the United States.

In the event of the National Railways of Mexico taking over the Kansas City, Mexico & Orient's division in that country, it is considered doubtful if the connecting up of the different stretches of track would be made for many years to come. It is the expressed opinion of men who are familiar with the situation that in their present positions of isolation these component parts of the Kansas City, Mexico & Orient cannot be made to pay profitable returns, but that by finishing the line all the way through from Alpine, Texas, to Topolobampo, it would obtain a heavy freight traffic.

Equipment and Supplies

Locomotives

The Sewell Valley has ordered one Mikado type locomotive from the Baldwin Locomotive Works.

The New York Central is having 50 locomotives overhauled at the shops of the Baldwin Locomotive Works.

The Illinois Central is inquiring for 15, 0-8-0 type switching locomotives, 25 Santa Fe type locomotives and 25 Mikado.

The International Harvester Company has ordered two 6-wheel switching locomotives from the Baldwin Locomotive Works.

The Western Meat Company, San Francisco, Cal., has ordered one 6-wheel switching locomotive from the American Locomotive Company.

The Erie has entered into a contract for the repair of 20 locomotives a month for a period of six months at the American Locomotive Company's Cooke Works.

The Baltimore & Ohio has ordered 35 Mikado type locomotives from the Baldwin Locomotive Works. This road is also having repairs made to 25 locomotives at the Baldwin shops.

The Delaware, Lackawanna & Western, reported in the *Railway Age* of July 1 as contemplating asking for bids on about 30 locomotives, is now asking for 5 Pacific type and 25 Mikado type locomotives.

The Pittsburg Plate Glass Company, Zanesville, Ohio, has ordered one, 0-4-0 type switching locomotive from the American Locomotive Company. This locomotive will have 13 by 20 in. cylinders and a total weight in working order of 65,000 lb.

The Central America of Cuba has ordered one Mogul type locomotive from the American Locomotive Company. This locomotive will have 17 by 24 in. cylinders and a total weight in working order of 111,000 lb.

The Delaware & Hudson has ordered one Consolidation type locomotive from the American Locomotive Company. This locomotive will have 23½ and 41 by 30 in. cylinders and a total weight in working order of 312,000 lb. and will be equipped with superheater.

Freight Cars

The Southern Pacific is inquiring for 250 general service cars.

The Pere Marquette is considering having repairs made to 1,000 box cars.

The Buffalo Creek & Gauley is inquiring for from 200 to 300 hopper cars

The Burdett Manufacturing Company, Chicago, is inquiring for one U. S. R. A. box car.

The Humble Oil & Refining Company is inquiring for three 12-yd. capacity air dump cars.

The Argentina State Railways have placed an order with the Standard Steel Car Company for 100 ballast cars.

The Pittsburgh & West Virginia and the West Side Belt are inquiring for 1,000 hopper cars.

The Northern Refrigerator Car Company has ordered 500 refrigerator cars from the Pullman Company.

The Chicago & North Western is preparing to issue inquiries for repairs to a large number of cars, the number and type yet to be determined.

The Chicago, Milwaukee & St. Paul is inquiring for repairs on from 1,000 to 1,500 box cars and 250 gondola cars.

The Chicago, Burlington & Quincy is preparing to issue inquiries for repairs to a large number of cars the number and type yet to be determined.

The San Antonio Uvalde & Gulf is inquiring for 25, 30-ton steel underframe ventilated box cars and 25, 30-ton steel underframe composite gondola cars.

The Chicago, Rock Island & Pacific is inquiring for repairs to 1,500 box cars, from 500 to 1,500 gondola cars, 500 refrigerator cars and 500 furniture and automobile cars.

The Central Vermont will have repairs made to 200 steel gondola cars, 100 wooden underframe box cars and 400 steel underframe box cars at the shops of the American Car & Foundry Company.

The Illinois Central, reported in the *Railway Age* of July 8 as inquiring for from 500 to 1,000 gondola cars, is now inquiring for 2,000 gondola cars and is asking prices on the repair of 600 gondola cars.

The Nashville, Chattanooga & St. Louis has increased its recent freight car inquiry from 750 to 1,000, the revised inquiry calling for 750 box cars, 150 stock cars of 40 tons' capacity and 100 flat cars of 50 tons' capacity.

The Delaware, Lackawanna & Western reported in the *Railway Age* of July 1 as inquiring for 380 gondola car bodies of 40 tons' capacity, has given an order for 370 car bodies to the American Car & Foundry Company.

The New York, New Haven & Hartford has given a contract to the Keith Car & Manufacturing Company, Sagamore, Mass., for rebuilding 6,000 bad-order freight cars. The company also has a large number of additional cars awaiting repairs.

The Nashville, Chattanooga & St. Louis, reported in the *Railway Age* of June 10 as inquiring for 500 box cars, 150 stock cars and 100 flat cars, has ordered 500, 40-ton single sheathed box cars, 250, 40-ton double sheathed box, 150, 40-ton stock and 100, 50-ton flat cars from the American Car & Foundry Co.

The Texas & Pacific will build 532 freight cars in its shops at Marshall, Tex., as soon as the shopmen's strike is settled. This is the first authorization of a total 1,100 cars which are to be built in these shops, the company already having the necessary material on hand for the construction of the initial lot.

Passenger Cars

The Tennessee Central is inquiring for from 2 to 5 coaches.

The New York Central is having seven dining cars built at its West Albany shops.

The Nashville, Chattanooga & St. Louis is reported to be considering the purchase of 17 passenger cars.

Machinery and Tools

The Long Island has ordered a 150-ton overhead traveling crane from the Whiting Corporation for its Morris Park shops. The company is inquiring also for the following tools: Vertical boring mill, car wheel borer, car axle lathe, vertical double slotter, upright bushing press and a wheel press.

Signaling

Pennsylvania.—See item in General News Department.

The Grand Trunk has placed an order with the General Railway Signal Company for 12 color light signals complete, 36 type K ½ transformers, 26 Model Five switch boxes and 10 light type switch indicators for installation between St. Henry, Que., and Lachine.

The Victorian Railways, Australia, have placed an order with the General Railway Signal Company for two Model 2 B unit lever electro-mechanical interlocking machines for installation at Camberwell, Victoria, and Hawthorn. Both machines will have 32 levers.

Supply Trade News

The offices of the **Air Reduction Sales Company**, formerly maintained at 120 Broadway and 160 Fifth avenue, New York, have been consolidated with the executive office at 342 Madison avenue.

The Clarence Cottman Company, which operates one of the large piers at Canton Terminal, Baltimore, Md., has given a contract to Heyl & Patterson, Inc., Pittsburgh, Pa., for an 11-ton man trolley ore bridge.

W. J. Gruss, who has been head of the pig iron sales department of Pickands, Mather & Company, Cleveland, Ohio, has resigned to become manager of sales of the **Gartland-Haswell-Rentschler** interests, with headquarters at Dayton, Ohio.

The **Greenville Steel Car Company**, Greenville, Pa., is erecting a new building 75 ft. by 390 ft. in which the company plans to install its present fabricating equipment. The company has heretofore only repaired and rebuilt steel equipment but will in the future also build new freight cars.

Jay L. Hench, who resigned recently as Chicago district sales manager of the Lackawanna Steel Company, has formed **Jay L. Hench & Company**, 208 South La Salle street, Chicago, to engage in the purchase and sale of various iron and steel products including steel sheet piling, light and heavy tee rails, sheets, plates, shapes and bars with an additional line of open-hearth electric castings. Mr. Hench was born on April 11, 1885, at Hinsdale, Ill. He attended Cornell University from 1903 to 1905, specializing in iron and steel analysis. From 1905 to 1906 he was employed in the open-hearth and Bessemer departments of the Illinois Steel Company, and from 1906 until 1911 he was connected with the sales department of Joseph T. Ryerson & Son. He left in 1911 to become a sales agent of the Lackawanna Steel Company, having jurisdiction over the Indiana and Michigan territory. In May, 1919, he was promoted to district sales manager in charge of the Chicago office, which position he held up to the time of his resignation.

J. L. Hench

The **Pilliod Company**, Swanton, Ohio, manufacturers of the Baker locomotive valve gear, with New York office at 30 Church street, has secured control of the Southern Valve Gear Company. The former offices of the Southern Valve Gear Company located at Knoxville, Tenn., have been discontinued.

H. D. Shute, vice-president and general sales manager of the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., has been elected a member of the board of directors of the **Standard Underground Cable Company**, Pittsburgh. **A. B. Saurman**, general sales manager of the **Standard Underground Cable Company**, Pittsburgh, has been elected vice-president in addition to his other duties.

C. E. Knickerbocker, regional engineer, Eastern Region, United States Railroad Administration and formerly chief engineer of the New York, Ontario & Western, resigned effective July 1 and has formed a partnership with L. D. Rockwell, under the name of **Knickerbocker & Rockwell**,

with office at 2 Rector street, New York City. The new firm will handle railway supplies and specialties.

The Younglove Construction Company, United Bank building, Sioux City, Iowa, have been appointed representatives of the **Conveyors Corporation of America**, 326 West Madison street, Chicago, for the sale of American trolley carriers in northwestern Iowa and in South Dakota. The trolley carrier is equipment used for handling coal from cars to storage pile or overhead silos by means of monorail and self dumping buckets.

Sidney G. Johnson on July 1 resigned as assistant to the president of the Chicago Railway Signal & Supply Company. In the *Railway Age* of June 24, on page 1754, Mr. Johnson was by error mentioned as being connected with the Okonite Company instead of the Hazard Manufacturing Company, Wilkes-Barre, Pa., with which he has been connected since April, 1921. Mr. Johnson's headquarters are at 30 Church street, New York City.

Joseph H. Towle, who joined the selling forces of the **National Railway Appliance Company** of New York, some time ago, is now in charge of the company's new Pennsylvania headquarters at Harrisburg, Pa., where an office was recently opened at 85 Union Trust Building. Mr. Towle was formerly with the Railway Improvement Company, New York, as sales engineer. The National Railway Appliance Company is now selling a new product known as Tnemec paint. The principal use of this material is the protection and rust-proofing of metals and other materials.

Obituary

Harvey E. Miller, vice-president of the Fairbanks Company, New York City, died on July 9 of injuries he received in the Atchison, Topeka & Sante Fe collision at Burrton, Kan.

Trade Publications

CERTIFIED MALLEABLE IRON.—The daily service that is being rendered by one of the most important branches of the iron and steel business is outlined in a book, entitled "Certified Malleable in Transportation and Industry," just issued by the American Malleable Castings Association, Cleveland, Ohio. It tells in an interesting way the story of certified malleable castings and their contribution to safety, strength and economy.

The book points out the great responsibility that malleable castings assume when used for vital parts of railway and general industrial equipment and also describes the methods employed by the American Malleable Castings Association in bringing the product of its members to a uniformly high standard and maintaining it at that point. By standardizing the manufacturing process of an industry, scientists and practical foundrymen, operating through the American Malleable Castings Association, have produced certified malleable, a superior metal assuring high strength and ductility.

In the strict supervision of the product of its members, the work of the Association parallels the activities of the trade guilds of the middle ages whose chief reason for existence was the guardianship of the consumers' interests. They saw to it that their members conformed to adopted standards of material and craftsmanship, and their supervision was accepted by the careful buyer as a certain guaranty of quality. The book is a complete treatise on the subject of malleable iron and gives information regarding the properties of the metal that are of interest and value to all users.

"TAKE A CHANCE ON READING THIS, but never on a railroad crossing." This is the introduction to a circular addressed to "Our Friends the Automobilists," which has been issued by W. H. Gemmell, president of the Minnesota & International, for distribution in garages, hotels, commercial clubs and other places where it will be seen by the people addressed. "One hundred per cent of the terrible and distressing crossing accidents that happen," says the circular, "are caused by the drivers of cars and teams failing to exercise the ordinary care that is expected of prudent men and women in the interests of themselves and their families. Does this seem like a strong statement? Think it over. How can it be otherwise? * * *"

Railway Construction

ATLANTIC COAST LINE.—This company's shops at Montgomery, Ala., were recently destroyed by fire, but as yet no definite plans for rebuilding them have been made.

BALTIMORE & OHIO.—This company has placed contract with the Pittsburgh Construction Company, Pittsburgh, Penna., for the erection, concreting and waterproofing of a new railroad bridge crossing Spring Grove avenue, Cumminsville, Cincinnati, O. The new structure at this point is to be a solid floor bridge, consisting of four through plate girder spans, two 43 ft. in length and two 30 ft in length. The work has been undertaken for the purpose of replacing an old and light bridge, and constitutes a step in the modernization of the company's facilities in the Cincinnati district.

BALTIMORE & OHIO.—Contracts for bridgework recently placed by this company include the following: Bridge over Grand Calumet river, Gary, Ind.—Two plate girder spans, 78 ft. and 25 ft. in length, respectively, required for extension of opening provided by 14-ft, masonry arch. Contract for the fabrication of the steelwork has been placed with the American Bridge Co.; delivery is to be made September 1, and erection will be performed before the conclusion of the present working season. The installation of these spans has been found necessary, due to the increased volume of water in the Grand Calumet river, occasioned by drainage from the adjacent plant of the Illinois Steel Co. Similar work on the adjacent bridges of the New York Central and the Elgin, Joliet & Eastern is also involved, and is being prosecuted simultaneously: bridge crossing public road, south of Painsville, O.—The new structure at this point, consisting of two plate girder spans, with respective lengths of 63 ft. 6 in. and 33 ft., was fabricated by the American Bridge Co. Contracts for the erection has been let to the Kelly-Atkinson Construction Co., Chicago, Ill. The new bridge replaces an old masonry arch viaduct, constructed almost 70 years ago, which had been found inadequate for the company's needs and which provides a restricted opening for the passage of highway traffic: bridge crossing, Black river, Elyria, O.—This structure consists of two deck plate girder spans, each 47 ft. long, and two "I" beam spans, each about 20 ft. in length. The superstructure was fabricated by the American Bridge Co. Contract for the erection has been placed with the Kelly-Atkinson Construction Co.; overhead bridge west of Metchell, Ind.—This structure, which crosses the company's tracks on the line of the Lincoln highway, is to consist of three spans of plate girders, encased in concrete, center span 63 ft. long, two approach spans each 32 ft. long. The new bridge replaces a wooden structure, and the work is occasioned by the absorption of a county road into the Lincoln highway, increased volume of highway traffic and weight of vehicles. Contract for the construction of the new bridge complete has been placed with the American Bridge Co., and the work will be pushed to a prompt conclusion.

CANADIAN NATIONAL.—This company has awarded a contract for grading and culverts on a revision of the Grand Trunk Pacific main line, at the crossing of Sundance creek between Mile 60.71 and Mile 64.46, to David Fitzgerald, Carstairs, Alta.; also for grading and culverts on a proposed five-mile connection between the Canadian Northern Alberta and the Grand Trunk Pacific near Magnolia, Alta., to James Fitzgerald, Edmonton, Alta.; also for grading and culverts on a proposed connection at Camrose between the Bashaw division of the Grand Trunk Pacific and the Battle River subdivision of the Canadian National, to Fred Mannix, Calgary, Alta.; also for the construction of a pipe line approximately 16,200 ft. long at Kindersley, Sask., to C. U. McManus, Moose Jaw, Sask.

CANADIAN PACIFIC.—This company is calling for bids, up to 3 p. m. Monday, July 17, for the construction of a new pier between piers A and D at its Pacific terminals in Vancouver harbor. The pier will be 850 ft. long and 330 ft. wide, and is estimated to cost $2,000,000. It is to be completed by September 30, 1923. H. Rindal, district engineer, Vancouver, B. C., is in charge.

CHICAGO, BURLINGTON & QUINCY.—This company has completed surveys for and may undertake next year the construction

of a 17-mile cut-off authorized between Frederick, Ill., and Vermont, the work to involve heavy grade revision and probably to include four tunnels. This company is making surveys in contemplation of building a 45-mile extension northerly from Casper, Wyo., to the Salt Creek and Teapot oil fields.

CHICAGO, BURLINGTON & QUINCY.—This company has awarded a contract to the Great Lakes Construction Company, Chicago, for the construction of a power plant at Aurora, Ill. This company, reported in the *Railway Age* of July 1, page 45, as requesting bids for the construction of a new round house at Rock Island, Ill., has awarded the contract for this work to G. A. Johnson & Sons, Chicago. The company will also accept bids for the construction of one-story brick passenger stations at Fort Morgan, Colo., and Hardin, Mont., respectively.

CHICAGO & NORTH WESTERN.—This company will accept bids until July 16 for the construction of a one-story frame passenger station at Bassett, Neb.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—This company has been ordered by the Illinois Commerce Commission to construct a viaduct over its tracks and the track of the Lake Erie & Western at Bloomington, Ill.

EVANSVILLE, INDIANAPOLIS & TERRE HAUTE.—This company reported in the *Railway Age* of May 20, page 1197, as preparing to replace four steel bridges at various points on its line, has awarded the contract to the Walsh Construction Company, Davenport, Iowa, for the sub-structure work on three bridges, the fourth not requiring such work.

GREAT NORTHERN.—This company has been ordered by the Board of Railway Commissioners of Montana to extend its line from a point in or near Gilman to Augusta before September 15.

ILLINOIS CENTRAL.—This company is contemplating the improvement of its freight facilities at Indianapolis, Ind., the work to include the construction of a freight handling platform, the paving of the drive way and the laying of two tracks.

LOS ANGELES & SALT LAKE.—The Interstate Commerce Commission has issued a certificate authorizing the construction of a branch line from Delta to Fillmore, Utah, 31.4 miles, together with 3.6 miles of secondary track. The cost of the proposed line is estimated at $701,188.

MISSOURI, KANSAS & TEXAS.—This company has awarded a contract to Bowie, Lydon & Co., Inc., Chicago, for the construction of a freight terminal at Denison, Texas, to cost approximately $450,000.

MISSOURI, KANSAS & TEXAS.—This company is reported to have awarded a contract to the A. McKenzie Company for the construction of a two story brick and concrete freight house, 58 ft. by 400 ft. at Waco, Texas. It is also accepting bids for the construction of freight houses at Wichita Falls, Texas, and Fort Worth, respectively

NEW YORK CENTRAL.—This company is receiving bids until July 25 for covering a new metal superstructure for its bridge over Sherman street, Fort Wayne, Ind.

PENNSYLVANIA.—This company is receiving bids for the elevation of tracks from Everett street to south of White Horse Pike, Camden, N. J. Approximate quantities are as follows:—45,000 cu. yd. embankment; 590 cu. yd. concrete abutment masonry and concrete bridge floor, including reinforcement; 6,500 sq. ft. waterproofing; 2.4 miles track material unloaded, piled, distributed and laid; 4 turnouts and 1 crossover, etc. This company is also receiving bids for paving and track work along Front street, Chester, Pa., from Ridley river to Pennell street. Approximate quantities are as follows: 3,000 cu. yd. excavation; 0.76 mile track material unloaded, piled, distributed and laid; 2,000 cu. yd. unloading and surfacing stone ballast; 5 turnouts and 2 cross overs laid; 2,900 cu. yd. street grading; 3,750 lin. ft. concrete curb; 5,400 sq. yd. Belgian block paving on concrete base. The work will be in charge of C. W. Thorn, assistant engineer, Philadelphia, Pa.

UNION PACIFIC.—This company will accept bids until July 21 for the construction of a brick freight house at Denver, Colo. Its superstructure will be of steel, 610 ft. by 70 ft., including two platforms 16 ft. by 865 ft. and an automobile unloading shed, 50 ft. by 400 ft.

Railway Financial News

ATLANTIC COAST LINE.—*Authorized to Acquire Control.*—The Interstate Commerce Commission has authorized the acquisition by this company of control of the Rockingham Railroad by purchase of additional shares of its stock. The Rockingham Railroad operates 21 miles between Gibson, N. C., and Rockingham.

BIRMINGHAM & NORTHWESTERN.—*Purchased.*—This road has been purchased by the Gulf, Mobile & Northern, subject to the approval of the Interstate Commerce Commission. The Birmingham & Northwestern operates between Jackson, Tenn., and Dyersburg, 49 miles.

CHESAPEAKE & OHIO.—*Asks Authority to Acquire Trackage Rights.*—This company and the Norfolk & Western have applied to the Interstate Commerce Commission for approval of the acquisition by the Chesapeake & Ohio of trackage rights to operate over the line of the Norfolk & Western between Waverley and Valley Crossing, Ohio.

CHICAGO & NORTH WESTERN.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $5,250,000 of 5½ per cent certificates to be issued by the Farmers Loan & Trust Company at not less than 97½.

CHICAGO, MILWAUKEE & ST. PAUL.—*Equipment Trust Certificates Authorized.*—The Interstate Commerce Commission has authorized this company to assume liability in respect of $8,085,000 of equipment trust certificates to be sold at not less than 96¾.

CINCINNATI NORTHERN.—*Annual Report.*—The income account for the year ended December 31, 1921, follows:

	1921	1920
Miles operated	245	246
Operating revenues	$3,757,713	.....
Operating expenses	2,642,291	.....
Net from railway operations	1,115,422	.....
Railway tax accruals	274,948	.....
Railway operating income	840,448	.....
Net railway operating income	702,255	$475,243†
Total other income	8,224*	1,638
Gross income	694,031	476,882
Total deductions from gross income	131,543	121,665
Net income	562,488	355,217
Dividends declared (5 per cent in 1921; 3 per cent in 1920 charged to profit and loss)	150,000	.....
Surplus for year	412,488	355,217

†Includes compensation accrued for January and February, guaranty, March to August, and net railway operating income—corporate—September to December.
*Debit balance.

CUBA RAILROAD.—*Dividends.*—This company has declared two semi-annual dividends of $3 a share on the preferred stock, payable August 15, 1922, and February 15, 1923. Both disbursements are payable to stock of record July 20, 1922. The last previous payment was a $3 semi-annual disbursement on August 1, 1920.

DENVER & RIO GRANDE WESTERN.—*Receivership Is Asked.*—Receivership for this road has been requested by the New York Trust Company in an application filed July 7 in the Federal District Court of Denver, Colo. The petitioner alleges that there have been several defaults on the mortgage bonds which were first issued by the Denver & Rio Grande and later purchased by the succeeding company, the Denver & Rio Grande Western. Judge Foster Symes has set the hearing on the application for July 21.

ELGIN JOLIET & EASTERN.—*Annual Report.*—The income account for the year ended December 31, 1921, follows:

	1921	1920
Miles operated	457	457
Operating revenues	$19,334,942	$22,051,470
Operating expenses	13,613,040	16,249,936
Net from railway operations	5,721,902	5,801,534
Railway tax accruals	933,167	644,294
Railway operating income	4,788,736	5,157,241
Net railway operating income	3,370,340	3,106,832
Other income	1,470,297	220,033
Gross income	4,840,646	3,326,864
Rent of leased roads	3,008,088	1,358,981
Interest on funded debt (E. J. & E. Ry. Co.)	500,000	500,000
Total deductions from gross income	3,579,869	2,238,548
Net income	1,260,777	1,088,316

HOCKING VALLEY.—*To Exchange Bonds.*—The Guaranty Trust Company of New York announces that on and after July 10 the Hocking Valley Railway Company 6 per cent equipment gold notes, series 32 and 32A, in definitive form, with coupons due July 15, 1922, and subsequent attached, will be delivered in exchange for trust receipts now outstanding upon presentation of the latter at its trust department, 140 Broadway, New York City.

ILLINOIS CENTRAL.—*Authorized to Operate Line.*—The Interstate Commerce Commission has issued a certificate authorizing this company to operate in interstate commerce a line heretofore built and operated as an industrial spur track, from a point near Zeigler, Ill., for a distance of 4.83 miles and also to operate under trackage rights in connection with it 3,600 feet of track owned by a coal company.

LAKE ERIE & WESTERN.—*Annual Report.*—The income account for the year ended December 31, 1921, follows:

	1921	1920
Miles operated	719	738
Operating revenues	$9,061,494	.....
Operating expenses 66	8,137,734	.....
Net from railway operations	923,761	.....
Railway tax accruals	596,235	.....
Railway operating income	327,674	.....
Net railway operating income	197,252	$1,075,123*
Total other income	112,902	208,787
Gross income	310,154	1,283,910
Interest on funded debt	702,741	672,041
Total deductions from gross income	898,458	894,181
Balance for year	Def. 588,304	389,729

*Includes compensation accrued for January and February, guaranty, March to August and net railway operating income—corporate—September to December.

Applications Before I. C. C.—See New York, Chicago & St. Louis.

MEMPHIS, DALLAS & GULF.—*Sale Again Postponed.*—The sale of this road was again postponed on June 21, this being the third postponement.

MINARETS & WESTERN.—*Asks Authority to Issue Securities.*—This company has applied to the Railroad Commission of California for authority to issue $50,000 common stock and to sell $2,200,000 six per cent bonds at not less than 97. The road is being built primarily for the lumbering operations of Sugar Pine Lumber Company which recently established its mills in Fresno. The proceeds of the securities now asked to be issued are to reimburse the lumber company for advances and to provide funds for the completion of the road.

MISSOURI, KANSAS & TEXAS.—*Charter.*—The reorganized company filed incorporation papers in Missouri on July 6 with Secretary of State Charles U. Becker and was given a charter upon payment of an incorporation fee of $175,025.

MISSOURI PACIFIC.—*Annual Report.*—This company's annual report for 1921 is reviewed in an article on another page of this issue entitled "Operating Characteristics of Missouri Pacific." See also excerpts from annual report on adjacent pages.

NEW YORK CENTRAL.—*Bonds Sold.*—J. P. Morgan & Co. and associates have sold $25,000,000 refunding and improvement mortgage 5 per cent bonds, series C, at 94½ to yield approximately 5.30 per cent.

The bonds, which have been authorized by the Interstate Commerce Commission, are dated October 1, 1921, and are due October 1, 2013. They are redeemable as a whole, but not in part, at 105 and accrued interest on, but not before, October 1, 1951, or any interest date thereafter, on three months' notice. The proceeds of the issue will be applied to the retirement of the $25,000,000 of 7 per cent collateral trust bonds of the company, which will be called for redemption on September 1, 1922, and these bonds, due September 1, 1930, will be accepted in payment at 105.

In a letter to the bankers, A. H. Smith, president of the New York Central, said that the company's net railway operating income for the first five months of 1922 was $20,190,353, compared with $11,775,742 for the corresponding period of last year, an increase of 60 per cent. He said also that the average interest rate on the entire corporate indebtedness of the New York Central, including the present issue and $480,161,000 of underlying bonds, is approximately 4 per cent.

Equipment Trust Authorized.—The Interstate Commerce Commission has authorized the New York Central Lines to assume obligation and liability in respect to $27,645,000 of equipment trust certificates to be issued by the Guaranty Trust Company and to be sold at not less than 95.495.

NEW YORK CENTRAL.—*Acquisition of Further Control Authorized.*—The Interstate Commerce Commission has authorized the acquisition of further control of the Cleveland, Cincinnati, Chicago & St. Louis by the New York Central by the purchase of additional stock. The New York Central now controls the Big Four through the ownership of $30,207,700 of its common stock out of a total of $47,028,700. This does not, however, constitute complete control since the consent of a majority of the preferred stock is required for the issuance by the Big Four of any evidence of funded debt or the making by it of any lease of railway property which may entail increased fixed charges. The New York Central, therefore, desires to acquire at least a majority of the preferred stock. A group of the owners of preferred stock objected to the plan, contending that the proposed price is inadequate.

NEW YORK, CHICAGO & ST. LOUIS.—*Asks Authority to Acquire Control.*—This company and the Lake Erie & Western have filed a joint application with the Interstate Commerce Commission for an order approving an agreement made between the two roads effective July 1 providing for the operation, management and control of the Lake Erie & Western by the New York, Chicago & St. Louis as a single system. The application is filed under Paragraphs 1 and 2 of Section 5 of the Interstate Commerce Act, but it asks that the commission consider that it is also filed under other parts of the act if the commission considers necessary, and if the commission cannot give its complete approval of the agreement it is asked to state the extent to which it will give approval.

Contract for Exchange of Materials.—See article on another page entitled "Contract for Exchange of Materials Held Not to Constitute Control."

NEW YORK, NEW HAVEN & HARTFORD.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $5,900,000 of first and refunding mortgage bonds to be pledged with the Secretary of the Treasury as part security for a loan from the United States.

ROCKINGHAM RAILROAD.—*Acquisition of Control.*—See Atlantic Coast Line.

SILVERTON.—*Authorized to Abandon Line.*—The Interstate Commerce Commission has authorized the abandonment as to interstate and foreign commerce of this company's narrow gage railroad from Silverton to Joker Tunnel, Colo., 15.5 miles.

SOUTHERN PACIFIC.—*Asks Authority to Acquire Line.*—This company has applied to the Interstate Commerce Commission for authority to acquire the Chowchilla Pacific, 10 miles, in Madera County, Calif.

WESTERN MARYLAND.—*Annual Report.*—This company's annual report for 1921 is reviewed in an article on another page of this issue entitled "Western Maryland Increases Net with Less Traffic."

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out to or received from the several roads the following amounts:

San Antonio & Aransas Pass	$1,000,000.00
Gulf & Ship Island	575,000.00
Vicksburg, Shreveport & Pacific	250,000.00
Chicago, Peoria & St. Louis	1.00
Calumet Western paid Director-General	7,377.87

Dividends Declared

Central of Georgia.—Common, 2½ per cent; preferred, 3 per cent; both payable June 30.

Nashville, Chattanooga & St. Louis.—3½ per cent, semi-annually, payable August 1 to holders of record July 22.

Trend of Railway Stock and Bonds Prices

	July 11	Last Week	Last Year
Average price of 20 representative railway stocks	67.25	65.41	55.31
Average price of 20 representative railway bonds	87.02	86.41	73.96

Annual Report

Fifth Annual Report of Missouri Pacific Railroad Company

TO THE STOCKHOLDERS: St. Louis, Mo., April 15, 1922.

The Board of Directors herewith submits report of the operations and affairs of the Company as of December 31, 1921.

CORPORATE INCOME STATEMENT

FOR THE YEAR ENDED DECEMBER 31, 1921, COMPARED WITH THE PREVIOUS YEAR

	1921	1920	INCREASE OR DECREASE
Railway operating revenues	$109,785,949.76	$98,194,270.81	$11,591,678.95
Railway operating expenses	91,693,855.71	94,909,598.69	—3,215,742.98
Net revenue railway operations	$18,092,094.05	$ 3,284,672.12	$14,807,421.93
Railway taxes and uncollectible railway revenue,	$ 4,396,528.73	$ 3,820,708.53	$ 575,820.20
Railway operating income,..	$ 13,695,565.32Dr.	$ 536,036.41	$14,231,601.73
Other operating income,.....	799,173.59	660,230.05	138,943.54
Total operating income,....	$ 14,494,738.91	$ 124,193.64	$14,370,545.27
Deductions from Operating income, ...	4,257,890.60	4,741,202.29	—483,311.69
Net railway operating income,	$ 10,236,848.31Dr.	$4,617,008.65	$14,853,856.96
Non-operating income,.....	3,061,557.37	1,274,901.50	1,786,655.87
Compensation accrued under Federal Control, (Standard Return),.....		1,872,101.47	—1,872,101.47
Government guaranty under Transportation Act of 1920, ...	1,972,080.96	15,638,828.92	—13,666,747.96
Gross income.....	$ 15,270,486.64	$14,168,823.24	$ 1,101,663.40
Deductions from gross income, ...	11,733,470.55	11,135,748.07	597,722.48
Balance—Net income transferred to profit and loss,	$ 3,537,016.09	$ 3,033,075.17	$ 503,940.92

FEDERAL CONTROL

The Board of Directors at a meeting held on July 15, 1921, approved the settlement negotiated with the Director General of Railroads, covering the use of the properties of the Company during the Federal Control Period, January 1, 1918 to February 29, 1920.

Under the terms of settlement the Company received $13,927,787.35 consisting of a cash payment of $9,000,000.00 and the cancellation of all open accounts, the balance $4,927,787.35 was in favor of the Director General.

The settlement was an arbitrary one and no detailed information is available as to the allowances made by the Director General for Additional Compensation, Depreciation, Under-Maintenance and other items included in the claims presented by the Company.

The total amount credited by the Government was $43,959,387.35, of which $30,031,600.00 constituted Compensation for use of the property and the balance $13,927,787.35, the cash payment and cancellation of open accounts and all claims. The latter amount has been credited to Profit and Loss in compliance with Order of the Interstate Commerce Commission dated January 25, 1922.

GENERAL BALANCE SHEET

ASSETS.	December 31, 1921	December 31, 1920	Increase or Decrease
INVESTMENTS:			
Investment in Road and Equipment	$376,558,051.91	$367,672,892.18	$ 8,885,159.73
Improvement on Leased Railway Property	1,078.88	924.95	153.93
Sinking Funds.....	1,294.72	16,456.32	—15,161.60
Deposits in Lieu of Mortgaged Property Sold....	88,689.09	92,892.92	—4,203.83
Miscellaneous Physical Property	2,385,255.25	2,319,733.53	65,521.72
Investments in Affiliated Companies—Pledged	6,004,125.65	6,984,125.65	—980,000.00
Investments in Affiliated Companies—Unpledged ..	6,037,104.89	4,932,725.83	1,104,379.06
Investments in Securities Issued or Assumed or otherwise carried as a Liability by the Accounting Company—Pledged	4,165,065.10	5,816,000.00	—1,650,934.90
Investment in Securities Issued, Assumed or otherwise carried as a Liability by the Accounting Company—Unpledged	1,976,585.65		1,976,585.65
Other Investments—Pledged	15,355,549.87	15,375,448.31	—19,898.44
Other Investments — Unpledged	18,259,947.78	8,195,373.48	10,064,574.30
TOTAL	$430,832,748.79	$411,406,573.17	$19,426,175.62
CURRENT ASSETS:			
Cash	$1,941,990.59	$4,527,655.33	—2,585,664.74
Special Deposits	935,274.73	4,100,972.32	—3,165,697.59
Loans and Bills Receivable	115,344.25	132,804.97	—17,460.72
Traffic and Car Service Balances Receivable.....	565,465.86	1,831,838.05	—1,266,372.19
Net Balance Receivable from Agents and Conductors	2,356,038.31	3,211,672.71	—855,634.40
Miscellaneous Accounts Receivable	464,814.26	158,031.99	306,782.27
Material and Supplies....	11,221,087.11	14,543,515.00	—3,322,127.89
Interest and Dividends Receivable	464,814.26	158,031.99	306,782.27
Rents Receivable	37,350.00	33,750.00	3,600.00
Other Current Assets	242,535.29	355,356.53	—112,821.24
TOTAL	$22,727,702.97	$36,189,289.60	$13,461,586.63
DEFERRED ASSETS:			
Working Fund Advances...	$256 128.81	$257,962.63	—1,833.82
U. S. Government Open Accounts		22,267,105.72	—22,267,105.72
Other Deferred Assets.....	1.00	1.00	
TOTAL	$256,129.81	$22,525,069.35	—$22,268,939.54
UNADJUSTED DEBITS:			
Rents and Insurance Premiums Paid in Advance..	$57,135.08	$139,076.23	—81,941.15
U. S. Railroad Administration, (Compensation) .		11,612,729.76	—11,612,729.76
U. S. Govt. Guaranty under Transportation Act....	5,027,909.88	6,155,828.92	—1,127,919.04
Other Unadjusted Debits	344,540.39	349,321.25	—4,780.86
Total	$5,429,585.35	$18,256,956.16	—$12,827,370.81
	$459,246,166.92	$488,377,888.28	—$29,131,721.36

NOTE: The following Securities not included in Balance Sheet Accounts:

Securities Issued or Assumed—Unpledged .	$5,501,500.00	$3,501,500.00	$2,000,000.00
Securities Issued or Assumed—Pledged .	7,031,500.00	9,031,500.00	—2,000,000.00
TOTAL	$12,533,000.00	$12,533,000.00	

LIABILITIES.	December 31, 1921	December 31, 1920	Increase or Decrease
STOCK:			
Capital Stock:			
Common	$82,839,500.00	$82,839,500.00	
Preferred	71,800,100.00	71,800,100.00	
TOTAL	$154,639,600.00	$154,639,600.00	
LONG TERM DEBT:			
Funded Debt Unmatured..	$243,447,980.00	$243,752,880.00	—$304,900.00
TOTAL CAPITAL LIABILITIES.	$398,087,580.00	$398,392,480.00	—$304,900.00
CURRENT LIABILITIES:			
Loans and Bills Payable...	$70,000.00	$3,971,225.00	—$3,901,225.00
Traffic and Car Service Balances Payable	1,388,000.29	1,920,161.21	—532,160.92
Audited Accounts and Wages Payable	8,071,378.78	13,259,924.65	—5,188,545.87
Miscellaneous Accounts Payable	719,448.94	982,663.55	—263,214.61
Interest Matured Unpaid..	1,071,270.80	1,073,967.67	—2,696.87
Unmatured Interest Accrued	3,009,427.11	2,891,614.58	117,812.53
Unmatured Rents Accrued	284,256.61	254,553.20	29,703.41
Other Current Liabilities..	394,980.60	819,790.53	—424,809.93
TOTAL	$15,008,763.13	$25,173,900.39	—$10,165,137.26
DEFERRED LIABILITIES:			
U. S. Government Open Accounts		$36,409,705.36	—$36,409,705.36
Other Deferred Liabilities..	$125,567.38	207,850.30	—82,282.92
TOTAL	$125,567.38	$36,617,555.66	—$36,491,988.28
UNADJUSTED CREDITS:			
Tax Liability	$2,607,238.57	$1,889,994.51	$717,244.06
Insurance and Casualty Reserves	110,179.70	7,967.71	102,211.99
Operating Reserves	2,836,113.73	3,806,154.00	—970,040.27
Accrued Depreciation — Equipment	5,130,638.51	3,985,503.20	1,145,135.31
Other Unadjusted Credits..	1,129,009.12	1,629,543.56	—500,534.44
TOTAL	$11,813,179.63	$11,319,162.98	$494,016.65
CORPORATE SURPLUS:			
Additions to Property through Income and Surplus.....	$300,082 62	$188,726.17	$112,256.45
Profit and Loss	33,910,094.16	16,686,063.08	17,224,031.08
TOTAL	$34,211,076.78	$16,874,789.25	$17,336,287.53
	$459,246,166.92	$488,377,888.28	—$29,131,721.36
NOTE: The following Capital Liabilities not included in Balance Sheet Accounts:			
Funded Debt Unpledged .	$5,501,000.00	$3,501,500.00	$2,000,000.00
Funded Debt Pledged . . .	$7,031,500.00	$9,031,500.00	—$2,000,000.00
TOTAL	$12,533,000.00	$12,533,000.00	

The Capital Liabilities shown above include the securities issued under the Reorganization Plan for bonds of various issues dealt with by the Plan, including $1,687,500.00 principal amount, not acquired on December 31, 1921, which are accordingly not shown as Liabilities.

The company is guarantor jointly with other companies of the securities of certain terminal companies none of which are in default.

GUARANTY PERIOD

Under the terms of Section 209 of the Transportation Act of 1920, guaranteeing one-half of the annual compensation of the Test Period for the six months, March 1 to August 31, 1920, $12,583,[illegible]00 has been advanced by the Government. Final settlement is expected during the present year of claim prepared under the formula prescribed in the Order of the Interstate Commerce Commission dated December 15, 1921.

OPERATIONS

(Compared with previous year)

The Total Railway Operating Revenues for the year were $109,745,072 51, a decrease of $8,976,355.92 or 7.56%.

This decrease is attributable to the general depression in business.

The Total Operating Expenses were $92,042,456 [illegible], a decrease of $21,277,483.75 or 18.78%, largely due to reduction in force, reduction in cost of materials and economies effected in both Maintenance and Operation. The average number of employes in service was 33,462, a reduction of 7,722 or 18.75%.

Net Revenue from Railway Operations was $17,702,616.39, an increase of $12,301,127.83.

The total number of tons of revenue freight handled decreased 6,914,855 tons or 20.36%, while the revenue ton miles decreased 20.05%.

The average revenue per ton mile was $0.01270, as compared with $0.01076.

The number of revenue passengers shows a decrease of 27.98%, while the number of passenger miles decreased 25.29%, with an increase of 1.81 miles in the average haul per passenger.

The average revenue per passenger mile was $0.0344, as compared with $0.0294.

FEDERAL VALUATION

The federal valuation of the properties of your Company is to be made as of June 30, 1918. The Bureau of Valuation of the Interstate Commerce Commission has completed the inventory of the physical property of the Company and is now engaged in compiling and pricing same; it is expected that the tentative report will be completed and referred to us for review, before the close of the present year. The valuation department of your Company has worked in close co-operation with the Interstate Commerce Commission forces in completing the inventory and has done a large amount of work in anticipation of the receipt of the completed report in order that a prompt review may be made, as but thirty days are allowed for filing exceptions.

PENSION SYSTEM

The Employes' Pension System has been in effect since July 1, 1917. During the operation of this system, 242 employes have been carried on the pension rolls; the number on the rolls at the present being 189, with an average monthly allowance of $56.15 involving a monthly contribution of $10,617.50.

CAPITAL STOCK

No changes have been made in the Capital Stock during the year.

FUNDED DEBT

Funded Debt outstanding in the hands of the public decreased $304,900.

During the year the Long Term Debt was increased by notes to the United States Government payable proportionately, January 15, 1922 to 1936, inclusive, amounting to $1,200,000 and Equipment Trust Certificates, Series A, to the amount of $1,836,000, a total of $3,036,000 to cover the cost of fifty (50) locomotives. Equipment Gold Notes, Series 41, in an additional amount of $181,500 were issued to complete the balance due on the equipment allocated in 1920 to the Company by the Director General of Railroads.

Note in favor of the United States Government maturing March 1, 1930 for $3,000,000 was issued to cover a loan made by the Director General of Railroads on account of Additions and Betterments completed during the period of Federal Control, the Company having paid the Government in full for all such Additions and Betterments in the final settlement heretofore referred to.

Equipment Trust Certificates aggregating $2,135,400 were paid and General Consolidated Railway and Land Grant Mortgage bonds to the principal amount of $25,000 were purchased and retired during the year. Note representing a loan from the United States Government of $4,362,000 matured November 1, 1921 and was paid.

First and Refunding Mortgage Bonds, Series D, to the principal amount of $5,600,000 were pledged with the Government as security for the Notes above mentioned issued during the year and $9,416,000 of the amount of the same issue of bonds were returned to the Company's Treasury by the retirement of notes heretofore issued to the Government. This resulted in increasing the amount of unpledged bonds of this Series in the Company's Treasury $3,816,000 of which $1,816,000 principal amount are carried as "Investment in Securities Issued, Assumed or Otherwise Carried as a Liability by the Accounting Company," and $2,000,000 principal amount nominally issued.

LOANS AND BILLS PAYABLE

Notes of the company in favor of the Government aggregating $3,901,225 were returned and cancelled reducing this account to $70,000, which is represented by a demand note covering surplus funds of the Missouri Pacific Hospital Association.

NEW LINES

There were no new lines constructed during the year, and only changes of minor importance occurred in the operated mileage.

ROAD AND EQUIPMENT

The following new equipment has been received and taken into the accounts during the year:

25 Mikado Type Locomotives,
5 Mountain Type Locomotives,
5 Pacific Type Locomotives,
15 Switch Locomotives,
10 Steel Passenger Coaches.

The details of charges to Road and Equipment are summarized as follows:

Road,		$4,366,243.84
Equipment,	$5,378,679.35	
Less Equipment Retired,	913,391.95	4,465,287.40
General Expenditures,		1,279.91
Assets and Liabilities not appraised June 1, 1917		52,348.58
Total Charges to Road and Equipment,		$8,885,159.73

In the following pages the Corporate and Federal Accounts have been consolidated to afford ready comparison of results of the year covered by the report and with the previous year.

By Order of the Board of Directors,
B. F. BUSH,
President.

Railway Officers

Executive

Ross S. Marshall, whose appointment as assistant to the president on the Chesapeake & Ohio and Hocking Valley with headquarters at Richmond, Va., was announced in the *Railway Age* of June 24, page 1761, was born at Rock Island, Ill., on March 15, 1880. He attended high school at Anaconda, Mont., and, in 1897, entered railway service as a clerk. From 1902 until 1915 he served as division accountant and chief clerk to division engineer of the Chicago, Rock Island & Pacific. He then went to Panama where he served as chief clerk to the general superintendent and as local auditor of the Panama Railroad. Returning to the United States two years later he became a statistician to the general superintendent, the general manager and vice-president in charge of operation of the New York, New Haven & Hartford. From 1911 to 1914 he served consecutively as assistant to the vice-president in charge of operation and as division superintendent of the Minneapolis & St. Louis. In 1914 he went with the Seaboard Air Line as superintendent with headquarters at Richmond, Va. He subsequently served this company as assistant general manager and as general superintendent. In 1918 he went with the United States Railroad Administration as statistician in the division of law, where he served until his appointment as assistant to the president of the Chesapeake & Ohio.

W. M. Duncan, president of the Wheeling & Lake Erie, whose election as chairman of the board of directors was announced in the *Railway Age* of July 8, page 91, was born at Pittsburgh, Pa., on May 19, 1873. He was admitted to the bar soon after his graduation from the school of law of Cornell University in 1894, and entered railway service in the same year as an attorney for the Cleveland, Akron & Canton. He served in this capacity until 1897 when he joined the law department of the Wheeling & Lake Erie where he remained until 1905, following which he served as general attorney of the Wabash-Pittsburgh Terminal Railway, the West Side Belt and the Wheeling & Lake Erie. He became general attorney for the receiver of the Wheeling & Lake Erie in 1908, which position he held until June 20, 1912, when he was appointed receiver of this road. At the close of the receivership on Jan. 1, 1917, Mr. Duncan was elected president of the reorganized company and has continued in this capacity until his recent election as chairman of the board.

W. M. Duncan

Financial, Legal and Accounting

L. B. Williams, treasurer of the New York, Chicago & St. Louis, with headquarters at Cleveland, O., has been appointed general treasurer of that road and of the Lake Erie & Western with the same headquarters.

Operating

H. J. Humphrey has been appointed assistant general superintendent of the Ontario district of the Canadian Pacific with headquarters at Toronto. **H. J. Main** has been ap-

pointed superintendent of the Trenton division with headquarters at Toronto.

F. N. Reynolds, superintendent of the Indianapolis terminal of the Cleveland, Cincinnati, Chicago & St. Louis, has had his jurisdiction extended to include the Springfield division from Springfield, Ohio, to Indianapolis, Ind., with title of superintendent Springfield division and Indianapolis terminal.

D. Coughlin, general superintendent of the first district of the Chicago, Rock Island & Pacific with headquarters at Des Moines, Iowa, has been appointed acting manager of the district with the same headquarters, to succeed C. W. Jones granted leave of absence due to ill health. **A. T. Abbott**, division superintendent with headquarters at Des Moines, has been appointed acting general superintendent, to succeed Mr. Coughlin and he will be succeeded by **C. T. Ames**, train master at Des Moines who has been appointed acting superintendent. Mr. Ames will be succeeded by **F. A. Bogue**, trainmaster of the Chicago Terminal division, who has been appointed acting trainmaster, with headquarters at Des Moines.

R. E. Brooks, assistant superintendent of the Oregon Short Line, who has been promoted to superintendent of the Montana division effective June 25, was born at Bismark, Mo., February 5, 1885, and entered railway service in 1900 as a messenger with the Louisville & Nashville. He was employed by this road as messenger, telegraph operator, train dispatcher and chief dispatcher until April, 1910, when he entered the service of the Atchison, Topeka & Santa Fe as train dispatcher. He was employed as a dispatcher by the Denver & Rio Grande from September to December, 1911, and by the Union Pacific from December 15, 1911, to April 1, 1917. On June 15, 1917, he entered the service of the Oregon Short Line as dispatcher, later serving as chief dispatcher and assistant superintendent until the date of his recent promotion.

W. M. Neal, whose appointment as general superintendent of the Algoma district of the Canadian Pacific with headquarters at North Bay, Ont., was announced in the *Railway Age* of July 8, page 91, was born in June, 1886. On January 25, 1902, he entered the employ of the Canadian Pacific as a clerk for the Canadian Pacific in Toronto. In May, 1903, he became a stenographer and clerk in the general superintendent's office at Toronto. The following year he was transferred in a similar capacity to the office of the superintendent of transportation at Winnipeg. In January, 1908, he became chief clerk to the superintendent at Souris, Man. Two months later he became clerk to the general superintendent at Winnipeg. In June, 1910, he was promoted chief clerk of car service at Winnipeg and in May, 1915, was transferred in a similar capacity to Montreal. In January of the following year he was appointed car service agent of the Eastern division at Montreal. In April, 1916, he became acting superintendent of car service and, two months later, assistant superintendent of District No. 2, with headquarters at Montreal. The following month he again became acting superintendent of car service, and, a few days later, assistant superintendent of car service. In November of the same year he again became acting superintendent of car service and remained in that capacity until October, 1917, when he entered the service of the Canadian Railway Association for National Defense. In February, 1920, he was promoted to assistant general superintendent, which position he held on the Ontario district until his recent promotion.

Traffic

L. D. Knowles has been appointed traffic manager of the Union Refrigerator Company, Milwaukee, Wis.

C. B. Stovall, has been appointed district freight agent of the Lake Erie & Western, with headquarters at Memphis, Tenn.

G. W. Humphrey has been appointed assistant general freight agent of the Bangor & Aroostook with headquarters at Bangor, Maine.

A. E. Dove has been appointed general agent of the passenger department of the Chicago, Rock Island & Pacific with headquarters at Minneapolis, to succeed W. L. Hathaway, deceased.

H. E. Shepard has been appointed commercial agent of the Atlantic Coast Line with headquarters at Jacksonville, Fla., effective July 10.

R. G. Hyatt, formerly traffic manager of the Waco (Texas) Chamber of Commerce, has been appointed manager of the Texas Freight Traffic Association.

H. L. Pigott, traveling passenger agent of the Wabash with headquarters at Kansas City, Mo., has been promoted to division passenger agent, with headquarters at Ft. Wayne, Ind., succeeding G. D. Maxfield, deceased.

J. L. Bennett, travelling freight agent of the Chicago, Rock Island & Pacific with headquarters at Minneapolis, Minn., has been appointed commercial agent with the same headquarters, succeeding C. H. Bacon, retired.

Stuart C. Leake has been appointed general agent of the Richmond, Fredericksburg & Potomac, **William E. Phaup**, commercial agent, and **Edward W. Weeks**, commercial agent, all with headquarters at Richmond, Va.

Mechanical

J. E. Osmer has been appointed superintendent of motive power of the Denver & Salt Lake with headquarters at Denver, Colo.

Engineering, Maintenance of Way and Signaling

W. P. Wiltsee has been appointed principal assistant engineer of the Norfolk & Western with headquarters at Roanoke, Va., effective July 1.

Obituary

W. H. Biggar, vice-president and general counsel of the Grand Trunk, died suddenly at Toronto on July 7.

David Meriwether, Jr., regional engineer of the United States Railroad Administration at Washington, D. C., and formerly assistant chief engineer of the Southern Railway, died at Washington on June 21. He had been connected with the Southern since 1901 and became regional engineer for the Railroad Administration in March 1, 1920.

J. H. Manter, assistant freight traffic manager of the Atchison, Topeka & Santa Fe, died at Chicago on July 5 after a long illness. Mr. Manter was born at Murphysboro, Ill., on May 14, 1865, and entered railway service as a telegraph operator on the St. Louis, Iron Mountain & Southern in 1883, which position he held until 1885 when he left to become a telegraph operator on the Minneapolis & St. Louis. He later became a clerk in the general freight office of the same road and in 1886 he entered the service of the Minnesota & North Western as a chief clerk to the general agent at Minneapolis. From April, 1887, until August of that year he was a train dispatcher of the same road at St. Paul, Minn., and in August, 1887, he was transferred to Chicago as chief clerk to the general agent. From April, 1889, to September, 1890, he was chief clerk for the general agent of the Atchison, Topeka & Santa Fe at Chicago and from September, 1890, to February, 1891, he was contracting freight agent with the same headquarters. In February, 1891, he was promoted to commercial agent with headquarters at Peoria, Ill., which position he held until October, 1895, when he was transferred to Kansas City, Mo. On January 1, 1897, he was promoted to general agent with headquarters at Chicago, and he held this position until March 1, 1903, when he was promoted to assistant general freight agent with the same headquarters. On March 1, 1920, he was promoted to assistant freight traffic manager, which position he was holding at the time of his death.

FORCE OF HABIT—(From a recent train bulletin). "Nos. 10 and 1 on time; cause unknown."

EDITORIAL

Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

A Logical Step In Locomotive Development

The plain saturated locomotives with narrow fireboxes built before 1900 all had one outstanding limitation, the lack of boiler capacity at speeds above about 20 miles an hour. The first step taken to remedy this condition was the application of a wide firebox and a trailing wheel on passenger locomotives. As the size of motive power increased it became necessary to place the firebox behind the drivers on freight engines as well, adhesive weight being sacrificed to get greater steaming capacity. Most of the important developments since that time have tended to improve locomotive performance at the higher speeds. Typical modern designs for both passenger and freight service have considerable excess boiler capacity at low speeds and a relatively large proportion of weight on leading and trailing trucks. Where the locomotive of twenty years ago had relatively high starting tractive effort and was deficient in steaming capacity the modern locomotive often has inadequate adhesion for starting and considerable excess boiler capacity at low speeds. The desirability of a better balance between the starting tractive force and the power at running speeds is shown by the numerous efforts now being made to utilize the locomotive and tender trucks to secure additional power. Three different designs have been brought out of which two have already received thorough tests. There is no longer any room for doubt as to the practicability of locomotive boosters mechanically or their advantages from the operating standpoint. They represent the logical increase of machine power to utilize the increased boiler power already secured and will no doubt assume an important place in future locomotive design.

Pennsylvania's Lease of Panhandle

The Interstate Commerce Commission in a decision dated July 10 has approved the lease by the Pennsylvania Railroad of the Pittsburgh, Cincinnati, Chicago & St. Louis. It has made its approval conditional by adding a proviso that the Pennsylvania Company and the Pennsylvania Railroad Company shall not dispose of their stock in the Panhandle without the commission's consent. All of the stock of the Pennsylvania Company is owned by the Pennsylvania Railroad Company. The Pennsylvania Company and the Pennsylvania Railroad together own 98.3 per cent of the total shares outstanding. The proviso resulted in a number of dissenting opinions, these being expressed by Commissioners Hall, Daniels and Campbell. Commissioners Eastman and Aitchison dissented for other reasons. Commissioner Potter in a concurring opinion giving the views also of Commissioners Lewis and Cox expressed his disapproval of the proviso. It has not yet been announced whether the Pennsylvania management will go forward with its plans or not. The proviso is an apparent handicap to future financing on the part of the Pennsylvania insofar as concerns the Panhandle stock. Commisioner Potter says that "The condition is inherently unwise and unreasonable." A most important feature of the decision, however, reverts back to one of the main reasons for the desire to lease the Panhandle property. This was to save accounting costs and to get around the necessity of figuring out divisions of rates and classifying charges and costs of operation as between the Panhandle and the parent company. The savings in costs would be great and very much in line with the country's desire for decreased railway costs. It is disappointing that the Commission should feel it desirable to put obstacles in the way of such progress and particularly disappointing because of the unusual nature of the obstacle itself. We shall probably hear more of this decision.

Strikes and Fast Freights

Press dispatches from Fresno, Calif., are to the effect that $200,000,000 worth of fruit may be endangered by lack of freight transportation. This figure may be exaggerated. It may, indeed, be strike propaganda. Whatever it is, it emphasizes the importance that fast freight service bears to the welfare of the nation from the standpoint of keeping consumers distant from the producing centers supplied with foodstuffs of one sort and another. Fast freight service in this country is also one of the best indexes of efficient railroad service, the degree of efficiency being indicated by the fast freight schedules and the manner in which trains are kept on schedule. It is, therefore, at the present time an index, in addition, to the manner in which the various railroads are being affected by the shopmen's strike. If anything, it is a better index than the passenger service for the simple reason that special efforts are usually directed towards keeping passenger trains running normally and other things in comparison are secondary. With these ideas in mind it is interesting to learn from shippers that a number of roads, among them notably the Lackawanna, the Lehigh Valley, the Illinois Central, the Nickel Plate, the New Haven, and to a lesser extent, the New York Central and Pennsylvania are keeping their schedule freights on time, thereby showing that they apparently have the strike situation well in hand. The idea might be carried further. It is axiomatic that strikes are won or lost through the force of public opinion. It is an interesting psychology whereby the striking shopmen try to prove their case to the public by desiring first to tie up or delay passenger service which inconveniences the public itself and second to tie up the freight service—notably the fast freight service—which endangers the public's food supply. Various able students have recently been making a careful study of public opinion—its cause and effect. They will be very likely to find much material in the present railway strike.

The Trend in Building Design

One of the most attractive fields for the display of engineering ability in railway service and one which has only recently come to be recognized to any extent lies in the design of buildings for their most effective occupancy. The time has not long passed since the average engineer confined his attention to the design of the foundations, walls, roof and floor to carry the loads imposed on them safely and to the selection

of the materials of construction on consideration of maximum economy in first cost and maintenance. The more modern idea of building design contemplates all of this and more. It is coming to be considered that a building is well designed only when it complies with the principles of engineering as applied to both the construction and the operating needs of the department which will use it. This implies a thorough study of the methods of the using department and the visualization of these methods as they will be applied in the new structure. Only by such an investigation prior to the design of the structure can arrangements be made for the installation of the facilities required by the using department. The engine terminal which the New York Central is now completing near Syracuse, N. Y., and which is described on a following page, is an illustration of the care with which such buildings are being designed. It is evident that the spending of a relatively small amount for additional engineering services in the design of such a structure will yield large returns in decreased costs of operation by the department which will occupy it. It is from refinements such as are, for instance, noted here in the design of the enginehouse, the coaling station and the somewhat unusual type of ash pit, that many of the economies of railway operation must come in the future. Engineering department officers can contribute in no more effective way to the success of their companies than by utilizing every opportunity to familiarize themselves with the needs of the other departments which they serve and then so designing their structures that they may meet these needs to the largest possible extent.

Effects of Wheel Arrangement

"Electric Locomotives" is the title of a paper presented recently to the Institution of Mechanical Engineers by Sir Vincent L. Raven, chief mechanical engineer, Northeastern Railway, England. The paper describes the characteristics of many existing electric locomotives and outlines the requirements of electric locomotives for various classes of service. The comments made by Sir Vincent on the effect of wheel arrangement are of particular interest. There is a well-founded opinion in America that a symmetrical wheel arrangement is undesirable for high speed service as it may be the cause of excessive lateral oscillations or "nosing." Sir Vincent mentions this and then points out the fact that there are a number of locomotives with symmetrical wheel arrangements used successfully up to speeds of 75 miles an hour both on British and Continental railways. As an explanation for this difference he suggests that a possible cause of the trouble experienced in the United States and from which European railroads seem to be free is that on practically all railroads in the United States the rail joints are staggered, whereas on the British and also on French railroads the rail joints are opposite each other. Quite possibly staggered joints do contribute to the necessity for using unsymmetrical wheel arrangements and it is a point which may profitably be determined. In any event the paper by Sir Vincent provides an example of how the knowledge of a subject may be broadened by interchange of ideas and information. There is a more or less prevalent opinion in this country that the United States has nothing to learn about electric railroads in Europe because conditions in the two countries are so different. Fuel costs in Europe are generally high, train weights are comparatively light and the length of haul short. The point brought out by Sir Vincent, however, indicates what can be accomplished and how much has been done by the International Railway Congress, by exchanges of European engineers here and American engineers abroad and the exchange of information by letter and periodical.

Equipment Orders in June

THE LOCOMOTIVE orders reported in the issues of the *Railway Age* in June totaled 27: for freight cars, 11,097, and for passenger cars, 37. These totals include only the orders for equipment for domestic service. They are the orders reported in the issues of the *Railway Age* of June 3, 10, 17 and 24, but they do not include the cars or locomotives reported in the *Railway Age* of July 1. The June totals would be somewhat disappointing were it not for the fact that whereas normally there is seasonal decline at this time of the year, this year the buying movement has been continued into July in rather favorable manner. Totals for the first three weeks of July show 111 locomotives, 9,475 freight cars and 11 passenger cars. The totals for the month, for the half year and for July to date are shown in the following table:

DOMESTIC ORDERS

Month	Locomotives	Freight cars	Passenger cars
January	5	7,960	235
February	8	14,721	160
March	76	5,550	25
April	272	30,507	540
May	99	18,337	235
June	22	11,097	37
Total six months	482	88,172	1,232

July—first three weeks: Locomotives, 111; freight cars, 9,475; passenger cars, 11.

Presumably the most interesting feature of this table is that while the car and locomotive buying this year has not been exactly spectacular or record-breaking, it has gone on during a period when there was a car surplus and when there were large numbers of bad order cars and unserviceable locomotives. The buying movement has continued during a severe coal strike and seems to have suffered little, if any, retardation from the effect of the shopmen's strike. In fact, if anything, the latter strike has helped the builders because it has resulted in additional orders for contract repair work. The coal strike has hurt railway revenues but its continuance for a period of 3½ months is rather an argument in favor of equipment purchases because when the coal finally does begin to move the demands upon equipment supply will unquestionably prove severe particularly in view of the increase in the tonnage of other commodities which has characterized recent months.

The car and locomotive market has been greatly assisted by lower prices. Steel underframe box cars have been secured in recent months at prices approximating $1,500 or $1,600, steel hopper and gondola cars at from $1,000 to $1,800, the price varying, of course, with the size and design. Refrigerator cars cost at present about $2,700. Typical locomotive prices are $40,000 for a Pacific and from $37,000 to $42,000 for a Mikado. Six-wheel switchers have been bought at about $30,000 to $33,000. Passenger coaches have been secured at about $20,000. These prices represent marked decreases from the high prices which ruled in 1920 and are apparently proving a real attraction in so far as concerns bringing out orders. Considering the situation as a whole, other than the fact that we should normally expect a decline in business in the summer months, there is nothing at present in sight to lead one to believe that the equipment business will do else than continue in good volume.

The important orders in June included orders placed by the Baltimore & Ohio for 1,000 gondola cars and 1,000 box car bodies; Seaboard Air Line, 1,000 cars; New York, Chicago & St Louis, 1,000 automobiles; Wabash, 2,050 gondola car bodies; Atlantic Coast Line, 700 box, 30 passenger train cars, etc. Orders thus far in July have included among the important orders: Baltimore & Ohio, 35 Mikado locomotives; Chicago & Eastern Illinois, 10 Mikado and 6 Pacific type locomotives; Southern, 15 Mikado, and New York, Chicago & St Louis, 14 locomotives. Freight car orders have included 1,000 automobiles, 250 stock and 250 gondola cars ordered

by the Northern Pacific, 2,000 refrigerator cars placed by the Western Pacific, 2,000 hopper cars ordered by the Norfolk & Western, etc.

English at the International Railway Congress

COMMENTS published in the *Railway Age* for May 20 on the difficulties met by English-speaking delegates to the Congress of the International Railway Association at Rome last April in following and participating in the discussions have called forth a letter from V. Tondelier, president, and J. Verdeyen, general secretary of the Association, which is published elsewhere in this issue. Messrs. Tondelier and Verdeyen evidently think that what was said in the *Railway Age* may cause misunderstanding. The article in the *Railway Age* specifically stated that "French is the official language of the Association; and courtesy required that the language of the country in which the Congress was held should also be used." It added, however, "but certainly all the English-speaking delegates felt that English should have been used more, in view of the fact that more of the world's railway mileage is operated and more of its traffic is handled in countries using English than in countries using any other language."

Messrs. Tondelier and Verdeyen point out that all the reports were published in English translations and that resumés of all reports also were published in English. This is, of course, correct, and it might be added that the summaries of the reports published in English in Volume 4, Number 4, of the bulletin of the Association constituted discussions of a large number of technical railway problems which could be studied with profit by every man who desires to acquire a broad knowledge of the present practice, and the progress in practice, of the world's railways.

The comments made in the *Railway Age* pertained solely to the difficulties met by the English-speaking delegates in following and participating in the proceedings and discussions at the sessions of the Congress in Rome. Messrs. Tondelier and Verdeyen refer to the fact that all the speeches and communications made in each section were immediately rendered briefly in English and published in the English edition of the Daily Journal. Frankness requires us to say, however, that the summaries of the discussions published in English in the Daily Journal were so brief and fragmentary that they were not as helpful as they might have been made, and that in many cases interpreters who were employed to state in English what delegates had said in French, Italian and other languages, spoke English which it was difficult for the English-speaking delegates to follow.

The *Railway Age* does not desire to injure the International Railway Association, but to help make it a stronger and more useful organization. We realize that the language problem presented is a very difficult one. If, however, the problem is to be solved, it must be clearly stated and boldly attacked. The fact is, the United States is so far from France and the rest of Europe that extremely few Americans, including railway officers, speak or understand French or any other European language except English; and it had just as well be recognized that this will always be the case. The same thing is true of all other English-speaking countries, although not to the same extent of England because England is separated from the continent of Europe only by a very narrow body of water. It is further true that at the recent sessions of the Congress in Rome most of the English speaking persons attending could not understand a word of what was said in discussions often lasting for hours at a time, in addition to which, as we have said, the reports of the discussions published in English were very fragmentary and inadequate. To say that French is the official language of the Association largely explains the situation, but it does not in the least tend to remedy it. The only remedy is for English to be used more.

Why should not the Permanent Commission of the Association consider the question of making both French and English official languages and arrange for English to be used as much as French? It may be replied that the attendance of English-speaking delegates has not been sufficient to justify this. But how can the Association reasonably expect to get a larger attendance and participation by English-speaking railway men if it does not arrange for more use of the only language that most of them can understand? It would be no more tedious and unprofitable for delegates speaking other languages to listen to long discussions in English than it is for those who speak English to listen to long discussions in other languages. We urge upon the Permanent Commission serious and early consideration of this problem, as we feel sure that whether there will be an increase or decrease in American participation in the work of the Association will depend mainly on what is done about it.

Why the Strike Is Not Settled

THE INFORMAL conferences held by Chairman Hooper of the Railroad Labor Board recently with several railway executives and representatives of the striking shop crafts unions has made clear there are five matters upon which these railway executives and the labor leaders differ widely, and which must be settled before the strike can be terminated.

The public mind lately has apparently become somewhat confused regarding the attitude of the two parties relative to these matters. It is necessary that this confusion should be cleared up, since public sentiment must be relied upon to determine the outcome. The five major points involved and the positions taken by the railway executives and the labor leaders in these conferences are as follows:

First: Wage decisions of the Labor Board. The labor leaders insist that before the men will return to work the railroads must agree to pay wages different from those awarded by the Labor Board. The railway executives have positively refused to consider paying any wages except those awarded by the Board, but have indicated that the railways will be represented at any further hearings that the Board may hold, and will accept such modifications, if any, in the wage awards as the Board may hold reasonable after rehearing.

Second: Rules and working conditions. The labor leaders demand that the railways agree to modifications of the working rules made by the Labor Board as a condition of calling off the strike. The railway executives have positively refused to consider this, although indicating that if any modifications of the rules should be made by the Board after further hearings they would be accepted. The position of the railway executives who have conferred with Chairman Hooper has been that for the railways to grant to the strikers any rules or wages not authorized or fixed by the board would be to concede, in response to the use of force, more than the employees were able to secure by peaceful means. For the railways to let the labor unions get by force what they could not get by arbitration as prescribed by law would be directly to encourage the use of force in future labor controversies.

Third: Contracting of work. The labor leaders still claim that this is one of the principal matters in controversy. Samuel Gompers, president of the American Federation of Labor, in an interview published in the newspapers July 14 made the statement: "The railroads, in ignoring the Board's

decision on repair work contracts, are violating the Transportation Act because that Act specifically provides that such repair work shall not be let to outside contractors." Mr. Gompers' statement is entirely false. Neither the Transportation Act nor any other law does or ever did specifically provide that the railways should not let repair work to outside contractors. Furthermore, all the railways except two which have done contracting of the kind against which the Labor Board has ruled have agreed to discontinue doing so in compliance with the Board's request.

Fourth: Boards of adjustment. The labor leaders have succeeded in making many people believe that the railways have refused to establish boards of adjustment as provided by the Transportation Act. The facts are as follows: The Transportation Act provides (Section 302) that "Railroad boards of labor adjustment may be established by agreement between *any carrier, group of carriers, or the carriers as a whole,* and any employees or subordinate officials of the carriers, or organization, or group of organizations thereof." The leaders of the shop crafts have demanded the establishment of *national* boards of adjustment by the "carriers as a whole." The railways have insisted on the establishment of boards of adjustment representing only *each carrier* and its own employees, but the railway executives who have conferred with Chairman Hooper have indicated willingness to establish regional boards of adjustment on which would be represented each "group of carriers" and their shop employees, such as have been established for the train service employees. Either local, regional or national boards of adjustment would be in complete accordance with the Transportation Act.

Fifth: Seniority and pension rights, etc. The labor leaders insist that all men who have struck shall be taken back with the same seniority, pension and other rights and privileges which they had before they struck. Most of the railways individually have published advertisements and posted notices to the effect that strikers who did not return to work within designated periods would lose all these rights and privileges and have to return, if they returned at all, as new men. On every railway there are many men who have stayed at work or gone back to work with the understanding that at the termination of the strike they would be protected in seniority rights superior to those of the men who struck or did not return to work within the limits set. The men who struck voluntarily dissolved all relationships with the railways for which they had been working, and gave up every claim, based on continuity of service, that they had to special consideration. The men who have stayed at work or gone to work during the strike have prior claims upon the companies, the establishment and recognition of which are based upon working rules which the striking unions themselves have got adopted. The seniority rule is a rule which has been established because the unions demanded it, not because the railroads wanted it. For the railways to let the strikers come back with all their old rights and privileges would be to encourage still more men to strike when there is another controversy.

The public cannot, in its own interest, sanction any settlement based on any wages or working conditions except those established by the Labor Board. It cannot rationally sanction continuance of a strike against all the railways of the United States because two persist in contracting work. It cannot sanction continuance of the strike because the railways will not establish national boards of adjustment, when the Transportation Act also provides for local and regional boards of adjustment. Nor, it would seem, can it afford to support the labor leaders in demanding that men who have struck against the decisions of the Railroad Labor Board shall be taken back into service with rights and privileges superior to those of men who have accepted these decisions and stayed at work.

For men to gain anything by striking against the decisions of a government arbitration body would be to destroy the government arbitration body, and with it, the means of peaceful settlement of railway labor controversies in the future.

The British Report on Train Control

AMONG THE HIGH LIGHTS in the report of the Automatic Train Control Committee to the Ministry of Transport of Great Britain are its recommendations that the contact type of train control be adopted; that continuous control and speed control are not necessary to meet British operating conditions, and that a system of train control should supplement, but not replace, the existing signal system. On reading the report (which appears elsewhere in abstract in this issue), one cannot help but be impressed by its thoroughness. It appears to have been handled strictly from an engineering standpoint and its conclusions are based on intensive investigation.

The committee selected the contact type of control in preference to others because the ramp and shoe type has been more highly developed, is better known and has proved reliable after many years of satisfactory operation under all conditions. While the committee felt that the continuous type of control had advantages, it concluded that its disadvantages outweighed the advantages. Speed control was not deemed necessary because the accidents investigated which might have been prevented by it comprised only 1.6 per cent of the total and these, the committee felt, could have been prevented by other means. The committee felt that the intermittent induction type required more or less complex electrical apparatus on the locomotive which would add to the expense of installation and increase the likelihood of failures, which, even though on the safe side, would cause unnecessary delays.

In Great Britain, it is interesting to note that the Great Western has had an electro-mechanical system of control in service at distant signals for the past 16 years with about 200 track miles and 100 engines equipped. The North Eastern has had a mechanical appliance in operation at distant signals for about 15 years with 89 route miles and 1,528 locomotives equipped. The Great Central has had apparatus known as "Reliostop" in service for seven years, on 42 route miles and on 20 locomotives. The London & North Western has experimented with the Leigh device and the Biddle device, while the Great Eastern has experimented with the Syx, Daniels and Regan systems. The London, Brighton & South Coast has been experimenting with the Angus system of continuous train control.

While conditions in Great Britain are different from those in this country, the fundamental principles affecting the application of train control are largely similar and the report of this committee confirms the views already expressed editorially in these columns that it is advisable for American roads to start with simple apparatus and develop it along lines which experience shows to be necessary to meet traffic conditions rather than to attempt to force installations which later may prove unsuccessful. In striking contrast to the British report that such devices should be an adjunct to the block system, we find the Interstate Commerce Commission, in its order, saying that it has "no desire to discourage efforts to automatically control trains without the aid of fixed wayside signals," which position we believe to be a mistake on the part of the commission, considering the present development of the art.

Considering the importance of the train control question in this country we suggest that the report of the British committee be studied by railroad officers and members of the Interstate Commerce Commission, as it is a valuable contribution to the literature on this subject.

Letters to the Editor

[*The* RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.*]

The Operating Officers' Interest in Statistical Requirements

NEW HAVEN CONN.

TO THE EDITOR:

Your editorial entitled, "A Proposed Revision of the Operating Expenses Classifications" in your issue of June 17 and that headed, "The Matter of Statistics" in the issue of July 8 have in them much that should be of interest to railway operating men. The only adverse criticism which I would make of them is that you do not sufficiently show your position in the matter of the proposed changes in accounting requirements. This is doubtless due to the fact that you do not wish to take a definite stand at this time when the situation is still more or less indefinite.

It is my understanding that the source of the present inquiry came, first, from the difficulty experienced in compiling quickly information for the I. C. C. and the Senate Committee in the hearings in the past two or three years, and second, from the complaints made concerning the increasing cost of clerical work.

With reference to the latter, I have checked up the facts as to the increase in the number of clerks. I know that on our own road there was a large increase in clerks, but during the last year or so, there has been a considerable decrease. It is reasonably certain that if we exclude the men who are working on the various special jobs required by federal and guaranty period settlements, rate hearings, wage investigations, etc, the number, in comparison with the amount of business, will not be much different from the number in the period prior to federal control.

I assume that the first item is that which is of the most serious importance. As expressed by J. J. Ekin in his president's address at the Accounting Officers' meeting, the general impression seems to be that we should proceed along the lines of simplification in our accounts. Does simplification mean primarily, reduction in the number of accounts? I do not think that any one would be rash enough to state that it is not an advantage to reduce the number of accounts *if this can be done without reducing the amount of necessary information.* Simplification, however, does not necessarily mean elimination.

I think everyone would be glad to see a reduction in the enormous amount of detailed statistical and accounting work which is now necessary. This applies to both the revenue and expense sides. We have, however, this situation confronting us. The total net railway operating income which the railroad can earn is now limited to a percentage so low that in many cases it will do no more than provide a small return on the total amount of capitalization. Furthermore, there appears little prospect that the freight and passenger rates will be so fixed that this return can be made without difficulty. In the third place, the Transportation Act requires the Interstate Commerce Commission to give attention to the efficiency and economy with which railroads are operated. Since these three things are so, it is particularly necessary that the roads should know:

1. What classes of traffic are remunerative and those which are not.

2. Where further economies can be effected through increased efficiency and how much can be expected from these economies.

To obtain this sort of information requires a large amount of data, both accounting and statistical. It may be possible that the reduction in accounts will effect some reduction in the number of clerks in the accounting offices, although I believe there is room for considerable argument on this point. Regardless of this feature, however, the amount of work necessary to provide detail required by the operating officers would be very largely increased if we are to continue to provide the same amount of information to our operating officers that is given them today. This is particularly true in the grouping of the transportation expense accounts. The group "Other Yard Expenses" contains many elements which have no bearing on each other and which will vary from month to month by differing percentages. It will never be sufficient for an operating officer to know that other yard expenses have increased or decreased by a certain per cent when that group includes everything from the wages of a general yardmaster to the price of a fire hook on a yard locomotive. It would not be logical to combine the labor accounts into one item since the fluctuations of cost of yardmasters and clerks or of switch and signal tenders do not correspond with the fluctuations in yard enginemen and trainmen. The same general criticisms apply to grouping all the train accounts, other than fuel, into one item.

From the point of view of the operating officers, it is illogical to reduce the amount of information available for their purposes just at the time when the slight margin between revenues and expenses makes it absolutely necessary that they be provided with all the data which can be provided at a reasonable expense.

This objection to a decrease in the amount of information provided is even more serious when an attempt is made to determine the cost of some particular class of traffic. If we wish to ascertain the cost of suburban passenger service near a large city, or the cost of milk traffic, or the cost of less carload freight within a certain territory, it is necessary to sub-divide the accounts in even greater detail than the present classification provides. For example, the maintenance of station and office buildings must be divided as between office buildings and station buildings; the maintenance of shops and engine houses between shops and engine houses. Furthermore, accounts such as the various yard and train accounts must be sub-divided by individual yards or individual groups of trains. The proposed yard groups, containing not only wages but other elements which fluctuate in varying degrees, would render any such further sub-division extremely difficult. For example, if an attempt were made to divide freight train expense as between fast, slow and local trains, the sub-division of the expenses for water, lubricants and other locomotive supplies might well be made on the basis of locomotive fuel. On the other hand, the sub-division of the wages of train and engine crews into these three elements would require an entirely different basis of apportionment. When any such studies were made, therefore, the entire account would have to be broken down and set up on some basis as is provided at the present time. There appears little doubt that the additional work of breaking these accounts would entirely offset the economies which would be affected in compiling the accounts currently.

There is one other feature from the point of view of the operating department which requires attention. If accounts and statistics are to be changed, it would appear that operating department representatives should be consulted as well as the accounting department. The operating department officers are interested in the results although they may not be interested in the methods by which those results are obtained. In this work, I believe that a committee of operating officers, who have knowledge and understanding of statistics and make practical use of them, could well co-operate with

the accounting committee and the commission, at least when they are near the end of their labors. If such a committee were provided, the results obtained would furnish the proper balance in results obtained. The accounting department is responsible for the compilation of the statistics and for their accuracy and would be in a position to keep down the requirements in the way of accounts and statistics to a point where they can be effectively handled. In addition, the operating department would be represented and its voice heard to the extent that the data provided would be of practical use to the operating officers.

J. E. SLATER,
Special Assistant to General Manager, New York, New Haven & Hartford.

Dispatchers and Engineers

HAILEYVILLE, Okla.

TO THE EDITOR:

I have been reading the recent articles in the *Railway Age* concerning the controversy between the dispatchers and engineers. When the thing is all boiled down to the proper degree there is not very much to it. When one man commences to criticize another, who is in an altogether different department, there are ten chances to one his criticism is unjust. We cannot all be first class workmen in our several lines of work but I will venture to say that the man who has the interest of the company and his family at heart is doing the very best he can under the conditions which are open to him. In my experience in the railroad game which dates back over 30 years, in various departments, I have found some poor men in each department and the percentage of poor dispatchers, compared with engineers, is in favor of the engineers. It is true the dispatcher is always working against an unknown quantity; in other words he is banking his judgment on moves which he anticipates will be made providing every thing goes all right. If some engineer falls down his plans are all shattered; so with any one else concerned in the movement, or some part of the machinery. If the dispatcher falls down there will be some body else fall down and vice versa from one day's end to the other.

As long as the world stands individuals will make mistakes and have shortcomings but why not bury the hatchet and let the principles of the golden rule prevail? The railroad company pays us for every minute we work and it should make but little difference what we are doing, whether laying in the side track a while or sitting in the office smoking cigars.

It is the opinion of the writer that so much strife between the men employed by the railroads is caused by the fact that they are not better personally acquainted with each other; they should do more visiting with one another and study the characters of the individuals; in other words tune up for each other. I worked with a conductor once for nine years and had never met him personally; I came to the conclusion that he was about the worst man I had ever run across; we frequently had little tilts in connection with the work; no doubt he had formed the same opinion of me. However, I had the opportunity one time to meet him personally and we had a long visit. From that day to this I do not know of a finer man to work with. We know each other now and know just about how to set our pegs to avoid any friction whatever. Let's all get together closer, line up for each other, cut out the criticism and this old world will be a better place in which to work and live. My argument is borne out here on the Rock Island where the employees' clubs have been functioning for over a year; we know each other better; we get together frequently. The atmosphere is altogether different to what it was before the clubs were formed. Let's keep the clubs going. The railroad will be better off in every way; the employees will be better; the public will be benefited.

J. L. COSS,
Train dispatcher, Rock Island Lines.

Language Problem of the International Railway Association

BRUSSELS, Belgium.

TO THE EDITOR:

We have read in the *Railway Age* for May 20, 1922 (pages 1156 and 1163), the articles published on the International Railway Congress held in Rome in April last.

Our attention has been specially called to the paragraph entitled "In French and Italian," in which you point out the difficulties met by the English-speaking delegates, and especially by Americans, in taking part in the discussions.

We think we ought to remind you that article 16 of the statutes of our Association stipulates that "The discussions shall be conducted in French or in the language of the country in which the Congress is held. Speeches in any other language shall be translated into French." However, at the Berne session in 1910, at the request of delegates from English-speaking countries, a résumé of the discussion was given in English in each section in order that the said delegates might effectively follow the proceedings.

Special arrangements were made by the Organizing Committee for the Congress at Rome for the translation into English of all documents, discussions in sections and proceedings of the general meetings. All the reports of the reporters were published in English and distributed to the delegates before the opening of the session.

For every subject or question a brief résumé of these reports was published in English so that delegates, whose appointment had been delayed (as was the case with several American administrations), were able to obtain sufficient information before the sectional meetings.

All the speeches and communications made in each section were immediately rendered briefly into English and published, *for the first time in a non-English speaking country,* in the English edition of the Daily Journal. Sir Henry Fowler, chief mechanical engineer of the Midland Railway (England), was appointed a general secretary of the session, and although it was impossible for him to correct all the proofs of the Daily Journal, he paid attention to the conclusions arrived at.

In addition of the five sections of which the Congress was composed, the presidency of two of them was confided to English-speaking officials: George Gibbs, chief engineer of electric traction, Long Island Railroad (U. S. A.), for the second section, and Gustav Behrens, a director of the Midland Railway (England), for the third section. The first section was presided over by a Belgian, the fourth by a Frenchman, and the fifth by an Italian.

It is possible that the organization was not quite as satisfactory as we had hoped, but this was chiefly due to the small number of delegates from English-speaking administrations having sufficient knowledge of either of the official languages of the Congress (French and Italian). We are already trying to discover what improvements can be made in this organization for future sessions which do not take place in an English-speaking country.

We trust, however, you will be good enough to recognize that we have done the best we could to give every satisfaction to the English-speaking delegates.

We may also add that the English and American delegates generally expressed their appreciation of the arrangements made to assist them in understanding the discussions.

As the articles which your estimable journal has published might be wrongly interpreted by readers having no knowledge of the organization of the congresses of our Association, we should be very glad if you would kindly publish this letter in an early number of the *Railway Age*.

V. TONDELIER,
President.

J. VERDEYEN,
General Secretary, International Railway Association.

Superheated Consolidation Locomotive to Which the Tender Booster Has Been Applied

Booster for Tender Trucks Developed on D. & H.

Utilizing Tender to Increase Tractive Power Enables Locomotives to Haul Heavier Trains

DURING THE past two years there has been developed on the Delaware & Hudson a booster designed for application on the tender trucks. The basic principles underlying this development were: First, to utilize as a source of revenue tractive power at moderate speed the

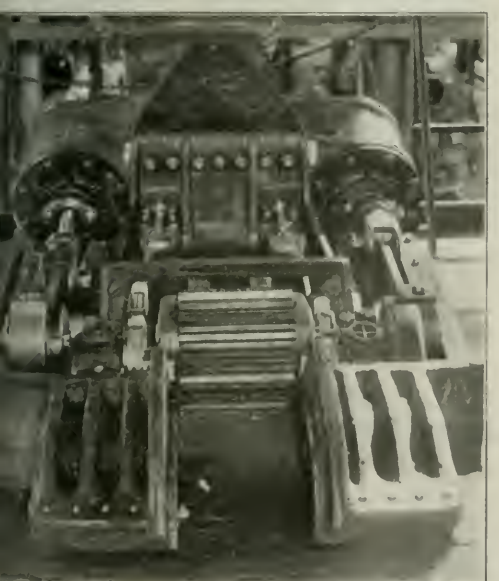


Fig. 1—Booster Engine Assembled in Shop

excess boiler capacity, the volume of which is increased materially by the use of superheated steam. Second, to convert the tender weight, unused as a motive agent, into a means of obtaining additional tractive power, the amount of increase depending on the speed and whether the application is made on one or both tender trucks. Third, to obtain more nearly constant tractive force at the tender draw bar during successive revolutions of the locomotive. The development of the tender truck booster has now progressed sufficiently to prove that these objectives have been attained.

The tender booster, which has been patented jointly by J. A. McGrew, general superintendent of equipment and way and J. T. Loree, general manager, comprises a four-wheel truck fitted with side rods and a reciprocating steam engine, arranged to drive one of the axles. The engine which supplies the motive force for the booster is shown in Fig. 1.

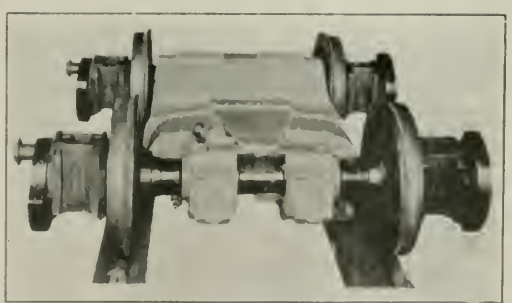


Fig. 2—Booster Truck Before Frame Has Been Applied

It is a simple two cylinder engine with 10-in. by 10-in. cylinders. On the main shaft of the booster engine is a pinion and on one of the tender truck axles is a large gear. Intermediate between them is a gear arranged to be thrown into mesh between the pinion and the large gear by a bell crank operated by a piston impelled by the superheated steam forming the motive agent for operating the booster cylinders. In Fig. 2 the engine is shown mounted on the axles before the frame has been put in place. The two bearings shown in the foreground of Fig. 1 span the geared axle and the opposite end of the frame casting rests on springs supported by journal boxes on the other axle, giving a three point

support. A view of the completed truck as applied under the tender is shown in Fig. 3.

The steam supply for the booster is taken directly from the steam pipes of the locomotive. Admission of steam to the booster is controlled by an air-operated valve in the main steam line, as shown in Fig. 4. Operation of the booster is governed by an independent air valve in the cab, thus in no manner interfering with the engineman in his method of running the locomotive, enabling him to use or cut out the booster at will as road conditions may indicate to be desirable. The booster cannot be started except when the main throttle is open and if the locomotive is shut off the booster

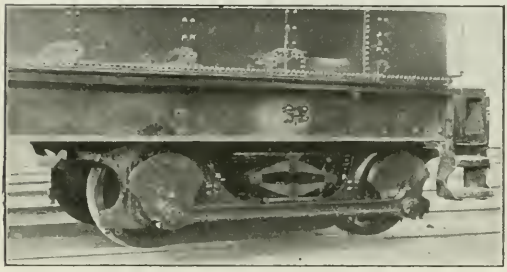


Fig. 3—Completed Truck as Applied Under Tender

is automatically thrown out of gear. Barco joints are fitted in the steam pipe between the locomotive and the tender to give the necessary flexibility at this point.

The steam on its way to the engine entrains the booster engine transmission gears. The fact that superheated steam in the locomotive steam pipe is simultaneously the motive agent of the booster and the controlling power effecting the meshing of the gears, produces practically perfect synchronization of effort of the locomotive and booster engines and also provides an elastic cushion for disengagement should excessive stresses be set up within the gears. The steam from the booster is exhausted direct, without pipe couplings, into a simple feed water heater located in the tender tank. The gear ratio between the booster engine shaft and the tender axle is 1 to 4.25, and the wheels are 33 in. in diameter. The rated tractive effort with 210 lb. steam pressure, based on the formula commonly used for locomotives, is 12,200 lb.

The locomotive to which the booster has been applied is

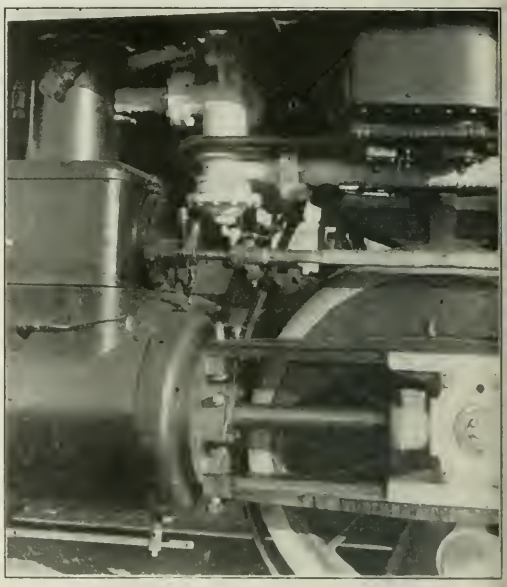


Fig. 4—Steam Pipe to Booster and Air Operated Valve

shown in the photograph at the beginning of this article. It is of the Consolidation type, the weight of the locomotive being 207,150 lb. and the rated tractive power 42,100 lb., developing a maximum draw bar pull of 36,000 lb. on level

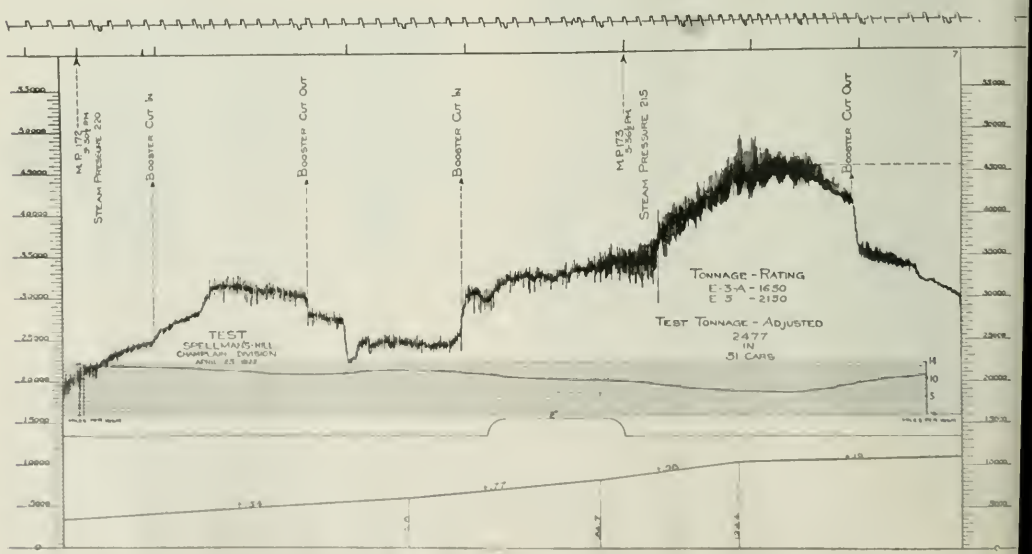


Fig. 5—Dynamometer Chart Showing Operation of Booster on a Ruling Grade

rack. The weight of the tender when empty is 58,800 and when loaded 120,800 lb.

To determine the results that can be obtained in actual service from locomotives equipped with the booster, tests were made over the Pennsylvania, Susquehanna and Champlain divisions. A photograph taken from the dynamometer chart on the controlling grade on the Champlain division is shown in Fig. 5. The increase in tractive power due to the booster is clearly shown in the draw bar pull curve. The standard rating for this class of locomotive, without the booster, on this division is 1,650 adjusted tons, while the tonnage of the test train was 2,477 adjusted tons in 51 cars, an increase of 48 per cent.

An analysis of the various tests conducted with the booster developed the following principles:

When superheated steam is used as the motive agent in the

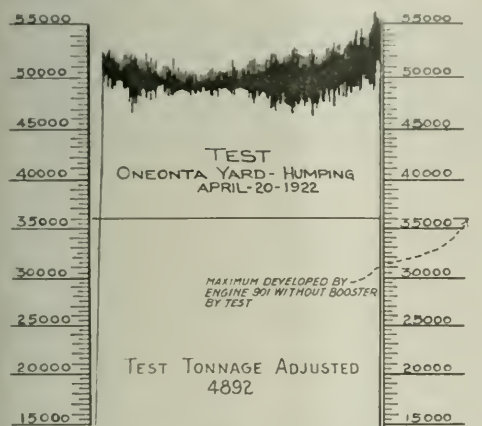


Fig. 6—Chart of Tractive Effort of Locomotive with Booster Pushing Over a Hump

booster, and advantage is taken of the opportunity thus afforded for using steam expansively in the locomotive cylinders, no difficulty is experienced in maintaining practically constant steam pressure.

The use of steam for the gear operating cylinders as well as for supplying power to the locomotive and booster cylinders, gives a complete synchronization of effort between the primary and secondary engines.

The results of the tests also clearly demonstrate the following operating advantages resulting from the booster application:

The tonnage which the locomotive can haul is increased; abnormal stresses on draft gears and equipment are decreased, and more prompt and constant acceleration is effected. Tire wear and rail wear, due to slipping of the locomotive driving wheels, are decreased. The average speed over grades is increased and grades may be equalized without a very heavy capital expenditure. The booster makes it possible to haul increased tonnage over divisions where the trainload is now limited by the weight of locomotives which the bridges can safely carry. The location of the booster is such that no delay in turning of power need be occasioned by repairs. The addition of the geared power unit on the tender permits of using a lower factor of adhesion in locomotive design. The booster also effects a saving in fuel by reducing the time required for movement over the division, and by making it possible for a smaller locomotive to do the work of a larger type.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR loading during the week ended July 8 showed the effect of the Fourth of July holiday by a reduction to 718,319 cars, as compared with 876,896 the week before but this still represented an increase of 77,784 as compared with the corresponding week of 1921, which also included a holiday, when the loading amounted to 640,535 cars. In the corresponding week of 1920 the total was 796,191. On the basis of a five-day week the average daily loading during the week of July 8 was 143,664, as compared with 146,149 cars for a six-day week the week before. As a holiday usually represents a loss of more than a single day this leaves only a slight decrease to be possibly accounted for by the first week of the shop strike. As compared with the corresponding week of 1921 increases were shown in all districts and in all classes of commodities except grain and grain products and coal. Coal loading, 68,996 cars, was about 26,000 cars less than during the week before and 54,974 cars less than during the corresponding week of 1921. The summary as compiled by the Car Service Division of the American Railway Association follows:

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, JULY 8, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Misc. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	7,924	2,303	5,545	2,074	4,597	6,842	59,946	73,384	162,615		
	1921	5,997	2,164	34,231	630	3,748	7,625	47,961	56,570		153,326	190,062
Allegheny	1922	1,743	2,037	12,793	4,265	2,548	11,366	44,748	61,375	140,905		
	1921	2,188	2,159	36,660	1,798	1,901	6,010	37,824	40,643		129,183	162,976
Pocahontas	1922	151	173	22,945	272	1,150	22	4,725	4,772	32,760		
	1921	151	190	17,394	93	1,112	11	4,256	3,166		26,373	31,561
Southern	1922	3,803	1,971	15,231	815	16,753	1,175	31,928	36,310	108,044		
	1921	3,526	1,973	16,245	396	12,313	313	31,370	32,408		98,544	117,178
Northwestern	1922	7,142	6,124	6,048	1,729	8,297	34,430	26,224	33,583	123,577		
	1921	6,806	5,459	5,071	511	6,765	16,525	23,352	24,913		89,402	132,252
Central Western	1922	9,983	7,333	3,859	401	4,444	1,529	28,913	40,768	97,230		
	1921	13,197	7,076	11,611	143	3,834	536	26,697	29,919		93,013	106,639
Southwestern	1922	4,515	1,906	2,575	109	6,947	335	13,556	23,247	53,190		
	1921	6,577	1,602	2,758	138	5,196	899	13,123	20,591		50,694	55,523
Total Western districts	1922	21,640	15,363	12,482	2,239	19,688	36,294	68,693	97,598	273,997		
	1921	26,580	14,137	19,440	792	15,605	17,960	63,172	75,423		233,109	294,414
Total, all roads	1922	35,267	21,847	68,996	9,665	44,736	55,729	210,140	271,939	718,319		
	1921	38,442	20,623	123,970	3,709	34,679	26,319	184,383	208,210		640,535	
	1920	29,793	21,897	184,127	9,927	40,011	68,564	141,997	294,475			796,191
Increase compared	1921		1,224		5,956	10,057	29,410	25,557	63,729	77,784		
Decrease compared	1921	3,175		54,974				68,743				
Increase compared	1920	5,474										
Decrease compared	1920		50	115,131	262	1,175	12,835		32,536	77,87		
July 8	1922	35,267	21,847	68,996	9,665	44,736	55,729	210,140	271,939	718,319	640,535	796,191
July 1	1922	41,897	28,546	94,748	10,361	61,432	64,776	247,111	328,035	876,896	776,079	891,621
June 24	1922	38,411	29,934	96,960	9,466	64,271	64,284	249,193	325,337	877,856	775,447	911,503
June 17	1922	39,333	29,151	92,136	9,302	64,082	53,822	248,044	324,902	860,272	775,328	916,736
June 10	1922	40,035	29,765	94,824	9,008	62,358	46,372	248,405	315,235	846,002	787,283	930,976

Hearing on Coal Car Distribution Rules

WASHINGTON, D. C.

HEARING WAS begun before Commissioner Aitchison of the Interstate Commerce Commission on July 17 on a proposed revision submitted by the Car Service Division of the American Railway Association of the coal car distribution rules now incorporated in Circular C. S. 31 (revised) together with rules for the rating of and car distribution to other than tipple mines loading bituminous coal. The proposed rules have been generally assented to by the National Coal Association, except as they apply to assigned cars, and the commission has ordered a general proceeding of investigation, consolidating with it its investigation of the distribution among coal mines of privately owned cars and cars for railroad fuel. Representatives of the Indiana and West Virginia state commissions also sat with Commissioner Aitchison and other members of the commission sat in for part of the time.

At the outset the attorney for the National Coal Association and other representatives of the coal operators asked for a continuance of the hearing on the ground that the operators have been so busy in labor negotiations and trying to open their mines that they are not prepared. R. V. Fletcher, general solicitor of the Illinois Central, on behalf of the railroads, declined to join in the request, saying that a car shortage may occur very soon if the coal strike is settled and the railroads desire to have the rules ready for use. He said that because of the strike it may be impossible for some of the operating officers desired as witnesses to appear but that the first witness was ready, A. G. Gutheim, who has recently resigned as manager of the public relations section of the Car Service Division, and who was chairman of the railroad committee that conferred with the National Coal Association on the proposed rules. Commissioner Aitchison then said the hearing could proceed at least that far.

Mr. Gutheim outlined the history of the car distribution rules, the present rules representing a modification of the uniform rules put into effect by the Railroad Administration. He said that they are recommendatory but that so far as the Car Service Division is informed they have been generally observed. Commissioner Aitchison was interested in knowing to what extent they have been in effect and whether they would automatically go into effect in case of a car shortage. Mr. Fletcher said many roads have had very little use for such rules during the past year and a half and some probably now have none in effect but that the old rules would go into effect unless new ones were available and unless restrained in some way most of the roads would probably put in effect the new revised rules which are the subject of the investigation.

Mr. Gutheim explained the desirability of having uniform rules and proper mine ratings, saying that the proposed rules base the ratings on the demonstrated producing and shipping capacity of a mine for the previous calendar month. He also spoke of the desirability of deflating the present ratings, which many operators admit are too high, saying that if they are uniformly too high the effect is not especially serious but that it is not pleasant to have it generally advertised in the newspapers that the railroads are furnishing only a 50 per cent car supply when they know that they are providing a 75 per cent supply.

He also said that the proposed rules require the operators to report the actual mine working time, which gives a more accurate index of the capacity than the tipple time, because some mines by increasing their tipple investment out of proportion to their other facilities, may secure more than a fair share of the cars if their rating is based on tipple time. The rules also propose a reinstatement of the principle that a mine served by more than one railroad shall have a higher rating, which was abolished by the Fuel Administration on the ground that under government control the railroads constituted but one system. However, this matter is now pending before the Interstate Commerce Commission and the roads are willing to put into the rules what the commission decides on this point. Mr. Gutheim also discussed the assigned car rule, saying the only alternative, except confiscation, for railroads that have not been able to make contracts or to obtain coal under their contracts, is to go into the spot market, which is expensive for the roads and has a serious effect on the market. Confiscation, he said, is the worst possible way for a railroad to get the necessary coal, both because of the effect on the owner of the coal confiscated and also because it is uneconomical for the railroad and often gives it the wrong kind of fuel. Also some roads do not handle enough commercial coal to supply their needs if they confiscated it all. Many roads have made a large investment in private coal cars to supply their own needs.

Mr. Gutheim occupied the stand for two days and was followed by Eugene McAuliffe, president of the Union Collieries Company, who advocated ratings based on tipple time. The hearing was then adjourned to August 14.

Business Organizations Urged to Support President's Stand on Strike

BUSINESS ORGANIZATIONS of the country are called upon by the board of directors of the Chamber of Commerce of the United States to take such leadership as will crystalize public sentiment in upholding President Harding in the exercise of his authority for the maintenance of uninterrupted railway transportation. At the same time the board commended President Harding's statement making clear the issues involved in the strike, and urged the administration to use all the power of the government to the end that the supremacy of the law be maintained.

President Harding was informed of the action of the board in a letter written by Julius H. Barnes, of Duluth, President of the Chamber. The declaration of the board, as set forth in the letter to the President, follows in part:

"The Board of Directors of the Chamber of Commerce of the United States commends the statement of President Harding making clear the issues involved in the railroad shop crafts strike. We believe in the peaceful settlement of controversies and due respect for agencies established by law or mutual agreement for securing just and impartial decisions. We believe in the compliance with such decisions by both parties and that the public will trust decisions so arrived at as generally fair and accord them the support of public opinion.

"This strike of a section of railroad employees is against a decision of the government's own agency.

"The attempt of the striking railroad employees to enforce their own views through methods of industrial war should meet the condemnation of all who believe in orderly processes of settlement.

"This country is slowly emerging from a period of unemployment and severe business depression, and cannot patiently view any unlawful interference with its transportation facilities, retarding its industrial recovery.

"We commend the President for his determination to maintain the supremacy of the law and we urge the administration to use all the power of the agencies of the government to that end.

"We call upon the business organizations of the country to take such leadership as shall crystallize public sentiment in upholding the President in the exercise of his authority for the maintenance of uninterrupted railroad transportation and for such local protection and community public order as will secure every man his right to work without intimidation."

British Approve Automatic Train Control

Ministry of Transport Committee Recommends Intermittent Contact Type—Disapproves of Speed Control

THE PRACTICABILITY of train control devices "has been proved beyond dispute by extended trial and actual operation covering long periods" and these devices can no longer be regarded as in the experimental stage, according to the Automatic Train Control Committee appointed by the Ministry of Transport of Great Britain. In its report which was submitted on April 20, 1922, the committee recommended the gradual adoption of the intermittent contact type of train control as best adapted to prevent a large proportion of train accidents directly occasioned by the failure of enginemen to obey signals, which it found amounts to about one-third of the total number. While the committee considered continuous control to possess merit, it was thought to have too many disadvantages to warrant its recommendation. Speed control also was not considered essential because an analysis of the accident records for the past 10 years indicated that only 3 out of 193, or 1.6 per cent, of the accidents could have been prevented by speed control. The intermittent induction type likewise was not considered suitable for British railways because it would require complex electrical arrangements and a considerable addition to the skilled maintenance forces. Any system of train stop or train control must be used to supplement the present highly developed and efficient signal systems and be reasonable in first cost and annual charges for maintenance and renewals. The committee recommended that multiple track lines only (except in exceptional cases, single track) be equipped. This mileage was estimated to be 24,00 track miles. Approximately 23,00 locomotives should be equipped, while track devices would be required for 24,000 distant signals and 38,000 stop signals. The total estimated first cost was £4,660,000 ($20,550,600), with a total annual charge for maintenance and renewals of £407,000 ($1,894,870, based on a rate of exchange of $4.41).

Of 193 accidents analyzed for a 10-year period ending September 30, 1921, the committee said that 71, or 36.8 per cent, could have been prevented by train control and that on the basis of the number of accidents reported by the railways but not investigated by the government, train control "would have a preventive effect, not obtainable by any other means, upon a yearly total of more than 100 cases." The committee did not recommend the use of speed control, saying that "the difficulties arising—* * * * and the need for insuring that the capacity of roads is not injuriously affected by imposing unnecessarily low speed restriction upon express traffic, would, in the opinion of the committee, render such devices unsuitable to British conditions." In discussing the continuous type of control, while the committee felt that such a system would cover practically every risk which such devices are designed to safeguard, other conditions would not make the expenditure justifiable upon surface lines in Great Britain. Therefore, the committee recommended the use of the intermittent contact type, which supplements rather than replaces existing signaling and block telegraph systems.

The use of train control was considered only for multiple track lines handling passenger and mixed traffic because of the security afforded on single track lines "by single line token working, with interlocking of signals and relative tokens, and to the small number of accidents upon single lines. The committee is of the opinion that a case for the adoption of automatic train control upon single lines so worked and protected has not been established although there may be a few special cases where control may eventually be found desirable. It considers also that lines used purely for freight or mineral traffic do not as a general rule call for the adoption of automatic train control."

The committee was instructed to enumerate the possible functions of train control as it relates to railway conditions in the United Kingdom; prescribe requisites which the devices should meet; examine those under trial; recommend others which are or may become available during the period of investigation and form conclusions on its adoption with regard to its advantages and the cost involved.

Three Early Conclusions

Three of the earliest general conclusions unanimously arrived at by the committee were: (1) That existing traffic facilities and line capacity must not be injuriously affected by the general introduction of automatic train control; (2) that any acceptable method of control must be such as can be fully developed in conjunction with the highly developed block working and signaling systems on the British railways and (3) that the introduction or extension of any system of control could not be recommended unless a standard, in respect to track and locomotive apparatus, be first decided upon, which would enable the desired effects to be produced upon all locomotives, whether on home or foreign lines.

Calling attention to the high degree of security attained on British railways in the past, the committee points out that in recent years the growth of traffic has made it necessary to shorten block sections in order to increase track capacity without incurring the cost of constructing new interlockings or additional lines. This has resulted in the adoption of track circuits, electric interlocking and other safety devices "to supplement the powers of observation and memory of signalmen." Continuing, the committee says that "no general action, however, has been taken to provide appliances for obtaining additional security against mistakes by enginemen, although they must have been affected, possibly to an equal extent with signalmen, by growth of traffic and altered conditions of working. The functions of automatic train control * * * are broadly to assist enginemen in the proper observance of signals and regulations and to safeguard liability to train accidents which may arise from failure in this respect." In the opinion of the committee, train control can no longer be regarded as being in the experimental stage. "The question is rather whether its adoption is ex-

pedient in the interests of safety, and financially possible."

Applicability to British Railways

In discussing the applicability of train control and its adoption on British railways, the committee considered it from the standpoint of (1) the conditions, whether technical, climatic or physical, which govern the conduct of railway traffic and which may render special treatment necessary; (2) the degree of safety existing, and the extent to which additional security is desirable and can be obtained; (3) the methods of control which appear most suitable for the purpose and (4) the cost of installation. In this connection the committee obtained the views of responsible officers and a number of locomotive inspectors and enginemen of standing and experience; it analyzed accident statistics furnished in government returns and by certain railway companies; systems of train control in operation on the Great Western, the North Eastern, and the Great Central were inspected and studied in detail and the experimental installations on the London & North Western, the Great Eastern and the London, Brighton & South Coast were also inspected. Estimates were obtained from railroad companies and inventors, which were based on present day prices, but without allowance for quantity production.

Relation of Block Signaling to Train Control

The committee, commenting on certain outstanding features in the working conditions, equipment, and methods of block signaling upon British railways, called attention to those peculiar to Great Britain and which needed special consideration. All are factors which have to be allowed for satisfactorily in considering the expediency of automatic train control. They are as follows:

"(a) The dissimilarity in brake power of trains. Three classes of trains have to be provided for, viz., passenger and express goods, which are fitted throughout with continuous power brakes; freight trains, which have only the locomotive fitted with the power brake; and mixed trains in which a certain proportion of unfitted freight cars may be attached to fitted passenger cars, and partially fitted freight trains with which the proportion of fitted cars is variable.

"(b) The speed maxima likely to be attained on level road by various classes of trains may differ as widely as 20 and 80 miles an hour.

"(c) The standard block interval or overlap (440 yd) has been fixed without any regard to speed or gradient. On level or falling gradient, therefore, if the brake, owing to inattention, etc., on the part of the engineman, is not applied until a stop signal at danger is actually reached, the speed of the train may be such that it will not be brought to a standstill, even though full brake is exercised, until a train has passed beyond the clearing point and entered the danger zone.

"(d) The liability to bad atmospheric conditions, such as fog, falling snow, etc., and the consequent difficulties that enginemen have in observing signals, have necessitated the use of a manual fog signal, supplementary to wayside signaling, without which congestion, amounting even to complete stopping of traffic would inevitably result.

"(e) The high frequency and complex character of traffic in many railway areas.

"(f) The number of lines either jointly owned or used by different railway companies.

"(g) Existing variations in structural and load gages will present difficulties in adopting a uniform system of automatic train control unless these are foreseen and provided against. This point also calls for special consideration in connection with the electrification of railways."

Devices to Prevent Mistakes by Enginemen

Continuing an abstract of the report, the committee says that all devices designed to prevent accidents primarily due to mistakes of enginemen obtain their effect either indirectly or directly as follows:

"(a) Indirectly: By automatically providing either on the train or on the track, distinctive visual and audible indications, supplementary to those given by the wayside signal. Reliance for necessary action to avoid danger is, with these inventions, still placed upon enginemen, and appliances of the kind are often described as cab or fog signaling devices.

"(b) Directly: 1. By the automatic application of the power brake. In this case it can be arranged that enginemen either have the power to release the brake at any time after it has been applied, or do not have the power of doing so until the train has come to rest. Appliances of this nature are indifferably termed 'train stops' or 'train control' devices.

"2. By automatic speed control. In this case the brake is applied at any desired point if the speed exceeds a prescribed rate, and cannot be released until either the train has come to rest or the speed has been reduced to a predetermined limit. All these effects can be produced either singly or in combination."

Continuous Train Control

The committee next divided the devices into two general types: "continuous" and "localized" or "intermittent." With respect to the continuous type of control the committee says:

"(a) A continuous type of control aims at entire and constant protection of the train at all stages of its journey against every risk of collision, either with other trains, or in some cases, with earth slides; and, as a general rule, against risk of derailment due to rail breakage, lack of continuity of track, washouts, etc. Devices of this kind are essentially electrical, and usually, though not invariably, of the non-contact type so far as the control mechanism is concerned. They are dependent on complete track circuiting or its equivalent. The outstanding advantage of a control of this type is that it can be made to cover practically every risk which automatic train control can be expected to safeguard.

"There are, however, the following arguments against the adoption of this form of control upon British railways:

"1. The first cost of engine and track equipment is higher than that required for localized control.

"2. The cost and difficulty of supplying electrical energy to all railways in the country in such a form as to be suitable for a standard system of control, is likely to be prohibitive, and would delay installation almost indefinitely.

"3. Although it can be arranged to exercise control at signal locations, its function, broadly speaking, is to provide a substitute for, rather than addition to, existing systems of signaling and block workings, which have already been installed at considerable cost, and have reached a high state of development.

"4. Maintenance would be costly and necessitate the use of a large number of skilled workmen.

"5. The principle of action in apparatus of this class is that electrical energy must be constantly supplied to the train during the whole of its journey. If this energy is cut off, the train is then unable to proceed. Its energy may be cut off for two reasons: (a) Because it is unsafe for the train to proceed owing to some obstruction, etc., on the line ahead; or (b) in consequence of failure in the source of supply, or break-down of the control apparatus.

"No form of automatic train control can be considered wholly immune from risk of failure such as described in (b). The continuous control systems which have been examined require the use of comparatively delicate locomotive apparatus. Such apparatus is more likely to be affected by the vibration and shock of ordinary working conditions than the more robust apparatus used in localized systems. Although failures from this cause would doubtless be on the side of safety, they would cause traffic delay. With regard to the breakdown of the main electrical supply, such a contingency would be serious in a continuous control system handling a frequent service of trains, as all traffic would come to a standstill in the area concerned. Failures from either of the above causes would necessitate arrangement to enable release from the control to be effective. The difficulty and risk of accident attached to such a provision will be apparent, particularly when the main electrical supply fails."

Localized or Intermittent Control

"In the light of the foregoing disadvantages, the committee is of the opinion that expenditure to the extent necessary for continuous control would not be justifiable upon surface lines in Great Britain. On the other hand, in the case of an entirely new railway system, or on railways upon which appliances are less complete, or where accidents of the class preventable only by continuous control are comparatively common, this type of control might be worthy of consideration. The attention of the committee has therefore been directed to localized control, which supplements rather than replaces existing signaling and block telegraph systems. Localized control can be either of the non-contact or contact type.

"The non-contact type is essentially electrical, and although it has the advantages consequent upon the avoidance of any physical contact between track and locomotive apparatus, it necessitates the use of somewhat complex electrical arrangements, entails a

considerable addition to the skilled maintenance staff, and is likely to be more expensive, both in first cost and upkeep, than the contact type. There is also a difficulty in arranging for the production of more than two distinctive effects.

"The contact type is the best known and most developed. Despite the inherent disadvantage, in regard to shock effects, which is common to all forms of contact control, apparatus of this nature has proved reliable after many years of operation under working conditions, and capable of withstanding satisfactorily the effects of high speed traffic. Three indications can readily be provided, viz., 'clear,' 'warning,' and 'danger,' and alternative methods for obtaining brake release can be arranged. Devices of this type do not necessarily require either primary or secondary batteries on the locomotive. In connection with local track circuiting, this type of control can be used with automatic and three position signaling. Moreover, as track circuiting is extended, the control exercised by any localized device, although not strictly continuous in character, will confer nearly all the benefits obtainable from the continuous system.

"To safeguard shock effects in the case of contact devices at wayside signal locations, locomotive and track elements used to obtain control of tracks at distant signals should be more robust than those at stop signals. Trains are authorized to pass, and do pass, distant signals at high speed, whether they indicate 'clear' or 'warning.' It follows, especially if separate indications for warning and clear are required, that contact between locomotive and track elements will be of high frequency. On the other hand, the occasions upon which trains pass stop signals at danger are comparatively rare, and it is not considered necessary for the stop signal apparatus to provide more than one effect, i.e., 'danger.' In special cases a 'clear' indication can, if required, be provided at stop signals by other means, e.g., hand signaling. While, therefore, means for detecting integrity and correct position of the track mechanism for affording control at stop signals will be required, to insure that contact is made when enginemen pass them at danger, it is not a matter of primary importance if damage to the apparatus should result from contact between locomotive and track elements at such signals."

Speed Control

"The employment of speed control and time element relay devices, in conjunction with other indirect or direct methods already mentioned, has been very fully considered by the committee, especially in relation to the outstanding features which characterize British railways. It is argued with some cogency that an appliance either of one character or the other is necessary, because the clearing point, which defines the length of overlap in advance of home signals, etc., is often too close to insure, in all conditions of gradient, speed, and brake equipment, that a train will be stopped by a full application of the power brake when the danger point is reached.

"With some well-known speed control devices, the conditional character of release would, in certain conditions, impose restrictions in the rate of speed unacceptable to British practices and unnecessary for safety. There is not only the dissimilar extent of power brake equipment upon trains to be remembered, but also the variation in speed maxima, in combination with gradient effect. It is common practice for the same engine to be used for hauling fully fitted passenger and unfitted freight trains. Consequently, an engine working a passenger train on one trip might require a speed control set to act at 40 miles an hour, and on another trip hauling a freight train, the device would have to be adjusted for a different speed, of, say, 20 miles an hour.

"Again, a time element relay arranged to apply the continuous brake to a passenger train which approaches a home signal at danger at a higher speed than, say, 55 miles an hour, would not furnish a safeguard to an unfitted freight train approaching the same signal at a very much lower, and yet, dangerous speed. Moreover, with time element relay appliances there is always in existence an element of danger. A train may be traveling at a comparatively slow rate of speed when the first point of contact on the track is made and afterwards accelerate, so that, although the time occupied in traversing the measured length of track is not less than that for which the apparatus is set, its speed at the moment it passes the second point of contact is considerably higher than that calculated to be safe in the event of the signal in advance being at danger.

"The difficulties arising from such conditions, and the need for insuring that the capacity of roads is not injuriously affected by imposing unnecessarily low speed restrictions upon express traffic, would, in the opinion of the committee, render such devices unsuitable to British conditions. Moreover, it will be seen that out of 193 accidents which have been fully analyzed, in only three (or 1.6 per cent) of the whole number could it be said that a speed control device would alone have proved remedial. Such cases of accidents can, in the opinion of the committee, be adequately safeguarded, if not entirely prevented, by installing a train control device, either of a permanent or temporary character, which would provide an audible indication, as well as a brake application, to remind enginemen of the existence of a speed restriction over any curve, crossing, etc., in advance.

"The question of the utility of any form of automatic train control as a means for preventing buffer stop collisions has been carefully examined. It has generally been recognized, and the analysis of accidents reported upon during the past 10 years confirms the view, that the majority of buffer stop collisions take place at low speeds, seldom exceeding 5 or 6 miles an hour. Collisions at higher speeds are of rare occurrence, and are almost entirely due to brake or pump failures, or to lack of continuity of the power brake upon a train. For accidents of this description no remedy could be found in any form of automatic train control. . . ."

Analysis of Accidents

"An analysis of accidents reported upon during the 10 years ending September 30, 1921, furnishes information with regard to the preventable character of typical accidents upon British railways. It will be seen that the 193 cases analyzed have been divided as follows:

"A.—Accidents of various types (including buffer stop collisions) for which automatic train stop or train control is not likely to afford any remedy—73. Percentage, 37.8.

"B.—Train accidents due mainly to signalmen's errors, which are preventable by such well-known appliances as track circuit, electrical control of signals, etc.—49. Percentage, 25.4.

"C.—Train accidents mainly caused by failure of enginemen, which some form of train stop or train control with automatic application can alone prevent or beneficially affect—71. Percentage, 36.8.

"The 71 cases of accidents under C have been allocated under three heads:

"1. Derailments due to speed upon sharp curves, etc., for which speed control would be the best remedy, 3. Percentage of these cases, 4.22; percentage of all cases, 1.6.

"2. Miscellaneous cases, such as collisions with platelayers' trollies or other vehicles standing in the section between block posts, and derailments due to switches being out of position, or to rail breakages. For these classes of accident either a form of continuous control is necessary or localized control combined with continuous track circuiting and signal interlocking. Number, 12. Percentage of these cases, 17.0; percentage of all cases, 6.2.

"3. Train accidents directly due to failure of enginemen to observe or obey signal indications. This type of accident is preventable either by localized or continuous control. Number, 56. Percentage of these cases, 78.87; percentage of all cases, 29.0."

The committee considers that on a very conservative estimate, automatic train control would have a preventive or beneficial effect, to the same percentage as is shown in the foregoing tabular statement, upon a total number of accidents at least 10 times as great as those actually inquired into.

Relative Value of Train Control at Distant and Stop Signals

"The evidence of both railway officers and men was generally in favor of some form of automatic train control, as a preventive measure against accidents of the class under consideration. But with regard to the relative value of train control at distant and stop signals, there are two distinct schools of thought. One, perhaps the older, school considers that the provision of control at distant signals is indispensable for safety; and that control at stop signals is of quite minor importance. This view is held very strongly by some of its advocates, so much so that it is thought that, if observation by enginemen of distant signals can be secured, security will result in many cases of accidents. The other school regards control at stop signals as of first importance, and control at distant signals as of secondary value. The main points in the evidence may be briefly summarized as follows:

"(a) In respect of stop signals—the weight of evidence was in favor of control by means of a full brake application when danger was indicated, but against any audible indication.

"(b) In respect of distant signals—a partial brake application combined with an audible indication was favored by the majority for the warning position.

"(c) There was unanimity against the utility of visual cab signals, with which the general opinion of the committee concurs.

"The committee is in no doubt respecting the relatively higher value of control at stop than at distant signals. Further information obtained from the critical analysis of accidents confirms this view. In the 56 cases in which it is considered that beneficial results might have been expected from a system of automatic localized train control, it is shown:

"1. That control at distant signals would in the circumstances have been necessary as a preventive measure in 7 instances.

"2. That control at either a distant or stop signal would have proved effective in 18 instances.

"3. That control at a stop signal, either home, starting or advance, would have been necessary in 31 instances.

"The above figures prove conclusively that control at the selected stop signals is an essential feature of automatic train control. * * * The committee finally agreed that in general, and especially in areas liable to bad atmospheric conditions, sufficient provision for safety against preventable train accident due to failures of enginemen cannot, in the existing conditions, be made without recourse to train control at distant signals also.

"There are three alternative methods of train control at distant signals:

"1. The first and simplest, which provides 'location' effect, is to provide a track appliance fixed in character which shall give one and the same effect on locomotives whenever the distant signal is approached, irrespective of its position. Advocates of this method were particularly unanimous that a brake application and audible signal should be combined for the desired effect.

"2. The second method is to provide an appliance which shall give these warning effects, whenever distant signals are passed in the 'warning' position; no effect being produced when the signal is in the 'clear' position. This method necessitates, if the track appliance is fixed in character, the employment of electrical energy for the purpose of differentiating between the warning and clear positions of the distant signal. It is consequently more costly, both as regards track and locomotive apparatus than the 'location' system. * * *

"3. The third method, advocated by a large majority of the witnesses examined, provides train control in the direction of two separate effects for the warning and clear positions, respectively. The clear effect to be an audible signal distinctive from that given for the warning effect, but with no brake application. The increase in cost of this over the second method (presuming the track apparatus is fixed in character) is small, and affects the locomotive apparatus only. * * *"

Fog Signaling and Train Control

"Train control at distant signals should be considered in relation to manual fog signaling. The questions that arise are: Will control prove an acceptable substitute for fog signaling; and if so, what effects must train control produce to prove acceptable? On the first point, though some of the witnesses expressed doubt, the answer was in the affirmative by a large majority of both officers and men. On the second point, it is clear, at all events, in areas subject to fog, that train control must produce effect on all occasions when the train passes distant signals, otherwise, one of their functions, i.e., to give geographical information to engineman of their whereabouts, will only be performed when these signals are passed in the warning position. With this minimum requirement, both the first and last methods comply, but the second does not.

"There was considerable diversity of opinion whether it is essential, in order adequately to meet all fog signaling requirements, that separate effects must be produced by train control to differentiate between the clear and warning positions of distant signals. It appears to the committee to be more a traffic than a safety question. In some areas, no doubt, existing traffic facilities would be reduced unless a dual indication were provided.

"As a general rule, the committee considers that train control at distant signals, in order adequately to meet fog signaling requirements, should provide distinctive effects for both clear and warning positions. Over large and well defined districts, however, where there is no liability to fog, the 'location' method, whereby the warning indication only is given on approaching, all equipped distant signals, whatever their position, may prove sufficient. * * *"

Outside of the financial effect which the committee states would not be so great as might be expected, it continues, saying, "there are certain beneficial effects which it may be anticipated will result from the use of control wherever possible, in place of manual fog signaling. These are:

"(1) Manual fog signaling is not free from special danger to the personnel employed. A number of fatalities occur yearly to men employed in visiting fog posts, and injuries result to fogmen from the explosion of detonators. The elimination of this class of accident proportionately to the degree of substitution of control may be anticipated.

"(2) Owing to the sudden appearance of fog, it is not always possible for fogmen to be at their posts when their services are essential. Enginemen in such conditions have an anxious time. Sometimes they receive no geographical indication of their whereabouts and are in complete uncertainty whether they have passed a signal, and have missed seeing the fogman's green light, or whether the absence of an explosion or green light is to be explained by the fact that the fogman has not arrived at his post. Control producing both an unmistakable clear and warning effect would do away with this sense of insecurity, and undoubtedly improve safety conditions.

"(3) Failures of detonators to explode, and of enginemen, especially in the case of double-headed trains, to hear the sound of detonations, as well as mistakes made by fog-signalmen themselves, are not unknown under the manual system of fog signaling. A betterment in all these respects may undoubtedly be expected from the introduction of control.

"(4) Some additional facilities to traffic working may be counted upon."

Train Control Considered Essential

"As the result of this general investigation of the subject matter, the committee has found that there is a *prima facie* case for automatic train control upon British railways, as the only means for obtaining greater security against the class of train accident, which in general results from failure on the part of enginemen.

"They consider that the method of automatic train control most likely to suit existing conditions upon British railways should supplement rather than replace existing block telegraph and signaling systems, and comprise:

"(a) Automatic train stop, located at or near selected stop signals, which shall, in the event of a train passing such signals, when they indicate, or should indicate, danger, bring the train to a standstill.

"(b) Automatic warning control at unworked distant signals, also at worked distant signals, whenever these are passed in the warning position, and at such other places where danger from too high a speed may be anticipated. In addition to the above, which the committee regards as the minimum necessary to obtain adequate security against train accident, it is held that the selected system of control should be capable of producing a distinctive audible effect for the clear position of worked distant signals, in order to meet conditions of fog signaling."

Requisites for Installation

"In compiling these requisites, due weight has been given to safety requirements, as well as to the following considerations:

"(a) Standardization of equipment to obtain uniformity of effect upon all railways.

"(b) Future development in the direction, for example, of three-position and automatic signaling, and extended electrification.

"(c) Lowest cost compatible, with due regard to safety conditions.

"1. The control apparatus should be constructed to work in conjunction with any system of fixed signaling, mechanical, power worked, or automatic.

"2. To be so constructed in respect of both track and train elements as to insure the undermentioned effects being produced upon locomotives* when running either upon home or foreign lines in Great Britain.

"3. The control to be capable of producing three alternative effects, namely, (a) danger, (b) warning, (c) clear, as follows.

"(a) The danger effect to be produced at a two- or three-position stop signal, when this indicates or should indicate danger, and to consist of a full application of the power brake. In the case, however, of purely automatic signals, the danger effect is required to be produced only when the signal correctly indicates danger. The brake application to be capable of release by the engineman, only by an action entirely distinctive in character from that required for the release of the warning brake application.

"(b) The warning effect to be produced at a two-position distant signal or at a three-position signal, whenever these indicate or should indicate caution, and to consist of an unmistakable brake application and audible warning. The brake application in this case to be capable of immediate release by the engineman. The action for brake release in respect of both 'danger' and 'warning' effects must necessarily reset the locomotive apparatus in the normal receptive position.

"(c) The 'clear' effect to be produced at a two-position distant signal or at a three-position signal, when these correctly give the clear indication, and to consist of an audible signal distinct from that required for the warning effect. The control of this locomotive apparatus to be in the hands of the engineman, so that he can render it operative or inoperative at will.

"The clear effect shall be produced only when this condition is indicated both by the signal concerned and by the position in the frame of the corresponding signal lever; and in the case of automatic or semi-automatic signaling also by the condition of the corresponding track controls. In all other circumstances, either the danger or the warning effect, as the case may be, shall be produced.

"4. To be so constructed that the correct position of all track and train elements of the device shall be assured under all conditions of speed, atmosphere, weather, wear, oscillation and loading; and that the device shall operate under all conditions which permit of traffic movements.

*The word "locomotive" wherever used in these requisites includes the leading control vehicle of multiple unit trains, whether steam or electric.

"5. The track apparatus in the event of failure of any of the actuating mechanism, electrical energy, or connections, and in the event of other electrical faults, to assume the danger or warning condition, as the case may be, and give the corresponding indication. The integrity and correct position of all moving parts of the track apparatus, which are designed to come in contact with the locomotive apparatus, must be continuously indicated to the signalman, or detected in the case of automatic signaling. Failure of any portion of the locomotive control apparatus, which prejudicially affects the brake control in connection with the danger and warning effects, to give an unmistakable application of the power brake.

"6. To be capable of operation upon locomotives fitted with air, vacuum, steam or other power brakes, or any combination thereof.

"7. The locomotive apparatus to be such as not to interfere with or impair the efficiency of the normal working of the power brake.

"8. The apparatus to be such that it will be operative when the locomotive is running in forward or backward gear, without involving any action additional to that normally necessary for reversing the direction of travel of the locomotive.

"9. The apparatus to be inoperative automatically in respect of the danger effect when a train passes a signal not applicable to the direction of its movement.

"10. To be of simple standardized construction with easily interchangeable parts so that maintenance, inspection and tests to insure efficiency of all the parts shall be easily carried out. Any part of the apparatus which is liable or designed to be destroyed by shock of impact must be capable of rapid replacement.

"11. To be so constructed and installed as not to constitute a source of danger to railwaymen or passengers.

"12. Where there are a number of signals at any point applicable in the same direction to one road, the track apparatus for that road must be capable of operation in conjunction with any one of the signals in question."

Recommendations Regarding Requisites

The committee has the following recommendations and remarks to make in connection with the requisites:

"(a) Localized (intermittent) control is recommended as more suitable for prevailing conditions on British railways than continuous control. The contact type is selected in preference to the non-contact type. The necessity in this country for a speed control or time element device has not been established.

"Locomotive and track apparatus for train control at distant signal locations must be of a robust and durable character; the track apparatus of the fixed element type. The use of electrical energy for obtaining a distinctive clear effect is acceptable. Locomotive apparatus should preferably not require the carriage of batteries, particularly those of a secondary character.

"For stop signals the train stop apparatus, both track and locomotive, should be of a simpler and less expensive character, the track element preferably of the mechanical movable trip type. In the case of the locomotive apparatus a mechanism of the frangible character would not be objectionable. Overhead train stop or train control devices are not regarded as suitable. The possible development of power working of signals should not be lost sight of in the selection of train stop and train control devices.

"(b) In the opinion of the committee the most suitable position for the track element of train control at distant signals is the center of the four-foot way. The possible effect of the selection of this position upon any scheme for electrification has to be borne in mind.

"(c) Requisite No. 3.—Change of effect: In connection with the release of this effect of control the committee records its preference that the arrangement should be such as will permit of the engineman actuating the release without having to leave the foot plate of the engine for the purpose, unless the additional expense thereby incurred is considerable.

"(d) To meet the possibility of failure of locomotive apparatus for train control or train stop appliances, the cut-out or other device for the purpose should differ essentially from that in use for obtaining the normal stop signal control release, and will require to be protected from unauthorized use.

"(e) For emergency, e.g., pilot, working upon track equipped with control apparatus for one direction of travel only, it will be necessary for railway companies to issue instructions regarding the precautions to be taken for cutting out the locomotive control or stop apparatus as required.

"(f) The requisites do not deal specifically with difficulties which may arise from the adoption of automatic train control in connection with helper engines, double-headed trains, or two trains coupled together. As regards helper engines, it is held that track control apparatus will not be required at signal locations on short and continuous lengths of service rising gradient where helper engines are normally employed at the rear of all trains. This may perhaps render the retention of manual or fog signaling at distant signals located on such grades necessary.

"In localities where, over longer sections of track, with variations in direction and inclination of gradient, automatic train control will no doubt require to be installed, there is a possibility of signalmen returning a track control device from clear to normal before a banking engine in rear of a train, or the second engine of two trains coupled together, has passed it. The committee suggests a last-vehicle or track circuit device would meet the case. In the case of double-headed trains, the committee sees no reason why both enginemen should not be called upon to release their brakes in the event of a train control distant signal warning effect. In the case of stop signals, the likelihood of the signal being returned to danger before the second engine has passed is inconsiderable.

"(g) The effect of the extended adoption of electric traction upon the use of the electrified ramp for distant signal control will require consideration, and special precautions may be necessary to safeguard a false clear effect being given as the result of the ramp becoming energized from an extraneous source. The possibility of alternating current proving necessary eventually for the purpose of energizing the ramp, will be for consideration in the design of the engine apparatus.

Cost of Installation

In estimating the cost of installation the committee has taken the figure of 24,000 track miles as representing the maximum mileage for passenger lines to which automatic train control would in any circumstances require to be applied. Regarding the number of signals and locomotives it estimates as follows:

Distant signals—Equipped with dual application, 18,000; Equipped with warning indication only, 6,000.

Stop signals—Equipped with trip device for "danger" effect, 38,000.

Locomotives—23,000.

The estimated first cost is, 18,000 distant signals at $308.70 each, $5,556,600; 6,000 distant signals at $110.25 each; $661,500; total for distant signals, $6,218,000.

The annual charge for maintenance and renewals at 7½ per cent of first cost, $466,357.50. First cost of fitting 38,000 stop signals at $4,189,500. Annual charge for maintenance and renewals, 7½ per cent, $314,212.50.

First cost of fitting 23,000 locomotives at $441, $10,143,000. Annual charge for maintenance and renewals (10 per cent first cost) $1,014,300.

The total cost of the full scheme would appear to be:

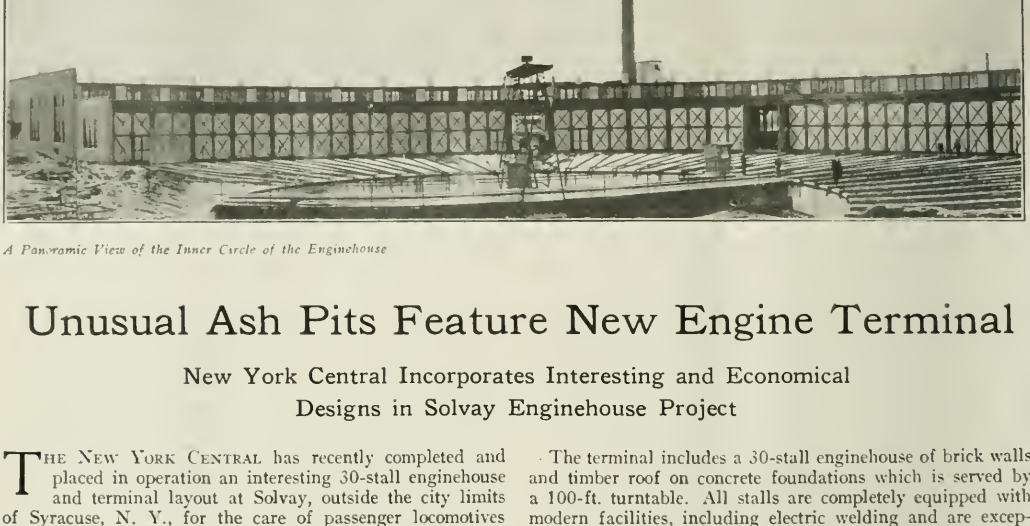
Distant signals, $6,218,100.

Stop signals, $4,189,500.

Locomotives, $10,143,000.

Total first cost $20,550,600. Total annual charge for maintenance and renewals, $1,894,870.

The Crossing at Hurricane Gulch, Alaska Railroad



A Panoramic View of the Inner Circle of the Enginehouse

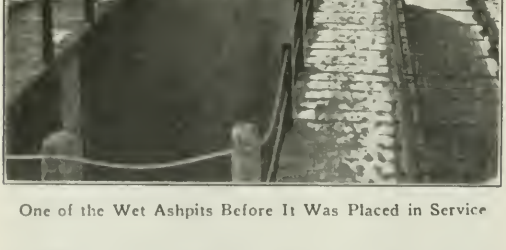
Unusual Ash Pits Feature New Engine Terminal

New York Central Incorporates Interesting and Economical Designs in Solvay Enginehouse Project

THE NEW YORK CENTRAL has recently completed and placed in operation an interesting 30-stall enginehouse and terminal layout at Solvay, outside the city limits of Syracuse, N. Y., for the care of passenger locomotives turned at this division point. The new terminal, which replaces one that had become congested and crowded because of its circumscribed limits within the city, contains many features of economical design, construction and operation which are a departure from ordinary practice. This is notable in the design of the ash pits, which are circular in section, of mass and reinforced concrete and economical both in cost and operation.

Location and General Features of the Terminal

The new terminal had been under consideration for a number of years preceding the war and in 1918 construction was started but on account of financial and other conditions



One of the Wet Ashpits Before It Was Placed in Service

little was done. Work was resumed in 1921 and the project was carried through rapidly to completion. The layout is primarily for the care of passenger train locomotives received from and sent out over the several divisions of the New York Central centering at Syracuse. Some freight power is handled, however, as well as switching locomotives. The terminal is located about 3.5 miles west of the Syracuse passenger station. It adjoins the four-track main line to Buffalo and the two-track line of the West Shore Railroad, also a part of the New York Central.

The terminal includes a 30-stall enginehouse of brick walls and timber roof on concrete foundations which is served by a 100-ft. turntable. All stalls are completely equipped with modern facilities, including electric welding and are exceptionally well lighted, aside from the natural light, by a comprehensive overhead direct lighting system. Portable inspection lights are also provided. Flood lights are used in considerable number in and around the turntable, the ash pits and the coaling station. A modern power plant furnishes hot air for heating, steam and compressed air. A well equipped machine shop adjoins and is a part of the enginehouse, as are the offices, etc. The coaling plant has a rated capacity of 1,000 tons with duplicate hoisting machinery. Four ash pits of the circular type have been installed, giving a capacity for about four days, normal operation between cleanings.

Passenger and Freight Power Are Turned at Different Points

Both the New York Central's four-track main line and the West Shore's two-track main line pass through Syracuse and there is a heavy through passenger and freight traffic over both of these lines. There is also considerable traffic which originates at or is destined for industries in Syracuse and the immediate vicinity. In addition the Rochester division, better known as the Auburn Road, leads to the west, the Ontario division to the north and the Chenango branch to the south. The traffic handled through Syracuse is naturally large and the problem of turning power quickly and efficiently becomes important. Under the method of operation now in use in connection with the new terminal, freight and passenger engines are, with a few exceptions, turned at separate points. Freight power from and to the west, i.e., locomotives used on the Syracuse and Rochester divisions are handled at DeWitt, a combined engine terminal and freight yard, while those on the Mohawk division (Syracuse to Albany) are handled at Minoa. Both of these terminals are east of Syracuse proper. Other freight power is ordinarily handled at Belle Isle to the west but at the present is being turned along with all of the passenger engines at Solvay.

In more detail, the power now turned at Solvay consists of both passenger and freight locomotives for the following approximate number of trains and divisions over which they pass: The passenger train movement over the Syracuse division is about 30 trains daily each way and the number ove

Coaling Station in the Distance at the Right

the Mohawk, its complementary division, is about the same. There are about six passenger trains each way over the Ontario division, about five each way on the Rochester division and about three each way on the Chenango branch. Added to this number of passenger train movements, there are five double header freight trains each way on the Ontario division while from one to three coal trains are received daily from the Pennsylvania or handled by the Pennsylvania from Elmira, N. Y., over the Central's line. Thus 85 or more locomotives are handled daily without taking into account the switching power housed and handled at Solvay. It should be noted in connection with this, that the turning of freight power at Solvay is only temporary and that it is intended solely for passenger locomotives.

The Ash Pits Are of Unusual Design

The ashing facilities at Solvay are easily the outstanding features of the Solvay terminal because of their departure

The Arrangement of the Three Ashpits on the Inbound Tracks

from ordinary practice, their low cost and their ease of construction. The arrangement consists of four wet ash pits of mass and reinforced concrete, built in the form of circular wells. Three of these pits are located under the inbound engine tracks and one under one of the outbound tracks, thus providing ashing facilities for outbound power, an arrangement of which the advantage is obvious.

Certain advantages are accorded to this type of pit which are of importance. They can be built for about $11,000 each, exclusive of water connections and drainage. Three pits, giving the same number of engine positions as would be permitted by a 200 ft. pit, can be built for less than half the first cost of the long pit. Maintenance of traffic not being a necessity, these particular pits were constructed and others can be constructed likewise by forming the circular rim and then excavating inside the shell by means of a crane and clam shell bucket, the weight of the shell carrying it down into position. After the circular shell has reached the proper elevation the bottom and piers can be placed and likewise the section of concrete forming the slope.

As compared with the long 200-ft. pit, there is very much less structure to maintain. In the case of the long pit, 400 lin. ft. of steel girder construction must be maintained, as contrasted with 150 ft. for the three small pits. The storage is concentrated directly opposite the engine positions for the full capacity of the pit, and until any one pit is completely filled, the number of engine positions is not reduced. While the long pit will allow greater storage capacity for the same number of engine positions, nevertheless to utilize the maximum storage capacity of the long pit, the number of engine positions must be reduced for a portion of the time in order to completely fill it, thereby reducing the efficiency of the terminal from an ash pit standpoint. In the circular types, additional storage capacity can be obtained by deepening the pit.

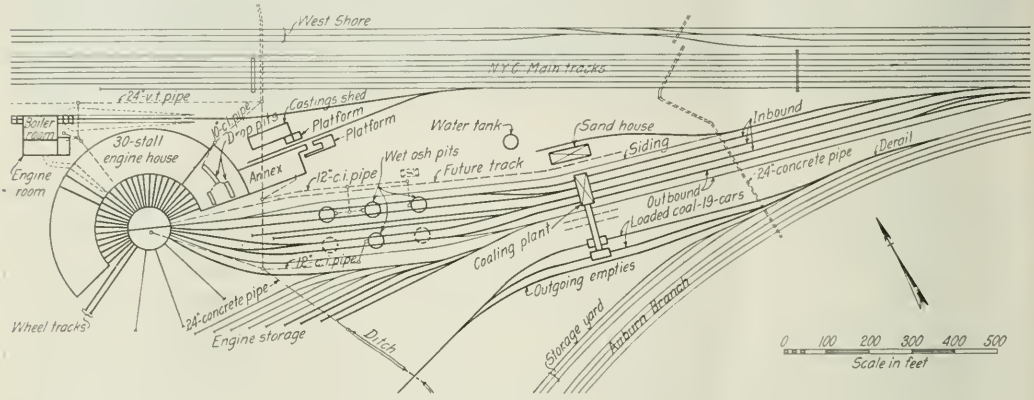
If an extension of plant is required, one or more pits may be added without disturbing the others. In view of the lesser lengths of track supported over or adjacent to the water, a much better opportunity is afforded for protection and a man may cross between the engines without as great an element of risk. On account of the smaller first cost, it is reasonably economical to install pits with walkways on the water side rather than to leave them open or to install gratings. When the circular type cannot be built by the methods described here, an alternate type, somewhat hexagonal in section, has been developed which can be built in place at about the same cost.

Basically the pits are concrete wells with an inside diameter of 32 ft. and with 15-in. walls. The total depth from base of rail to the under surface of the bottom slab is 20 ft. and to the upper surface, 17 ft. 8 in. The outer ring was poured as a unit on the surface of the ground and when the concrete had set sufficiently it was brought to final position. This was done by digging out in the center of the ash pit by means of a clam shell bucket, the pit wall sinking of its own weight as the dirt was removed. Once in position, the reinforcing could be placed for pouring the slab base or floor, which was poured integral with the track supports. The circular wall was not reinforced except at the base which was strongly reinforced by a series of 5/8-in. rods and stirrups, the base being not unlike the bottom edge of some caissons; and at four points around the circumference where the wall was built out to form supporting posts. This is shown clearly in the drawings.

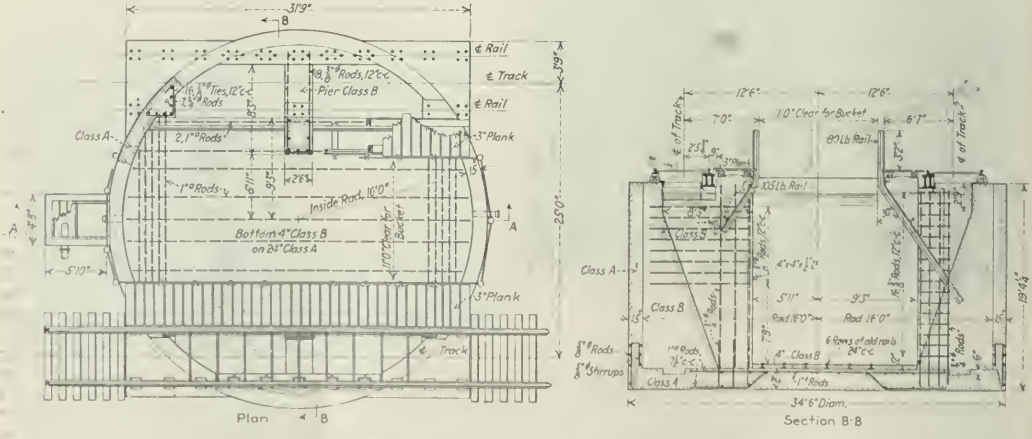
The two lines of rails nearest the circumference of the

pits are each supported upon a concrete sector with a maximum thickness at the top of 1 ft. 10 in., measured along the diameter at right angles to the track center. The inner surfaces of these supporting sectors are perpendicular for a distance of 2 ft. 9 in., after which they slope inward to a maximum thickness of 6 ft. 9 in. Each sector is poured integrally with a small pier extending at a 90 deg. angle from the sector and forming a center support for the inner rail of the track. This pier is finished flat under the supports but is brought elsewhere to a "V," thus diverting the ashes to either side. In order to continue the support under the outer rail to the same distance that the inner rail is supported, concrete blocks 4 ft. deep were poured on the outside of the pit wall. There are four of these blocks, two to each track over the pit.

The tracks over the pit are supported above the concrete by special castings for the lines of rail nearest the circumference and by I-beams on the inner lines. Two 12-in., 55-lb. beams are used for each line of rail, the space between the beams being filled with concrete and the side exposed to the hot ashes being protected by a ¼-in. steel plate specially fitted. The pits are cleaned by a locomotive crane with clam shell bucket, operating on a stub track adjacent to the pit tracks. In order to protect against damage from the bucket six rows of old rails 30 ft. long and on 24-in. centers have been imbedded in the concrete at the bottom of the pit with the ball of the rails slightly above the surface of the concrete. Each side of the opening between the 4 ft. walks on the inner side of the pit tracks has been protected by a series of 80-lb. rails bent at about a 30-deg. angle. These rails are vertical above the edge of the pit but slope toward the walls, thus forming guides for the bucket when it is withdrawn. Each alternate rail is extended and imbedded in the concrete sectors mentioned. The ends of the shorter lengths of the bent 80-lb. rails and the centers of the longer ones are tied together on each half of the pit by a length of 105-lb. rail paralleling the center line of the track while a second line higher up adds to the rigidity of the arrangement. A clear opening, 11 ft. wide, is secured.



General Layout of the New Terminal



A Plan View and Cross Section of One of the Circular Pits

The extended vertical sections of the 80-lb. rails form the posts for the protective "railing" on the inside of the walks. The railing consists of ¾-in. steel cables run through holes drilled in the web of the rail and is carried around the ends of the pits by wooden posts, making a continuous protection.

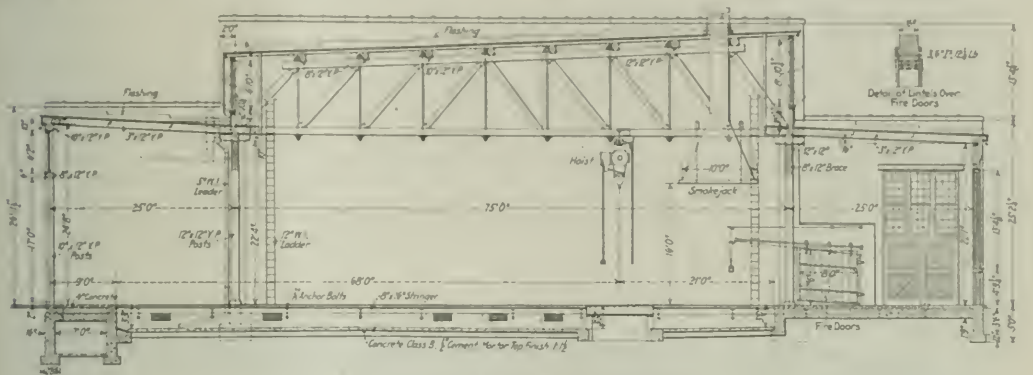
The two walkways are placed independently in the pit and are built of timber, easily removed and replaced when necessary.

A Well Arranged 30-Stall Enginehouse

The type of enginehouse which has been built at Solvay is one which has become, in a way, a standard on the New York Central. This particular house is a 30-stall structure with mass concrete foundations, brick walls and fire walls, timber posts and a timber monitor roof structure. It is felt on this road that in view of the question of obsolescence and the considerable amount of reconstruction work which is nearly always being carried out around engine terminals in which the location of the enginehouse is often changed, the more permanent forms of completely fireproof structures have serious disadvantages. The road also favors the idea of a minimum number of supporting posts between engine stalls and the elimination of all metal possible in the superstructure.

The enginehouse is a semi-circular structure with an inner radius of 126 ft. 5 9/16 in. With the exception of five stalls at one end which are 125 ft. deep, all stalls are 110 ft. from center line of the door posts to the interior faces of the pilasters in the rear wall. One stall has been constructed as an outbound track through the building; this divides it into sections of 10, 14 and 5 stalls, respectively, each separated by fire walls. The angle between center lines of stalls is 6 deg. 48 min. for all except the outbound track mentioned where the angles to either side have been increased to 7 deg. 15 min. This gives an opening of 15 ft. center to center of door posts on 29 stalls and 16 ft. 11 1/4 in. for the outbound track, although this section has no doors at front or rear. Each stall is divided into three bays which, in the 110 ft. sections of the house, are 25 ft., 64 ft. and 21 ft., respectively, from the door end. In the 125 ft. 5-stall section they are 25 ft., 75 ft. and 25 ft. The roof is a timber structure carried on 12-in. by 12-in. yellow pine posts. The center bay forms the monitor and this section is supported by timber trusses between stalls. The trusses are reinforced with steel rods in the 125-ft. section, which is chiefly the repair section of the house and little affected by hot gases. The roof over each bay is of the shed type, the slope of the inner bay and the monitor being toward the first line of interior posts and of the outer bay toward the rear of the house. In the 125-ft. 5-stall section the entire roof structure has been raised slightly over five feet, thus increasing the clearance under the monitor section for the use of a monorail hoist of 7½ tons capacity. The effectiveness of the lighting was also improved—a distinct advantage since this section is also the main repair section of the enginehouse.

Windows of large size have been installed in the rear and end walls, in both sides of the monitor and over the doors of the 125-ft. section. Smaller sash has been installed over the doors of the 110-ft. section. Daylighting is thus well taken care of, there being about 19,000 sq. ft. of windows in the enginehouse and in the 52-ft. by 92-ft. annex which



A Section Through a Standard 125-ft. Stall

A Compact Well-Arranged Layout

includes the machine shop, offices, oil storage and quarters for engine crews. The interior electric lighting is also well taken care of. Besides three large drop lights between stalls, six drop lights have been provided in clusters of two with large reflectors, so arranged as to throw the light on each side of the locomotives. These lights are controlled by a switch arrangement on the rear wall. There are also numerous outlets for the use of portable lights. Another installation of interest electrically is the provision at each stall for the use of a portable electric welder.

Engine Pits Form Sides of Hot Air Ducts

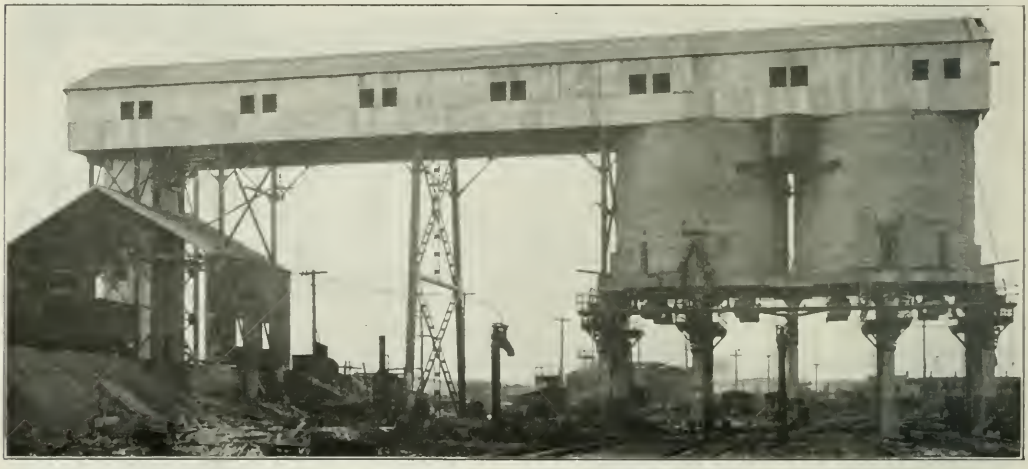
The engine pits are of concrete, crowned slightly at the bottom and drain toward the inner and outer circles. The wheel pits have all been installed in the 125-ft. section, three tracks having driver wheel pits and two tracks having pony truck and tender pits. One wall of the pits forms one side of the hot air ducts through which the pits and the house are heated. These air ducts have five screened openings into each pit and connect at the inner circle with a large hot air duct which follows the line of the inner circle just below the floor system and inside the doors. It is of concrete of variable inner dimensions to secure the most efficient flow of the heated air. The two arms of this duct tap into the main heating duct from the power house adjacent to the enginehouse between stalls Nos. 18 and 19, the sides of the pits at this point forming the sides of the duct. The clear height at this point is about 7 ft. 6 in. The junction of the two arms is constructed to divert the air in the proper quantities. This is accomplished chiefly through a "V" or baffle wall located so as to give different dimensioned passageways to either end of the house. The entire enginehouse is floored with six inches of concrete, this flooring forming the top of all air conduits except the feeder extending around the inner circle, over which the enginehouse tracks pass. At these points a reinforced concrete slab 11½ in. thick forms the top and on this is placed 7½ in. of cinders and then the regular floor construction. As a precaution against engines going through the rear walls, an opening has been left in the floor back of the bumpers. This opening is covered with plank flooring which the pony trucks can easily break through, thus effectually stopping the engine.

In addition to the equipment mentioned for the enginehouse proper, each stall is provided with a link in the rear wall by means of which, in conjunction with a special motor and drum on the turntable, dead engines can be hauled into position. Another unit of interest is a portable oil and repair truck used by the enginehouse forces. This truck contains a generous equipment of tools, oils, grease, etc., necessary for the pit work and inspection on the engines. It also contains a special high candle-power inspection light which can be placed in the pit or at any other desired location, greatly facilitating the work. By concentrating all of the various needs of the locomotive, electrical, air brake and other inspectors, and the men and their helpers, it is estimated that a substantial saving has been made in time saved. A test indicated that the amount of walking eliminated by the foreman and his 11 men in one 8-hour period was the equivalent of 43 miles by one man.

The enginehouse, power house and machine shop are completely equipped with all necessary facilities where needed, arranged for easy access. The equipment includes three 400 hp. water tube boilers with space for a fourth unit, pumps, feed water heaters, boiler washing plant, hot air heating coils and large size blower, oil filters and an ash hoist and storage bin, etc. The power house has an inside trestle for coal cars.

A Large, Modern Railroad Designed Coaling Plant

The coaling plant is of reinforced concrete and steel throughout, making a fireproof structure with a rated capacity of 1,000 tons. The actual capacity appears to be somewhat greater than this. The entire design aside from the machinery was prepared by the engineering department of the road with the purpose, among other things, of facilitating the rapid construction of the plant. Coal is delivered in hopper-bottom cars operated by gravity over two tracks and is discharged into hoppers under the tracks from which it is elevated to a conveyor gallery. Duplicate hoisting and conveying machinery has been installed. The storage facilities are in the form of two circular concrete bins resting on a "flat" slab which in turn is supported by 15 concrete posts, all concrete being reinforced. The bin structure spans four tracks and serves six tracks with two coaling spouts per track. The shed over the hopper tracks, the enclosure of the hoisting equipment and the conveyor gallery are of steel construction. The concrete bins are 33 ft. 8 in. inside diameter, 30 ft. 8 in. in height and have a wall thickness of 8 in. The slab measures 74 ft. long by 37 ft. wide by 1 ft. 7 in. thick and the supporting posts vary in size from 2 ft. by 2 ft. 6 in. to 2 ft. 6 in. by 3 ft. 6 in.



A Modern, Workmanlike Coaling Plant

An interesting feature of this coaling station, aside from its design, was the short period of time required for its creation. The excavation for the footings was started on August 30, 1921. By October 8 the columns supporting the bins had been poured and by October 31, the concrete work in the storage bins had been completed. Thus in about 50 working days after excavation had been started all footings, piers, columns, floor slab and bins involving a total of 850 cu. yd. of concrete had been reinforced and poured with due time given for aging of all parts. While the speed of the work in this instance was the most outstanding feature, excellent time was made in the construction of the terminal as a whole. No delays were encountered at any time, the contractors having their materials and their forces well in hand at all times.

The Solvay terminal was designed by and erected under the supervision of the engineering department of the New York Central, Geo. W. Kittredge, chief engineer; J. W. Pfau, engineer of construction, and R. E. Dougherty, designing engineer; and J. H. Van Buskirk, mechanical engineer. R. H. Colson, assistant engineer, was in active charge of the field work. W. M. Ballard, Syracuse, N. Y., was the general contractor for the grading, framing and masonry; the Edward Joy Company, Syracuse, for the piping, plumbing and electrical work; and the Link-Belt Company, Chicago, for the coaling plant machinery.

Lease of Panhandle by Pennsylvania Authorized Conditionally

WASHINGTON, D. C.

THE INTERSTATE COMMERCE COMMISSION has rendered a decision authorizing the acquisition by the Pennsylvania Railroad Company of control of the railroad and leased lines of the Pittsburgh, Cincinnati, Chicago & St. Louis by lease for 999 years from January 1, 1921, subject to the condition that the Pennsylvania and the Pennsylvania Company shall not dispose of their stock in the Panhandle without the consent of the commission. Commissioners Potter, Lewis and Cox signed a concurring opinion vigorously opposing the imposition of this condition as not workable; Commissioners Hall, Daniels and Campbell dissented because of it, and Commissioners Eastman and Aitchison dissented on the ground that the lease is not in the public interest.

The Pennsylvania on June 2, 1921, filed an application, pursuant to paragraph (2) of section 5 of the interstate commerce act, for an order authorizing the lease. Hearings were held on September 27 and December 13, 1921. No representations were made by any state authority either in favor of or against the granting of the application.

At the first hearing the Continental Insurance Company filed an intervening petition asking that the application be denied on the ground that the proposed lease is unfair to the independent stockholders of the Panhandle. At the second hearing it was contended in behalf of L. Kemp Duval, an intervening minority stockholder owning 1,225 shares of the Panhandle, that not only should the past earnings for a period of not less than 10 years be considered, but that in determining what those earnings were, the commission should make an investigation and ascertain what the true earnings were.

4 Per Cent to December 31, 1925, 5 Per Cent Thereafter

By the terms of the proposed lease, the Panhandle demises to the Pennsylvania all the railroads owned and operated by it, and assigns to the Pennsylvania the leases which it holds of the Little Miami, the Terre Haute & Peoria, and that portion of the Evansville & Terre Haute extending from Terre Haute, Ind., to Rockville, Ind. The Pennsylvania proposes to pay to the Panhandle, as rental: (a) a sum equivalent to four per cent on the Panhandle's outstanding capital stock until December 31, 1925, and five per cent thereafter, without deduction for any taxes other than an income tax on the stockholder levied by the government of the United States; also a sum equivalent to such percentage on any additional capital stock that may be issued in the future. (b) A further sum sufficient to enable the Panhandle to maintain its corporate organization and to pay all taxes and assessments and all installments of interest and sinking funds on its bonded and other indebtedness, when due and payable, and all taxes in respect of such bonded or other indebtedness.

The Pennsylvania further agrees to pay all rentals accruing under the leases of the Little Miami and the Terre Haute & Peoria, and all sums to become due under any contracts for trackage or other rights conferred upon or possessed by the Panhandle. The lease further provides that the Pennsylvania may and will make all such improvements, betterments and additions to the demised premises as shall in its judgment be necessary, and that the cost thereof shall be repaid to it by the Panhandle, either in money, or by the issue and delivery to it of bonds of the Panhandle, or of its capital stock, as the Pennsylvania shall elect. Upon the maturity of any of its bonds, during the term of the lease, the Panhandle, if unable to pay them, agrees to provide for their extension, or to issue and deliver to the Pennsylvania other bonds to provide for such payment.

Owns 98.3 Per Cent of Panhandle Stock

On March 15, 1920, the Pennsylvania Company, whose entire capital stock is held by the Pennsylvania, owned 651,245 shares of the capital stock of the Panhandle and the Pennsylvania owned 4,500 shares. These holdings aggregated 77.54 per cent of the entire capital stock. The remainder of the stock, amounting to 189,908 shares, was held by outside stockholders.

For many years the Pennsylvania Company and the Pennsylvania have been the financial backers of the Panhandle and its predecessor companies. Either one or the other of these two companies has guaranteed all the outstanding bonds of the Panhandle and has advanced funds from time to time to enable it to enlarge and improve its property, to provide equipment and to sustain its credit. On March 15, 1920, the Panhandle was indebted to the Pennsylvania Company for advances to an amount approximating $22,000,000, and thereafter issued and delivered to the Pennsylvania Company $20,000,000 of its five per cent, 50-year bonds, to discharge this indebtedness. Thereupon the Pennsylvania Company offered to purchase the outstanding minority stock of the Panhandle by paying to the holders thereof, par for par, 50-year five per cent bonds of the Panhandle, guaranteed, principal and interest, by the Pennsylvania. This offer was accepted by the holders of 174,791 shares. There remain outstanding 15,117 shares of minority stock, comprising 1.7 per cent of the total issue, of which the Continental Insurance Company owns 2,000 shares. The shares held by the Continental company were the only shares that voted against the approval of the proposed lease.

The Commission's Report

The commission says in its report:

"For many years the Panhandle and the Pennsylvania have worked in close co-operation and have interchanged and moved traffic as one transportation system. It is stated by the applicant that the proposed lease will enable it to operate the railroad of the Panhandle as a part of its system, which will eliminate much of the separate accounting now necessary. It is expected that economies in operation will be effected through a better alignment of operating divisions and the reduction of overhead expenses.

It should also simplify the work of preparing reports required by federal and state regulatory bodies.

"The interveners do not contend that the proposed lease would not be advantageous to the railroad companies involved nor that it would not effect economies beneficial to the public. They do contend, however, that the net income of the Panhandle for the years 1908 to 1917, inclusive, before deducting payments required to be made to sinking funds, averaged 6.75 per cent on its outstanding capital stock. They contend further that the principal factor in determining the value of the capital stock of a railroad company is the prospect of future earnings of the company, and that the circumstance that the stock of the Panhandle is virtually guaranteed by the Pennsylvania should not be given any appreciable weight in determining its value. For obvious reasons, the earnings for the period 1908 to 1917 cannot be taken as an index of future earnings. A vice-president of the Pennsylvania testified that in his opinion there was no hope that the Panhandle would earn a return equal to 4 per cent on its capital stock during the next five years, even with all economies that might be effected. As to the value of the guaranty, it is common knowledge that in many cases a guaranteed stock may sell on an interest basis comparable to that of bonds. Furthermore, in comparing the value of a rental with a return through dividends, it must be taken into consideration that dividends are not ordinarily measured by net income but are usually and properly much less.

"We do not consider it necessary to discuss our responsibility in protecting the interests of minority stockholders who may object to proposed action on the part of a carrier corporation, inasmuch as it is our view that the granting of the authority herein requested will not be inimical to the interests of any of the interested stockholders.

"As heretofore stated, approximately 98 per cent of the Panhandle stock is owned by the Pennsylvania or by the Pennsylvania Company. It is obvious that so long as that situation continues, the payment of the rentals reserved in the lease will be merely a matter of bookkeeping as regards the 98 per cent of the stock which is so owned. If the Pennsylvania were to dispose of the stock which it and the Pennsylvania Company now hold, an entirely different situation would be presented and one which might very well be said to be against the public interest. Such a sale of stock would separate the responsibility in operating the property under the lease from the proprietorship in the property which is now vested in the lessee. The Pennsylvania contends that we have no power to guard against such an occurrence by means of a condition attached to our authorization which would prevent the Pennsylvania from disposing of the stock without our consent, its position being that the conditions referred to in paragraph (2) of section 5 of the act are the conditions of the lease itself, and that the language does not cover a condition subsequent which is unrelated to the subject matter of the transaction.

The Condition

"We are unable to accept this construction of the law. In considering the propriety of proposed action for which our authority is sought, it is plainly our duty to take into consideration all surrounding circumstances that have a bearing upon the interest of the public in the thing sought to be done. It follows, in our opinion, that where the authorization depends for its justification upon certain existing circumstances, the authority given may be conditioned upon a continuance of the controlling circumstances, and proper provisions may be made to insure such continuance, or the substitution of circumstances as satisfactory from the standpoint of the public interest. In this case, we regard the relationship between lessor and lessee as essential to our approval of the proposed arrangement, and such approval will be given upon condition that the Pennsylvania Company and the Pennsylvania Railroad Company shall not dispose of their stock in the Panhandle without our consent. Subject to the aforesaid condition, we find that the acquisition by the Pennsylvania of control of the railroad and leased lines of the Panhandle under the terms of the lease described in the application will be in the public interest."

Commissioner Potter Dissents

Commissioner Potter in his concurring opinion, said:

"Our proper function is limited to an approval or disapproval, in whole or in part, of the proposed acquisition. We possess no power to require the establishment of a relation between the acquiring carrier and this commission, by virtue of which we may say what the carrier may or may not do in the future. We may not exact tribute from a carrier as an inducement to us to grant approval. We may not, as a condition, require that a carrier part with any of its property or surrender any of its existing rights. We could not properly demand that the applicant surrender to us its Panhandle stock. Nor should we demand control of that stock by tying it up so that it cannot be used without our consent. And yet this is exactly what the report attempts to do when it says the Pennsylvania may acquire the Panhandle by lease only upon the condition that it surrender control of an important asset which it now owns, and give to us the power of saying how it shall be used during 999 years.

"There is much that can happen within 999 years. This commission may not be in existence that long. Notwithstanding our order, the Pennsylvania might in the future go ahead and sell the stock without coming to us. It may be sold under a decree of court at the instance of a creditor. The condition would not prevent these and many other events. Certainly it could not be said that we are empowered to destroy the value of the Panhandle stock as property, although such is really the logic of the condition imposed. The stock in question is property, and will continue to be property, and the title and power of sale remains with the Pennsylvania. Would its sale constitute a breach of a contract made with us, and, if so, would the remedy be to recover damages and how and to what extent would we have been damaged? We have no authority to build up such a right for the government. Would the lease automatically terminate and the property revert to the Panhandle? Clearly not. Would a breach of the condition which we have exacted give the Panhandle the right to re-enter and take its property? If we thought we secured that right to the Panhandle and it did not want to exercise the right, there apparently would be nothing that we could do. But the Panhandle could not have any such right. It would have agreed otherwise. The condition simply is not workable.

"The condition is inherently unwise and unreasonable. If effective, it is a destruction and waste of which we ought not to be guilty. Our job is to develop financial strength—not dissipate it. We should conserve assets for credit and other purposes and not render them unavailable. A lease without condition would vastly improve and strengthen the position of both carrier properties and serve the public interest. The condition, if valid, will injure the carrier and the public. In imposing such a condition we transgress our duty rather than perform it. We prejudice where we should benefit. The Pennsylvania now has a practical control through stock ownership of the Panhandle. The continuance of that control we find to be desirable and obviously it is. The Pennsylvania could part with the Panhandle stock and could hypothecate and otherwise use it. It is available to serve the public interest for credit purposes, but with the present relations between the companies such use might disrupt the system. Allow the lease to be made without condition and the stock could be used no more freely than now, but if through any adversity the stock should get out of Pennsylvania control the system would not be disrupted as would result from a sale of the stock without a lease. The public interest clearly requires that the lease should be made and that the stock should remain available for use as now. It cannot be in the public interest to render unavailable an available $50,000,000 asset.

"We say it is a good thing to put the properties together. We don't even say that the stock ought not to be sold. We recognize that perhaps it should be sold—but only with our consent. We say the Pennsylvania may acquire the Panhandle by lease *if* it will turn over to us the right to say whether an asset consisting of shares of stock shall be continued in its present form for 999 years or be converted into something else. To my mind this is an invasion in management in the field of company policy which has not been authorized and which properly was withheld from a government agency.

"Section 2 of paragraph (5) authorizes us to ascertain whether the terms and conditions of the lease or other instrument of acquisition are just and reasonable. Such an instrument necessarily must have terms and conditions. The terms and conditions contained in such an instrument presented by the application, and only those so contained, are the ones we are authorized to consider. The purpose is to give us power to determine whether the terms and conditions are unduly burdensome. There is no warrant in the statute for imposing any outside or new conditions establishing a right in us or a relation between the applicant and us as an inducement to us to act.

"The explanation of my vote in favor of the report containing the offensive condition is this. Perhaps the applicant will desire to proceed under the report. The application has been before us for a long time. Bad as I think is the report, it seems to be the only way by which the applicant can obtain what I conceive to be even partial justice. Perhaps the applicant will conclude that the condition is illegal, as I am strongly inclined to think it is, and that it may be disregarded, as seems to me it may. Whatever we may think of our power, we are not above the law. The courts may intervene in a helpful way. And then, too, it may be that some time within 999 years this commission will be composed of men whose views do not accord with ours. Perhaps other men at another time will correct our error. I even indulge the hope that with further consideration we may change our mind. The report is no worse than a denial and it may be helpful to have our views understood. So I vote for the report in its present form rather than for a denial. Commissioners Lewis and Cox concur in these views."

Strike Situation Shows General Improvement

Roads Refuse to Restore Strikers "Rights"—Interruption to Traffic on Few Roads

NEGOTIATIONS BY the Labor Board for ending the strike came to an end this week when it was learned that representatives of the managements were steadfast in their resolve not to restore seniority and other "rights" to the men out on strike in precedence over men now employed, should the strikers decide to return to their jobs. Announcement to this effect was made by Chairman Hooper on July 20. A. O. Wharton, a labor member of the Board, at the same time characterized the attitude of the carriers in this regard as "unusual" and said that this action "will place full responsibility" for the "continuation of the strike with the inevitable consequences" upon the carriers. The position of the executives was outlined in a statement issued by the western presidents' committee on public relations on July 20.

Acts of violence and intimidation continued throughout the week, although such instances were, on the whole, less serious than those which occurred last week. A number of railroads secured injunctions restraining strikers from interfering with new employees or the operation of trains. The walkout of clerks and stationary firemen and oilers on some roads caused some trouble, but on the whole the situation of the railroads all over the country shows steady improvement. On some roads, especially in the Southwest, a number of passenger trains have been cancelled and in a few instances the movement of freight has been slowed up somewhat.

The roads with a few exceptions are continuing to employ new men and in most cases applicants are so numerous that little difficulty is being experienced in selecting skilled men. In the East present forces are reported as being from 50 to 60 per cent of normal and with overtime work seems to insure a continued improvement in operation in the few cases where it has been impaired.

Strike Developments at Chicago

VIEWED FROM CHICAGO, headquarters of the Railroad Labor Board, the strike developments during the past week have included continuance of violence at many points, the clarifying of the real issues involved, and indications of a possible spread of the movement.

The "secret" meetings between Ben W. Hooper, chairman of the Labor Board, and B. M. Jewell, head of the federated shop crafts, were briefly outlined in last week's *Railway Age*. These meetings developed the shopmen's attitude toward a settlement, namely, that the present walkout may be ended (1) if an agreement to stop the practice of contracting is made by the carriers; (2) if an arrangement for modifying certain working rules which reduce the overtime pay of the shopmen is made; (3) if assurances are granted to Mr. Jewell that his organization will be given a hearing by the Labor Board on the wage issue; (4) if the establishment of *national* boards of adjustment is agreed to by the carriers; and (5) if the strikers are taken back without loss of their seniority and other "rights."

Photo by International

E. F. Grable (Right), Leaving White House After Conference With President

This program was presented to a committee of railway executives composed of B. F. Bush, president of the Missouri Pacific, representing the southwestern roads; W. R. Cole, president of the Nashville, Chattanooga & St. Louis, representing the southeastern roads; L. F. Loree, president of the Delaware & Hudson, representing the eastern roads, and Samuel M. Felton, president of the Chicago Great Western, representing the western carriers. The results of this conference are indicated in the following parts of a letter which was subsequently sent to Chairman Hooper by the executives present at the meeting:

> This strike is a refusal to accept the results of the arbitration of the Labor Board pursuant to law, after exhaustive hearings in which all parties concerned were fully heard. After careful consideration of your inquiry the conclusion seems necessarily to follow because of the strike called in defiance of the decision and order of the Labor Board and the controlling provisions of the Transportation Act, the issue thus raised is not one for consideration between the carriers and the representatives of the organized crafts on strike except through the further orderly processes before the Labor Board as contemplated by the Transportation Act. This statement is confirmed by statements which have appeared in the public press to the effect that these representatives are only willing to abandon this strike and return to service on the condition that they be relieved from acceptance of the mature decision of the Labor Board in the case referred to.
>
> No conference for that purpose is in our judgment permissible or tolerable because it would place the carriers participating therein in apparent cooperation with those on strike in seeking to find means to subvert the decision of the Labor Board. On the other hand, a prompt recall of the strike order would permit the resumption of former methods of conference and permit the consideration of any matters which representatives of the employees might desire to submit.

The letter also assured the board that the carriers will respond to the Board's call for further hearings on the issues involved should that course be taken.

The meeting on the same day between the heads of the five train service brotherhoods and the committee of railway executives named above, announced in last week's *Railway*

Age, resulted in the agreement by those present that the carriers would refrain from requesting the members of these organizations to perform work which would otherwise be done by the men on strike.

On July 13 the heads of the striking shop crafts unions carried their controversy to President Harding in a telegram in answer to the President's strike proclamation. In this telegram they charged the railroads with many violations of the Transportation Act, charged the Labor Board with having fixed lower than "living wages," and added:

We respectfully insist that no interruption of commerce or interference of mails was caused by direct or unlawful acts of the organized employees. Such interruption and interference result inevitably from attempts of railroads to operate with insufficient, incompetent and unskilled workmen.

Such interruptions and interference will continue and increase until agreement is obtained upon just and reasonable wages between the representatives of the skilled employees and railroad executives, who up to date have refused even to meet with employees' representatives.

Unrest Prevails Among Other Employees

Reports from Cincinnati told of a serious split in the ranks of the maintenance of way men, many of the general chairmen of that organization being in favor of joining the walkout and disregarding the refusal of E. F. Grable, president of the organization, to call a strike. In a statement T. C. Carroll, president of the general chairmen's association of the brotherhood, said that he had received from a majority of the general chairmen requests that he call them together in a meeting at which plans might be made for calling out the maintenance men.

Mr. Grable, who immediately announced his intention of going to Washington to enlist the aid of the President in holding his men in line, attributed a great deal of the unrest among them to requests made upon them to perform work formerly done by members of the striking organizations. He said, however, that only 24 out of the 197 general chairmen of the union were in favor of a strike.

It became known on July 14 that other workers, particularly the stationary firemen and oilers and clerks, had either been authorized to join the shopmen or were seriously contemplating such action. Timothy Healey, president of the International Brotherhood of Stationary Firemen and Oilers, authorized a strike of the members of that organization effective on July 17 in response to an "88.6 per cent strike vote of the membership." Defections in the ranks of the clerks' organization similar to those being reported among the maintenance of way men were indicated on July 14 in the reports of sporadic strikes of clerks on various railroads and threatened walkouts at many other points. E. H. Fitzgerald, president of the clerks' organization, predicted that some of his men would quit work despite his orders to the contrary. The prediction has been partly fulfilled.

Chairman Hooper continued his "personal" efforts to bring about a settlement of the shop crafts strike but on July 15, after a series of conferences, issued a statement outlining the "fundamental differences." He said:

Mr. Jewell and his associates suggested four things for consideration. Set out in the order of their importance, namely, the contract question, the protested rules embraced in board decisions, the recent wage decision and the establishment of a national adjustment board. Incidentally they demanded that after a satisfactory adjustment of the four matters named, all men out on strike would be reinstated in their former positions without impairment of their rights of seniority.

The carriers suggested that they would undertake to meet the first request of the employees by wiping out the contract system on the two or three roads where it still exists. They expressed the belief that this could be done and the board's decision against this practice made effective on all roads.

The railway executives further agreed to establish regional boards of adjustment similar to those already in operation for the train and engine service men.

The executives would not agree that the strikers, when they returned to the service, should take the positions and the seniority of the new men and the men who had remained in service.

As to the rule decision and the wage decision of the Labor Board, the carriers took the position that the shop crafts were at liberty to petition the board for a rehearing of these decisions, in which hearing the carriers would participate and by the result of which they would abide.

Mr. Jewell and his associates insisted that the carriers must agree to satisfactory modification of both the wage and the rule decisions of the board before the strike is called off. The executives declined to consider these two decisions, except in connection with a rehearing by the board.

Roads State Their Position

The position of the railroads was further clarified the following day when the western presidents issued a statement outlining the strike situation and answering several of the contentions being widely circulated by Mr. Jewell through the medium of statements to the press. The statement of the executives said in part:

The situation is somewhat better in eastern territory than elsewhere, but western railways report increasing numbers of men returning to work, and most of them report the movement of trains normal. Developments show that the main thing needed to insure the return of normal conditions is protection of men who want to work from violence by strict enforcement of the laws.

Photo by International

Strikers at Slater, Mo., Looking Over Incoming Passengers for New Employees

Several railway executives have, at his request, met and conferred informally with Chairman Hooper of the Railroad Labor Board regarding possible means of terminating the strike. The railway executives have unanimously indicated that they will not agree to any plan which is inconsistent with the decisions which have been rendered by the Labor Board, and that they will not confer with representatives of the strikers while the strike continues, but that they are perfectly willing to attend any meeting, or participate in any hearing called by the Labor Board with a view to effecting a settlement that would not nullify but uphold and carry out the board's decisions.

The railway executives also have indicated a willingness to accept any modification of its decisions which the Labor Board, after hearings, might make. They cannot agree to any conference with the representatives of the strikers because the very purpose for which such conference is sought by representatives of the strikers, as avowed by B. M. Jewell, is to secure a settlement contrary to the decisions of the board, and for the railways to agree to this would be to undermine the dignity and influence of the board, just as the unions are trying to do by this strike.

The facts show clearly that the executives of the railways have shown willingness to do everything that is reasonable to end the strike, while Mr. Jewell has indicated that only by the railways surrendering to his demands and disregarding the decisions of the Labor Board can it be ended. This leaves responsibility for continuance of the strike solely upon the leaders of the strikers.

Hooper Abandons Peace Plans

The proposed plans for the settlement of the strike were outlined and the futility of reconciling the men and the

railroads on certain points were stressed by Chairman Hooper in a statement issued on July 20 intended apparently to end the many rumors of new "peace" plans sponsored by members of the Board.

"As there does not seem to be any probability of reconciling the antipodal views of the carriers and the men on the question at issue (seniority) the Labor Board or none of its members are now engaged in further efforts along that line," Chairman Hooper said. After outlining again the peace proposals of Mr. Jewell which have been described in previous issues of the *Railway Age* but to which has been

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Meanwhile the Public Should Keep Cool

added the provision that all strikers must be restored to service with their seniority and other rights unimpaired, the statement says: "My investigation of the attitude of the carriers has convinced me that no serious obstable is to be found in any of the items enumerated except the fifth (seniority). As to the contracting of railroad shops only 16 out of the 201 Class I roads had entered into or proposed to enter into such contracts. Nearly all of them have desisted from this objectionable practice and a majority of the carriers would be pleased to see the few remaining roads withdraw from it. As to the reopening of the wage decision and the disputes in regard to the seven protested rules, the carriers have no objection to this course. The foregoing disposition of wages, contracting and rules would remove from conflict all three of the questions on which strike votes were taken. The proposal to establish an adjustment board was not embraced in any strike ballot but has been a mooted question a long time. Many of the carriers are willing to have regional adjustment boards, some are willing to have a national board and some would favor such a board on individual roads. An agreement of some sort could doubtless be reached on this matter. But at present there is no possibility of an agreement on the question of the reinstatement of the striking employees with all rights restored."

Chairman Hooper then outlined the carriers' position on this question as stated in the announcement by the Western presidents and the employees' position as described by A. O. Wharton, labor member of the Board. Mr. Wharton's analysis of the employees' views is as follows: "Any settlement of the present controversy which has for its object the restoration of harmonious relations and efficient operation of the shops must take into consideration, first, the restoration of the men involved to their status as employees as of date prior to the stoppage of work; second, that the great majority of these men are permanently located and are more desirable employees than those who have been employed since the stoppage of work began; third, that it will be an unusual position and one which it is not believed to be justifiable if the carriers in this case adopt an attitude denying the requests of the organizations in this respect when by so doing they prevent the possibility of a settlement; fourth, no organization has heretofore been called upon or expected to sacrifice all the accumulated rights of years of service in situations of a similar character; fifth, that this action on the part of the carriers will place full responsibility of a continuation of the strike with the inevitable consequences therefrom on the carriers."

The Carriers' Position on Seniority

On July 20, the western presidents' committee on public relations issued a statement outlining the carriers' position on the seniority of the strikers in the event of a settlement of the present controversy. This statement said in part: "Not only justice but the public interest demands that in any settlement of the strike the seniority rights of men who are now working shall be recognized. If those who have struck against the decisions of the Labor Board and tried to interrupt transportation are favored in any settlement that may be made, the incentive of men to stay at work in

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C. & A. Shops at Bloomington Under Guard

case of future strikes will be destroyed and difficulty of maintaining transportation service increased."

After calling attention to the ruling of the Labor Board on the right of the men who remained in the service and those who are employed to take the place of the strikers and President Harding's statement on the same subject, the western executives said "that it will be seen that the men who are now working have claims upon the railways and the public superior to those of the strikers is a fact that has been repeatedly recognized by Government bodies and officials and that they have remained at work or gone to work with the distinct understanding that their rights will be protected."

Developments at Washington

WASHINGTON, D. C.

THE PRESIDENT and his advisors have been devoting more of their attention to efforts to settle the coal strike than they have to the railroad situation, although both of them have been under constant consideration by the cabinet at its meetings and the administration has kept in close touch with the situation through its reports. Apparently it has been considered that if a basis for settlement of the coal strike could be reached it would be less difficult to settle the railroad strike because in that case a government tribunal is in existence to deal with the situation, and optimistic expressions have been made as to the probability of an early adjustment of the railroad controversy. For several days it has been stated to newspaper men that the question of restoring seniority rights to the strikers if the strike should be called off on a promise of a new hearing by the Labor Board has been the principal stumbling block to a settlement.

Following the failure of negotiations with the mine operators and the union the next step of the President was the sending of the message to the governors of the coal-producing states, the purpose being to give the coal operators an opportunity to demonstrate whether they can open their mines, as many of them have said they could, if the government would refrain from interfering and would furnish protection for those willing to work. Calling upon the state authorities was also regarded as a necessary preliminary before making use of the federal troops.

Action of State Authorities Awaited

Secretary of War Weeks on July 13 made public a telegram he had sent in reply to a request for federal troops from C. E. Schaff, receiver of the Missouri, Kansas & Texas, advising him to make demand on the governor of Texas for the protection of lives and property, including requisite protection from lawlessness and violence to permit the operation of trains. The state is charged with responsibility in such matters, he said, "but in case the state authorities are unable or unwilling to maintain law and order the federal government is ready to afford protection and will take action, if necessary," as soon as Mr. Schaff had a reply from the governor.

Secretary Weeks also sent a message to Major General John L. Hines, commanding the Eighth Corps Area at San Antonio, stating that if protection is not furnished by state authorities the federal government will take action and directing him to prepare a sufficient force for that purpose. He added that the receiver is acting under appointment by a United States court. The telegram from Mr. Schaff was as follows:

"Referring to President's proclamation assuring movement interstate commerce and protection of men employed therein the Missouri, Kansas & Texas Lines are being operated by me as receiver under appointment by United States Court. The largest and most important terminals on these lines are at Parsons, Kansas, and Denison, Texas. At Parsons we now have for protection state troops and are having no difficulty in operations. At Denison we have not been able to get protection and a serious situation has arisen. K. O. & G. roundhouse foreman was shot and killed last night while at work; thirty guards brought into Denison on our passenger train number four about midnight last night were taken in charge by mob of strikers while being escorted to shops by deputy United States marshal and sent out of town; a number of our guards have been taken off and beaten up. Sixty-four cars of livestock and meat in interstate commerce are being detained on account of interference by strikers. United States marshals so far have been unable to cope with situation. We have just now reported situation by telephone to Commanding General of Eighth Corps Area at San Antonio. We have also reported it to governor of Texas. I respectfully request aid and urge that you send to Denison today a detachment of United States troops to prevent riot and bloodshed or loss of lives and property and to assure movement of interstate commerce on Missouri, Kansas & Texas lines which have heretofore been designated by War Department as Class A military lines to be maintained and operated in event of major emergency. Please telegraph your decision and greatly oblige."

Messages received since then from Col. Lincoln, the inspector general, indicate an absence of disorder at Denison because little effort is being made to operate trains from that point. He also reported that the governor of Texas wanted more time before deciding whether to send state troops to that point and also that he had taken the position that local authorities should act first. The Secretary of War said on Monday that he had received no additional requests for troops but the Attorney General has received many requests for additional deputy marshals and many of these have been complied with.

Secretary Weeks said on Friday that he had not as yet acted to send federal troops to Denison, Tex., because the governor of Texas, by sending the state adjutant general to make an investigation, was apparently acting in good faith and so he had also ordered an inspector general to that point so as to be prepared to act if necessary in case the state authorities failed to do so. He said most of the representations made to him in telegrams from railroad officers involved cases of individual sabotage rather than mob action and that they were therefore rather difficult to deal with by the use of troops.

Following the cabinet meeting on Friday the administration apparently held a most optimistic view of the situation and it was stated that a settlement might be reached before morning.

The cabinet meetings on Friday and Tuesday were devoted entirely to the railroad and coal strike situations. The Secretary of War and the Attorney General reported on the numerous telegrams that they had received from various railroad officers asking for or suggesting the possible need of protection from federal marshals or troops and Secretary Hoover had complete reports as to the situation on each road. There was also a report from Chairman Hooper of the Labor Board on his negotiations looking toward a settlement of the strike.

President's Power

President Harding believes that the executive has full power to take over and operate the coal mines or the railroads and to draft men into the service to keep them in operation in the event of any well established emergency, it was stated officially at the White House, in reply to questions from correspondents, but it was also stated that the railroad situation was not likely to take that tack. The President believes that in case of a sufficient emergency involving the welfare of the public the executive has almost limitless power, because the only way of proceeding against him would be impeachment and he would be willing to run the risk of impeachment if he considered it necessary to serve the people. He also believes that it would hardly be held to constitute an abrogation of any one's liberties to draft a citizen into the public service in an emergency.

Grable Calls on President

E. F. Grable, president, and Fred L. Feick, legislative representative, of the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers, spent two hours on Saturday in conference with the President and urged him to call a conference between Mr. Jewell and the railroad executives in order to prevent a continuance and spread of the strike. According to a statement from the White House "they brought to the President the first personal and official protest that the railway managers were ignoring the decisions of the Railroad Labor Board, and presented their objections to the decision of the board relating to the appeals of that brotherhood." It was also stated that "the President

gave the fullest possible hearing and assured Messrs. Grable and Feick that they had taken the one defensible course in presenting their case. He assured them that inasmuch as Congress has constituted the Railroad Labor Board for the express purpose of settling disputes and preventing interruptions to transportation, all decisions must be accepted by employers and employees alike, and assured them also that non-compliance on the part of railways had not been brought to his attention until the strike was called. He explained that any inadequacy in the law must be corrected by Congress and cannot be affected by interrupting railway operations. Messrs. Grable and Feick expressed a hope for an early settlement and declared that the proper conferences would end in such a settlement. The President assured them that every possible conference was being sought."

After his visit to the White House Mr. Grable announced that he had issued a call for a meeting at Detroit on Wednesday of the grand officers of the brotherhood to decide on its policy.

Amendment of Transportation Act Proposed

Hearings for the purpose of considering amendments to strengthen the labor provisions of the Transportation Act will be held soon before the Senate committee on interstate com-

Photo by International

Instructing New Employees in the Care of Journal Boxes, Erie Yards, Jersey City

merce, Senator Cummins announced on July 15 after a conference with the President on the strike situation. While he said there was no expectation of legislation in time to affect the present strike he was convinced that the law ought to be changed to make the decisions of the Labor Board mandatory and enforceable by the provision of penalties for their violation and also to guarantee a "living wage" to the railroad employees as a minimum, including a definition of a living wage. Senator Cummins, at the time the transportation act was being written was in favor of imposing penalties for failure to comply with decisions of the Labor Board and for conspiracies to interfere with interstate commerce by strikes.

Senator Cummins has also announced his intention of introducing a bill providing for a tribunal similar to the Railroad Labor Board to deal with coal labor controversies.

Gompers Advises the Press

Washington newspaper correspondents on Friday were given their choice between two very different sources of news and guidance on the railroad situation. The information and publicity service of the American Federation of Labor sent out a notice that President Gompers "has thought that reporters and correspondents might care to come together with him for a discussion of the present railroad situation in which views might be exchanged and questions asked freely" and that he would be glad to see them at his office at three o'clock, hoping "that such a conference may be of value both for its general interest and for its news value." The time corresponded exactly with one of the regular twice a week conferences of the newspaper men with President Harding, who was also expected to have something of interest to say on the railroad situation. The press associations and the larger papers that have large staffs in Washington were able to cover both conferences but more papers have only one man here and it was observed that the number at the White House was about the same as usual. However, the President had very little to say on this occasion, being in expectation of more definite news from Chicago, and many of the correspondents were able to arrive at Mr. Gompers' office a little late but still in time to hear some of his fulminations. The extent to which they exchanged views with him was not reported but he apparently succeeded in convincing some of them that the government was trying to "enforce" the decisions of the Labor Board by "coercing" the employees but not its decisions against railroads that have failed to comply with orders of the board, rather than trying to protect those who are willing to work under the board's decision from interference by those who do not wish to. Mr. Gompers also took the position that the Labor Board is a "fifth wheel," that attempts to regulate wages are all wrong, and that the three public representatives on the board are simply representatives of the railroad interests, although two of them were those who two years ago voted for the wage increase of over $600,000,000. He said that the best medium for a settlement would be direct negotiations between labor and the railroad managements without interference from the board, and he has issued numerous statements to the press along these lines.

Motor Trucks and Airplanes for Mail Transport

Plans for mobilizing motor trucks and airplanes for the transportation of mails if the strike conditions make it necessary have been worked out by the postoffice authorities and motor trucks were put into service on July 15 to carry the mails between Bedford and Switz City, Ind., after the mail trains had been annulled. The Secretary of War has furnished the postoffice department with an estimate that 131 planes and 172 air pilots are available at 13 widely distributed fields while the Navy Department said it could furnish 163 planes and 240 pilots. Postmasters were also directed to make a canvass of all government agencies in the immediate vicinity of their offices for the purpose of ascertaining what government-owned trucks other than those belonging to the postal service will be available for mail transportation. Should a contingency arise necessitating the use of motor trucks in lieu of mail transportation service they were to advise the department promptly by wire or letter, depending upon the nature of the emergency, stating the motor trucks available and the branch of the government having jurisdiction over them.

However, it was stated at the White House on Tuesday that there had been very little real disturbance of the mails and the report that marines would be placed on mail trains as guards was characterized as "bunk."

Mail Train Schedules Affected

Reports received by Paul Henderson, second assistant postmaster general, from Lovilla, Iowa, on Tuesday, state that the interference of strikers who sought to prevent strikebreakers from clearing the wreckage of a Burlington passenger train which jumped the track has ceased, and the wrecking crew has been permitted to build a temporary track around the wreck, which allows the passage of trains.

Inspector-in-Charge S. H. Cisler, St. Louis, wired that

20 deputy United States marshals are on duty at Hannibal, Mo., but officials of the Missouri, Kansas & Texas and Wabash railroads state that 50 will be necessary before they can take action to open shops or restore trains. No more trains have been taken off, but the Wabash railroad reported that its stock of coal is being depleted rapidly. The St. Louis-Omaha line, which has been interrupted by washouts, was expected to resume during the day. Branches of the Burlington in northwest Missouri are getting in better shape and regular service will be resumed shortly. The M. K. & T. advised the inspector that it expects to resume service on the Hannibal-New Franklin line by Wednesday.

Superintendent of Railway Mail Service Gaines, Fort Worth, Texas, wired that passenger train service between Colmesnell and Trinity has been superseded by motor car service, with no delay to the mails. Trains 5 and 6 between Dallas and San Antonio have been annulled, but mail cars will operate on trains 7 and 8 between those cities. Trains 25 and 26 between Fort Worth and Waco have been discontinued but mail service will be transferred to trains 17 and 18. All train service between Stamford and Rotan was omitted Saturday and Sunday, but was resumed Monday. The superintendent stated that all of the services referred to are on the Missouri, Kansas & Texas and the discontinuance of trains has been due to strike troubles.

Superintendent of Railway Mail Service Harris, Atlanta, stated that the following trains were discontinued Monday to conserve power, mail cars being assigned to other trains: Trains 5 and 6 between Harriman and Nashville; 17 and 18 between Hamlet and Atlanta; trains 20, 21, 23 and 24 between Hamlet and Jacksonville; 402 between Nalaca and Burtow; 13 and 14 between Savannah and Montgomery.

Mr. Henderson on Wednesday heard from Superintendent Gaines, Fort Worth, Texas, that striking employees prevented the operation of train service on Tuesday on the Deleon-Cross Plains, Texas, line. Gaines stated that the railroad people expected to get a train out some time during the night, but the superintendent regarded that as a doubtful possibility. The superintendent further stated that if train service is not resumed by this morning, he will arrange to supply Cross Plains, Pioneer and Rising Star by truck from Cisco.

A. A. Fisher, superintendent in charge of the Washington division, stated that Norfolk & Southern trains 30 and 31 between Raleigh and Charlotte, N. C., and trains 32 and 33 between Raleigh and Fayetteville, N. C., had been withdrawn, and announced that the mail carried on those trains had been transferred to other trains.

S. H. Cisler, superintendent at St. Louis, wired that the St. Louis-San Francisco would discontinue trains No. 3 and No. 4 between St. Louis and Paris, Mo., and also annul trains 18 and 19 between Springfield and Clinton, Mo., trains 22 and 23 between Kansas City and Clinton, trains 827 and 828 between Cape Girardeau and Hayti, Mo., and trains 873 and 874 between Cape Girardeau and Poplar Bluff. Mail cars scheduled to run on these trains have been transferred to other trains.

Superintendent Formanek at Cleveland, stated that trains 2 and 7 between Grand Rapids and Chicago have been withdrawn because of coal shortage and strike conditions. Trains 101 and 108 between Pentwater and Holland, Mich., trains 1 and 4 between Saginaw and Manistee, train eight from Petoskey to Grand Rapids, trains 102, 105 and 120 between Bay City and Detroit, trains 22 and 27 between Port Huron and Saginaw, and trains 21, 22, 23 and 26 between Big Rapids and Grand Ledge, Mich., have been annulled, the mail cars being transferred to other trains.

Instructions to U. S. Marshals

The Attorney General telegraphed the following instructions on Tuesday to United States marshals:

"In making requests for the appointment of special deputies, you should base them on specific facts, the result of investigations made by you and the United States attorney. You should make your investigations independent of the railroad companies and reach your conclusions uninfluenced by their requests, except as they are competent and relevant to the situation as you find it to exist. You will readily appreciate that the Department of Justice is anxious and willing to do all within its power to preserve federal law and order in your district. You will just as readily understand that the department cannot police the railroads and prevent the infraction of state laws at different points where disturbances occur and are likely to occur.

"In making your investigations you should particularly inquire as to what steps, if any, the state and county officials have taken to uphold the law of the state in which your district is located. You should co-operate with the local authorities and request that they co-operate with you in enforcing the law. When you do reach a conclusion, based on the investigation and evidence above outlined, you should submit it to your federal judge for approval if possible, and then only make your specific request of the department for authority to appoint deputies or additional deputies to prevent either a direct or immediate indirect violation of the federal laws in your district. You should reduce this special force as the situation improves and will permit keeping the best and most experienced men until the last." Commenting upon his telegram, Mr. Daugherty said:

"Deputy United States marshals cannot run trains, but they can see to it that the mails are not interfered with and that interstate commerce is maintained. The Department of Justice cannot furnish a regiment of deputy marshals to run the railroads, but it can and will prosecute violations of the law. Deputies will do what is necessary to be done until other agencies are required. If any one doubts the power of the government, he is very much mistaken, and if any one doubts the intention of the government to preserve order, he, too, is very much mistaken."

A. F. of L. Asks Support of Strike

The executive council of the American Federation of Labor has addressed an appeal "to all workers everywhere to support the railroad workers in their efforts to secure a just settlement of the railroad shop trades dispute." The appeal has been forwarded to every labor organization in the United States, to every labor publication and to all organizers of the American Federation of Labor, as follows:

"We call upon working people everywhere and upon all Americans who love justice to sustain the cause of the railroad workers who have ceased work as their only remaining method of protest against an injustice which must rank as one of the most reprehensible which any American industrial or political institution has ever sought to impose.

"No workman, whether a member of a union or not, will, if he is possessed of true American manhood, engage in any work formerly done by men now on strike.

"No man now on strike, will, if he is true to the cause, conduct himself in any but a law-abiding manner.

"The cause for which the workers are contending is worthy of every just and proper effort that can be put forth in its behalf.

"Let there be a determination and a solidarity which shall at the same time bring victory in the present struggle and serve notice upon reactionary employers and financial interests everywhere that there is to be no return to autocratic, despotic methods in American industrial life."

President Asks Governors to Protect Mines

President Harding on Tuesday addressed to the governors of the 28 coal producing states a telegram urging them to second his invitation to the mine operators to return to

their mines and resume activities, in which he expressed in a general way the policy of the federal government toward both the coal and the railroad strikes. He stated that the invitation should be accompanied "by such assurance of maintained order and the protection of lawful endeavor as will give assurance to everybody concerned," by way of pointing out that the preservation of law and order is primarily the function of the state and local authorities. He said he wanted to convey the assurance of the prompt and full support of the federal government "whenever and wherever you find your own agencies of law and order inadequate to meet the situation," and that "your state government and the federal government are jointly responsible for maintained conditions under which free men, willing to work, may work in safety" and that "we are responsible for the production and transportation of a fuel supply ample for the necessities of the American people and the public utilities which serve them, particularly the railways engaged in interstate commerce."

"Thus far," he said, "there has been no challenge of the right of the workers to decline employment or the right of the employers to hire as they elect," and "there has been no government assumption of a part in the dispute between the organized workers and organized employers."

The Situation on Western Roads

The third week of the strike brought few developments of a serious nature. The sharp encounters of the preceding weeks gave way to "trench warfare" with both sides on the defensive. The center of violence shifted from Illinois to the southwest. The presence of state troops in Bloomington and Clinton, Ill., seemed to have a salutary effect and a certain degree of quiet was restored. In Bloomington the members of the train service brotherhoods, who had voted on July 11 to not handle trains out of the Chicago & Alton yards as long as troops were on duty there, rescinded their action the following day.

One more state, Ohio, found it necessary to mobilize troops during the past week. Disorders at Cleveland, Toledo and other points forced Governor Davis, on July 14, to order a battalion of infantry and auxiliary troops to be mobilized and held in readiness for the suppression of further disorders. It was also found necessary on July 14 to mobilize another detachment of the Missouri national guard to reinforce the troops on duty at Poplar Bluff, but by July 17 the situation at this point had so quieted that one company of guardsmen was believed sufficient to cope with the situation, and three companies were transferred to Chaffee, Missouri, where state troops had been requested by the sheriff following the announcement that the St. Louis-San Francisco will reopen its shops at that place on that date.

Governor Boyle of Nevada was asked by the Union Pacific for protection at Las Vegas, while Governor Russell of Mississippi received an appeal for troops to protect the shops of the Mississippi Central, and the St. Louis-San Francisco renewed its appeal to Governor Taylor of Tennessee to send national guardsmen to protect its shops at Memphis. The situation at Grand Rapids and Saginaw, Mich., where officials have threatened to appeal for federal troops in the event of strike violence, is said still to be critical, although no open outbreaks have occurred.

The center of violence during the past week has been in Texas where orders for the mobilization of regular army forces at San Antonio were expected as a result of the statement by Governor Neff that state troops would not be ordered out to protect Missouri, Kansas & Texas property. The governor's statement followed a telegram from Secretary of War Weeks to Maj. Gen. John L. Hines, commander of the eighth corps area, to the effect that "if protection is not furnished by state authorities, the federal government will take action and you will prepare a sufficient force for that purpose." Secretary Weeks announced on July 14 that he had ordered the inspector general of the eighth corps area to proceed to Denison, Tex., and report on conditions there, further appeals for assistance having been received from the receiver operating the line from the Dallas, Tex., Chamber of Commerce.

Strikers are believed to be responsible for the increasing number of train wrecks reported since July 16. At Nevada, Mo., it was reported that a switch on the main line of the Missouri, Kansas & Texas had been thrown three times, but that it was discovered each time by employees before an accident resulted. Postmaster General Work received notice at Washington that coal and rail strikers and sympathizers had blocked all attempts by wrecking crews to clear the Chicago, Burlington & Quincy tracks at Lovilia, Iowa, where a train had been derailed. Local authorities were said to be "lukewarm."

On July 16 an attempt was made to wreck Texas & Pacific train No. 16, running between New Orleans and El Paso. The engine was derailed but the remainder of the train did not leave the track.

On July 14, temporary injunctions restraining strikers from violence or intimidation were obtained from federal courts by the Wabash at Little Rock, Ark.; the Chicago & North Western at Winona, Minn.; the Kansas, Oklahoma & Gulf, at Guthrie, Okla.; the Union Pacific, at Reno, Nev.; the Chicago, Rock Island & Pacific, at Fort Smith, Ark., and the Baltimore & Ohio at Indianapolis, Ind.

Picketing of railroad shops by strikers was definitely forbidden in preliminary injunctions granted four railroad companies by Federal Judge FitzHenry at Springfield, Ill., on July 17. The injunctions continue in effect the temporary restraining orders granted several days previously. They are directed against strikers of the Wabash, the Illinois Central, the Chicago, Burlington & Quincy and the Chicago & Alton.

Reports from western roads indicate that operating conditions are improving. Recruiting of workers has resulted in shop craft forces ranging from 25 per cent to 60 per cent of normal. Full traffic schedules are being maintained with comparatively little difficulty. Injunctions have proven effective and have contributed to the maintenance of service.

The Cleveland, Cincinnati, Chicago & St. Louis reports a 60 per cent locomotive and a 30 per cent car department force working, and recruiting progressing favorably in spite of much intimidation. Little trouble has been experienced with men in other departments. This company has operated every passenger train on schedule and about 85 per cent of the time has accepted all freight offered, with no accumulations at any time.

The Pere Marquette has experienced much trouble through the interference of strikers, but secured an injunction on July 18, which is expected to eliminate the majority of the difficulty.

The Great Northern has a force of approximately 2,000 men at work out of a normal force of 9,000. The strike of firemen and oilers crippled this road somewhat, but normal traffic has been maintained.

The Michigan Central is operating normally with a 60 per cent force. Traffic has not suffered and recruiting of workers has been carried on rapidly. This company is contracting with outside shops for repairs wherever possible.

The Denver & Rio Grande Western has 211 shopmen working and 2,400 still on strike, more men being hired daily. No serious disturbances or interferences with traffic

have been encountered and other classes of employees have remained neutral.

The Southern Pacific System reports that of the 9,778 shopmen who walked out 764 returned by July 6, on which date the ultimatum regarding the loss of seniority rights expired. The working force has since been recruited to 6,768. The company reports that it is encountering serious interference by intimidation and that violence is being continually used to prevent recruiting. Sufficient protection has been obtained at the present time and with an injunction in force traffic is being maintained at a normal status, other employees remaining neutral.

The Missouri Pacific has increased its shop forces to within approximately 25 per cent of normal. It has suffered some congestion but with the assistance of the United States marshals, militia and local authorities the situation is well under control. The injunctions are proving effective and the attitude of other employees is satisfactory.

The St. Louis-San Francisco reports improved conditions. With a number of its former employees returning in addition to the new workers, it has a sufficient force to handle all traffic; all passenger trains are now being operated although the removal of several trains from branch lines is contemplated due to the difficulty in turning engines at small terminals and the decrease of travel due to the strike.

The Missouri, Kansas & Texas has 25 per cent of its normal force at work and is having no serious labor disturbances or interference with traffic nor has any difficulty been experienced with its other employees.

The Atchison, Topeka & Santa Fe reports that 8,358 men are working. Approximately 11,000 are on strike. No difficulty has been encountered in operation and traffic is moving satisfactorily, the attitude of other employees remaining neutral.

The Pennsylvania, Northwestern region reports that conditions are practically unchanged and that from 50 to 60 per cent of its shop positions are filled. Little or no interference or operating difficulty is noticed and all train schedules are being maintained.

The Chicago & Alton reports that it has approximately 500 men at work in place of its pre-strike force of 2,450. This company has been seriously hampered by labor influences at points on its line although traffic is moving satisfactorily and conditions are improving.

Conditions in the East

Developments in the strike situation in the East have been largely in the nature of steady and gradual improvement. Passenger and freight business is moving in normal volume with few delays chargeable directly to strike conditions. Most of the roads are building up their shop forces by the employment of new men and from observation at some of the railway recruiting offices in New York City, it seems that there is no shortage of applicants. As to the numerical strength of present forces as compared with those of pre-strike days, John P. Walber, executive secretary of the Bureau of Information of Eastern Railways, said on July 19 that in the eastern district, present forces represent from 50 per cent to 60 per cent of normal and that this figure shows an increase of about 50 per cent over July 5.

The strike of the stationary engineers, firemen and oilers which was scheduled for July 17 has apparently had little effect, inasmuch as most of these employees who were likely to respond to the strike call had already gone out, without authority from their leaders, with the rest of the shopmen.

Several of the roads have secured from federal courts injunctions against strikers forbidding them to interfere in any way with the work of new employees or the operation of trains.

The refusal of mechanical employees in outside shops to have anything to do with repairing equipment sent to these shops by the railroads on account of the strike, which was rumored, has apparently fallen through in at least one important plant. Press dispatches from Albany carry the news that the employees of the Schenectady plant of the American Locomotive Company have voted by an overwhelming majority to continue repairing locomotives belonging to railroads affected by the strike.

Pennsylvania and Shopmen Come to Agreement

The Pennsylvania, on July 18, announced that it had reached an agreement as to wages with its shop crafts employees who had not left the service. This completes a series of wage negotiations which the company has carried on with employees in a number of its departments, viz., maintenance of way, signal department, clerks, miscellaneous forces and shop crafts. The company's announcement reads in part as follows:

> The matter of adjusting rates of pay of these classes has been under negotiation for several months. It was handled entirely with committees of employees representing the various classes.
>
> The new schedules of wages differ in some respects from the rates established by the Labor Board for other railroads, but the difference is in favor of the Pennsylvania employees. For the most part the Pennsylvania System rates are graded in accordance with the skill and experience required and the prevailing rates are generally higher than those established for other railroads.
>
> The completion of these wage adjustments marks the third important achievement in industrial relations under the Pennsylvania System's plan of employee representation which was established last year in order to give the employee an opportunity to have a voice in the Pennsylvania management. The first was the negotiation of mutually satisfactory rules covering working conditions to take the place of the so-called "National Agreements," and the second was the establishment of permanent methods of settling controversial questions.
>
> All three of these matters have been determined in joint conferences between the management and employees elected by secret ballot to represent the various classes.

Conditions on Baltimore & Ohio Improve

The Baltimore & Ohio, which was affected in a comparatively serious manner at a few of its points, reports continued improvement. The situation on this road is reported in an unusually complete fashion in a statement given out by C. W. Galloway, senior vice-president, last Saturday, which follows in part:

> A number of the old men who have been working at Mt. Clare, who failed to show up for work Monday, reported for work this morning. Their fears have been allayed by the issuance of the federal injunction of Maryland, and the realization of this means protection against the intimidation, threats and fear of bodily harm on the part of strikers and their sympathizers, who have been stopping the men on the streets and threatening them. This feeling on the part of the men who are working is justified from the results in other territories where federal injunctions have been granted.
>
> Information coming to me this morning from a number of men is that they want to return to work and I believe they will do so at many points as soon as they fully realize the value of the protection obtained under the injunctions which have been granted at various points on the Baltimore & Ohio and which have tended to restore almost perfect order.
>
> The Baltimore & Ohio continues to lose its business to non-union roads, one non-union road offering to handle the Baltimore & Ohio's lake business, the movement of which has been delayed by curtailed operations resulting from the strike.
>
> We hired 829 new men yesterday on the system as a whole, 550 of whom were employed on Eastern lines and 279 on Western lines.
>
> Everything is quiet this morning. The only disturbance in the last 24 hours was at Glenwood, Pa., where at 4 o'clock yesterday afternoon an attempt was made on the part of strikers and sympathizers, among them women, to assault a motor truck driver making deliveries to shops, which resulted in a large crowd gath-

ering off the property of the Baltimore & Ohio, some stones being thrown. The crowd was dispersed by city police by the use of clubs and the party who threw the stones was also arrested. There were also three pickets arrested for attempted assault on employees, the arrests being made personally by the commissioner of police, who was on the ground. There was no property damage and no one hurt.

The effect of the firemen and oilers being called on strike so far as the Baltimore & Ohio is concerned, is negligible, as a good many of them had illegally struck in sympathy and have been replaced.

Overtime Work a Factor

L. F. Loree, president of the Delaware & Hudson, on July 19 called attention to the fact that shop employees of his road are now working twice as many hours a day as normally, a factor which must be taken into consideration in estimating the effect the strike is having on the railroads. The percentage of present forces as compared with pre-strike forces is not enough—this figure in many cases should be practically doubled to determine with any degree of accuracy the railroads' present labor strength.

The *Railway Age* this week has not attempted to publish reports of the strike situation on the various Eastern roads as has been done in previous issues. The reason for this is that there have been few changes of a sufficiently pronounced character to warrant a complete summary of present conditions. In most cases the summaries published last week need only be amended by the simple statement, "Conditions improved."

Some Violence Reported

Some instances of violence and intimidation have been reported. One of the most outstanding of these occurred at Concord, N. H., where, it is said, 15 or 20 heavily armed masked men evaded the guards at the Boston & Maine shops on the night of July 18 and routed new employees of the railroad from the dormitory where they were sleeping. Approximately 40 new men were driven out into the rain by the invaders and some of them were injured.

Strike Situation in the Southeast

The strike situation in the southeast varied considerably with the different roads. On some roads a considerable number of the men had returned to work or had been replaced by others but on some of the larger roads there was very little change. Freight service was somewhat delayed and some local passenger trains were withdrawn. On a number of roads some of the clerks have gone out while others are talking about going out and whereas the situation had been rather quiet during the preceding two weeks, disorders have broken out at several points and in many cases the local authorities instead of trying to maintain order have been acting in support of the strikers.

Western Maryland Increases Net with Less Traffic

Tonnage Falls Off 36.9 Per Cent. Transportation Ratio Reduced to 36.64. Maintenance Savings

The Western Maryland in 1921 moved 36.9 per cent less tonnage than it moved in 1920. In spite of this fact it improved its net income markedly. The corporate income account for 1921 showed a credit income balance of $421,296, which compared with $57,735 in 1920. This meant that the road had a wide margin over fixed charges; it pays no dividends. The net was not up to pre-war standards. In 1917, for instance, there was a net after fixed charges of $1,614,285; in 1916, of $1,319,060. The 1921 income account included an item of $400,400 partial payment on the guaranty. In 1920 there was credited on the guaranty $1,001,788.

Because of the fact that the corporate income account takes into consideration the matters of standard return and guaranty, it does not give an adequate idea of the road's real operating results and does not reflect the real improvement that was made during the year. The improvement is better shown by the fact that in spite of the decline in traffic the road operated during the year at a ratio of 78.59. This compared with ratios of 101 in each of the years 1920, 1919 and 1918. In 1917 the ratio was 70.10. Transportation expenses in 1921 were brought down to 36.64 per cent, a figure which but few of the country's railroads were able to better. The transportation ratio in 1920 was 44.88; in 1919, 39.77; in 1918, 46.44 and in 1917, 34.62.

Bituminous Coal About 60 Per Cent

Bituminous coal makes up about 60 per cent of the Western Maryland's tonnage. In 1920 the road moved 11,527,675 tons of this commodity which made up 62.9 per cent of its total tonnage. In 1921 the bituminous tonnage totaled only 6,524,286 tons, or 56.4 per cent of the total. The drop in the coal tonnage was sharp and decisive as should be sufficiently clear from the figures given. This detail is further emphasized if it is noted that the tonnage of the best month of 1921—January, 626,731 tons—was less than the tonnage of the poorest month of 1920, June, in which month 674,474 tons were moved. The best month in 1920 was January, in which month the bituminous totaled 1,317,270 tons. The Western Maryland is being rather severely hit by the present coal strike. Its loadings of coal in the week ending April 15 this year were only 313 cars. In March and April, 1921, its weekly loadings approximated 1,300 cars. This reduction in coal tonnage will very likely be clearly reflected in the April, 1922, net.

The total tonnage of the Western Maryland in 1921 was 11,578,111 as compared with 18,335,345 in 1920, a reduction, as noted in the first paragraph, of 36.9 per cent. The transportation revenues totaled $17,643,054 as compared with $20,205,687, or there was a decrease of $2,562,633. The reduction in coal and coke revenues as between the two years was $2,200,647.

A Program of Drastic Economy

With this reduction in revenues confronting it, the road carried out a program of drastic economy. Whereas the revenues were reduced about $2,500,000, operating expenses were reduced $6,508,263. Maintenance of way was reduced $1,237,042; maintenance of equipment, $2,543,304; transportation, $2,605,185; the latter reductions, as above noted, resulting in a transportation ratio in 1921 of 36.64.

The reduction in maintenance of way expenses was partly due to lower material and wage costs. There were also actual savings in the amount of work done. There were laid 26.05 miles of new rail as compared with 20.65 miles in 1920; rail renewals were up to the average of preceding years. At the end of the year the road had in its total of 774 miles, 568 miles laid with 90-lb. rail, as compared with 561 at the end of 1920. On the other hand, the number of ties put in in 1921 totaled 269,351, as compared with 322,056

in 1920. The ties put in track in 1921 were the smallest in number for a period of 10 years with a single exception, 1916.

The Western Maryland is mostly ballasted with cinders and slag. Of the total mileage of 774 on December 31, there were 88 miles ballasted with stone, 561 with cinders and slag, and 125 were partly ballasted. In 1921 ballast on 57 miles was renewed as compared with 103 miles in 1920. The 1921 ballast renewals were the lowest for a ten-year period with the exception of 1917 and 1916. It is interesting to observe that in 1920 the road had 206 miles ballasted with stone; in 1917, 539 miles, but in 1921, only 88 miles. The road's practice since 1917 has been to prefer cinder and slag in renewals instead of stone.

Some Detailed Figures of Equipment Maintenance

With reference to equipment maintenance, the story is told in a percentage of bad-order cars on April 15 of 13.5 not as low as it should be but about the average for the country as a whole. The Western Maryland annual report gives some detailed figures relative to the maintenance of both way and equipment. Some of the maintenance of way figures have already been quoted. The maintenance of equipment figures include such details for cars as cars repaired and new wheels applied, and such details concerning locomotives as: locomotives receiving general, heavy and light repairs shown separately; boilers receiving general repairs; new driving and truck axles; new cylinders; new engine frames; new main and side rods; new tires, etc. The figures for 1921, in nearly every case, show reductions from those of 1920 and previous years, with the single exception of one item—cars receiving light repairs. Locomotives receiving general repairs in 1921 totaled 138, or 97 less than in 1920; those receiving heavy repairs, 95, or a reduction of 23. Freight cars receiving general repairs totaled 6,208 as compared with 8,023 in 1920; cars receiving heavy repairs, 2,557 as against 3,113; light repairs, 210,589 as compared with 157,958.

These details would seem to indicate that much of the economies carried out in 1921 will, of necessity, have to be made up in more opportune times than a year in which the road suffered a reduction of 36.9 per cent in its tonnage. Of course, it will be borne in mind that the figures which have been quoted must be used with discretion. With smaller traffic the amount of repair work to equipment would necessarily be less. To take one instance, the average mileage per locomotive in 1921 was 18,250 as compared with 25,745 in 1920 or approximately similar figures in other previous years. The road has also recently received a considerable number of new locomotives which makes a difference. These factors, however, do not get around a percentage of unserviceable locomotives on April 15 of 27.8 per cent, or the percentage of bad-order cars above noted of 13.5 per cent on the same date.

The savings in transportation expenses were due first to the smaller amount of traffic handled and to lower costs generally. To take one example, coal consumed by locomotives. The number of tons consumed in 1921 was 499,296 as against 640,543 in 1920. The average cost on the tender including handling was $3.68 per ton in 1921; $5.94 in 1920, a reduction of 26 cents. The pounds of coal per thousand gross ton-miles in 1921 were 245 as against 252 in 1920.

New Grain Elevator

One of the outstanding developments on the Western Maryland in 1921 was the work on the new grain elevator at Port Covington, Baltimore, Md. This will increase the present grain storage capacity at this terminal 1,500,000 bushels. The new elevator is expected to be completed in about four months. The capacity of the terminal with the new facilities will aggregate 3,500,000 bushels.

The Western Maryland has built up an important traffic in grain. It receives this commodity largely from the Pittsburgh & Lake Erie at Connellsville and, on the whole, has been securing a larger proportion of the traffic than one might expect. The reason is presumably that the road is making a special effort to get this business and is handling it well. It should be noted, however, that in 1921 the road did not get the same increase in wheat traffic that the roads serving the Gulf ports secured. The wheat tonnage in 1921 was 236,911 as compared with 328,195 tons in 1920. Corn, however, increased from 44,782 tons in 1920 to 276,235 tons in 1921.

Gasoline Motor Car and Trailer for the Baltimore & Ohio

The Baltimore & Ohio has recently received from the Edwards Motor Car Company, Sanford, N. C., a gasoline motor car and trailer for use in passenger service on branch lines out of Green Springs, W. Va.

The motor car has a baggage compartment 9 ft. 3 in. long by 7 ft. 8 in. wide just behind the operator's compartment, the rear of the car being fitted with seats for 22 persons. In addition, the trailer has capacity for seating 34 passengers. The cars are equipped with water coolers and toilets. The total weight of the motor car empty is 17,200 lb., and the weight of the trailer empty is 9,350 lb., or a total of 26,550 lb. It is stated that this equipment is lighter per seated passenger than any other of similar type

Looking Forward from the Rear of the Trailer

due to the use of heat treated chrome nickel steel and aluminum castings in the construction. On a recent test trip from Baltimore to Philadelphia over the Baltimore & Ohio, these cars made an average speed of 30 miles an hour, the maximum speed being 40 miles an hour.

Both the motor car and the trailer are carried on two four-wheel trucks. The rear truck of the motor car has fixed axles and drives through three chains, two of the chains transmitting the power from the differential shaft, the third chain carrying the drive from the front to the rear axle. It is stated that driving on all four wheels gives unusually good traction and enables the car to run when snow or frost is on the rails. The power to propel the car is furnished by a Kelly-Springfield motor with four cylinders, 4½ in. x 6½ in., which develops 60 hp. at 1,600 r.p.m.

The equipment of the cars includes Westinghouse air brakes, an air alarm whistle, a hot air heating system and 12 volt lighting system. The hot air heaters are of special design with aluminum castings made by the Peter Smith Heater Company, Detroit, Mich. An electric fan is mounted by the Edwards Railway Motor Car Company. There are two compressors, one driven from the line shaft and one from the axle of the rear truck. The compressor driven from the line shaft is used before the car is in motion. It is then cut out and the compressor driven from the axle

Edwards Motor Car Unit with Seating Capacity for 56 Passengers

on each heater which drives the hot air through the cars and distributes the heat uniformly.

The air brake system is a standard Westinghouse traction brake except that the compressors are of special design made is used thereafter. Both compressors weigh only 140 lb. and furnish 10 cubic feet of air per minute. An automatic cut-out device stops the compressors when the required pressure is obtained and a reduction starts them again.

A Remarkable Mikado on the Michigan Central

Maximum Power Per Unit of Weight and Utmost Efficiency in Use of Fuel Keynotes of Design

For the past month the Michigan Central has been operating a Mikado type locomotive built by the Lima Locomotive Works, which incorporates many new features of design. On account of the unusual character of this new motive power the railroad has not heretofore made public any of the details of its construction. The following general description has now been given out by the New York Central Lines:

An extraordinary locomotive "No. 8000," which is expected to prove a most important contribution to motive power progress, has just been put in service on the Michigan Central. In numerous details of its design and construction it is radically different from any locomotive previously built and in general appearance it presents striking departures from the familiar features of the ordinary locomotive.

The locomotive was planned and constructed under the personal direction of President A. H. Smith of the New York Central Lines, who specified the several most important main accomplishments to be sought by the new design and made provision for the use of every up-to-date improvement of proved worth, brought to the last degree of refinement for economy and efficiency. The engine is of Mikado type, but contains features never before incorporated in any locomotive.

Locomotive 8000 in its preliminary tests and subsequent daily service hauling heavy trains between Detroit and Toledo, has performed in a way highly satisfactory to the New York Central officials and the builders. In its initial road test, it hauled 100 heavily laden coal cars and later easily pulled a train of 140 cars containing more than 9,000 tons of coal, indicating a capacity of more than 150 cars and load in excess of 12,000 tons.

Locomotive 8000 is considered the last word in efficiency and economy in freight motive power. The principal advantages which it is expected to demonstrate in service are the following:

(1) For its weight, it will deliver more power than any other locomotive in the world.

(2) It will develop more power per ton of coal consumed than any locomotive ever built.

(3) It will prove a locomotive easier to operate and repair than its predecessors, this making for quick turnarounds and safety.

Locomotive 8000 was designed and built to expedite the movement of heavy fast freight trains. With an increase in weight of less than two per cent as compared with the heaviest Mikados in service on the Michigan Central, No. 8000 has an increase of nearly eight per cent in tractive power derived from the forward cylinders and an increase of over 26 per cent when the booster is cut in.

The designers of this locomotive in addition to securing the greatest possible tractive effort with a minimum weight at which strength would not be sacrificed, incorporated the best known practices and devices for securing economy in the use of fuel and water. A type E superheater has been applied which produces a higher temperature of steam than the superheaters in general use.

On Locomotive 8000 a maximum tractive effort of 74,500 lbs. is obtainable. Of this figure 11,000 lbs. are delivered by the booster, the remaining 63,500 lbs. being obtained from the main cylinders.

Refinements in design and the use of alloy of steel and hollow axles and crank-pins have made it possible to eliminate a great amount of weight ordinarily necessary. The weight of the locomotive, exclusive of tender, is 334,000 lbs. The tender, which has a capacity of 10,000 gallons of water and 16 tons of coal, weighs 199,700 lbs. The boiler carries 200 lbs. per square inch steam pressure. The main cylinders are 28 in. in diameter, with 30 in. stroke. The diameter of the driving wheels is 63 in.

On this locomotive for the first time superheated steam is used to operate the air pump, feed-water pump, booster engine and headlight turbo-generator.

The locomotive is equipped with the superheater company's feed-water heater. The heater is located at the front of the engine, above the headlight and near the top of the boiler, on a level above the top of the tank so as to give the condensate pipe line plenty of fall to return the condensed water to the filter on the rear of the tender. The feed-water pump is mounted on the left side of the boiler just back of the smoke-box.

Another important departure from standard railway practice is the feature of superheating the steam before it reaches the main throttle. In locomotive 8000 the steam from the boiler passes through the steam dome into the dry pipe and thence to the superheater units, the dry pipe, which is outside of the boiler, being connected at the forward end direct to the superheater.

Before the steam leaves the dome it is passed through a separator which collects any water that may be carried in the steam, the water being automatically returned to the boiler, which, together with the taking of steam from the highest possible point of boiler, insures absolutely dry steam. From the superheated steam passages in the header, the superheated steam is conveyed to the throttle, located in a throttle box, at the top of the smoke-box and just forward of the stack, another unusual departure from existing designs and practice which was necessary in order to permit the use of superheated steam for the auxiliaries.

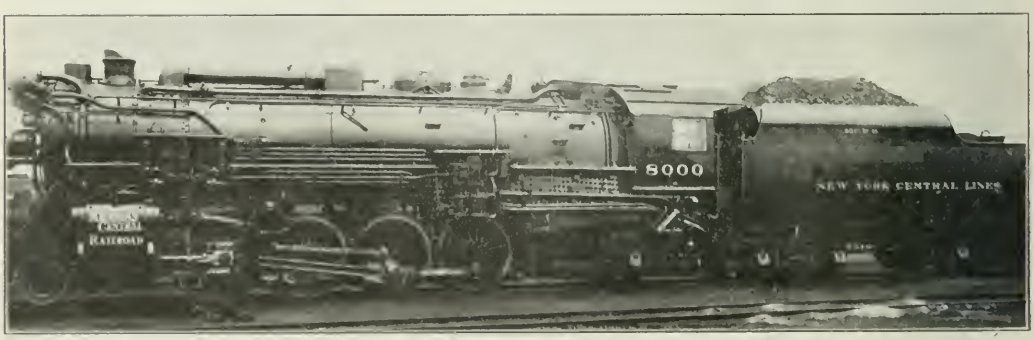
Careful attention has been given to the application of devices to facilitate handling the locomotive by the enginemen, the special equipment consisting of the precision power reverse gear, an Elvin stoker and a power grate shaker. The interior arrangement of the cab is such that the engineer and fireman perform the necessary duties in connection with the operation of the engine with minimum of movement from their positions on either side of the cab, the physical effort of each being practically nil. Even the blowing of the whistle is pneumatically controlled, an air valve being located near the side of the cab and immediately in front of the engineer.

The Front of the Locomotive Presents a Striking Appearance

As is customary on the Michigan Central, the engine is equipped with a water scoop, which eliminates stops and consequent delays for taking water.

Before being put into service the engine was inspected by President Smith, Vice-President E. D. Bronner and General Manager Henry Shearer of the Michigan Central.

Locomotive 8000 has more than lived up to expectations in the short time it has been in service. When it has been in service a sufficient length of time dynamometer tests will be taken and results very definitely determined.



Many Radical Changes Have Been Made in the Construction of This Locomotive

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The Central Railway Club, Buffalo, owing to the current labor troubles, has postponed until further notice its outing scheduled to take place on the last Thursday in August. The next regular meeting will be held on September 14, at 8 p. m. (standard time) at the Hotel Iroquois.

General News Department

The Ashley, Drew & Northern has announced that it will install oil burners on all its locomotives in the near future.

A Broken Rail caused the derailment of Seaboard Air Line train No. 3 one mile south of Cox, Ga., on the morning of July 17. Five cars left the tracks. A dining car employee was killed and several passengers were injured.

Brotherhood Bank Gets Charter

The Transportation National Bank of Minneapolis, organized by the four transportation brotherhoods, has been granted a charter by the government and is preparing to open for business on September 1. This bank will be patterned after the enginemen's bank at Cleveland, Ohio. It will accept deposits and carry on a regular banking business. The stock will be sold exclusively to the members of the four brotherhoods and will be limited to 10 per cent dividends The capital of the new bank, as given in the charter application, is $200,000.

Connecting Lines Discuss K. C. M. & O. Problems

Kansas City, Mexico & Orient problems were discussed at a conference held in Chicago on June 18 between the executives of the company and representatives of connecting carriers. The chairman, S. H. Johnson, vice-president and freight traffic manager, stated that no definite conclusions were reached regarding the situation. The plans discussed, however, will not be divulged until reviewed by the Interstate Commerce Commission. It is believed that car routing and readjustment of freight rate divisions were the immediate subjects under discussion.

Baldwin Locomotive Works Issues Quarterly Magazine

Under the title "Baldwin Locomotives," the Baldwin Locomotive Works has published the first issue of a periodical devoted to the interest of transportation and motive power problems. It is intended to illustrate from time to time the newest types of locomotives constructed at the Baldwin Works and to present articles on technical or commercial subjects allied to transportation. The first issue, dated July, 1922, contains articles on the first uniform gage transcontinental railway in South America, on the lubrication of railway car journals, and on South American business. The locomotives described include the Consolidation type built for the Western Maryland, Santa Fe and Pacific types built for the Argentine state railways and also logging and tank locomotives. The interests of foreign readers have not been overlooked as some of the articles are published in both English and Spanish and the locomotive specifications are given also in French and Portuguese.

Railway Club Secretaries Meet

At a special meeting of the Society of Railway Club Secretaries held on Tuesday at the Railway Club of New York, further consideration was given to the matter of enlarging the organization and broadening the scope of its work which was agreed upon at the annual meeting held at Atlantic City in June at the time of the convention of the A. R. A. Mechanical Division. Considerable time was given to a study of a tentative plan which is to be submitted to all secretaries of other organizations representing either directly or indirectly various railroad interests and is to be made a subject of more definite action at a general meeting of those concerned. It is expected that this movement will ultimately result in the formation of an association of mutual advantage to those engaged in secretarial work for the organizations in question. The men identified in this capacity for the railroad clubs have taken the initiative and express their earnest wish to make the suggested organization a medium for increased usefulness and efficiency.

Illinois Central Large Purchaser of Shovels

During the last four years the Illinois Central and the Yazoo & Mississippi Valley have used 129,110 shovels of all kinds at a cost of more than $143,000. Of that number 68 per cent or 88,266, were track shovels, representing an expense of $81,102, or an annual expenditure of $20,275. An average of 74 track shovels were furnished each working day at a daily expense of $70 and, assuming that 50 per cent of the time the track forces used no tools other than shovels, the average life of each shovel was only a little more than two months. The company states that if the employees give the proper care and use to track shovels a reduction of 50 per cent in the purchasing of these implements would be effected. Many shovels are broken by nipping ties, being thrown under pressure bearing materials, pulling the ties, or by driving stakes, etc.

Maine Holds Hearing on Consolidation Proposals

Opposition to an all-New England railroad system and approval of the plan of A. H. Lane, chairman of the transportation directorate of the State Chamber of Commerce and Agricultural League, for linking up the Maine railroads with the New York Central and other trunk lines were voiced at a hearing on July 13, by the committee appointed by Governor Baxter to get the views of Maine people on the proposed consolidation, according to the Boston Transcript.

Judge Benjamin F. Cleaves, executive secretary of the Associated Industries of Maine, declared his belief that if the railroads of Maine were left alone within the next 15 years they would be back in as good condition as several years ago. Others who participated in the discussion asserted that the roads must have help. Among those present was Professor William Z. Ripley of Harvard University, who prepared the tentative consolidation proposals for the Interstate Commerce Commission.

James Q. Gulnac of Bangor, president of the State Chamber of Commerce, said he thought there was an absolute need for the consolidation of the Maine Central and Bangor & Aroostook railroads.

Standards for Overhead Wire Crossings

The American Engineering Standards Committee, by letter ballot, has approved the National Electrical Safety Code of the Bureau of Standards which covers the generation, distribution and utilization of electricity for power, light and communication.

In making public this decision, the Standards Committee announces that there is now in process of formation a thoroughly representative sectional committee to consider any revisions of Part 2 of this Code, "Rules for the Installation and Maintenance of Overhead and Underground Electrical Supply and Signal Lines," which may be deemed necessary by any of the interested parties. There are also being organized three sub-committees to take up the unification of crossing specifications under the three following heads:

Signal lines crossing railways.
Power lines crossing railways.
Power lines crossing signal lines.

These committees are being organized in conformity with the action of the recent conference (March 2) on the standardization of crossing specifications at which there were present representatives of 14 national, engineering, utility and industrial associations, four departments of the federal gov-

ernment, various state commissions of Connecticut, Iowa, Minnesota, New York, and of the telephone, telegraph and cable companies.

Plan for Settlement of Coal Strike Fails

The President's plan for a settlement of the coal strike by a submission of all points in controversy to a commission of arbitration having failed because of a flat rejection of the plan by the United Mine Workers, President Harding on Monday invited the operators, who had accepted the plan, to return to their mine properties and resume operation. The President had received the replies of the operators to his proposal during the day, and while some groups of them had accepted only conditionally, he had construed them as an acceptance by the majority of the principle of arbitration. He expressed his disappointment at the lack of unanimity among the operators but his gratitude to the large majority who had pledged readiness to resume activity under the government's proposal and said that "we have now reached a point, owing to the refusal of mine workers and the minority of your operators, to accept the proposed arbitration, where the good offices of the government in seeking a voluntary adjustment of the dispute between mine operators and mine workers are without avail."

It was explained by administration officials that the administration had now exhausted its resources and that efforts would now be made to test the ability of the operators to resume operation, as many of them had taken the position that if assured protection they could induce a large percentage of their employees to return to work. Legislation to protect the public interest will be sought, however, as soon as the House returns after adjournment to August 15.

Long Island Establishes "Committee on Public Relations"

The Long Island on July 19 announced the appointment and organization of a "Committee on Public Relations." The committee consists of C. D. Baker, general superintendent; J. F. Keany, general solicitor; C. L. Addison, assistant to the president; Donald Wilson, general freight agent; P. H. Woodward, general passenger agent, and George Flatow, publicity agent.

In addressing the committee at its first official meeting, Ralph Peters, president of the road, referred to the work that the company had already done to bring about closer co-operation between management, employees and public, and said that the time had come for an expansion of such activity. Continuing, he said:

"I believe that the public is beginning to realize that it has been duped, in many instances, by political regulation, rather than economic regulation of many of our industries. The public is beginning to realize that capital, the public and the government must all co-operate through a mutual understanding. The loose way in which language and figures are used by so-called experts in economics, must be counteracted by plain and simple facts which all can understand. The propaganda of many employees' organizations must be met with clear, patient and painstaking statements of facts.

"The railroad employees need more liberal education. They need information that will give them courage to speak for the company. It may be that officers of this railroad and its principal employees have been reticent in speaking out on railway questions for fear of incurring the displeasure of their higher officers. This we want to overcome, and I hope the committee on public relations will plan to supply officers and employees with such facts as will enable them to speak authoritatively and clearly on matters pertaining to our own situation, as well as railroad problems generally."

The committee elected Mr. Woodward, chairman; Mr. Wilson, vice-chairman, Mr. Flatow, secretary, and T. P. Brennan, special representative.

New York Railroad Club Officers Attend Shore Dinner

Celebration of the Golden Anniversary of the organization of the New York Railroad Club will be observed in a more pretentious way next December than the usual annual dinner at the Hotel Commodore, New York. Plans to this effect were initiated last Tuesday evening with a shore dinner at the Atlantic Yacht Club in honor of the officers and members of the executive committee. The host of the occasion was Daniel M. Brady, the club's oldest member and active in its affairs from its inception. The number of guests participating was nearly 100 and would have been greater had it not been for the absence of railroad officers who at the last minute were forced by labor disturbances to cancel their acceptances and remain in direct touch with the properties they have in charge.

At the dinner formal addresses were made by L. F. Loree, president of the Delaware & Hudson, and Elisha Lee, vice-president of the Pennsylvania. Both speakers stressed their conclusion that the present labor troubles are largely attributable to politics and to politicians who use the railroads to create political issues for their personal advantage, and to labor leaders who seek chiefly to gain their personal ends, while the public suffers from their interference with the legitimate functioning of public utilities and industrial interests. In these comments they were joined by Frank Hedley, president of the Interborough Rapid Transit, and they appeared to be agreed that unless a strictly impartial tribunal is created with sufficient power to safeguard the public and vested interests on a parity in this regard with the United States Supreme Court, the situation will become worse instead of better. Such a tribunal should be free from every possibility of bias in behalf of either side of pending controversies.

Mr. Lee dwelt upon the method of handling disputes on the Pennsylvania as a result of which so far as known at present no grievances are pending on that system and none is at this time anticipated that cannot be amicably adjusted. He also indicated that men and women should meet their own responsibilities at the polls. Others spoke concerning the value of the railroad clubs, notably in that they assist in training and educational work for young men in railroad service. It was urged that railroad companies give to the clubs substantial practical encouragement.

Railway Returns for May

The Interstate Commerce Commission's summary of railway revenues and expenses of Class I roads for May is as follows:

Item	May 1922	May 1921	Four months 1922	Four months 1921
Average number of miles oper.	235,228.50	234,721.28	235,183.99	234,715.34
Revenues:				
Freight	$319,361,730	$313,132,827	$1,533,531,215	$1,548,206,619
Passenger	*85,532,720	193,500,428	‡406,840,345	$475,187,3[illegible]
Mail	7,608,836	7,828,163	37,223,429	41,428,923
Express	11,759,010	6,961,162	46,992,677	34,062,729
All other transportation	15,171,893	13,367,849	67,850,895	63,705,078
Incidental	8,953,161	9,634,038	41,763,407	49,719,627
Joint facil.—Cr	741,458	628,691	4,007,278	3,257,402
Joint facil.—Dr.	180,910	193,647	869,505	971,706
Railway operating revs.	448,947,898	444,859,511	2,137,339,741	2,214,595,980
Expenses:				
Maint. of way and struct.	68,033,436	65,095,833	275,635,778	301,200,618
Maint. of equip.	100,893,624	101,100,850	488,619,683	542,164,166
Traffic	7,266,242	7,200,205	35,396,644	35,961,271
Transportation	163,026,584	158,969,442	832,950,238	1,011,774,400
Miscel. opera.	3,814,595	3,884,184	18,514,341	20,705,707
General	13,004,812	14,177,703	65,772,732	73,333,294
Trans. for invest.—Cr.	450,416	562,941	2,200,494	2,651,789
Ry operat. ex.	355,588,877	379,865,276	1,714,688,922	1,982,487,667
Net rev. from railway operations	93,359,021	64,994,235	422,650,819	232,108,313
Ry. tax accruals	25,673,518	22,543,709	119,964,000	109,990,623
Uncol. ry rev.	135,936	103,726	554,173	419,939
Ry operat. in.	67,549,567	42,346,800	302,132,646	121,697,751
Equip. rents—Dr. bal.	4,002,296	3,967,439	21,748,843	19,137,246
It. fac. rent—Dr. bal.	1,566,652	1,436,125	7,124,792	8,142,606
Net ry. oper. income	61,980,619	36,943,236	273,259,011	94,417,900
Ratio of exp. to rev. (per cent)	72.20	85.39	83.23	89.5[illegible]

*Includes $2,619,329, sleeping and parlor car surcharge
†Includes $2,717,926, sleeping and parlor car surcharge.
‡Incl. des. $12,102,529, sleeping and parlor car surcharge
‖Includes $13,101,538, sleeping and parlor car surcharge.

Traffic News

C. A. Bland has been appointed general traffic manager of the El Paso (Tex.) Chamber of Commerce.

As a further step in its efforts to eliminate the abuse and misuse of commutation tickets the Long Island has just established a new rule which requires commuters to buy their own tickets and sign them with pen and ink at the time of purchase.

It is reported that the cities of Norfolk, Portsmouth and Newport, Va., will raise $10,000 to fight Boston's appeal to the Interstate Commerce Commission for an equalization of all import and export freight rates with other Atlantic ports. A hearing will be held in Boston on September 12.

The Traffic Club of Augusta, Ga., has been organized with E. W. Matthews, traffic manager of the Riverside Mills, as president, and R. B. Arthur, commercial agent of the Southern, as secretary; the election of other officers being postponed pending the report from committee on organization.

Traffic Statistics for April

The revenue ton miles of freight handled by the Class 1 railroads in April totalled 22,284,788,000 as compared with 23,083,759,000 for April, 1921, according to the monthly report of revenue traffic statistics compiled by the Interstate Commerce Commission. The decrease is accounted for by the falling off of coal production due to the strike. For the first four months of the year the ton miles totalled 100,846,975,000, as compared with 96,141,529,000 in 1921. Freight revenues, however, showed a decrease from $1,230,964,365 in 1921 to $1,209,894,593 in 1922 and the average revenue per ton mile was 1.2 cents as compared with 1.28 in 1921. The revenue passenger miles showed a decrease both for April and for four months as compared with 1921. For April the total was 2,701,720,000 as compared with 2,846,848,000 and for four months it was 10,395,936,000 as compared with 12,170,328,000. Passenger revenue for the four months were $321,272,002 as compared with $381,559,164 in 1921 and the number of revenue passengers per car was 14.66 as compared with 16.4. The figures are for 183 roads, excluding switching and terminal companies.

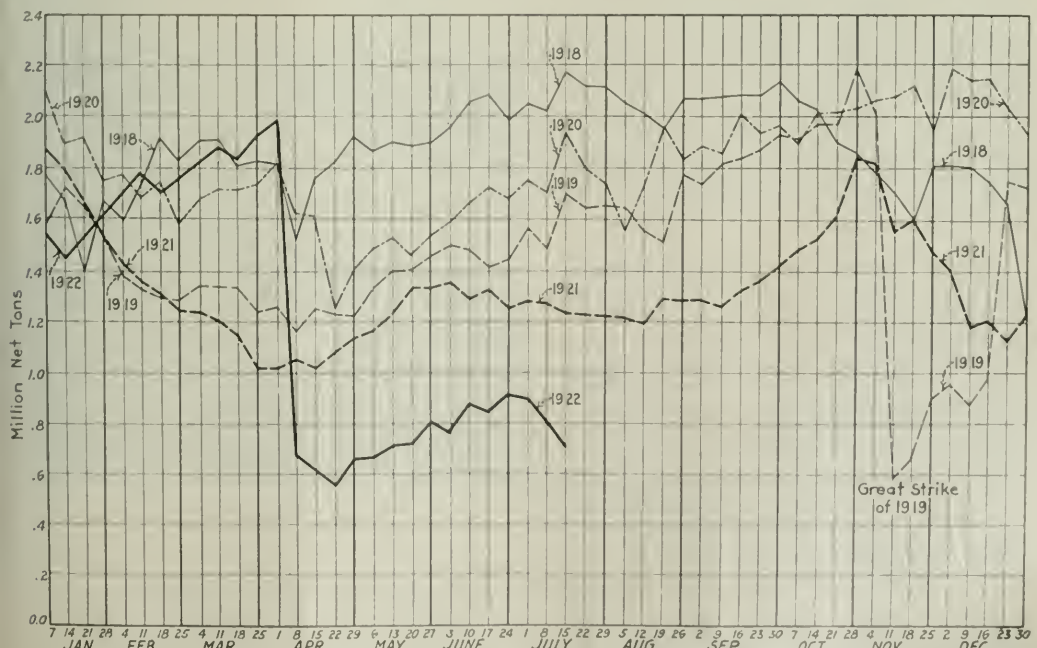
Coal Production

A new cause has arisen to limit the production of coal, namely, local congestion of traffic associated with the strike of the railway shopmen, according to the weekly bulletin of the Geological Survey. Because of the uncertainties of the situation it is difficult to forecast production for the week of July 10-15, but the record of the first four days suggest that the output of bituminous coal can hardly exceed 4,300,000 tons. Production of anthracite continues practically zero.

Final returns on the week of Independence Day, the fourteenth of the strike, show that 3,936,000 net tons of soft coal and 23,000 tons of anthracite were produced, a total of all coal of 3,959,000 tons.

The trend of production in the fifteenth week of the strike (July 10-15) is indicated by the cars of coal loaded daily. Monday's loadings (14,952 cars) were lower than those of Monday in other recent weeks, yet on Tuesday loadings dropped to 12,829 cars, and on Thursday they fell to 11,584, the lowest on any Thursday since mid-April.

The cause of the decrease is said to have been congestion of traffic resulting indirectly from the shopmen's strike. The first districts to be affected were Logan and Eastern Kentucky, but in Western Kentucky and Southwestern Virginia also loadings soon began to decrease, and by Wednesday even the Pocahontas, Tug River, and Kenova-Thacker districts were producing far below normal. In the non-union fields of Pennsylvania and in Alabama and the Far West no decrease in output had been reported up to Wednesday. No reports have been received to indicate any significant change in the number of men on strike.



Fluctuations in Coal Production During Last Five Years

Foreign Railway News

German Car Plant Burns

According to press dispatches from Berlin, the Orenstein & Koppel Works, builders of cars, was completely destroyed by fire on July 16.

Reduction in British Railway Wages

LONDON.

Owing to the fall in the cost of living in Great Britain, the railway workers' war bonus has been reduced by 4 shillings (about 97 cents at the normal rate of exchange) per week. However, a number of classes have not been affected by this reduction, as they have already reached their standard of wages.

French Railway Earnings

The gross earnings of the leading railways of France from January 1 to June 3 are as follows, according to the Economic Review (London):

	Francs (mill.) (a) 1922	(b) 1921	Increase (actual)	% per kilometer
State	394.0	385.7	38.3	10.78
Paris-Lyon Méditerranée French section	702.2	663.4	38.7	5.8
Nord	412.1	368.4	43.7	11.6
Orleans	359.2	352.3	6.8	1.94
Est	393.5	355.6	37.8	10.64
Midi	182.0	166.5	15.5	9.31
Alsace-Lorraine and Guillaume-Luxembourg	187.3	170.7	16.5	9.72

(a) Estimated. (b) Ascertained.

Switzerland Finances Electrification

LONDON.

The Swiss Federal Council has decided to fix the amount of the second railway electrification loan at 150,000,000 francs (about $28,713,000 at the present rate of exchange) only, although the first intention was to take up 200,000,000 francs (about $38,540,840 at the present rate of exchange). The amount subscribed was 280,000,000 francs (about $53,957,173 at the present rate of exchange). The cause of the reduction of the amount of the loan, which was issued at 4½ per cent, is to be looked for in the expectation that the rate of interest in Switzerland will be further reduced. Electrical locomotives now cost in Switzerland only 500,000 francs (about $96,349 at the present rate of exchange) each as compared with the former price of 900,000 francs (about $173,429).

Further Cheap Railway Fares in Great Britain

LONDON.

The railway companies of Great Britain have announced further cheap railway fare facilities, as follows:

Special day excursion tickets for individuals are to be reduced to a single ordinary fare for the round trip. At present the charge is a single fare and a third. These tickets, available for the day of issue only, will be issued to passengers in the following circumstances: (1) Local journeys from holiday resorts, (2) local journeys from towns to holiday resorts within a radius of 60 miles, (3) passengers attending local events, such as agricultural and flower shows, regattas, bazaars, etc., (4) on early closing days to towns within a radius of 60 miles, (5) to important cricket and football matches from stations within a radius of 60 miles, (6) to metropolitan sports clubs, (7) pleasure party tickets, with a minimum number of 12 adult fares. The reductions are to come into force on July 1, 1922.

First, second and third class walking tour tickets, available on the day of issue, enabling individual passengers to travel out to one station and return from another are also to be introduced. These tickets are to be issued at two-thirds of the ordinary single fare from point to point to stations within a radius of 30 miles.

Improved Condition of Palestine Railway System

Local communications have been greatly improved within the past year, and today Palestine enjoys probably the best railway, telephone and telegraph and mail service in the Near East, according to advices from the U. S. Shipping Board representative at Constantinople.

An efficient railway system in Palestine is a heritage of the war. In their military operations the British built the line from Kantara on the Suez canal to a point near Gaza, connecting there with the old pre-war narrow gage system. The gage was broadened and an extension built into Haifa. The system, now 500 kilometers in length, connects with the Egyptian State Railways at Kantara and with the Syrian railways in the north.

The motive power and rolling stock is in first-class condition. American locomotives built in 1918 for the British war department are used, having evidently been turned over to the Palestine railways. A few mountain saddle-tank type locomotives built in Leeds, England, have been added recently. A number of new passenger coaches from England, together with international sleeping cars afford good accommodations to travelers. Daily passenger and mail service are proving beneficial to business.

L. & N. W. Asks Employees for Suggestions

LONDON.

In a circular Arthur Watson, general manager of the London & North Western, asks employees for suggestions as to improved service and efficiency. The circular reads in part:

"It is further recognized that almost every railway employee has ideas concerning the management or working of his railway, but that there has existed a certain amount of diffidence, and in some cases, difficulty, in making known those ideas to some one in authority. Suggestions from the staff on all matters likely to promote the economical working of the concern or to increase the receipts are, therefore, welcomed. Such matters are:

(a) Any new method—mechanical or electrical—which it is believed will result in economy.
(b) The elimination of the waste of engine power, stores and materials.
(c) Improved methods of working trains or road vehicles and accelerating movement.
(d) Improvement in rolling stock and equipment.
(e) Improvements in passenger and goods station working.
(f) Improvements in stationery forms, office methods and equipment.
(g) The prevention of accidents.
(h) The improvement of relations with our customers and the securing of additional business to the company."

Decrease in Railway Accidents in Great Britain

LONDON.

As compared with the year 1920, there was a decrease in the number of passengers killed from 121 to 89 in the year 1921, on the railways of Great Britain and Ireland, while the number injured fell from 2,675 to 2,095. There was a still more satisfactory decline in the number of railway employees killed and injured, the figures being 231 killed and 2,892 injured as compared with 376 killed and 4,414 injured in the year 1920. The figures for individuals not included in the two foregoing categories were: killed 406 for the year 1921 as compared with 409 killed in the year 1920, and injured 168 in the year 1921, as compared with 286 in 1920. The grand total of passengers, employees and other persons was 726 killed and 5,155 injured in 1921, as against 906 killed and 7,375 injured in 1920. It is noteworthy that the number of accidents due to failure of rolling stock or permanent way fell from 13,675 to 9,408, an indication of the increasing care exercised by the companies with a view to the safety of passengers and employees. The number of accidents to trains was also considerably less. There were only 14 collisions between passenger trains in 1921, as compared with 39 in 1920, 49 collisions between passenger trains and freight trains or light engines in 1921, as compared with 62 in 1920, and 85 collisions between goods trains, light engines or other moving vehicles in 1921, as compared with 187 in 1920. There was also a decrease of 153 or nearly 33 per cent in the number of derailments.

Officials of Chilean State Railways Inspect Their New Equipment at Westinghouse Plant

Manuel Trucco, director general, and other representatives of the Chilean State Railways recently made a tour of inspection of the Westinghouse Electric & Manufacturing Company's plant at East Pittsburgh where the $7,000,000 order for electrification equipment, received last October, is now being furnished. Accompanying Senor Trucco and the other officers of the railway were

One of the Locomotives for Chile

Guy E. Tripp, chairman of the board of directors, E. M. Herr, president, and other representatives of the Westinghouse Company.

Only a few days prior to the visit of the Chilean representatives, a train, almost a quarter of a mile long, left the Westinghouse works loaded with sub-station equipment for the Chilean State Railways. This was the first shipment of material on this order.

A Train Load of Equipment for Chile with a Chilean Locomotive at the Head

At the head of the train was one of the 39 Baldwin Westinghouse locomotives to be furnished for the electrification.

An accompanying photograph shows the group of Chilean Railway officials with representatives of the Westinghouse Electric Company and Baldwin Locomotive Company in the yards of the Westinghouse East Pittsburgh plant following the inspection tour.

Equipment and Supplies

Locomotives

THE BALTIMORE & OHIO is inquiring for 15 Pacific type locomotives.

THE CANADIAN PACIFIC is inquiring for 15 Mikado type and 15 Pacific type locomotives.

THE SOUTHERN RAILWAY has ordered six 0-8-0 type switching locomotives from the Baldwin Locomotive Works.

THE CHICAGO & NORTH WESTERN is considering repairs to a number of its locomotives, although no definite decision reached regarding number or time when.

THE DELAWARE, LACKAWANNA & WESTERN, reported in the *Railway Age* of July 15 as inquiring for 5 Pacific type and 25 Mikado type locomotives, has ordered this equipment from the American Locomotive Company.

THE LEHIGH VALLEY is having 5 Consolidation type and 10 switching locomotives repaired at the shops of the American Locomotive Company and 6 Consolidation type and 9 switching locomotives at the shops of the Baldwin Locomotive Works.

THE NATIONAL ENAMELING COMPANY, Granite City, Ill., has ordered one, 0-6-0 type switching locomotive from the American Locomotive Company. This locomotive will have 21 by 26 in. cylinders and a total weight in working order of 141,000 lb.

THE ILLINOIS CENTRAL, reported in the *Railway Age* of July 15 as inquiring for locomotives, has ordered 15 switching locomotives from the Baldwin Locomotive Works, 25 Santa Fe type locomotives from the Lima Locomotive Works and 25 Mikado locomotives from the American Locomotive Company.

Freight Cars

THE NORTHERN PACIFIC is inquiring for 1,000 sets of steel center sills.

THE CANADIAN PACIFIC is asking for prices on from 250 to 500 refrigerator cars.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE is inquiring for 300 gondola cars of 50 tons' capacity.

THE UNION REFRIGERATOR TRANSIT COMPANY, Milwaukee, Wis., is inquiring for 350 refrigerator cars.

THE CHESAPEAKE & OHIO is inquiring for 50 steel underframe refrigerator cars of 40 tons' capacity.

THE NORFOLK & WESTERN has ordered 1,000 single sheathed box cars of 50 tons' capacity from the Ralston Steel Car Company.

THE MANILA RAILROAD COMPANY has ordered 50 cane cars of 30 tons' capacity from the Koppel Industrial Car & Equipment Company.

THE ILLINOIS CENTRAL, reported in the *Railway Age* of June 15 as inquiring for repairs to 600 gondola cars, has contracted for this work with the Ryan Car Company.

THE NEW YORK CENTRAL will have repairs made to 500 freight cars at the shops of the Ryan Car Company and to 500 cars at the shops of the Buffalo Steel Car Company.

THE PITTSBURGH & WEST VIRGINIA, reported in the *Railway Age* of July 15 as inquiring for 1,000 hopper cars of 55 tons' capacity, has ordered this equipment from the Cambria Steel Company.

THE PHILADELPHIA & READING, reported in the *Railway Age* of June 17 as inquiring for 1,000 gondola cars of 70 tons' capacity, has ordered 500 cars of this type from the Pressed Steel Car Company and 500 from the Standard Steel Car Company.

The Missouri Pacific will have repairs made to 2,500 freight cars at the shops of the following companies: American Car & Foundry Company, 1,250 cars; Mount Vernon Car Manufacturing Company, 250 cars and Sheffield Car & Equipment Company, 1,000 cars.

The Chicago, Burlington & Quincy, reported in the *Railway Age* of July 15 as preparing inquiries for repairs to a large number of cars, is now inquiring for repairs to 500 box cars and 500 steel gondolas. This company may call for inquiries for further repair work later.

The Humble Oil & Refining Company, Houston, Texas, reported in the *Railway Age* of July 15 as inquiring for three 12-yd. capacity air dump cars, has revised the inquiry to three 16-yd. capacity air dump cars with alternate on one 20-yd. capacity air dump car.

The Buffalo Creek & Gauley, reported in the *Railway Age* of July 15 as inquiring for from 200 to 300 hopper cars, has ordered 300 steel hopper coal cars of 55 tons' capacity from the American Car & Foundry Company. This road is owned by the Elk River Coal & Lumber Company.

The Chicago, Milwaukee & St. Paul, reported in the *Railway Age* of July 15 as inquiring for repairs on 1,000 to 1,500 box cars and 250 gondola cars, is now asking for prices on repairs also on 750 wooden gondola cars of 30 tons' capacity and 450 wooden gondola cars of 40 tons' capacity.

The Baltimore & Ohio has let contracts for freight car repairs as follows: To Baltimore Car & Foundry Company, 1,000 steel coke cars; American Car & Foundry Company, 1,000 box cars; Pullman Company, 1,000 composite gondola cars; Pressed Steel Car Company, 1,000 box cars; Hamilton Car Company, 500 box cars; Youngstown Steel Car Company, 500 hopper cars; Illinois Car & Manufacturing Company, 500 box cars, and General American Car Company, 500 gondola cars.

Passenger Cars

The Winston-Salem Southbound is inquiring for 6 coaches and three baggage and mail cars.

The Chicago, Aurora & Elgin, reported in the *Railway Age* of July 8, as contemplating the purchase of a number of new electric passenger cars, is said to be preparing inquiries for 20 all-steel coaches.

The Philadelphia & Reading, reported in the *Railway Age* of July 1 as inquiring for 5 baggage cars and 5 combination baggage and mail cars, has ordered this equipment from the American Car & Foundry Company.

The Nashville, Chattanooga & St. Louis, reported in the *Railway Age* of July 15 as considering the purchase of 17 passenger cars, has ordered five baggage cars, four mail cars, two compartment cars and four coaches from the American Car & Foundry Company.

The Chicago, North Shore & Milwaukee, in addition to its recent order for 15 merchandise dispatch cars and one utility line car from the Cincinnati Car Company, has purchased seven motor limited coaches, two parlor observation cars and one motor dining car from the same company.

Brooklyn Rapid Transit.—The New York Transit Commission has issued an order for increased service on the rapid transit lines; the order includes the purchase of 50 new steel passenger cars for subway use and the order has been accepted by the New York Consolidated Railroad Company. The company will retire 65 of the present wooden car equipment.

Iron and Steel

The Pennsylvania is expected to issue inquiries soon for 5,000 to 10,000 tons of car repair plates.

The Southern Pacific has placed an order with the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., for 30,000 tons of steel rails.

The Union Pacific is reported to have placed an order with the Illinois Steel Company for 10,000 tons of steel rails.

The Cleveland, Cincinnati, Chicago & St. Louis has issued inquiries for its third quarter requirements, including 500 tons of plates and 700,000 small bolts.

The Missouri, Kansas & Texas has placed an order with the Mount Vernon Bridge Co. for 1,400 tons of steel for repairs to its locomotive shop at Waco, Texas.

The Illinois Central has placed orders with the American Bridge Company for 369 tons of structural steel and field rivets and for 142 tons of steel deck plate girder spans.

The Michigan Central will receive bids until October 1 for its requirements of steel sheets, bars, shapes, plates, billets, springs, axles, tubes, crank pins, piston rods, steel rope, wire, bolts, nuts, washers, cotters and keys, rivets and bar iron.

The Java State Railways have ordered through the Netherlands Government, Colonial Department, New York City, from the Blaw-Knox Company, 60 galvanized steel transmission towers making a total of about 160 tons of steel. These towers form a part of a transmission line to be used to transmit power to the Batavia-Buitenzorg Line, about 40 miles long, which is now being electrified. The same company is inquiring for 4,000 unfinished car wheel tires to weigh about 400 lb. each.

Track Specialties

The Missouri, Kansas & Texas is inquiring for 400 tons of tie plates.

Machinery and Tools

The New York Central has ordered a 6 ft. American radial drill from the American Tool Works.

The Chesapeake & Ohio has bought a 5 ft. Western radial drill from the Dale Machinery Company.

The Illinois Central, reported in the *Railway Age* of June 10 as inquiring for a large list of machine tools, is expected to begin placing orders for these supplies this week.

The Atchison, Topeka & Santa Fe has placed an order with the Whiting Corporation for a 240-ton screw jack locomotive hoist to be used on the Gulf, Colorado & Santa Fe.

The Louisiana & Arkansas in connection with the construction of a new shop at Stamps, Ark., will receive bids until 11:00 a. m., July 31, for the following: Three overhead electric traveling cranes, one of 90 tons' capacity, 1 of 10 tons' and 1 of 7½ tons'; steam heaters with motors and diffusing outlets; 150 hp. boilers of either return tubular, water tube or Scotch marine type; 2,100 kw., d. c. electric generators connected directly to four valves, unaflow condensing or non-condensing, turbines condensing, full Diesel or semi-Diesel engines; one 69-in. wheel lathe; one 24-in. slotter; one 48-in. boring mill; one 24-in. shaper; one 2¼-in. flat turret lathe; one 48-in. car wheel borer; one 4-ft. radial drill; one 18-in. tool room lathe; one double car wheel press; one 2,500-lb. steam hammer; one 1½-in. forging upsetting machine; one 1¼-in. bolt heading upsetting forging machine; one condenser, boiler feed pump and feed water heater.

Signaling

The Raritan River has placed an order with the Hall Switch & Signal Company for 19 unit type color light signals, 52 relays and 36 switch boxes.

The New York Central has placed an order with the Hall Switch & Signal Company for 59 Style L top post motor signals with accessory material and 156 neutral relays and 52 motor type relays.

The Missouri Pacific has placed an order with the General Railway Signal Company for one 30-lever Saxby & Farmer interlocking machine and four Model-2, form "B" locks, all of which are to be installed by company forces at Kenneth, Kansas.

Supply Trade News

K. C. Gardner, formerly general sales manager, central district, of the Pressed Steel Car Company, is now associated with the **Greenville Steel Car Company**, Greenville, Pa., as vice-president in charge of sales. Mr. Gardner's headquarters are at Greenville.

S. H. Lanyon has been appointed manager of the recently opened San Francisco branch office of the **Okonite Company**, Passaic, N. J., manufacturers of insulated wires and cables, splicing tapes, etc. His office is located at 509 New Call building.

J. H. Rodger, western manager of the **Safety Car Heating & Lighting Company**, with headquarters at Chicago, has been promoted to vice-president with the same headquarters, in charge of that company's western business. Mr. Rodger entered the railway supply business in 1899, in the service of the Standard Coupler Company, which company he left in 1905 to become assistant to the president of the Monarch Machine Company, New York. In 1911, he became a sales agent of the Safety Car Heating & Lighting Company in its Chicago offices. He was promoted to western manager of that company in 1919, which position he was holding at the time of his recent promotion.

J. H. Rodger

G. A. Woodman has been appointed sales manager of the **Northwestern Malleable Iron Company**, Milwaukee, Wis., with offices at 237 Railway Exchange building, Chicago. He will have charge of the sales of the Joliet journal box which was formerly handled by the Joliet Railway Supply Company, Chicago, now the Republic Railway Equipment Company, of the same city. Mr. Woodman was born at Dunkirk, N. Y., on August 21, 1866. On August 21, 1883, he entered the service of the Brooks Locomotive Company as a machinist's apprentice and was successively thereafter, in the drafting department, same company, mechanical engineer, Lima Locomotive & Machine Company, assistant master car builder, Swift & Company, Chicago, assistant superintendent, American Car & Foundry Company, Chicago; mechanical engineer, Kirby Equipment Company, Chicago, when that company sold the Woodman journal box, the name of which was later changed to the Franklin journal box; and the National Car Equipment Company, Chicago. He retired two years ago and has been inactive in the railway supply business up to the time of his recent appointment.

G. A. Woodman

G. M. Jacobsen has joined the service staff of the **Franklin Railway Supply Company**, New York, and is now in charge of Southern territory with headquarters at Atlanta, Ga., relieving **B. C. Wilkerson**, who has been appointed a special service representative of the company on locomotive booster applications.

The **U. S. Light & Heat Corporation**, of California, has been incorporated as a subsidiary of the U. S. Light & Heat Corporation, Niagara Falls, N. Y. A site has been leased and construction started on a new plant at Oakland, Cal. The new plant is to handle the company's business on the Pacific Coast, and it is expected that production will start in the new factory about October 1.

Republic Railway Equipment Company

The Republic Railway Equipment Company, Inc., Chicago, has been organized to take over the Joliet Railway Supply Company, which owns and operates a modern brake beam and bolster plant at 93rd street and Drexel avenue, Chicago. At a meeting of the board of directors of the new company in Chicago on July 7, Fred A. Poor, president of the P. & M. Company, was elected chairman of the board; Burton Mudge, president of Mudge & Company, was elected president; J. H. Slawson, vice-president of the Joliet Railway Supply Company, was made first vice-president; C. A. Carsecadin, vice-president of the Joliet Railway Supply Company, was elected vice-president, sales; A. M. Pearson, secretary of Mudge & Company, was made secretary, and W. F. Hoffman, treasurer. J. E. Simons, manager of sales of the Joliet Railway Supply Company, has been appointed to the same position in the new organization. **Fred A. Poor** was born in Maine in 1870. He was superintendent of electric signals of the Illinois Central with headquarters at Chicago from 1892 to 1900. In the latter year he entered the service of the Weber Railway Joint Manufacturing Company as western sales manager with office in Chicago, which position he held until 1906, when that organization was merged with the Rail Joint Company, at which time he was sent to London, England, as foreign manager. In 1908 he returned to this country as western sales agent with headquarters at Chicago, which position he held until 1914, when he became president of the P. & M. Company which he had organized in 1905. In 1914 he became president also of the Vermilion Malleable Iron Company; in 1916, president of the P. & M. Company, Ltd., of Canada, in 1921, chairman of the board of the Canton (Ohio) Forge & Axle Company, and most recently chairman of the board of the Republic Railway Equipment Company, all of

F. A. Poor

Burton Mudge

which positions he is now holding. **Burton Mudge** was formerly connected with the operating departments of the Atchison, Topeka & Santa Fe, the Chicago & North Western, the Fort Worth & Denver City, and the Chicago, Rock Island & Pacific. He resigned as assistant general manager of the last named road in 1908 to enter the railway supply business and in September that year he organized the firm of Burton W. Mudge & Bro., representing the Commonwealth Steel Company, which later became Mudge & Co. In January of this year Mr. Mudge was elected vice-president and director of the Pilliod Company, New York, which duties he assumed in addition to those with Mudge & Co. His work as president of the Republic Railway Equipment Company will also be in addition to that mentioned above.

J. H. Slawson

J. H. Slawson was born at Cleveland, Ohio. He entered railroad service in 1890 as a clerk in the office of the assistant general freight agent of the Lake Shore and Michigan Southern (now a part of the New York Central) and was thereafter employed successively in the revision department, the tariff bureau, the auditing department and the office of the chief engineer. In 1902 he entered the service of the Malleable Castings Company at the Sharon, Pa., plant with special duties pertaining to railroad matters. He later became chief clerk, following which he was promoted to local treasurer in charge of the finances of the Sharon plant. He was transferred to Chicago in 1912, as sales agent, which position he held until 1917, when he was elected vice-president of the Joliet Railway Supply Company, a subsidiary of the Northwestern Malleable Iron Company, Milwaukee, Wis. He was holding this position up to the time he became first vice-president of the new organization.

C. A. Carscadin

C. A. Carscadin, vice-president, sales, was born in Buffalo, N. Y. He entered railway service in 1881 as a stenographer in the employ of the New York Central & Hudson River (New York Central), at New York, which position he held until 1882 when he left to become stenographer and secretary to the president of the Michigan Central at Detroit, Michigan, and from 1887 to 1902 he was a traffic representative of the same road. From the latter date until the present he has been engaged in the railway supply business, having been connected with the Detroit Seamless Tube Company the Globe Seamless Tube Company and the National Car Equipment Company. He was elected a vice-president of the Joliet Railway Supply Company in October, 1917, which position he has held until the recent change in the organization

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The O'Malley Beare Valve Company has removed its downtown, Chicago, sales and service office from 841 Railway Exchange building to its new general office and manufacturing plant 231 to 259 East Ninety-fifth street.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company, reported in the *Railway Age* of June 17, page 1507, as authorizing the construction of the first unit of enlarged freight terminal facilities at Dallas, Tex., to cost approximately $200,000, has completed plans for this work. The work includes a new concrete warehouse and office building, 60 ft. by 240 ft. with an 8 ft. by 200 ft. platform; a 60 ft. by 60 ft. concrete warehouse addition with an 8 ft. by 60 ft. platform, and a 30 ft. by 150 ft. open concrete platform.

BALTIMORE & OHIO.—This company will rebuild its elevators and grain piers at Locust Point, Baltimore, recently destroyed by fire. The new facilities will be built of steel and concrete and provided with modern conveying machinery. The elevators will be equipped with conveying galleries leading from storage bins to merchandise piers and running the full length of these. These galleries will be provided with chutes enabling vessels to load grain simultaneously with general cargo, thus effecting a saving in time in loading vessels and enabling shifting at the piers to be reduced to a minimum.

CANADIAN PACIFIC.—This company has completed plans for branch lines, construction to include the closing of the existing gap in the Weyburn, Sask.-Lethbridge, Alta., line; the grading of the first 60 miles east from Consul, Sask.; the equipping for traffic of the first 50 miles of the line from Lanigan, Sask., to Naicam and the completion of the line extending north from Russel, Man., 12.5 miles.

CANADIAN NATIONAL.—This company has awarded contracts for water supply improvements on the Grand Trunk Pacific as follows: The construction of dams at Pope, Man., Raymore, Sask., Maryfield, Sask., Mecheche, Alta., and Conquest, Sask., to W. A. Dutton, Winnipeg, Man.; the construction of a dam at Wiseton, Sask., to the Northern Construction Company, Winnipeg, Man.; the construction of a dam at Rama, Sask., to C. G. Anderson, Norwood, Man.; the construction of pipe lines at Wiseton, Sask., Rama, Sask., Raymore, Sask., and Maryfield, Sask., to Green & Elsasser, Winnipeg, Man.; the construction of a pipeline at Pope, Man., to G. M. Irwin, Stonewall, Man.; a pipe line at Mecheche, Alta., to the Jamieson Construction Company, Edmonton, Alta.; a pipeline at Tilney, Sask., to Riley & Reed, Patience, Alta.; and 10,000 ft. of pipeline at Lloydminster, Alta., to Simpson & Shillington, Winnipeg, Man. This company has also awarded contracts to Gibbs Bros., Lumsden, Sask.; and to Rossa & Wikstrand, Saskatoon, Sask., respectively, for a line revision of the Boundary subdivision near Lampman, Sask., and for a connection between the Craik and Riverhurst subdivisions at Regina, Sask.; also a contract to the Ideal Fence & Spring Co., of Canada, Winnipeg, Man., for approximately 50 miles of fencing on the Oakland, Man., subdivision.

CHICAGO, BURLINGTON & QUINCY.—This company reported in the *Railway Age* of June 24, page 1755, as accepting bids for the construction of a power house at Plattsmouth, Neb., and a five-stall roundhouse at Council Bluffs, Iowa, has awarded the contract for the former to the Jones Engineering Company, Chicago, and contract for the latter to the Home Builders, Omaha, Neb.

ILLINOIS CENTRAL.—A contract has been awarded to Joseph F. Nelson & Sons, Chicago, for the construction of brick standard interlocking towers at Peotone, Ill., Manteno and Monee streets.

LOUISIANA & ARKANSAS.—This company will receive bids until 11:00 a. m., July 31, for the construction and equipment of a locomotive repair shop at Stamps, Ark. The work includes a main building 280 ft. by 120 ft., a blacksmith shop 60 ft. by 80 ft., a power house 68 ft. by 72 ft., a lavatory building 17 ft. by 32 ft., and an office building 36 ft. by 60 ft. With the exception of the office building, which will be a two-story frame structure, all the buildings will be of brick construction with large glass wall areas. The main building and the blacksmith shop will have structural steel frames. The equipment to be provided will be found in our equipment and supplies column.

Railway Financial News

ALABAMA & VICKSBURG.—*New Directors.*—R. E. Kennington, of Jackson, Miss., and A. S. Bozeman, of Meridian, Miss., have been elected directors.

BALTIMORE & OHIO.—*Equipment Trusts Sold.*—Kuhn, Loeb & Co., Speyer & Co., and the National City Company have sold privately at prices to yield an average of 5.25 per cent and subject to approval by the Interstate Commerce Commission, $6,750,000 5 per cent equipment trust certificates, maturing in equal annual instalments from August 1, 1923, to August 1, 1937, inclusive.

BOSTON & MAINE.—*Meeting Postponed Again.*—The annual meeting, several times adjourned, was again held up on July 14 by new court action of E. D. Codman. A bill in equity was filed in the Supreme Court of Massachusetts against the New York Central and 42 other defendants, including officers and directors of the Boston & Maine, to prevent what the plaintiff says is an attempt on the part of the New York Central to secure a control of the Boston & Maine. Judge Crosby issued an order of notice returnable July 18 and the Boston & Maine meeting was adjourned until July 27.

Mr. Codman filed his suit after Supreme Court Justice Crosby had denied his previous petition for an injunction to prevent a declaration of the vote cast at the Boston & Maine meeting in May on 222,000 shares of stock held by the New York, New Haven & Hartford. These shares are in the custody of trustees appointed by the United States Circuit Court for the Southern District of New York. Under the order of that court the trustees were directed to vote for six directors nominated by the New Haven Road.

BOSTON & MAINE.—*Equipment Trust Authorized.*—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability in respect of $1,815,000 of equipment trust certificates to be issued by the First National Bank of Boston and sold at not less than 98.42.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*Payment for Stock.*—See New York Central.

CLINTON & OKLAHOMA WESTERN.—*Authorized to Issue Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $500,000 of first mortgage 6 per cent gold bonds and $400,000 of second mortgage 5 per cent gold bonds to be exchanged at a par for $900,000 of first mortgage 5 per cent gold bonds now outstanding.

DAYTON, TOLEDO & CHICAGO.—*To Be Sold.*—W. H. Ogborn, receiver, pursuant to a court order, will offer this road for sale at public auction on August 24, 1922, at the court house in Troy, Ohio. The sale will include the 90 miles of main track between Stillwater Junction, Ohio, and Delphos, 12 miles of side track, one locomotive, two coaches, one baggage car, right-of-way, real estate and all other properties incident to and connected with the operation of the line.

DULUTH & IRON RANGE.—*Annual Report.*—The income account for the year ended December 31, 1921, compares as follows:

	1921	*1920
Operating revenue	$4,972,513	$10,781,71
Gross income	5,348,710	11,471,821
Operating expenses	4,369,544	5,695,087
Railway tax accruals	298,852	1,159,239
Interest on funded debt	407,550	407,550
Total deductions	5,204,034	8,721,492
Net income	144,676	2,750,329
Income applied to sinking and other reserve funds	.....	1,254,447
Balance to profit and loss	144,676	1,495,882

*Does not include federal income for months of January and February.

EASTLAND, WICHITA FALLS & GULF.—*Authorized to Issue Securities.*—The Interstate Commerce Commission has authorized the issuance of $556,000 of common stock and $350,000 of first mortgage bonds to be delivered to John Ringling in payment for advances.

IONIA, JI[illegible] & CLOVERVILLE.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell $550,000 of 4½ per cent 50-year first and [illegible]dated general refunding mortgage bonds.

GULF, MOBILE & NORTHERN.—*Authorized to Abandon Line.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of 3.4 miles of this company's McLain branch north of Pryor, Miss.

KNOXVILLE & CAROLINA.—*Authorized to Issue Securities.*—This company has been authorized by the Interstate Commerce Commission to issue at par $200,200 of common stock and $132,000 of first mortgage bonds to be used to pay for the railroad property acquired from L. C. Gunter, formerly the Knoxville, Sevierville & Eastern.

LOUISIANA & NORTHWEST.—*Initial Dividend.*—The directors have placed the stock on a 6 per cent annual basis by declaring an initial dividend of $1.50 a share, payable October 1, for the quarter ending September 30, 1922.

MEMPHIS, DALLAS & GULF.—*Authorized to Abandon Line.*—The Interstate Commerce Commission has issued a certificate authorizing the receiver to abandon as to interstate and foreign commerce its lines from Glenwood to Hot Springs, Ark., 35.3 miles; Graysonia to Leard, Ark., 5.49 miles; and from Daleville to Clark's Mill, Ark., 10.64 miles.

MISSOURI, KANSAS & TEXAS.—*Cash Installment on Deposited Stock.*—J. & W. Seligman & Co. and Hallgarten & Co., reorganization managers, announce that a cash instalment of $5 a share on the common stock and $4 a share on the preferred was payable July 18 on stock deposited with the Equitable Trust Company of New York.

Bond Readjustment.—See Sherman, Shreveport & Southern.

MUSCATINE, BURLINGTON & SOUTHERN.—*To Foreclose.*—Foreclosure proceedings to collect $517,800, brought by the Continental & Commercial Trust & Savings bank, Chicago, against the Muscatine, Burlington & Southern, were heard in the Federal District Court at Muscatine on July 13. It is expected that this road, which operates between Muscatine, Iowa, and Burlington, 54 miles, and is now in the hands of a receiver, will be ordered sold by the court eventually. There are rumors that the Minneapolis & St. Louis, the Chicago, Milwaukee & St. Paul or the Chicago, Burlington & Quincy might seek to annex the property.

NEW YORK CENTRAL.—*Authorized to Issue Stock.*—The Interstate Commerce Commission has authorized an issue of $23,478,880 of stock to be used in payment for common and preferred stock of the Cleveland, Cincinnati, Chicago & St. Louis. The order calls attention to the fact that the Big Four is included in the New York Central System in the grouping of roads under the tentative plan for consolidation promulgated by the commission and that it is represented that the proposed acquisition of stock of the Big Four will be in aid of such consolidation.

NORTHERN PACIFIC.—*Bond Offering.*—J. P. Morgan & Co., the First National Bank and the National City Company are offering this morning an issue of $8,702,300 refunding and improvement mortgage 5 per cent bonds, series "C," dated January 1, 1922, and due July 1, 2047, at 96 and interest to yield 5.20 per cent. The bonds are callable at 105 after 1952. The proceeds will be used to pay off the outstanding Northern Pacific-Great Northern joint 6½s, which were not exchanged.

OCALA & SOUTHWESTERN.—*Asks Authority to Abandon Line.*—This company has applied to the Interstate Commerce Commission for a certificate authorizing the abandonment of its line from Ocala to Ray, Fla., 6 miles.

PENNSYLVANIA.—*Lease of Panhandle.*—See article on another page entitled "Lease of Panhandle by Pennsylvania Authorized Conditionally."

PITTSBURGH, CINCINNATI, CHICAGO & ST. LOUIS.—*Pennsylvania's Lease.*—See article on another page entitled "Lease of Panhandle by Pennsylvania Authorized Conditionally."

SEABOARD AIR LINE.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to enter into an equipment trust agreement with the

Chase National Bank for the issuance of $2,450,000 of 6 per cent equipment trust certificates under the Philadelphia plan for the acquisition of 1,000 new freight cars and 4 dining cars and 1,000 rebuilt box cars. The certificates have been sold to Freeman & Co. at 97.02

SHERMAN, SHREVEPORT & SOUTHERN.—*Readjustment of Bonds.*—A plan and agreement of readjustment of the 50-year first mortgage 5 per cent gold bonds, guaranteed by the Missouri, Kansas & Texas, has been prepared by the protective committee of these bonds, according to an announcement by R. Walter Leigh, Chairman. Mr. Leigh has sent a notice to all holders of certificates of deposit of the Columbia Trust Company, issued under the deposit agreement of February 15, 1916, stating that they shall be assumed to have assented to and ratified the plan unless within twenty days after July 19 1922, the date of first publication of the announcement, they shall dissent and withdraw the bonds represented from the deposit agreement. Holders of undeposited bonds who do not deposit shall have no right, the notice states, to participate in the plan of readjustment.

ST. LOUIS-SAN FRANCISCO.—*Six Months Guaranty Certified.*—The Interstate Commerce Commission has issued a final certificate placing the amount of this company's guaranty for the six months period of 1920 at $5,385,449, of which $835,449 was still to be paid and that of the St. Louis, San Francisco & Texas at $314,967 of which $114,967 was to be paid.

RUTLAND.—*Asks Authority to Discontinue Operation of Line.*—This company has applied to the Interstate Commerce Commission for authority to discontinue operation between the Vermont shore of Lake Champlain and Fort Ticonderoga, N. Y.

TOLEDO TERMINAL.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $321,000 of first mortgage bonds at 91.78 for the purpose of liquidating $294,613.80 of demand notes payable to proprietary companies.

YAZOO & MISSISSIPPI VALLEY.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $5,034,000 of 5 per cent gold improvement mortgage bonds to be delivered to the Illinois Central at par in payment of advances for additions and betterments.

Dividends Declared

Cuba Railroad.—Preferred, $3, semi-annually, payable August 15 to holders of record July 20; $3, semi-annually, payable February 15, 1923, to holders of record July 20.

Louisiana & Northwest.—$1.50, quarterly, payable October 1, to the quarter ending September 30.

Trend of Railway Stock and Bonds Prices

	July 18	Last Week	Last Year
Average price of 20 representative railway stocks	67.65	67.25	55.37
Average price of 20 representative railway bonds	87.78	87.02	74.42

The Erie Triplex on the Susquehanna Grade

Railway Officers

Executive

Morris K. Trumbull, formerly assistant chief engineer of the Chicago & Western Indiana and more recently consulting engineer with the American Sugar Refining Co., has been appointed executive assistant to the president of the Canton Railroad Company with headquarters at Baltimore, Md.

Stanton Ennes, whose election to the presidency of the Wheeling & Lake Erie was announced in the *Railway Age* of July 8, page 91, was born on March 19, 1862, at St. Louis, Mo. He began his railroad career on July 10, 1881, on the Texas Pacific. Leaving this road on December 31, 1881, he entered the service of the Southern Pacific as a telegraph operator and was employed in this capacity and later as a brakeman in the service of this company until December 20, 1883. On August 9, of the following year he entered the service of the Missouri Pacific as a telegraph operator and consecutively from that time he was engaged as a telegraph operator, until May 15, 1886, as a train dispatcher until June 1, 1893, and as chief dispatcher until July 1, 1902, on which last date he was promoted to division superintendent with headquarters at Nevada, Mo. He left the Missouri Pacific in April, 1904, and consecutively thereafter was superintendent on the Western Maryland until September, 1905; assistant superintendent on the Grand Trunk at Ottawa, Ont., from January 15, 1906, to April 1, 1907; and superintendent on the Great Northern from the latter date until 1915, when he re-entered the service of the Western Maryland as general manager. During federal control he was transferred to the Baltimore & Ohio and served as general manager of the lines of this road from Cumberland, W. Va., to the Atlantic coast after March 1, 1920. He continued as general manager of the Eastern Lines of the Baltimore & Ohio until January 1, 1921, when he was elected vice-president and general manager of the Wheeling and Lake Erie, which position he held at the time of his recent promotion.

S. Ennes

Financial, Legal and Accounting

G. E. B. Welles has been appointed to the newly created position of supervisor of land valuation of the Southern Pacific, Pacific system, with headquarters at San Francisco.

F. J. Goebel, assistant counsel of the Cincinnati, Indianapolis & Western, with headquarters at Indianapolis, Ind., has been appointed general attorney which position he will hold in addition to serving as secretary of that road.

J. Welch, assistant comptroller of the Chicago, Milwaukee & St. Paul with headquarters at Chicago, has been promoted to assistant secretary and treasurer with headquarters at New York. He will be succeeded by **T. I. Walsh**, assistant auditor of expenditure with headquarters at Chicago.

George D. Hill, statistician in the operating department of the Seaboard Air Line, has been appointed traveling auditor of joint facility accounts, with headquarters at Portsmouth,

Va. The office of statistician has been abolished, the work being transferred to the accounting department.

Operating

E. E. Peterson has been elected secretary and general manager of the Lakeside & Marblehead with headquarters at Cleveland, Ohio, succeeding A. B. Mack, resigned.

A. W. Flanagan has been appointed assistant superintendent of telegraph of the Southern Pacific, Pacific System, and of the Western Union Telegraph Company, with headquarters at San Francisco, Cal.

George Hodge, whose appointment to assistant general manager, Eastern lines, of the Canadian Pacific was announced in the *Railway Age* of July 8, page 91, was born in October, 1874. In March, 1890, he entered the service of the Canadian Pacific as a clerk in the general passenger department at Montreal. In August, 1890, he became a clerk in the office of the assistant to the president. Two years later he was promoted to secretary to the vice-president and, in 1897, became chief clerk to the vice-president. In March, 1907, he was promoted to superintendent of terminals at Montreal and, in March, 1911, was transferred in a similar capacity to London, Ont. A year later he was appointed general superintendent with headquarters at Montreal and in June, 1915, was appointed assistant to the general manager, Eastern lines, with headquarters at Montreal. In October, 1918, he became assistant to the vice-president which position he was holding at the time of his recent appointment.

G. Hodge

Alfred Price, whose retirement from the general managership of the Canadian Pacific, Eastern lines, for an indefinite period at the advise of physicians was announced in the *Railway Age* of July 8, page 91, was born in Toronto, Ont., on December 6, 1861, and was educated in the public schools and the School of Practical Science, Toronto. He entered business as a messenger for the Montreal Telegraph Company, at the Toronto office in 1875. On September 3, 1879, he joined the service of the Ontario Credit Valley Railway as a telegraph operator and clerk. In 1881 he took charge of the car accounting and records department of the company and in July, 1882, was promoted to dispatcher. In July, 1888, he became car distributor and in May, 1896, assumed the duties of chief dispatcher. Mr. Price was in August, 1898, appointed superintendent of the Toronto terminals of the Canadian Pacific. In May, 1903, he became superintendent of the Fort William terminals and in August, 1904, was promoted to superintendent of transportation with headquarters at Winnipeg. Three years later he was promoted to general superintendent with the same headquarters and in December, 1907, was transferred in a similar capacity to Calgary, Alta. In 1913 he became assistant general manager, Eastern lines, with headquarters at Montreal and in October 1918, was promoted to general manager, Eastern lines.

A. D. Price

John J. Scully, whose appointment as general manager, Eastern lines, of the Canadian Pacific was announced in the *Railway Age* of July 8, page 91, was born on February 3, 1872. On January 4, 1887, he joined the service of the Canadian Pacific as office boy in the offices of the car accountant at Montreal. He successively filled the following positions: February, 1888, clerk in the car account's office, Montreal; June, 1888, clerk to the assistant superintendent at Farnham, Quebec; August, 1890, clerk in the office of the superintendent at Montreal; April, 1891, clerk to the assistant superintendent at Farnham; March, 1893, clerk in the mechanical department at Montreal; September, 1894, clerk in the mechanical department at Toronto Junction. In March, 1898, he was appointed assistant to the master mechanic at Toronto Junction and in August, 1901, he was transferred in a similar capacity to Winnipeg. In August, 1902, he became chief clerk in the general superintendent's office at Winnipeg. He was appointed assistant superintendent of the Western division in June, 1903, and in July, 1903, chief clerk to the assistant manager at Winnipeg. In April, 1904, he became assistant superintendent at Brandon, Man., and three months later was appointed superintendent at Brandon, Man. In November, 1906, he was transferred to Kenora, Ont., and in May, 1910, became superintendent of the Western division. He was promoted to general superintendent of the Saskatchewan district in July, 1910, and in April, 1912, was transferred to the Algoma district, North Bay, Ont., where he was serving at the time of his recent promotion.

J. J. Scully

H. C. Koch has been appointed general superintendent of the New Orleans, Natalbany & Western with headquarters at Natalbany, La., to succeed O. C. Pantall and the office of superintendent has been abolished.

C. J. Brown, trainmaster of the Chester district of the Missouri Pacific, has been appointed acting superintendent of the Illinois division, to succeed **O. E. Coyne**, granted leave of absence due to ill health. **E. E. Buckminister** has been appointed acting trainmaster of the Chester district.

Mechanical

M. Meehan has been appointed master car repairer of the Western division of the Southern Pacific, Pacific system, with headquarters at West Oakland, California, to succeed **H. Englebright**, retired.

Engineering, Maintenance of Way and Signaling

C. F. Hinchman, engineer maintenance of way of the Indianapolis terminals of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Indianapolis, Ind., has had his jurisdiction extended over the Springfield division, from Springfield, Ohio, to Indianapolis, with the title of engineer maintenance of way, Springfield division and Indianapolis terminal, with the same headquarters.

Traffic

N. C. Osborn has been appointed commercial agent of the Seaboard Air Line with headquarters at Memphis, Tenn.,

succeeding D. W. Anderson, effective August 1. **B. F. Black** has been appointed general eastern freight agent with headquarters at New York, N. Y., succeeding N. C. Osborn and **D. W. Anderson** has been appointed commercial agent with headquarters at New York, N. Y., succeeding Mr. Black.

R. G. Nicholson, chief clerk in the general freight office of the Atchison, Topeka & Santa Fe at Chicago, has been promoted to assistant general freight agent, with headquarters at Chicago, to succeed J. H. McCabe, promoted. Mr. Nicholson was born on October 10, 1882, at Milwaukee, Wis. He entered the service of the Wisconsin Central (now a part of the Minneapolis, St. Paul & Sault Ste. Marie) in October, 1898, as a clerk, which position he held until 1900 when he left to become a stenographer and clerk for the Atchison, Topeka & Santa Fe. He left in 1902 to engage in other business and in 1905 he re-entered the employ of the Atchison, Topeka & Santa Fe as a clerk in the traffic office at Milwaukee, Wis., and was soon transferred to the Chicago office. He was promoted to claim clerk in the freight department at Chicago in 1907 and served successively as rate clerk, chief rate clerk, assistant chief clerk and chief clerk in the same department, which latter position he was holding at the time of his recent promotion.

R. G. Nicholson

C. C. Dana, general freight agent of the Atchison, Topeka & Santa Fe, with headquarters at Chicago, has been promoted to assistant freight traffic manager with the same headquarters, to succeed F. A. Manter, deceased. Mr. Dana was born on August 17, 1868, at Morrisville, N. Y., and after graduating from Princeton University in 1891, entered railway service as a clerk in the general manager's office of the Atchison, Topeka & Santa Fe at Topeka, Kan. He was later employed as a clerk in the local office at Topeka, which position he held until 1895, when he left to become material agent of the Cerrillos Coal Railroad Company at Los Cerrillos, N. M. He returned to the Atchison, Topeka & Santa Fe in March, 1895, as assistant chief clerk in the assistant superintendent's office at Fort Madison, Iowa, and on December 31, 1897, he was promoted to agent at Pekin, Ill. From January, 1898, to June, 1913, he was successively traveling freight agent with headquarters at Streator, Ill., and division freight agent with headquarters at Fort Madison, Iowa. On the latter date he was promoted to industrial agent with headquarters at Chicago, which position he held until July 1, 1916, when he was promoted to general freight and passenger agent of the Panhandle & Santa Fe and assistant general freight agent of the Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex. He held these positions until July 14, 1920, with the exception of the period from October 1, 1918, to April 15, 1919, when he was assigned to the U. S. R. A. at Washington, D. C. to act as personal assistant to Edward Chambers, director of the division of traffic. On July 15, 1920, he was appointed general freight agent of the Atchison, Topeka & Santa Fe, with headquarters at Chicago, which position he was holding at the time of his recent promotion.

C. C. Dana

J. H. McCabe, assistant general freight agent of the Atchison, Topeka & Santa Fe with headquarters at Chicago, has been promoted to general freight agent with the same headquarters, succeeding C. C. Dana, promoted. Mr. McCabe was born on November 20, 1873, at Washington, D. C., and entered railway service in February, 1887, as an office boy in the auditing department of the Atchison, Topeka & Santa Fe at Chicago. He has been in service of that company continuously since the latter date, as a clerk in the local office from 1891 to 1898, a clerk in the refrigerator department from 1898 to 1900, and a clerk in the general freight department from 1900 to 1913. In the latter year he was promoted to chief clerk in the general freight department, and on March 1, 1920, he was appointed assistant general freight agent, which position he was holding at the time of his recent promotion.

J. H. McCabe

Purchasing and Stores

A. H. Laret, whose appointment as assistant to the vice-president and chief purchasing officer of the St. Louis-San Francisco was noted in the *Railway Age* of June 17, page 1514, was born on October 11, 1890, at Pittsburg, Kan. He entered railway service in 1906 as a stenographer in the local freight agent's office of the St. Louis-San Francisco at Pittsburg, Kan. He was employed as a stenographer in the general storekeeper's office of the Kansas City Southern from January, 1907, to August, 1909, and as a stenographer in the stores department of the Atchison, Topeka & Santa Fe from August, 1909, to December, 1910. He was then promoted to secretary to general storekeeper of the latter road. He re-entered the service of the St. Louis-San Francisco on November 15, 1913, as secretary to the chief purchasing officer. In April, 1914, he was promoted to assistant chief clerk, and in August, 1915, to chief clerk, which latter position he held until the period of federal control when he acted as assistant chief clerk to purchasing agent of the St. Louis-San Francisco and the Missouri, Kansas & Texas. At the close of federal control on March 1, 1920, he was appointed chief clerk to the vice-president and chief purchasing officer of the St. Louis-San Francisco, remaining in that capacity until June 1, 1922, when he was promoted to his present position.

A. H. Laret

EDITORIAL

Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

A New Way to Advertise

The Northern Pacific has found a new way to advertise the scenic attractions along its route and hereafter the slogan of its publicity department will be "Say It with Pictures." Beginning last week, actual photographs, each showing some point of beauty on that road, were substituted for the ordinary printed menus on its dining cars. Patrons will be permitted to retain these photographs as souvenirs, and to increase their value as such, no advertising has been added to mar the face of the picture, the meal items being printed on the reverse side. This seems to be a step forward in the art of railway advertising, for no words can describe the garden spots of this country as well as a clear photograph. It is reasonable to expect, as the Northern Pacific does, that this advertising will prove to be an excellent means of developing travel, for the photographs will find a wide distribution in homes and offices throughout the country.

A Duty and an Opportunity

While foremen and the rank and file of railway forces are in many instances excluded from participation in any work of the departments now affected by the strike, it is commonly expected that the subordinate officers shall willingly assume any duties that the requirements of the hour demand of them. This is as it should be. These men and their superiors, taken collectively, constitute the management of the railroad, and as a part of it each man should do his share to insure the continuity of transportation service. While such duties have their disagreeable aspects and may take men away from their regular work to its obvious detriment, the emergency employment which the present condition imposes on them affords an opportunity for acquiring a knowledge beyond the scope of their regular employment which is bound to accrue to their benefit. As the railroad man is advanced in his department to positions of increasing responsibility, he soon finds that his progress is governed in considerable measure by the extent of his knowledge concerning railway matters outside his own regular work. Therefore, any opportunities afforded him for obtaining a broader grasp of railway transportation should be seized with enthusiasm.

Hauling Unnecessary Dead Weight

A choice from a number of designs of rail motor cars is now offered to railroad officers. A study of these cars brings out one point with the greatest clearness; namely, that those responsible for their design strongly realize the importance of holding the dead weight to the lowest possible amount consistent with strength. One of the latest designs of such equipment consists of a motor car with a baggage compartment which weighs 782 lb. per passenger seat, together with a trailer which weighs 275 lb. per passenger seat. The two cars combined have a seating capacity for 56 passengers in addition to baggage and weigh only 478 lb. per passenger. Other designs of motor cars weigh from 600 lb. to 700 lb. per passenger seat. The operating economies claimed for gasoline driven rail motor cars depend to a considerable extent on keeping the dead weight down to a minimum. The contrast between the weight of such cars and the usual passenger coach is striking. Modern steel day coaches rarely weigh less than 1,500 lb. and frequently 2,000 lb. per passenger while sleeping cars run as high as 7,000 lb. per berth. There would appear to be possibilities of some real reductions in railway operating costs by a somewhat greater attention to passenger car design and an elimination of all unnecessary dead weight.

The Unions' Interest in Efficiency

Various methods have been adopted by the railroads from time to time in the effort to get suggestions from employees as to improving efficiency and safety of operation. Many attempts also have been made to educate employees for advancement, but this only to a limited extent in the operating department. None of these trials has been successful in great enough degree to attract general attention. One method by which the desired results might be obtained seems to have been given but scant chance to prove its merits. That is an out-and-out bid to the unions for their co-operation. Cars, locomotives, yards, signal plants—these are the tools with which operating department employees work. That the men have some degree of interest in these tools and the regulations under which they are used is self evident. Notwithstanding this, it has been difficult to get them to express their opinions when appealed to as individuals. Why not call in the local officers of the unions affected and ask them to find the sentiment of their men regarding proposed changes in facilities or methods? Is it not reasonable to suppose that a greater degree of co-operation might be secured than under present methods of appealing directly to the employees as individuals? Almost every magazine published by the operating department unions contains a certain amount of technical material, indicative of some interest in these matters and this in spite of the fact that the railroads have done little if anything to encourage the interest of the unions as such in technical problems. Great economies could doubtless be effected if the interest of operating department employees could be aroused. A general movement of this nature might go far toward bringing about the increased efficiency of labor which alone makes general wage increases possible. More than that, the interest of the worker in securing the greatest efficiency of production is the only solution of the labor problem.

The Economy of Purchasing Electric Power

In view of the increasing use of electricity for power and lighting by the railways and the rapid extension of local utilities companies, it is worth while to investigate whether this power cannot be purchased more economically than it can be generated with railway owned and operated equipment. While the decision in each case must be based on the local conditions existing at that point, it is capable of demonstration that roads can buy electric power for driving shop machinery or lighting large office buildings cheaper than they are now producing the same energy at many points. The

electrical engineer of a southern road said recently that while "the demand for electrical power in our shop has far exceeded the capacity of our boilers and generators, as long as we can buy power from the public utilities company at the present rate we cannot justify an expenditure for further additions to our generating plant, for investments in other improvements will pay a much higher return." This condition is not due to any lack of skill on the part of the railway engineering forces but rather to the fact that the public utilities companies operate large and efficient generating units and their load factor is more nearly constant during the 24 hours of the day. Where they have large evening lighting demands, they can offer attractive power rates during the day in order to keep the machines on a constant load. While it is true that up to a certain capacity exhaust steam can be used economically for heating buildings, this capacity is exceeded in many cases. Furthermore the heating of buildings is necessary during less than half of the year, although in some cases it is possible that money can be saved by buying power only during certain months of the year. Of course, there are many well engineered and efficiently operated power plants in the large railroad shops of this country but there are as many or more that are losing money, if all operating and overhead charges are considered. After extensive engineering studies the 5,000 kilo-watt connected load to be used in and about the new union station in Chicago is to be furnished under contract by a public utility company at such a low rate that a power plant for even this large load was not considered a profitable investment. If such a condition prevails here it would seem advisable for railroads to make a similar study of many of their smaller projects.

Graduated Wage Rates for Foremen

The principle of regulating wages through the agency of a national authority, which was first exercised by the Railway Wage Commission of the United States Railroad Administration and subsequently perpetuated by the Railroad Labor Board, has had a general leveling effect on the wages of all classes of railway employees. Whatever the effect of this so-called standardization may have been on laborers or craftsmen, it is undeniably unfortunate as applied to foremen. Whereas the railroads formerly maintained differentials in the rates for these men to compensate for variations in degree of responsibility, capacity or service record, the tendency now is to pay all men the established minimum rate without regard to the effect of these influences. The section foremen may properly be taken as an illustration. It is not feasible or desirable to subdivide sections so that each man is accorded exactly the same degree of responsibility. Some of these men have more ability than others and any tendency to reduce these men to a common level by an arrangement that would insure each of them the same degree of responsibility would represent a shameful waste of ability. However, any attempts to recognize difference in capacity without acknowledgment in the form of graded compensation cannot be entirely successful. Men are selected for foremen because they have demonstrated the "will to do" and this characteristic cannot be fostered to the fullest extent unless the men are afforded encouragement through the promise of reward. That the wages of foremen in railway service are now well within reason is evidenced by the findings of the Labor Board in the recent wage reduction for maintenance of way and mechanical department employees. By recognizing these rates as true minimum rates and applying proportionate increases to them for the foremen deserving of special recognition, it should be possible for the railroads to effect a marked improvement in the morale of their subordinate supervisory forces.

When Treating Plants Pay Dividends

In the last few years a very considerable number of water treating plants have been installed on various railroads. These installations were undoubtedly made only after the management was convinced that certain good would come from an investment ranging from a few hundred dollars, perhaps, to a figure in excess of $20,000. Once installed and set in operation, however, it has happened in many cases that little interest has been shown in these installations, other than perhaps to ascertain occasionally if they are operating or to inquire into the seemingly large expense for their maintenance or longer justification for their use. At a time like this when the paramount concern is the getting of trains over the road with a crippled organization, the treating plant is apt to receive little attention either from the roads operating them or such roads as have had the matter of their installation under consideration. As a matter of fact, however, on roads where bad water is encountered, in even small amounts, this is the very time when the treating plant should receive special attention, for by removing scale-forming matter and improving water in other respects, the properly designed and properly operated treating plant at once emerges from a position of relative obscurity to one of much significance as an important factor in getting trains over the road when, regardless of the cost, it is next to impossible to give more than a minimum amount of attention to keeping the rolling stock in repair and operation. On some roads a survey will undoubtedly disclose the fact that a system of treating plants is enabling locomotives to operate without boiler trouble for several days more than they possibly could under raw water conditions and may even disclose the fact that by reason of treating the water, the power can be operated over much longer divisions than it now is. To the same degree that railroads having good water, therefore, can congratulate themselves on their good fortune, railroads having bad water can look with satisfaction upon their earlier foresight in having established treating plants. This is a time when treating plants pay big dividends, by reason of which railroads having them should by all means give close attention to their proper operation.

The Train Control Question

Advocates of train control may be classified under three heads: (1), those favoring a simple automatic stop; (2), those who advocate speed control as the only logical solution of this problem, and (3), those who feel that there is a field for both types, depending upon the service conditions to be met. Regarding the automatic stop, we have on the one hand the railroads, who requested, through A. M. Burt at the hearing before the Commission in March, that prohibitive restrictions should not be placed on the use of the automatic stop by roads wishing to avail themselves of such a device and on the other hand the Commission's decision that the granting of this request would not provide the necessary safeguards. Advocates of speed control contend that the only logical way that train control should be installed is with the speed control feature and good arguments are advanced in support of this contention. Others (and we are among them) feel that there is a field for both types and that the railroads should be allowed some latitude in their selection of devices in line with the Commission's statement that "the degree of control desired by a railroad will depend upon the particular operating and traffic conditions upon its road."

Speed control has proved its case insofar as the control of trains is concerned in dense traffic territory on electrically operated lines with equipment having practically the same

constant in its braking power. We contend, however, that undue weight has been given to the application of speed control to steam line service in open territory with much lighter traffic in the majority of cases, and with varying percentages of braking power depending on the type of train because we believe that the effects of speed control on freight trains have not been demonstrated on a large enough scale and over an extensive enough territory to determine definitely its effects in this service. We agree that speed control applied to passenger equipment should operate satisfactorily, but freight service must also be considered.

The control of long freight trains, particularly on long descending grades, is a matter which requires the exercise of sound judgment. In the exercise of this judgment many times there is little latitude between what constitutes success and what constitutes failure, which generally means disaster. Under the cycling system of brake operation with alternate high and low speeds on long descending grades it is as yet an open question whether the operation of an automatic speed control is not likely to create a hazard greater than that which it is intended to remove? Can it be applied to drag freight trains under all conditions without increasing the chances of wrecks and damage due to break-in-twos? If it is impracticable in one class of freight service can it be made applicable in any other without completely equipping all locomotives? Are any of these questions as yet answerable on the basis of experience under service conditions?

Train control, we believe, if properly applied, will materially assist in train operation as well as promote safety. However, as only one type of automatic train stop or train control has proved itself, viz., the intermittent contact type, train control as respects the induction, the continuous and the wireless types is still in the experimental stage. Consequently we have contended that the order of the Commission was drastic and that much greater good would have been accomplished if arrangements had been made for eight or ten roads to make installations of various types on a sufficiently extensive scale to furnish comparative data as to the operating results of speed control in comparison with the intermittent contact type. The roads then would be in a better position to determine which types of control meet their operating conditions most satisfactorily.

Union Leaders' Concessions Show Strike Was Without Cause

B. M. Jewell and other leaders of the shop crafts unions now admit that they had no good reason for ordering the shop employees' strike. They do not do this in specific language but by stating the terms on which they are now willing to call the strike off.

They indicate that they are willing to accept the wages and working conditions fixed by the Railroad Labor Board, provided they shall be given rehearings regarding these matters. But they knew when they ordered the strike that the Labor Board was functioning daily and that they could always get hearings by it regarding any controversy with the railways. All they had to do to get further hearings was to go to work under the wages and rules awarded by the Board, get conferences with the railways regarding proposed new wages and working conditions and thus start a controversy within the meaning of the law. The Board would then have had to give them hearings even if there never had been any strike.

Another condition they make for calling off the strike is that the railways shall agree to abolish the system of contracting out work. But all the railways except two promised to do this before the strike order went into effect.

Another condition they make is that the railways shall agree to the establishment of a national board of adjustment. They knew when they ordered the strike and know now that most of the railways will never agree to this, although many of them are willing to establish regional boards of adjustment. The question of a national board of adjustment really was dragged in after the strike order was issued and had no actual part in causing it to be issued.

The labor leaders also demand as a condition of calling off the strike that all strikers shall be taken back to work with their full seniority rights. This the railways refuse to do. Recent developments have made clear the seniority issue for some days has presented the only real and substantial obstacle to the termination of the strike. This fact conclusively demonstrates that there never was any good reason for ordering the strike. Of course the issue of seniority rights arose only because the strike occurred, and after it occurred. Since the labor unions are willing to yield on every issue that existed before the strike began, it necessarily follows that no issue existed before the strike began that was sufficient to justify its being begun.

A large part of the public apparently does not fully understand why the railways are standing so firm on this question of seniority in spite of the fact that their stand obviously is protracting the strike. There are three main reasons:

First, the men who stayed at work and those who have since gone to work have been promised steady employment by the railways. On many railways if the strikers should be taken back with their full seniority rights it would be impossible to retain in the service even at present a large number of the men who are now at work. Furthermore, in periods of business depression when it is necessary to reduce forces, the men with the highest seniority rights are able to stay at work while those who come last on the seniority list are laid off. Therefore, to take the strikers back with their full seniority rights would be to condemn a large part of the men who are now at work to relative irregularity of employment, or to complete loss of their jobs. This would be unjust to these men and would involve violation by the railways of the promises they have made to them. It would also involve disregard of promises to protect them which were made by President Harding in his proclamation, and by the Board in the resolutions that were adopted when the strike began.

Second, it is not improbable that there will be future strikes on the railways either in the absence or in disregard of decisions rendered by the Labor Board, and if the men who have worked during this strike are not protected fewer men will be willing to work during future strikes, thereby increasing the difficulty of preventing interruptions of transportation.

Third, the labor leaders have indicated that they will "discipline" their members who have stayed at or returned to work during the strike. This doubtless means that they will throw them out of the unions and make their work as disagreeable as possible in future wherever they work among members of the unions. If these men are not to be protected by the railways in the settlement of the question of seniority and at the same time are to be "disciplined" by their unions, their punishment for having stayed loyally at work when not only the railways but the government of the United States, through the President and the Railroad Labor Board, asked them to do so will be severe indeed.

It is very unfortunate that the strike is being protracted because of inability to settle an issue which was not involved in the controversy which caused the strike, but it is a natural and indeed inevitable result of the calling of the strike without any justification. In the circumstances it is plain if the railways should lose, why this would make strikes more probable and numerous in the future. If, on the other hand, they win, and they are gaining ground every day, the outcome will greatly increase the probability of peaceful settlements in future. Certainly this is what the public and the railways desire, and what railway employees, in their own interests, ought to desire.

Letters to the Editor

[*The* Railway Age *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.*]

Speed Control vs. Automatic Stop

Chicago.

To the Editor:

I have read with considerable care the editorial appearing on page 51 of the *Railway Age* of July 8, entitled "Permissive Features Omitted from Automatic Stop Specifications." This editorial is not at all in line with the facts, as I understand them, either as to the omission of the permissive feature or as to speed control. Certainly the statement of the editor that the use of speed control in connection with train control "may be compared to a contractor trying to erect a building by attempting to construct the top floors first," is incorrect to say the least; because obviously such construction is impossible while the use of speed control is not only practicable but it is, in fact, comparable to the foundation of a building upon which the entire structure is erected.

It is a well known fact that before a train can stop it must be slowed down. Where, then, in the movement of a train should the reduction of speed be made if not when approaching a stop signal? How can we insure that a train will approach a stop signal prepared to stop, other than by the use of speed control? How can safety be assured for a train passing a stop signal and running into an occupied block other than by prescribed low speed control? How can safety with dispatch be obtained by means other than speed control?

The successful solution of the problem of automatic train control in connection with railway operation must take into account trains of varying tonnage and varying speeds, areas of thin and areas of thick traffic density, gradients and curves, railroad crossings and junctions at grade, etc. A train moving slowly, particularly a heavy tonnage train moving slowly, should not be affected or restricted as to speed when passing a caution signal nor should such a train be restricted as to speed, so long as it approaches the stop signal prepared to stop.

The same rule holds true for a train of light tonnage moving slowly. Certainly all trains moving at high speed should be reduced as to speed, so that they will stop within safe limits.

It must be apparent that without automatic speed control either one of two objectionable conditions will be present: (a) An automatic stop located a sufficient distance from the stop signal to insure that the highest speed train, under steam, will be brought to a stop before passing the stop signal. (b) An overlap of sufficient length to insure that the highest speed train will stop within the overlap limits. (c) A combination embracing (a) and (b). The objection to such an arrangement is obvious. With reference to (a): Slow moving heavy tonnage trains would receive an automatic stop more than a mile from the stop signal, thus not only causing unnecessary stops but when the vision of the engineman is obscured as by rain, snow and fog, such a stop would leave him entirely uninformed as to conditions ahead and of necessity, in addition to the loss of time due to such an unnecessary stop, considerable additional time would be lost in approaching the stop signal. Precisely the same conditions are true of any train even when moving slowly and under complete control of the engineman. (b) An overlap is not practicable at all locations as at an interlocking plant at a crossing or junction where derails are adjacent to signals so that it is impossible to establish uniform operation with satisfactory results when (a) and (b) are considered.

Automatic speed control is necessary to successful operation and to make the train control system consistent with signal indications; it is necessary to provide sufficient flexibility to meet the varying demands of traffic. Why put a two-way train control system on a three-position signal system or a signal system carrying the three standard signal indications as proceed, proceed with caution, and stop? Speed control is necessary to insure that the train will conform with the indication of the caution signal and to avoid unnecessary delays when a train is running at a safe speed.

By a proper application of automatic train control, including speed control, trains may be kept moving safely and maximum capacity of the track will be secured. Automatic speed control may be applied to provide protection wherever conditions necessitate reduced speed.

Automatic speed control may be so provided that when the engineman is on the alert, the necessity of stopping a train at a permissive stop signal will be eliminated since the speed of the train may be restricted automatically to that predetermined for an occupied block.

It is evident that any train control system, to insure safety and observance of signals, should control the train when danger is immediately impending, hence speed control is necessary when approaching danger. Why permit unlimited speed to be restored when conditions necessitate reduced speed preliminary to a stop? Why provide for a repetition of such an accident as occurred at Porter, Ind.?

Automatic speed control is necessary to insure safe speed when approaching railway crossings or junctions at grade as an extended overlap cannot be provided at such locations. Obviously it is not good practice to stop a train automatically a considerable distance from a crossing or junction and then remove all speed restrictions in the face of danger.

Now as to paragraph (c) of the requisites of the Interstate Commerce Commission, referred to in your editorial, I believe that the editor is grossly incorrect in his interpretation of this paragraph. The order of the commission as published provides for the following: (a) Automatic stop, after which a train may proceed under low speed restriction until the apparatus is automatically restored to normal or clear condition by reason of the removal of the condition which caused the stop operation. (b) Low speed restriction; automatic brake application under control of the engineman who may, if alert, forestall application at a stop indication point or when entering a danger zone and proceed under the prescribed speed limit, until the apparatus is automatically restored to normal or clear condition by reason of the removal of the conditions which caused the low speed restriction. (c) Medium speed restriction, requiring the speed of a train to be below a prescribed rate when passing a caution signal or when approaching a stop signal or a danger zone, in order to forestall an automatic brake application. (d) Maximum speed restriction, providing for an automatic brake application if the prescribed maximum speed is exceeded at any point.

Under paragraph (c) it is evident that the medium speed restriction is provided so as to forestall automatically an automatic stop when passing a caution signal or in other words, to insure a safe speed when approaching a stop signal or danger zone. Under such conditions the train will receive an automatic stop before passing the stop signal, the stop indication being received a sufficient distance from the stop signal to insure a stop before passing the signal. Where the indicating point is close to the signal a short overlap would be provided at the rear of the signal to insure protection.

J. Beaumont.

The Santa Fe Has Recently Received 2,500 of These Cars

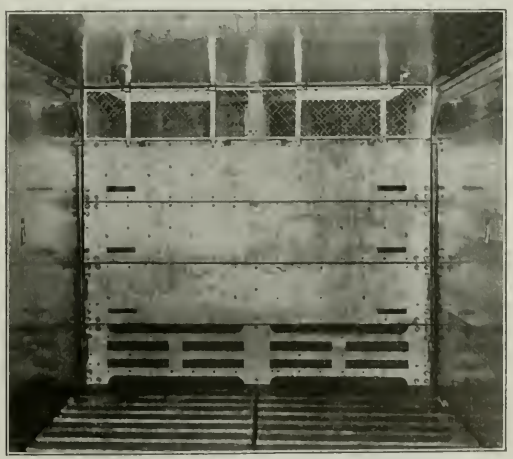
New Designs of Refrigerator Cars for the Santa Fe

Include Two Similar Types, One with Movable, the Other with Stationary Bulkheads

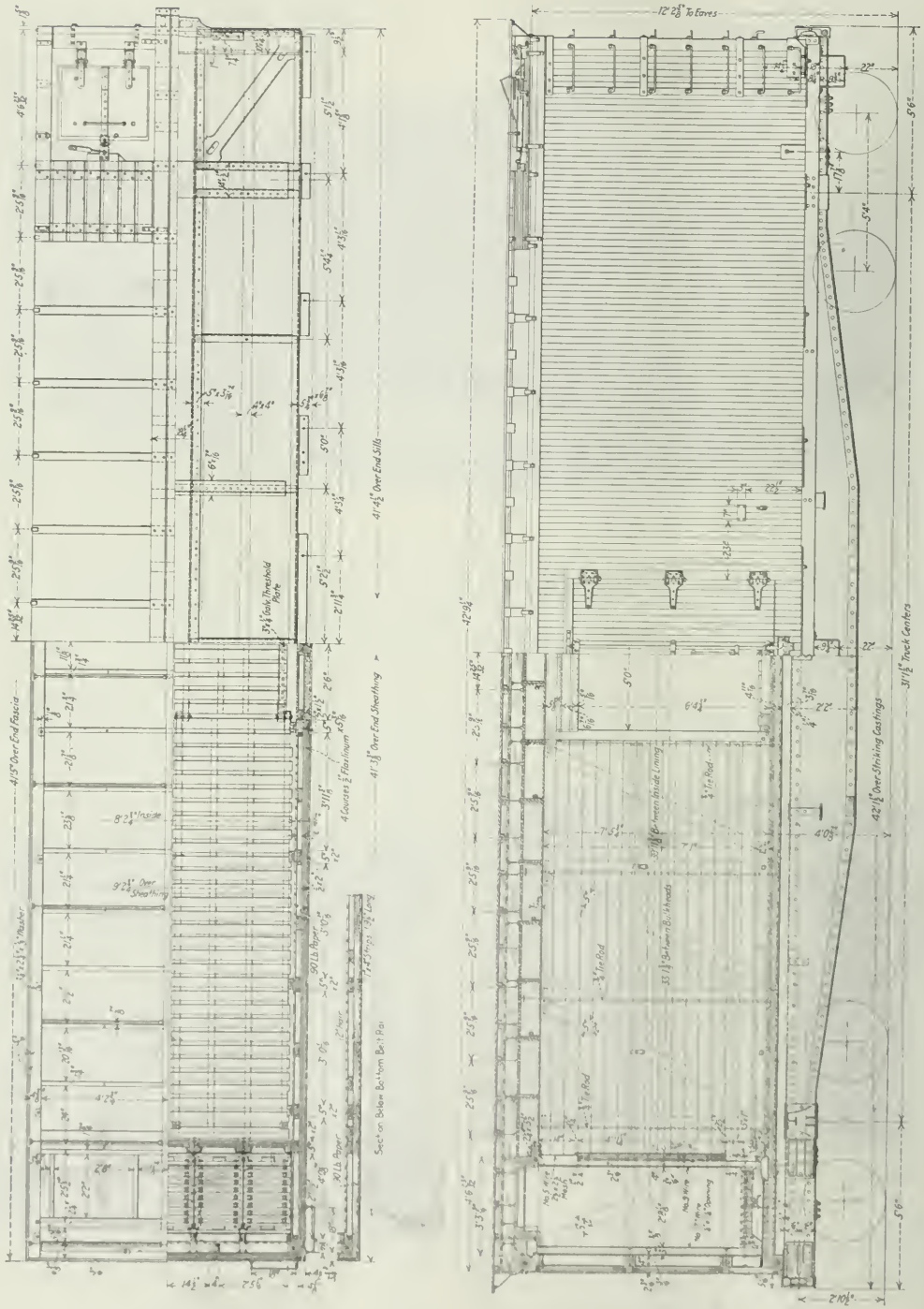
FRESH FRUITS and vegetables form an important part of the eastbound traffic of the Atchison, Topeka & Santa Fe, and to care for this business the road had in service at the end of 1921, 11,751 refrigerator cars. This is approximately 16 per cent of all the freight cars which the company owns. Compared with this is a total of 32,282 box and furniture cars. Since refrigerator cars form a comparatively large proportion of the house cars, the problem of keeping this equipment in revenue-earning service is important, and the road has followed the practice of loading suitable commodities in refrigerator cars for westbound movement. As the traffic is fairly well balanced, there has been comparatively little empty mileage, in fact it has sometimes been necessary to haul empty box cars eastward.

Bulkhead Sections and Floor Racks Raised to Permit Loading Entire Length of Car Body

In 1920 the Santa Fe needed refrigerator cars and in view of the excess of westward traffic at that time, a design with collapsible bunkers was prepared so that the cars could haul perishables eastward and be loaded to full cubical capacity with box car freight westward. Two thousand five hundred of these cars were accordingly built, half by the

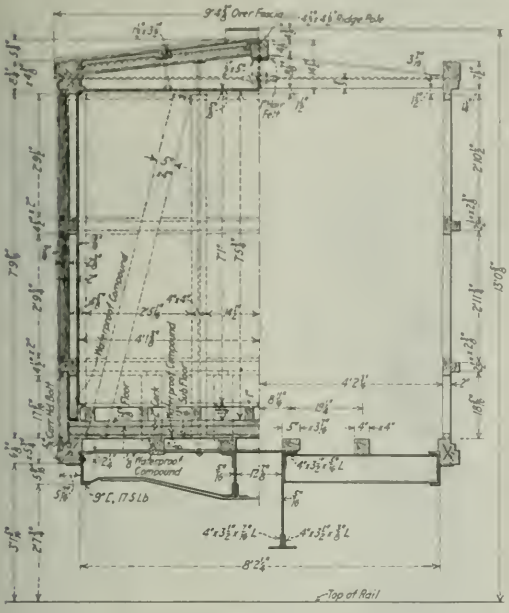


End View with Sectional Bulkhead and Floor Racks Down



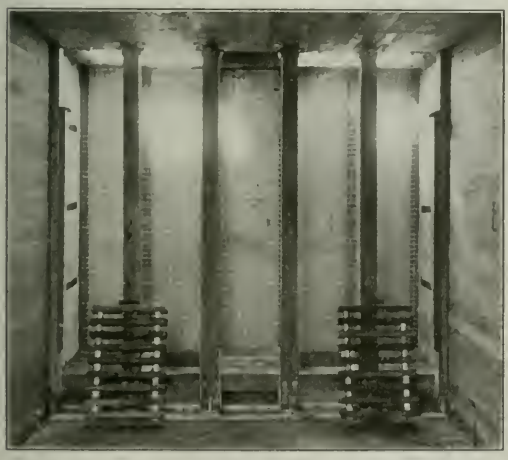
Plan and Elevation of Santa Fe Refrigerator Car with Fixed Bulkheads

American Car & Foundry Company and half by the Haskell & Barker Car Company. In the following year additional refrigerator cars were found to be required. At that time the traffic situation had changed and the box and refrigerator



Sections Through the Car Body

car equipment was adequate to handle the westward movement. The fixed bulkhead was somewhat cheaper and gave a capacity of 1,000 lb. more ice per car and was therefore

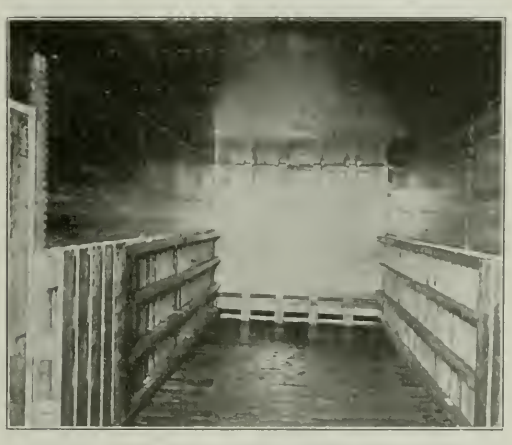


View of Bunker Before Bulkhead Is Applied, Showing Removable Ice Grates

adopted for the later design. An order of 2,500 of these cars, also divided equally between the American Car & Foundry Company and the Haskell & Barker Car Company, has recently been delivered.

Construction of Bunkers and Movable Bulkheads

The movable bulkhead applied to the first order of cars consists of four parts, each built up of 2½-in. boards lined on both sides with No. 20 galvanized sheets. Each section has arched screens on the inside, as shown in the illustration of the bulkhead in the raised position. A movable post is located at the center of the bulkhead to support the sections at that point. The ends of each section of the bulkhead are fitted with trunnions sliding in guides extending up the sides and horizontally just beneath the ceiling. Above the top section and hinged to the ceiling is a screen bound in a channel iron frame. When the screen is down the bulkhead sections are locked, making it impossible to enter the car through the hatches. When it is desired to raise the bulkhead the screen is swung up and secured beneath the ceiling, leaving room for the bulkhead to slide by in the guides to the overhead position. The bulkhead sections when raised are locked in place by gravity catches. The bottom of the bunker is formed by a floor rack hinged to the end so that it can be swung up out of the way when the bulkhead is raised. The back of the ice bunker consists of screens stapled to vertical wooden spacers. A recess is provided between the two center spacers to receive the movable post.



Interior of Car With Stationary Bulkheads; Floor Racks Raised

The sides of the bunker are lined with No. 24 galvanized iron sheets. A locking chain is used to hold the hatch plug down and prevent anyone entering the car through the hatch when the bulkhead is raised. The icebox pans are made of No. 12 galvanized steel with double outlet traps and drains as shown in the drawing.

Stationary Bulkheads

The stationary bulkheads used in the later cars have four intermediate posts, 4 in. by 4 in., and two side posts, 2 in. by 4 in. The tops of the intermediate posts are secured by stirrups, thus avoiding the use of a transverse member which would deflect the air current at the top of the bulkhead and retard circulation. The bottoms of these posts rest on galvanized malleable iron castings which bridge the gutters of the floor pans.

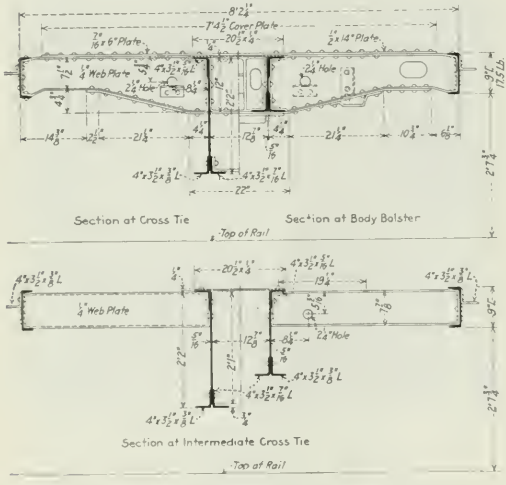
The bulkheads are insulated with two layers of ½-in. Insulite backed by 13/16-in. lining and faced on the outside of the posts by 1-in. shiplapped boards. The inner side of the bulkhead is covered with No. 24 gage galvanized sheets. The top opening of the bulkhead, which is 14 in. high, is covered with a galvanized screen of No. 15 wire, 2½ by

2½ mesh to the inch, and a netting of No. 9 wire with .977-in. openings is applied across the inside of the bulkhead posts. The sides of the iceboxes are covered with No. 20 galvanized sheets without netting. The ends of the cars are lined with No. 28 galvanized sheets. Over these sheets 2½ in. by 3 in. wood spacers are applied which in turn hold the netting of .177-in. wire with 1¼ by 1¼-in. openings.

The ice grates are supported on 4½-in. galvanized tee bars at each of the bulkhead posts and by galvanized angles at the sides of the bunkers. The grates consist of 1½ in. by 4 in. oak pieces rounded on the top, joined with rods and malleable iron spacers. The grates can be raised if it is desired to clean the floor pans and if it is necessary to remove the grates, they can be taken out through the hatches. The outlet traps and drains are of the same type used with the movable bulkhead.

General Design

Aside from the arrangement of ice bunkers, these two orders of cars have other interesting details of construction. Both types have the same general dimensions, the length over striking plates being 42 ft. 1½ in.; the width over eaves 9 ft. 4-⅜ in.; the height from rail to top of running

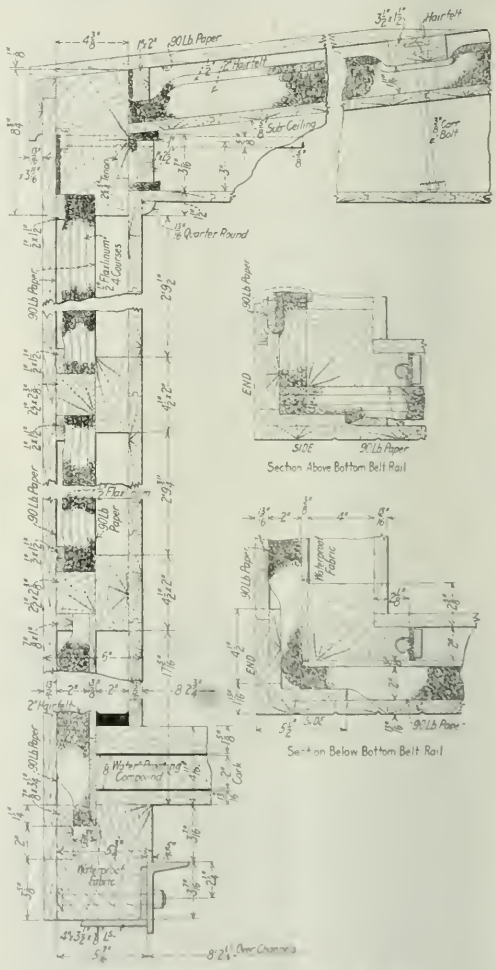


Sections Through the Underframe

board 13 ft. 5⅛ in., and the height inside from floor to ceiling, 7 ft. 5¾ in. The length between inside linings is 39 ft. 11⅜ in., the distance between the stationary bulkheads being 33 ft. 1¾ in. and between the sectional bulkheads 33 ft. 2¼ in. When the movable bulkheads are raised, the inside length of these cars is increased to 39 ft. 2¾ in., thus adding about 370 cu. ft. to the capacity.

The cars have steel underframes with wooden superstructure. The underframe is of the fish-belly centersill type, the depth of these sills at the middle portion of the car being 2 ft. 2¼ in. The web plates are 5/16 in. thick and are reinforced at the top by one 4 in. by 3½ in. by 5/16 in. angle on the outside and at the bottom by one 4 in. by 3½ in. by ⅜ in. angle on the outside and by a 4 in. by 3½ in. by 7/16 in. angle on the inside. The sills are reinforced at the top by a 20½-in. by ¼ in. cover plate extending the entire length of the car. The side sills are 9-in. channels weighing 17½ lb. per ft., and the end sills are of the same section. The body bolsters are of a built-up design with cast center fillers and two side diaphragms pressed from ¼-in. steel plate. The diaphragms are spaced 7½ in. between webs and reinforced at the top and bottom by a 14 in. by ½ in. cover plate. There are two main cross ties, each with a single diaphragm of the same section as used in the body bolsters, reinforced by plates on the top and bottom. The three intermediate cross ties are pressed of ¼-in. plate and are of a channel section 7⅞ in. deep. Six longitudinal stringers of fir support the floor.

The construction of the body framing in general follows the usual practice, one novelty being found in the use of



Sections Showing Insulation in Car Body

turnbuckles in the horizontal tie rods at the carlines. These provide a ready means for tightening the framing at this point should it become loose in service.

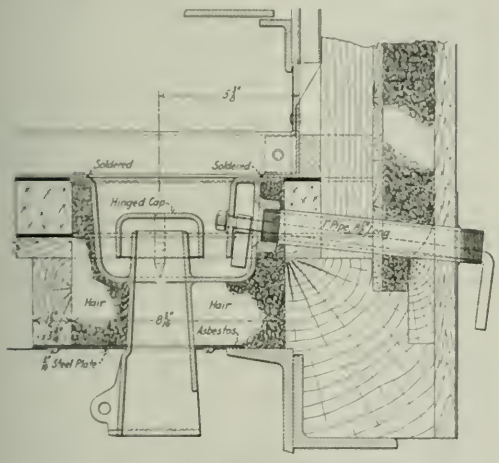
The false flooring which is laid on the floor stringers is 13/16 in. thick. A layer of paper is placed over the false floor and is covered with ⅛ in. of asphaltum. A layer of 2-in. cork board is then laid and is covered with ⅛ in. of asphaltum and one layer of paper before the 1⅝-in. top floor is applied. The floor racks used in both types of cars are the same with supports 3¾ in. high and 1 in. slats.

The sides of the car have 13/16 in. inside lining next to

which is a 2-in. air space. Between the lower belt rail and the side stringers hairfelt insulation is used. A 3/8-in. blind lining is applied which overlaps the floor at the bottom and the lower belt rail at the top. Next to this a layer of waterproof fabric is placed and the hairfelt is then inserted between the fabric and the 13/16-in. outside sheathing. Waterproofing compound is poured between the blind lining and the inside lining to a depth of 3/4 in. over the floor to seal the joints between these parts. Above the lower belt rail the insulation in the sides and ends is made up of four layers of 1/2-in. flaxlinum covered with a layer of paper.

The side of the door opening is 5 ft. 0 in. by 6 ft. 4 3/4 in. The doors are made double with siding on the outside and lining on the inside and with insulation to correspond with that in the sides of the car.

A 5/8-in. blind ceiling is laid over the top of the carlines and hairfelt insulation, held in place by a nailing strip, is applied to cover the joints between the blind ceiling, the lining, the ceiling and the side plate. The 5/8-in. ceiling is then applied under the carlines. The insulation in the ceiling is 2 1/2 in. of hairfelt in one 2-in. and one 1/2-in. layer. The hairfelt is covered with a layer of paper and a 13/16-in. sub-roof is placed over it, supported by the ridge pole and side plate and one intermediate purline. The Standard Railway Equipment Company's outside flexible metal roof, with No. 24 galvanized sheets in the center of the car and No. 20 gage around the hatches is laid over the sub-roof.



Double Outlet Drain and Trap

The light weight of the cars is 55,000 lb., being practically the same for both designs.

Painting

All parts coming in contact on the trucks and underframes are given one coat of carbon paint before assembling. The finished underframe is painted with three coats of carbon ready-mixed paint and the top of the underframe coated with Lucas car roof cement. The trucks are protected with two coats of carbon paint.

The sides of the car are finished with three coats of refrigerator yellow and the ends with three coats of mineral paint of the Santa Fe standard color. The roof boards, outside flexible metal roof and the hatch covers receive one coat of mineral paint. This is also applied on all tenons and in all mortises on both ends of posts and braces, on shoulders at all tenons and post and brace castings and in all places where two pieces of wood touch each other, except siding, lining, roofing and flooring. All iron fittings of the car receive two coats of paint, the same as used on the trucks and underframe.

The interior of the sides, the ceiling and all exposed wood in the interior of the car body is painted with three coats of raw linseed oil mixed with an equal quantity of Sipes Japan. All nails are set and puttied after applying the first coat of oil and Japan. The floors are finished with two coats of raw linseed and Japan.

The cars are carried on trucks with 5 in. by 9 in. journals, having Andrews cast-steel truck side frames and cast-steel truck bolsters fitted with the Standard Car Truck Company's lateral rollers. A.R.A. type D couplers with 6 in. by 8 in. shanks are applied, connecting to cast-steel coupler yokes by a transverse key. The draft gear is the Miner friction type A-18-S. The brake equipment is the Westinghouse Air Brake Company's schedule KD-1012. Other specialties applied to the cars include Creco brake beams and Imperial uncoupling arrangement.

Court of Appeals Reverses Pennsylvania Injunction Decree

THE RECENT RULING of Judge George C. Page of the United States District Court at Chicago upholding the Pennsylvania in its legal controversy with the Railroad Labor Board has been reversed by the United States Circuit Court of Appeals. Judge Page's decree was abstracted in the *Railway Age* of April 29, page 1021, and the hearings before the Court of Appeals were similarly described in the *Railway Age* of June 10, page 1339.

The latest ruling in this controversy, which was written by Judge Alschuler who with Judges Baker and Evans heard the case, followed to a large extent the analysis of Judge Page's decision made by Ben W. Hooper, chairman of the Railroad Labor Board, and outlined in the *Railway Age* of May 13, page 1124.

After reciting the history of the case, the Appellate Court's decision answers in detail the contentions of the Pennsylvania and the ruling of the lower court. The following is an abstract of the latest decree from which have been taken practically all of the supporting arguments of the court.

The Pennsylvania contends that if Title III of the Transportation Act makes the decisions of the Labor Board binding upon the carriers and enforceable by appropriate proceedings it is unconstitutional. Suffice it to say, there is not here involved any proceedings for the enforcement on the carrier of a decision of the Board as to wages or working conditions. Indeed, the action of the Board most complained of by the Pennsylvania was in furtherance of securing an agreement between the carriers and their employees with the probable alternative that if ultimately they failed to agree, the Board itself will decide upon and prescribe rules and working conditions. If and when this stage is reached and one or more of the parties refuse to obey the Board's decision, it will be time enough to interpose the defense of unconstitutionality to any undertaking to enforce the decision as one binding and conclusive on the parties.

The decree (of the lower court) seems to be predicated upon the assumption that the action of the Board in these matters was wholly under the provisions of Section 301 and that in the absence of a joint submission of the dispute to the Board, it was wholly without jurisdiction. Section 301 by its terms is applicable to "any dispute between the carrier and the employees." If the concluding sentence of the section, providing that in case the dispute is not decided in conference, it shall be referred "by the parties" thereto to the Board authorized to deal with the dispute, means that unless *both* parties agree so to refer it, the Board can not in any event deal with the matter, Title III might as well not have been enacted; for if the right of the Board to act depended upon the joint submission of the parties to the dispute, it lay in the power of either party to block utterly any action by the Board by simply refusing to join in the submission.

Referring to the Pennsylvania's contention that there was involved no dispute of which the Board could take cognizance, or of which under Title III it had jurisdiction, the

Appellate Court's decision calls attention to the existence of a nationwide controversy over wages, rules and working condition *prior* to the creation of the Board, adding:

The fact that the dispute existed long before the Board was created made it none the less a dispute cognizable by the Board in continuing to exist after the Board began to function. It is thus apparent that at the very outset, this dispute as to rules and working conditions *was* before the Board and was so treated by both parties to the dispute, including the Pennsylvania. Under these circumstances, it would be immaterial whether it got there by *ex parte* or joint submission or on the initiative of the Board itself. Title III is broad and remedial and no fine jurisdictional lines should be drawn to circumscribe its scope or by procedural technicalities to limit its application.

This will answer also the Pennsylvania's contention that the Board had no power to order (as in Decision No. 2), that existing rules and working conditions, until further order, remain as they then were under the National Agreement. The whole subject matter being before it, it could make such temporary order concerning it as in its judgment the exigencies of the case required.

Referring to the Pennsylvania's contention that "the matter of the election of representatives by the employees is wholly procedural and is something with which the Board is in no wise concerned and its action in this regard was wholly beyond its jurisdiction," the Appellate Court says:

The force of the contention is not apparent. Title III confers upon the Board important duty and prescribes in Section 308 that it "may make regulations necessary for the efficient execution of the functions vested in it by this title." This alone, if indeed in the very nature of things it were not necessarily so, would empower the Board to make provision for determining whether those purporting to represent disputants before the Board do in fact so represent them. If it is claimed that a pending dispute has been adjusted between the parties to it, it is very essential that the body before whom the dispute is pending assure itself of the authority to so dispose of the controversy of those who purport to act for the parties. This is especially true where one side of the dispute is a body of individuals such as employees of a great carrier. It was eminently proper that the Board, either by general rule or otherwise, indicate how in its best judgment such representation should be manifested and the election conducted.

The question of whether the employees may be represented by an organization as held by the Board or whether they may be represented only by individuals who are employees of the carrier as contended by the Pennsylvania "is not properly a question for account," the Appellate Court held. "Even though the court were of the belief that more just and true representation would result through the method of the Pennsylvania, it is not for the court to substitute its opinion for that of the Board in matters by law committed to the Board," the decree added.

In closing the decree, the Appellate Court said:

"Under the foregoing views, it follows that the Labor Board did not, as to the matters involved, transcend its power and functions under Title III and that relief under the bill should have been denied. It will not be necessary to consider the contention earnestly pressed for the Board, that the action is in effect one against the United States, which has not given its consent thereto, and must for that reason be dismissed. The decree of the District Court is reversed with directions to dismiss the bill."

Pennsylvania Will Appeal

The Pennsylvania has announced that it will appeal from the Circuit Court decision and take the case to the United States Supreme Court. W. W. Atterbury, vice-president in charge of operations, addressed a statement to this effect to the employees under date of July 21.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING during the week ended July 15, the second week of the shopmen's strike, totaled 860,907 cars, an increase of 86,023 as compared with the corresponding week of 1921 and a decrease of 81,944 as compared with 1920. This represented a decrease of about 17,000 cars as compared with the loading during the last two weeks of June, some of which may be attributed perhaps to the strike, the principal reduction being in coal loading, which was 77,334 cars as compared with 96,960 during the week of June 24, and 94,748 during the week of July 1. As compared with the last week in June increases were shown in the loading of grain and grain products, livestock and ore, but there were small reductions in the loading of coke, forest products, merchandise and miscellaneous freight. As compared with the corresponding week of last year increases were shown in all classes of commodities except grain and grain products, and coal and in all districts except the southwestern. The summary as compiled by the Car Service Division is given below.

The freight car surplus for the period from June 30 to July 8 averaged 239,160 as compared with 239,225 for the period ending June 30. Of the total, 147,558 were coal cars and 60,101 were box cars. The number of bad order cars also showed a further reduction during the half month ended July 1 to 14.3 per cent of the total as compared with 14.6 on June 15.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, JULY 15, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year, 1922	Total revenue freight loaded: Corresponding year, 1921	Total revenue freight loaded: Corresponding year, 1920
Eastern	1922	10,752	3,229	7,744	1,838	5,603	7,110	70,034	91,126	197,436	.....	.....
	1921	9,500	2,677	42,142	819	4,454	1,769	56,503	69,841	.....	187,705	228,266
Allegheny	1922	3,156	2,455	15,898	4,483	2,987	11,657	49,934	77,991	168,551	.....	.....
	1921	3,824	2,516	44,494	1,847	2,527	7,073	41,783	49,834	.....	153,898	192,082
Pocahontas	1922	256	215	22,174	272	1,416	62	5,336	4,202	33,933	.....	.....
	1921	253	222	20,800	92	1,394	23	5,152	3,714	.....	31,650	34,618
Southern	1922	5,098	2,549	16,266	884	19,350	1,192	36,589	40,763	122,691	.....	.....
	1921	4,562	2,215	18,904	254	13,837	215	34,056	34,697	.....	108,740	129,127
Northwestern	1922	10,449	8,722	7,215	1,672	13,672	47,050	30,280	40,586	159,646	.....	.....
	1921	8,898	6,372	6,451	493	10,040	20,823	27,251	33,549	.....	113,877	168,504
Central Western	1922	13,478	10,333	5,195	376	6,669	1,719	33,514	46,168	117,452	.....	.....
	1921	20,618	8,335	14,213	171	5,616	696	31,307	35,671	.....	116,627	127,261
Southwestern	1922	5,722	2,713	2,852	173	8,424	372	15,493	25,449	61,198	.....	.....
	1921	9,528	2,130	4,284	131	5,961	800	15,111	24,442	.....	62,387	62,993
Total Western Dists.	1922	29,649	21,768	15,262	2,221	28,765	49,141	79,287	112,203	338,296	.....	.....
	1921	39,044	16,837	24,948	795	21,617	22,119	73,669	93,662	.....	292,891	358,736
Total all roads	1922	48,911	30,216	77,334	9,698	58,121	69,162	241,180	326,285	860,907	.....	.....
	1921	57,183	24,467	151,288	3,807	41,829	31,899	211,163	251,748	.....	774,884	.....
	1920	33,967	26,643	207,425	11,668	56,800	78,222	180,872	347,254	.....	.....	942,851
Increase compared to	1921	.....	5,749	.....	5,891	14,292	37,263	30,017	74,537	86,023	.....	.....
Decrease compared to	1921	8,272	.....	73,954	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared to	1920	14,944	3,573	.....	.....	1,321	.....	60,308	.....	.....	.....	.....
Decrease compared to	1920	.....	.....	130,091	1,970	.....	9,060	.....	20,969	81,944	.....	.....
July 15	1922	48,911	30,216	77,334	9,698	58,121	69,162	241,180	326,285	860,907	774,884	942,851
July 8	1922	35,267	21,847	68,996	9,665	44,736	55,729	210,140	271,939	718,319	640,535	796,191
July 1	1922	41,867	28,546	94,748	10,361	61,422	64,776	247,111	328,015	876,896	776,079	891,621
June 24	1922	38,411	29,934	96,960	9,466	64,271	64,284	249,193	325,337	877,856	775,447	911,503
June 17	1922	39,333	29,151	92,136	9,302	64,082	53,822	248,044	324,902	860,772	775,328	916,736

Plan for Coal Distribution and Price Restraint

Presidential Committee to Be Appointed—I. C. C. Declares Emergency and Issues Priority Orders

WASHINGTON, D. C.

THE ADMINISTRATION'S PLAN for controlling the distribution of the available coal supply to the most essential consumers, including the railroads, which is also designed to exercise a restraining influence upon coal prices during the period of coal shortage, as worked out by Secretary Hoover in collaboration with representatives of the Interstate Commerce Commission and other governmental departments and the American Railway Association, and coal operators was announced on Monday and the Interstate Commerce Commission on Tuesday issued two service orders, declaring the existence of a national emergency because of unfavorable labor conditions and shortage of fuel supply which furnish the necessary basis of legal authority to carry the plan into effect. Service Order No. 22, numbered to follow the series of service and priority orders issued by the commission in 1920, directs the railroads to forward traffic by the most available routes regardless of routing orders, and is intended to help clear up the congestion which has developed on certain lines. Service Order No. 23 directs the railroads east of the Mississippi to give preference and priority to food, feed, livestock, perishable products, coal, coke and fuel oil and preference in the use of coal cars for the transportation of coal over other commodities. It also sets up a classification of priority of coal for various purposes.

An outline of the general plan, as given out by Secretary Hoover on Monday after it had been approved by the Attorney General and accepted in principle by representatives of the coal operators, is as follows:

1. A committee in Washington, to be appointed by the President, of representatives of the Department of Commerce, the Interstate Commerce Commission, the Department of Justice, and the Department of the Interior, to be designated the Presidential Committee. This committee is to have general supervision of the measures to be taken hereunder and to authorize the execution of such of these measures as may be necessary from time to time.

2. The Administrative Committee, comprising representatives of the Presidential Committee together with representatives of operators, representatives of the railways, and, where necessary, representatives of the larger consuming groups.

3. The Presidential Committee will establish a representative in each coal producing district.

4. The Presidential Committee will appoint a committee of operators in each district to be nominated by the district operators' association or independent operators (in case of failure of the operators to take such action the Presidential Committee may appoint such operators as they see fit on such committee). The members of these district committees may be changed as determined upon by the Presidential Committee.

5. The Presidential Committee will co-operate with the Interstate Commerce Commission in carrying out preferential orders issued by the commission.

6. The governmental representatives of the districts with the co-operation of the district committees shall advise the agencies of the Interstate Commerce Commission as to local car movement to effect the purpose of this plan.

7. The operators will proceed with their usual business until they are affected by preference orders.

8. It is expected that the district committees under authority of the Presidential Committee will recommend the allotment of cars on the basis of those who conform to the fair prices to be agreed upon with the Presidential Committee.

9. When the operators demand, then suitable guarantees shall be given for payment by persons buying under priority orders.

10. The railroads will be requested to appoint a representative to deal with purchases of railway fuel.

11. The basis of prices agreed upon between the operators and the Secretary of Commerce on June first are to be maintained, except where varied by the Presidential Committee, and this same basis of price determination shall be applied to all districts which are so far not co-operating.

The whole of the above was called tentative, pending further consideration by the Interstate Commerce Commission, the Department of Justice, Department of Interior, and the Department of Commerce.

Secretary Hoover Busy on Situation

While the President was working on the railroad strike Secretary Hoover busied himself with the coal situation. On Thursday he talked with Commissioner Aitchison, who is in charge of car service matters for the Interstate Commerce Commission, after which the commissioners held a conference among themselves and on Friday Mr. Hoover announced that "plans had been formulated for the co-operation of the Department of Commerce and the Interstate Commerce Commission and the Department of Justice by which, with the co-operation of responsible operators, the control of price and distribution can be effected." The plan was placed before the Department of Justice for its consideration and further conferences between Secretary Hoover, Attorney General Daugherty and Chairman McChord and Commissioner Aitchison of the commission were held on Saturday and Sunday.

Mr. Hoover also called a meeting of the district representatives from the producing Virginia, West Virginia, Tennessee, Kentucky, Pennsylvania and Alabama districts for Monday to consider the questions of price and distribution.

In explaining the need for a coal distribution plan, Mr. Hoover emphasized the necessity of taking care of the railroads as well as of the public utilities, industries producing necessities, public institutions, etc. Some of the railroads, he said, have a three months' supply of coal, while others will need assistance within a week or so. Some have made arrangements for importing coal. British coal is being laid down at American ports at prices ranging from $6.50 to $7.75 and 600,000 tons of shipping have been engaged for the transportation of coal to this country from abroad. Forty-three Shipping Board vessels having an approximate tonnage of 350,000 tons have been chartered through the Shipping Board to transport coal from Wales and the east coast of England and the board has announced that it could place a sufficient number of its own ships in service within a short time to guarantee the importation to this country of at least 500,000 tons a month.

It is estimated that 8,000,000 to 10,000,000 tons of coal will be needed to supply the districts served through the Lake Superior docks during the balance of the season of navigation while the needs of the entire lake district are estimated at 17,000,000 to 25,000,000 tons.

Plan Approved by Attorney General

Attorney General Daugherty announced on Monday that he had submitted an opinion to Secretary Hoover sustaining every phase of his plan with reference to its legality, in part as follows:

"I have before me your letter of the 21st instant in which you inquire whether certain steps which you propose to take to safeguard the public interests in the face of the impeding coal famine run counter to the law of Congress. . . .

"As I understand it, your plan is to form associations acting under your directions whose sole purpose will be to meet the emergency in distribution and stop profiteering; and at the proper time you intend to apply to the Interstate Commerce Commission to promulgate rules governing car distribution during the existing shortage, to the end that the available equipment can be placed at mines affording the greatest opportunity of service and willing to charge for its coal no more than is fair and just. As between

two mines whose output is the same, your plan contemplates, during the existing shortage, favoring the mine in the supply of cars which charges the public fair prices as against the mine which allows its greed to exact whatever can be obtained, however unwarranted and extortionate the price may be. You have no purpose other than to promote the welfare of the public by inaugurating a plan of distribution designed to maintain national life itself and to restrain extortion by the stern hand of repression. Your idea is to have both operators and miners furnish you with statistics along the lines just mentioned, thus enabling you to place before the commission from time to time whatever information is necessary to enable it to give proper and intelligent directions. In thus acting you intend to represent the commission as one of its designated agencies, or to go before it in any other capacity, whichever method meets with its approval. In view of all these conditions causing the present emergency, the inevitable result of which is to disrupt and demoralize interstate commerce, you inquire whether the plan you have outlined would be illegal and whether authority exists for its adoption and enforcement.

"In my opinion the plan is entirely legal. I fail to see wherein any law of Congress will be violated. The interests of the public are deserving of paramount consideration, and I have no misgivings in giving it my unqualified approval. Moreover I feel convinced that full and ample authority exists for its adoption and effective enforcement. If the Interstate Commerce Commission finds the existence of an emergency such as you describe, that body has ample and unquestioned authority to provide such rules and regulations as will enable the plan you suggest to be carried into operation.

"In concluding I want to say that I have no hesitancy in advising you that in my opinion where and when an emergency exists on account of the shortage of coal for use in interstate commerce and in the transportation of the mails and when the price of coal for such purposes and for the general necessities of the people has been unjustifiably and unbearably increased by operators who produce a large supply, associations such as your plan contemplates to act with and under governmental agencies to meet the existing emergency, more equitably to distribute coal, and to prevent extortion in the price thereof while acting with and under governmental agencies for the purposes aforesaid, are legal and do not violate any provision of the so-called Sherman anti-trust law or any other federal law.

"In carrying out such plan for the sole purpose you propose all persons, firms, or corporations chosen by governmental agencies to assist you, as long as they act in good faith to carry out such plan with and under governmental agencies and not otherwise, will violate no law of the United States."

District Associations Express Approval

General approval of the necessity for a plan to maintain fair prices and distribution of coal was expressed by representatives of the producing bituminous fields in conference with Secretary Hoover on Monday, subject to reference back to the district associations concerned. An executive committee composed of the chairman of the district delegations considered details of the plan and reported back to the whole conference in the afternoon. The executive committee also appointed a smaller drafting committee which met with officials of the Interstate Commerce Commission and with representatives of the American Railway Association in the afternoon and discussed the general plan for coal control and discussions were conducted under the chairmanship of Secretary Hoover, in collaboration with Commissioner Aitchison of the Interstate Commerce Commission, Blackburn Esterline of the Department of Justice, Director Smith of the Geological Survey, and Acting Director Holbrook of the Bureau of Mines for the Department of the Interior, the representatives of the coal operators, M. J. Gormly, chairman of the Car Service Division of the American Railway Association, and J. C. Davis, director general of railroads.

Under the Hoover plan the Interstate Commerce Commission's emergency powers over car distribution are to be used not only to allocate coal to the most essential consumers but also to meet a situation with which the government found it impossible to deal at the time of the great demand for coal in 1920, that is, to control prices within reason by withholding cars from operators who refuse to observe the voluntary agreement entered into with Secretary Hoover a few weeks ago to observe a scale of maximum prices based on the Garfield scale with modifications, which in most instances means $3.50 a ton at the mines. While there is still a large surplus of coal cars, because of the congestion which has developed in some of the coal fields the surplus cars are not where they are needed and shortages have occurred at a few points during the past two or three weeks. The effect of the plan, it is understood, will be that no very strenuous efforts will be made to place cars for those who will not observe the price agreement and it is also expected that the plan will necessarily remain in effect during the balance of the year and will therefore be available if a real shortage of cars or congestion should develop after a settlement of the coal strike, which is regarded as inevitable sooner or later. Mr. Hoover had received reports that operators in one or two districts had refused to co-operate in the plan of voluntary price restraint and that certain operators in West Kentucky last week were charging as much as $7.50 a ton and on Monday had raised this to $13 a ton, although a group of operators in the same district were observing the $3.50 maximum. Also a minority of irresponsible operators in other districts have broken away from the agreement. "The responsible operators," Mr. Hoover said, "are holding to the price. On the other hand some panicky railway buyers are sending out orders offering $8 at the mines. The plan for restraint of prices to the Garfield basis threatens to break down through the above influences."

Mr. Hoover explained that the plan intends merely to make the best use of the available coal and does not guarantee the production of a pound of coal but that for the present the government has exhausted its resources in its efforts to settle the coal strike.

Service Order No. 22

The orders issued by the commission under the new plan are as follows:

The subject of routing of freight traffic being under consideration, and it appearing to the Commission, that an emergency exists upon the lines of all carriers by railroad in the United States subject to the Interstate Commerce Act, which requires immediate action; and that each of such carriers, by reason of unfavorable labor conditions, and shortage of fuel supply, is unable to transport the traffic offered it so as to properly serve the public.

Therefore, in order best to promote the service in the interest of the public and the commerce of the people, *it is ordered and directed*:

1. That from and after July 26, 1922, and until the further order or direction of this Commission, all said common carriers by railroad are hereby directed to forward traffic to destination by the routes most available to expedite its movement and prevent congestion, without regard to the routing thereof made by shippers or by carriers from which the traffic is received, or to the ownership of the cars, and that all rules, regulations, and practices of said carriers with respect to car service are hereby suspended and superseded in so far only as conflicting with the directions hereby made.

2. That inasmuch as such disregard of routing is deemed to be due to carriers' disability, the rates applicable to traffic so forwarded by routes other than those designated by shippers, or by carriers from which the traffic is received, shall be the rates which were applicable at date of shipment over the routes so designated, unless the rates applicable over such designated routes are higher, in which event the rates applicable over the route of movement will apply.

3. That in each instance where the traffic is routed, or rerouted by carriers by railroad under the authority of this order, the carrier responsible for such routing or rerouting, shall, within 24 hours thereafter deposit in the United States mail, a notice addressed to the consignee of the traffic, stating: the car numbers and initials, places and dates of shipment, the routing, and respective routes over which the traffic is moving and that charges for the transportation of the traffic, including transportation, and schedules of rates, fares, and charges, as those terms are defined in said Act, will be the same as they would have been if such routing, or rerouting had not taken place, unless, as above provided for, the rates applicable over the route the traffic moves is less.

4. That in the case of shipments in private cars, which are subject to equalization of empty mileage, and also of fruits and vegetables, live poultry and other shipments customarily reconsigned upon instructions of the consignor, a telegraphic notice of the diversion shall be sent to the consignor by the carrier responsible therefor.

5. That in executing the directions of the Commission contained in this order, the common carriers involved shall proceed without reference to contracts, agreements, or arrangements now existing between them with reference to the divisions of the rates of transportation applicable to said traffic, that such divisions shall be, during the time this order remains in force, voluntarily agreed upon by and between said carriers, and that, upon failure of the carriers to so agree, said divisions shall be hereafter fixed by the Commission in accordance with pertinent authority conferred upon it by said Act.

6. That copies of this order and direction be served upon all carriers by railroad in the United States, subject to the Interstate Commerce Act, and that notice of this order be given to the general public by depositing a copy of the order in the office of the Secretary of the Commission in Washington, D. C.

Service Order No. 23

It appearing, In the opinion of the Commission that an emergency which requires immediate action exists upon the lines of each and all the common carriers by railroad subject to the Interstate Commerce Act, east of the Mississippi River, including the west bank crossings thereof, and because of the inability of said common carriers properly and completely to serve the public in the transportation of essential commodities,

It is ordered and directed,

1. That each such common carrier by railroad, to the extent that it is currently to be unable promptly to transport all freight traffic offered to it for movement, or to be moved over its line or lines of railway shall give preference and priority to the movement of each of the following commodities: food for human consumption, feed for live stock, live stock, perishable products, coal, coke and fuel oil.

2. That to the extent any such common carrier by railroad is unable under the existing interchange and car service rules, to return cars to its connections promptly, it shall give preference and priority in the movement, exchange, interchange and return of empty cars intended to be used for the transportation of the commodities specially designated in paragraph numbered 1 hereof.

3. That any and all such common carriers by railroad which serve coal mines whether located upon the line or lines of any such railroad or customarily dependent upon it for car supply, herein termed coal-loading carriers, be, and they are hereby, authorized and directed whenever unable to supply all uses in full, to furnish such coal mines with open top cars suitable for the loading and transportation of coal, in preference to any other use, supply, movement, distribution, exchange, interchange or return of such cars; *provided*, that the phrase "suitable for the loading and transportation of coal" as used in this order shall not include or embrace flat (fixed) bottom gondola cars with sides less than 36 inches in height, inside measurement, or cars equipped with racks, or cars which, on July 1, 1922, had been definitely retired from service for the transportation of coal and stenciled or tagged for other service.

4. That all such common carriers by railroad other than coal-loading carriers, herein termed non-coal-loading carriers be, and they are hereby authorized and directed to deliver daily to a connecting coal-loading carrier or carriers, or to an intermediate non-coal-loading carrier for delivery through the usual channels to a coal-loading carrier, or carriers, empty coal cars up to the maximum ability of each such non-coal-loading carrier to make such deliveries and of each such connecting coal-loading carrier to receive and use the coal cars, so delivered for the preferential purposes herein set forth.

5. That all such common carriers by railroad be, and they are hereby, authorized and directed to discontinue the use of cars suitable for the loading and transportation of coal, for the transportation of commodities other than coal, so long as any coal mine remains to be served by it with such cars; and as to each non-coal-loading carrier, so long as deliveries of any such cars to connecting carriers may be due or remain to be performed under the terms of this order.

6. That all such common carriers by railroad be, and they are hereby, authorized and directed, to place an embargo against the receipt of coal or other freight transported in open top cars suitable for coal loading, by any consignee, and against the placement of such open top cars for consignment to any consignee, who shall fail or refuse to unload such coal or other freight so transported in coal cars and placed for unloading, within 24 hours after such placement, until all coal or other freight so transported in coal cars and so placed has been unloaded by such consignee and shall notify the Commission of such action. This authorization and direction as to embargoes shall not interfere with the movement of coal to tidewater or the Great Lakes for transshipment to water, nor shall it apply where the failure of the consignee to unload is due directly to errors or disabilities of the railroad in delivering cars.

7. That in the supply of cars to mines upon the lines of any coal-loading carrier, such carrier is hereby authorized and directed, to place, furnish and assign such coal mines with cars suitable for the loading and transportation of coal in succession as may be required for the following classes of purposes, and in following order of classes, namely:

Class 1. For such special purposes as may from time to time be specially designated by the Commission or its agent therefor. And subject thereto:

Class 2. (a) For fuel for railroads and other common carriers, and for bunkering ships and vessels; (b) for public utilities which directly serve the general public under a franchise therefor, with street and interurban railways, electric power and light, gas, water, and sewer works; ice plants which directly serve the public generally with ice, or supply refrigeration for human foodstuffs; hospitals; (c) for the United States, state, county, or municipal governments, and for their hospitals, schools, and for their other public institutions—all to the end that such common carriers, public utilities, quasi public utilities, and governments may be kept supplied with coal for current use for such purposes, but not for storage, exchange, or sale. And subject thereto:

Class 3: (As to each coal-loading carrier which reaches mines in Pennsylvania, Ohio, West Virginia, Kentucky, Tennessee, and Alabama.) For bituminous coal consigned to any Lake Erie port for transshipment by water to ports upon Lake Superior. And subject thereto:

Class 4: (As to all such common carriers by railroad.) Commercial sizes of coal for domestic use. And subject thereto:

Class 5: Other purposes.

No coal embraced in Classes 1, 2, 3, or 4, shall be subject to reconsignment or diversion except for some purpose in the same class or a superior class in the order of priority herein prescribed.

8. That all rules, regulations and practices of said common carriers by railroad with respect to car service as that term is defined in said act are hereby suspended so far as they conflict with the directions hereby made.

9. That this order shall be effective from and after July 26, 1922, and shall remain in force until the further order of the Commission.

10. That copies of this order be served upon the carriers hereinbefore described, and that notice of this order be given to the general public by depositing a copy hereof in the office of the Secretary of the Commission at Washington, D. C.

The commission is also expected to issue special orders from time to time to expedite particular shipments designated by the district committees. It is hoped that the routing order will assist in a short time in relieving the congestion which is said to have been caused to some extent by the desire of the coal-originating railroads to route cars in such a way as to save for themselves the long haul. The priority order, in addition to providing for the most essential uses for coal also gives recognition in Class 3 to the needs of the Northwest for shipments via the lakes.

The Intent of the Service Orders

While the commission's orders were heralded in some of the newspapers as amounting practically to "government control of the railroads" similar to that exercised during the war, an examination of the orders shows that they do not become applicable except to the extent that a road may be "currently unable promptly to transport all freight traffic offered to it for movement" and such a condition does not exist on many roads, although it would be very likely to exist very generally if a full production of coal were suddenly to be offered to the roads by a resumption of mining in the union fields. One of the most important, if not the most vital of the considerations which led to the issuance of the order and the setting up of the plan of distribution was the fact that whereas coal production had fallen to approximately 3,600,000 tons a week the railroad requirements alone were approximately 2,500,000 tons a week and some roads had only a few days' supply left. Therefore unless something was done at once many railroads that would not have been materially affected by the shopmen's strike for some time would have been disabled by shortage of fuel. It was also apparent that the effects of the railroad strike were being concentrated where they would have the most effect on the coal situation.

While the plan does not provide for repairing a single car or engine nor for digging a pound of coal it is intended to prevent efforts to stock up with coal on the part of those who might be able to do so by offering high prices, at the expense of other consumers who need it currently. While many telegrams received in Washington indicate apprehension on the part of shippers of other commodities that use open-top cars they will not in general be affected as long as the surplus of such cars exists unless they are so located as to come into competition with a coal mine for the cars in a particular locality. This part of the order will have more effect later if coal production is increased. The commission's order said nothing about withholding cars from the profiteers, which the Attorney General's opinion said would be entirely legal, but it is understood that that object will be accomplished in the practical administration of the plan.

R. H. Aishton, president of the American Railway Association, has been spending a large part of his time in Washington for some weeks and is in charge of the situation for the railroads.

The following telegram has been sent by Commissioner Aitchison to the various state commissions:

Commission desires to know whether if local developments connected with our general service orders require we can rely on having active assistance your Commission. This possibly may involve survey certification and policing certain local needs under priority orders issued or to be issued. Emergency most acute and requires best efforts of all under common plan if distress which will come is to be mitigated.

Coal Distribution Committee

The Presidential committee proposed in the plan was appointed on Wednesday when the President requested the Attorney General, the Secretary of the Interior, the Secretary of Commerce, and Commissioner Aitchison of the Interstate Commerce Commission, or their representatives, to act as a Coal Distribution Committee under the temporary chairman-

ship of the Secretary of Commerce. A fifth member is to be added to the committee later who will undertake the administrative direction. The ultimate character of the organization, it was stated, must depend upon the situation.

Secretary Hoover sent the following telegram today to the Governors of the states on behalf of the Presidential Coal Distribution Committee, as the first step toward decentralizing the organization for equitable distribution, and maintenance of fair prices, of coal. Under this plan the distribution for railway use will be directed from Washington, but, with the possible exception of a few interstate public utilities, the responsibility for all other distribution will rest upon organizations set up under state control.

In order that the federal government may do its part in the distribution of coal supplies over the present very difficult situation the President has appointed a committee on coal distribution comprising representatives of Departments of Justice, Interior, Interstate Commerce Commission and Department of Commerce under my chairmanship for the purpose of securing co-ordination of federal agencies in the best distribution of the available coal supplies. Certain priorities have been established in necessary commodities and fuel by the Interstate Commerce Commission, who have asked your state public utilities commission if Interstate Commission may have its active assistance in the distribution of coal to transportation and public utilities and governmental institutions if necessary. Beyond this the Presidential Committee on coal distribution are co-operating with coal operators and with the Interstate Commerce Commission in an endeavor to secure that coal shall be sold from the mines at a fair price. The agencies and present authority of the federal government of course do not enable it to protect the ultimate consumer of coal within the boundaries of a state further than such protection can be secured by the above means that coal sold in Interstate Commerce shall be sold to the original purchaser at a fair price and that fair distribution between states be obtained. The problem of securing that the ultimate consumer shall be protected upon coal now in circulation and on resale of coal distributed as above and that equitable distribution shall be carried out must rest within the authority of each state. I am sending this telegram at the request of the President to learn if you feel that you can undertake to create a state organization under your direction to secure that this shall be done and with which we can co-operate.

Electric Locomotives Rebuilt for English Railroad

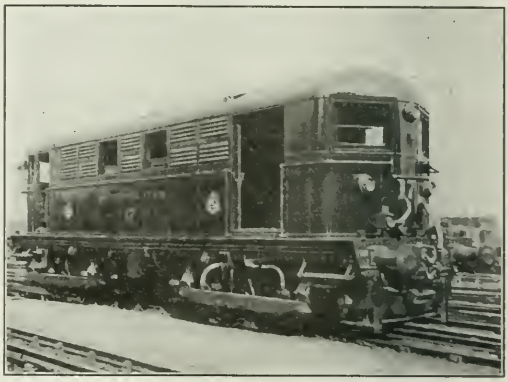
The Metropolitan Railway in England has recently made alterations in track layout on its electrified section which make it possible to run a number of trains without a stop from Baker Street to Harrow-on-the-Hill, a distance of nine and one-half miles. The greater part of the electric train service includes many stops requiring locomotives with large starting effort and moderate running speeds. The new service requires also high speed and for this purpose 20 locomotives are being reconstructed. Six-car trains are used, weighing with passenger load about 180 tons and with the locomotive 240 tons. The locomotive has a 0-4-4-0 wheel arrangement and is equipped with four 300 hp. motors. According to American standards the train is light, but the power of the locomotive is proportionally large.

The cost of coal in England has made the power consumption by electric trains a matter of greater importance than it was at one time and careful tests have been made to ascertain the performance of the locomotives. Automatic acceleration is used as it increases efficiency of operation when train weights are fixed as they are in this case. The tests showed the power consumption to be under 55 watt-hours per ton-mile. Complications of design are avoided in the reconstructed locomotive as regenerative braking is not required and the total amount of power used is not extremely large, permitting the use of self-ventilated motors.

There are four series-wound, commutating-pole motors on each locomotive. Each is rated at 300 hp. at 600 volts on the one hour rating, the corresponding locomotive speed being 30 miles an hour. The maximum speed of the locomotive on the non-stop runs is about 60 miles an hour. The motors are the largest it was possible to have with the standard rolling stock wheel which would at the same time conform to regulations for clearance between track level and the bottom of the motor and the gear case. The magnet frame is of the box type cast in one piece and provided with the usual arrangement of suspension bearings from the running axle and with a nose support at the other end. The running wheels are of the disc center type having brake blocks acting on both sides of the rim. The truck frames consist of plate frames stiffened with cast steel corner castings.

Vacuum brakes are used on the coaches while the locomotive is equipped with vacuum brakes and Westinghouse air brakes. These are interlocked with the controller so that unless one or the other of the two brake systems is operative, power can not be applied to the motors. The Westinghouse brake is used generally for switching in the yards and the vacuum brake for operating the train.

Direct current power is supplied to the locomotive at 600 volts on the third rail system and an insulated return rail is laid in the center of the track. The running rails are not used for the return and carry only signal circuits. There are



One of the Reconstructed Locomotives

four positive and two negative collecting shoes on the locomotives; the positive shoes are in duplicate, one set of two being placed on each side. The negative shoes are on the center line. Collecting shoes are also fitted to some of the coaches which are connected to a power bus line carried through the train to enable the train readily to pass over breaks in the collecting rails.

There is a driver's compartment in either end of the locomotive. The control apparatus, including contactors, resistances and auxiliary machinery is arranged in a group placed along the center line of the locomotive. This arrangement provides a runway on each side which facilitates inspection and the making of repairs.

PRINCIPAL DIMENSIONS

Length over buffers	39 ft. 6 in.
Length over body	35 ft. 0 in.
Width over body	8 ft. 0 in.
Height from rail	12 ft. 4½ in.
Centers of motor trucks	20 ft. 3 in.
Wheelbase of motor trucks	9 ft. 3 in.
Total wheelbase	29 ft. 6 in.
Diameter of running wheels	43½ in.
Gear ratio	26/54
Capacity of motors	300 hp.
Total hp.	1,200

The mechanical work on the locomotive is being done at the Barrow Works of Messrs. Vickers while the electrical equipment is being supplied and erected by the Metropolitan Vickers Electrical Company, under the direction and supervision of Charles Jones, chief locomotive and electrical engineer, Metropolitan Railway Company.

Strengthening Chicago Track Elevation Subways

Floors of Structures Built in the Nineties Are Now Being Renewed for Heavier Loading

About two years ago, the Illinois Central completed the replacement of its street subway structures for the first track elevation work done in Chicago in 1892. Evidence that some of the other structures of the early track elevation work in that city are gradually nearing their service life is seen in the replacement of the floor system of subways used by the Chicago, Rock Island & Pacific and the New York Central in their joint entrance to the La Salle Street station. The first stage of this work was completed last fall and it is anticipated that further progress will be made during the coming year. The present work is of interest

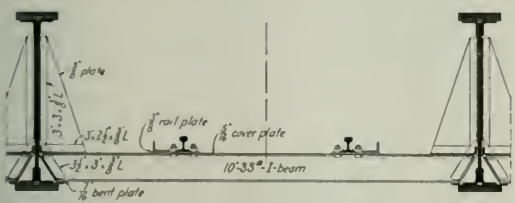


Fig. 1—The Original Construction

because it relates to a type of floor which was rather popular in the early subways, namely transverse steel I-beams covered with a steel plate, the rails being supported on a rail plate which was carried directly on the cover plate and secured by means of clips. The old floor in this case is being renewed with heavier construction of substantially the same type though with a number of improvements that decrease the cost of the work.

The old Rock Island-New York Central subways had floors consisting of 10-in. 33-lb. I-beams spaced 12-15/16 in. center to center and covered with a plate 15/16 in. thick, the general nature of the construction being shown in Fig. 1. However, after 20 years, through increases in the imposed loading and reduced strength of the steel on account of corrosion, it became necessary to relieve the floor beams by introducing cross ties supported on the beams by means of oak blocks under their ends. This had the effect of concentrating the live load on the beams closer to the ends and thereby reducing the live load bending moment. This, however, was designed purely as a temporary expedient and conditions finally required the renewal of the floor with heavier material.

The new floor beams are 12-in. 70-lb. Bethlehem girder beams carried on end connections substantially like those in the old structure and covered with a ⅜-in. plate. The track is supported on this floor after the manner of the original construction as modified, that is, with the use of cross ties and bearing blocks, every third tie being made long enough to engage a bracket on the girder so that the track can be secured to line without any connection being made through the deck plate.

The construction differs from the old in one important essential. There are no direct rivet connections between the deck plate and the flanges of the I-beam. The only rivets in these plates are those required for splices, for connections between plates, for curb angles along each side and for clip plates for holding the plates in position on the beams. This change in construction was effective in eliminating practically 1,000 rivets per track for each bridge, or approximately 26,000 rivets for the work done on 13 subways last year.

In order to further eliminate field riveting, the old shelf angle which was riveted to the web of the girders and to the old deck plates, was not provided for under the new arrangement. The new deck plates are entirely free or separate from the girder webs, small angles being riveted along the edges near the girders and the space between the web and this angle being filled with concrete for a water-shed.

Work Done Jointly

The line on which this work was done consists for the most part of four tracks, the right of way being on the center line between tracks so that each railroad owns two tracks. The two middle tracks are used as joint double tracks, the outside tracks being used as service or standing tracks. The work has been carried on jointly by the two roads; but instead of working independently with arrangements for cross piling, it was decided to carry on the work simultaneously with a crew for each road working on either side of the center line and arranging for an amicable sub-division of the work to be done on the center line girder as occasion demanded. This work was carried on under this arrangement without any misunderstanding or friction and the presence of the two crews assigned to exactly the same character of work served to foster a friendly rivalry which was instrumental in speeding up the progress. During the course of the work on a given structure a portion of the two middle tracks was isolated by introducing temporary cross overs to the outside track on either side. This left the tracks over the bridge free for the use of the construction forces and for occupancy by the erecting equipment. According to the usual arrangement the compressor

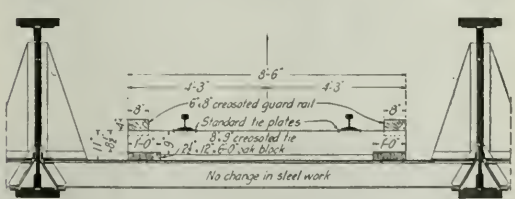


Fig. 2—Introduction of the Ties Reduced the Stresses in the Old Floor

car occupied the track at one end of the bridge and the derrick car that at the other end. The manner of carrying out the work at the individual bridge was as follows:

First the ties and rails were removed from the bridge. At this time the concrete along the sides of the girders and the ends was also removed and the brackets were burned with acetylene torches on the girders between the main line and side tracks, this being necessary so that the old rivets could be cut and new ones driven.

On many of these bridges considerable dirt had collected and packed down and hardened, and all this had to be removed before access could be had to the deck plates so as to cut the rivets. This work usually required about half a day's time.

The next step was cutting the rivets. When this work was started at Twenty-fourth street, the rivets had to be cut

by hand, which was a slow process, requiring 13 days. Later a Duntley-King pneumatic rivet buster, was used by which it was possible to reduce the time required for a bridge to five days. The first step in rivet cutting was on the brackets and angle irons running the entire length of the structure, then cutting the rivets in the hangers for the floor beams, and next cutting the rivets in the deck plates. To subdivide the work on the center girder, the New York Central forces cut the old rivets and the Rock Island forces drove the new rivets. This was considered an equal division of the work, with the exception of the Thirty-ninth street subway, where this method of procedure was reversed with respect to the center girder.

The deck plates were loosened and pried off and swung around in a parallel position, making them convenient for

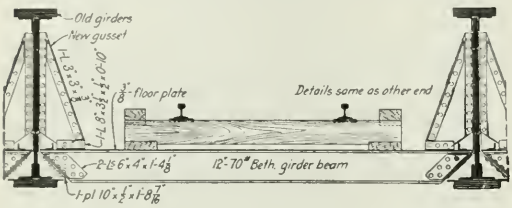


Fig. 3—The Present Floor with New Steel Beams

handling with the derrick. The derrick was then used to lift these plates and carry them from the bridge out of the way.

This being finished, the beams were next removed, using the derrick also for this purpose. Two beams could be removed at once and carried back out of place, and then a new beam brought up and installed. This method was followed until all of the beams were removed and the new ones installed. In doing this the rivets on the girder between the main line and the side track were driven out of place as the old beam was removed, and as the new one was installed it was held in place by a drift pin or a bolt, in some cases, until necessary to go on with the riveting.

When the old beams were removed the bottom flange of the girder was thoroughly cleaned of all rust and dirt and repainted on the face where the beam had been removed before the new beam was put in place. The new beams all being in place, the new top deck plates were installed and the riveting was then started on the floor beams. Riveting the deck plates was the next step and riveting the brackets last. During the period of riveting part of the crew was loading up the old beams and plates in gondola cars for shipment.

Whenever a girder was found out of level it was jacked up and shimmed to a fairly good level by placing oak board shims underneath the bearings. This was done in all cases where practicable. The rivets in the floor beams were all tested by inspectors from both the Rock Island and the New York Central, those for the center girder were inspected by both inspectors.

After the steel erecting crew had completed its work by replacing the new beams and deck plates, painters did the necessary painting, then the carpenter forces replaced the ties and the section forces replaced the rails. The division forces put on the necessary concrete work along the girders, and, where necessary, removed the old cracked and shattered bridge seats under the west girders and replaced them with new concrete bridge seats.

As the floors of these bridges are level, it was not thought necessary to waterproof the tops of the deck plates, as it would not be possible to obtain a good job of waterproofing with the ties resting directly upon the plates, as they do. However, as so many rivets connecting the deck plates to the beam flanges have been eliminated, thus doing away with the possibility of many loose rivets developing, it was thought that due to this change the steel itself would be tight enough to hold the water until it had either evaporated or run off over the backwalls of abutments.

This work was done under the direction of I. L. Simmons and B. R. Leffler, bridge engineers respectively of the Chicago, Rock Island & Pacific and the New York Central, Western Lines. The *Railway Age* is indebted for the above information to S. T. Corey, assistant bridge engineer of the Chicago, Rock Island & Pacific, Chicago.

Five Hundred Tons of British Columbia potatoes recently went to Cuba. The potatoes were all grown in the neighborhood of Vancouver City.

P. & O. Photo

Waterloo Station, London, from the Air

Administration Continues to Back Up Labor Board

No Settlement to Be Considered That Is Not Founded on Recognition of Its Authority

WASHINGTON, D. C.

THERE WERE some indications Thursday morning that efforts to settle the strike were coming to a head. T. DeWitt Cuyler, chairman of the Association of Railway Executives, went over the entire situation with the President after which Mr. Jewell and heads of the organizations on strike conferred with the President. Mr. Cuyler remained in Washington to await further developments and other railway executives were to see President Harding.

From the Indianapolis News

Among the Interested Parties

That the first essential looking to a settlement of the railroad strike is that the strike be first called off is apparently the position now taken by President Harding after a series of conferences during the past week at which he has gone over the entire situation. In a telegram made public on Wednesday, addressed to J. Cleve Dean, chairman of the "Railway Employees' Publicity Association," Chattanooga, Tenn., in reply to a protest against the attitude of the President, he extended an invitation to urge the striking railway men to accept the decision of the Railroad Labor Board and return to work under its decision, pending a rehearing on any question concerning which there is reasonable doubt as to the correctness or justice of the decision made. The President said in his telegram, dated July 25:

Since you speak as chairman of the Railway Employees' Publicity Association, and since it is exceedingly important that the American people know precisely the question at issue in the present railway and coal strikes, I am more than glad to answer your telegram, though I can only treat your politically partisan references with that contempt which is felt by every good citizen in the hour of deep public concern. Happily for the American public everything done and everything said by government authority relating to the two strikes is a matter of record, and can not in any way be distorted. There is no dispute about the American citizenship of the men on strike, nor will anyone question that many of them gave everything that men can give for the service of this country in the World War. Nor is it disputed that the men on strike are exercising their constitutional and lawful rights, under exsting statutes, in declining to work under the terms decided by the Railroad Labor Board or tendered to the workmen by the mine-operators of the country. No one has attempted or proposed to draft free men into either the railway or mining service, or suggested coercion under military force. The military forces of free America are never used for such a purpose. Their service is only that of preventing lawlessness and violence.

That same unchallenged freedom which permits you and your associates to decline to work is no less the heritage of the free American who chooses to accept employment under the terms proposed. The difference between the two positions is that the striking railroad workers exercise their rights of freedom in seeking to hinder the necessary transportation of the country; notwithstanding the provision made by law for the consideration of any just grievance; and the striking miners seek to prevent the production of coal necessary to common welfare, notwithstanding the offer of an agency to make an impartial settlement; while the men who choose to work in response to the call of the country are exercising their like rights, and at the same time are making their contribution to our common American welfare. The decisions of the Railroad Labor Board are in compliance with a mandate of the law-making body of the United States. Without discussing the decisions at issue, it is fair to assume that a government agency is ever ready to correct an error which is made, else government itself would become unjust. Moreover, it is indisputable that there can be no government unless its mandates are accepted by the citizenship of the Republic.

This observation relates more particularly to the railroad situation. When the mining situation became menacing I invited representatives of the mine-workers and the operators to a conference.

Photo by Keystone

New Employees at Work on Lackawanna Locomotive, Hoboken, N. J.

They came together, they were advised as to the call of common welfare, yet in eight days of opportunity no progress was made. In the absence of any tribunal authorized to settle disputes between mine-workers and their employers the federal government then voluntarily proposed the creation of a national commission before which the disputes might be settled justly, in the light of full information and in accordance with the best expressions of our modern civilization. Instead of contemplating the resort to force, it anticipated the very opposite—industrial peace with justice to every man concerned. Instead of aiming at involuntary servitude, to which you inexcusably refer, the government asked the mine-workers to resume their activities, in response to a manifest public need, at precisely the same wages and under precisely the same working conditions as those under which they had been working

contentedly for the last two years. Those who spoke for the mine-workers refused such a proposal. There is no dispute of the right to refuse. Since they declined to respond, and since it is believed there are enough men who love this country and cherish its security, and believe in serving the common welfare, to come to the relief of the mining situation, and avoid suffering, privaton and paralysis, I asked the governors of the coal-mining states to invite mine-operators and mine-workers to resume their activities, and to promise that to which every man is entitled, namely, protection in his lawful pursuits. This protection applies alike to the men on strike who observe the law and make no lawless interference with men at work, and to the men who are lawfully at work and entitled to protection by every agency of government in that work. If you mean to challenge the rightousness of free men to be protected in their lawful pursuits against interference and violence, I will be glad to join you in submitting that question to the decision of the American people.

It will interest you to know that instead of the government's action being an expression of the preference of the capitalistic class, it has been quite as much opposed by those who speak for employers as it is by you and your associates. Government undertakes to represent neither class alone, and is opposed to all conflict among classes, and disputes the right of any group or class, organized or unorganized, to imperil American welfare. Government speaks only for the American people as a whole and the common good of all its citizenship.

In view of all that the government has done or attempted to do during the past year and a half to relieve the American farmer from the burdens of readjustment and to relieve labor from the hardships of unemployment, I know your attempted appeal to American prejudice will fall upon deaf ears. It is ungrateful and it is untruthful. If you are the believer in peace and harmony and the reign of justice which you would have believed, I invite you now to pass judgment on the failure of the mine-workers to accept the awards of an able and impartial commission in determining the merits of the dispute between coal-miners and coal-operators, and I invite you to urge the striking railway workmen to accept the decision of the American Railroad Labor Board, acting under authority of the law, which must be supreme, and return to work under that decision, until you and I, and everyone else interested in American welfare, may join in asking the Railroad Labor Board to give a rehearing on any question concerning which there is reasonable doubt about the correctness or the justice of the decision made. These are the ways of peace, these are the requirements of enlightened civilization, these are the things expected by your government of its loyal and law-abiding citizenship.

The telegram from Mr. Dean to which the President replied was as follows:

I wish to point out to you that the railway employees and miners who are on strike are loyal American citizens and are only executing their constitutional rights. A large percentage of them fought on European soil that there might be no more war, and for you or any governor to attempt to operate the mines or railroads by military forces or to attempt to draft men into mining or railroad service would be an attempt to establish involuntary servitude. And I dare to predict when "involuntary servitude" is attempted by you, then the long predicted war between labor and capital will loom up. The American farmer and laborer have come to realize the hostile attitude of the G. O. P. toward them, and they realize that the hard times that now exist is a premeditated plan to bring the farmer and labor down to their knees. The blood of the American farmer and labor is at a boiling heat because they came to the firm conclusion that their government, or your administration at least, is against them. I pray that it will not come, yet I feel at liberty to predict that in your attempt to place the American labor under the gun nothing short of a revolution will happen. I am a lover of peace and harmony, yet I am for these striking railway employees and miners and I know that they will put forth every possible means to keep peace in our country. But these are days which "try the very souls of men," and I am hoping that you will be wise enough to see the dark clouds that are in the horizon sky and will change your attitude so as to remove those clouds.

It was stated that the government is not unmindful of the seriousness of the situation, the country being threatened with a coal famine this winter and diminished industrial production before that time, while there is "more or less of a threat of a paralysis of transportation," and that the government is seeking to work out the problem and at the same time "maintain the dignity and majesty of the government." The President had said on July 20 in a telegram to Governor Sproul of Pennsylvania that the selection of a commission similar to that proposed in the President's arbitration plan, not only to settle the coal wage controversy but to conduct a broad inquiry into the fundamental economic condition of the coal industry, may be expected in due time but that it may be desirable to modify the form of the commission as originally proposed. It was stated again on Tuesday that this commission would be appointed but not this week and it is thought that the President may be awaiting an opportunity for legislation authorizing its appointment. A bill providing for a commission was introduced in the Senate by Senator Borah on Tuesday.

President Takes Personal Charge

President Harding on July 20 took personal charge of the efforts to ascertain whether a basis exists for the settlement of the railroad strike, after word had been received from Chicago that the endeavors of Chairman Hooper of the Labor Board had failed to reconcile the "antipodal views" of the railroad executives and Mr. Jewell and his associates. Up to that time the President had been devoting more of his attention to the coal situation and leaving the railroad strike to be dealt with by the Labor Board but the failure to settle the coal strike served to emphasize the effect which the slowing up of rail transportation is having in some districts. At this writing the efforts of the President apparently have been confined to obtaining complete information regarding the situation from all angles. There has been no announcement that would indicate that he has found any method of procedure that can have any present effect. For some time administration officials appeared optimistic over the prospects of an early settlement after they had been told that Mr. Jewell was no longer insisting upon the rescinding of the wage decision that was the cause of the strike, but that, providing the board would allow a rehearing on the wages and working rules, a settlement could be speedily agreed upon if the railroads would waive the seniority issue and discharge their new employees to take back the strikers. They apparently failed to appreciate the importance of this question until they had been informed of the extent to which many roads, particularly those in the east, had replaced the strikers with new men to whom they had promised permanent positions and the places in the seniority list that had been forfeited by the strikers.

The President delegated three Republican members of the Senate Committee on Interstate Commerce to meet with a committee of railroad executives; Secretary of Labor Davis, while on a visit to his home at Mooseheart, Ill., conferred with Mr. Jewell and the President himself summoned Chairman Hooper to Washington for an extended conference at which the entire situation was gone over in the light of the information reported by the senators and Mr. Davis. It is understood that the senators were called upon to act as intermediaries with the idea that possibly a solution might be found in some form of emergency legislation, but it was early agreed that nothing of this kind could be made effective for the present and the discussion of legislation was mainly confined to changes in the Transportation Act designed to strengthen its provisions in such a way as to prevent a recurrence of the situation that has arisen.

Railway Executives Called to Washington

A telegram asking for a conference with the railroad executives for the purpose of ascertaining their exact position and the possibility of their making concessions was sent to a meeting of the eastern presidents at New York on Thursday, July 20, and in response a committee consisting of Thomas De Witt Cuyler, chairman of the Association of Railway Executives; W. H. Truesdale, president of the Delaware, Lackawanna & Western; L. F. Loree, president of the Delaware & Hudson; A. H. Smith, president of the New York Central, and W. W. Atterbury, vice-president of the Pennsylvania, came to Washington Thursday evening and held

a three-hour conference with Senators Cummins, Kellogg and Watson. The senators then reported to President Harding the next morning.

It was announced that they had discussed the possibility of legislation and had reached the conclusion that there was no immediate legislative solution for the present situation, although the possibility of future legislation had been considered, and that the senators had sought full information for the President regarding the points at issue which were in the way of a settlement. Senator Cummins said that there was "no immediate hope" and Senator Watson said that the committee of executives did not have full authority and that there would probably be other conferences. He said both the senators and the executives understood and that Mr. Hooper had indicated, that the question of seniority is the only real issue involved but that there was some doubt as to whether the question of adjustment boards is involved. It was apparent that the railroad men had offered no hope that they would recede from their insistence on standing by the new men they had taken on.

The senators communicated President Harding's conviction that with a big part of the year's coal production already lost, a heavy movement of fuel during the rest of the year necessary and large crops coming along, it is imperative that some settlement be reached, if possible, without waiting for the carriers and the unions to fight it out. The executives, on the other hand, pointed out the necessity of establishing the authority of the board and that this cannot be done if concessions are to be made to men who have struck against its decisions. They also pointed out that some of the eastern roads have filled half of the jobs made vacant by the strikers, giving the new men assurances of permanent employment, and therefore have the strike practically won, and that if they were to displace these men for the benefit of those who left their service they would not only be paving the way for future strikes but would make it much more difficult to replace strikers on another occasion.

Chairman Hooper Consults with President

After the senators had reported it was announced that Chairman Hooper had been summoned to Washington so that the President might inform himself more closely than he had been able to at long range. Mr. Hooper arrived on Saturday morning and spent five or six hours with the President, giving him a complete history of the situation up to date, including his various conferences with the strike leaders and the railway executives. During a part of the time Senators Cummins, Kellogg and Watson were also present and also Secretary Weeks of the War Department. Mr. Hooper left Washington late in the day to return to Chicago without making any public statement and there was no announcement from the White House. Senators Underwood and Pomerene, Democratic members of the Senate interstate commerce committee, also conferred with the President later. President Willard of the Baltimore & Ohio had been at the Capitol earlier in the day talking with senators regarding the situation and apparently inspired some confidence in the ability of some roads to effect individual settlements as he had arranged for conferences with the former employees of his road for Tuesday.

Secretary Davis reported to the President by long distance telephone regarding his conference with Mr. Jewell on Saturday and on Monday he reported personally. He expressed the opinion that the strike could be settled at once if the railroads would restore seniority rights to the strikers. J. C. Davis, director general of railroads, was also consulted by the President.

On Wednesday W. W. Atterbury of the Pennsylvania conferred with the President for an hour or so and it was learned that Chairman Cuyler of the Association of Railway Executives was to see the President on Thursday. Mr. Atterbury on leaving the White House gave out a statement that the Pennsylvania was willing to leave the question of seniority to its "employees," who are now those who did not strike or who returned after going out and new employees who have taken the places of the strikers, and who therefore would hardly be expected to vote to displace themselves in favor of the strikers. Mr. Atterbury said: "The President, realizing the importance of the seniority question as the crux of the present railroad situation, desired to discuss its various angles in a definite settlement of the railroad problem. I expressed to him the opinion that, so far as the Pennsylvania system was concerned, such a question should properly be determined by our employees and that the Pennsylvania system would be entirely guided by any determination that our employees thought wise, fair and equitable."

Jewell in Washington

B. M. Jewell and the heads of the unions on strike came to Washington on Thursday morning to see the President. It was stated at the White House that, while they had not been invited, the President would see them. Several railway executives were also expected.

Conferences at the Capitol

Attorney General Daugherty also conferred at the Capitol on Saturday with Senator Cummins, chairman of the committee on interstate commerce, and Senator Borah, chairman of the committee on education and labor. Senator Borah and

Halladay in the Providence Journal

Out of the Way!

Senators Walsh and King of his committee had previously held a meeting with President Gompers and Secretary Morrison of the American Federation of Labor and Edgar Wallace, legislative agent of the United Mine Workers. "I think we agree," the attorney general said, "that the government has all the law needed in case of emergency. If the government has the right to protect interstate commerce it has the right to protect the men in an industry essential to the maintenance of interstate commerce. We discussed the Transportation Act and additional legislation which might be thought necessary. We have a plan for anything which might happen." He also said that the Department of Justice was

watching the strikes with a view to determining whether there existed a conspiracy among the leaders to interfere with interstate commerce but that no evidence along this line had yet been discovered.

The legislative agents of the four train service brotherhoods at a long conference with Senator Cummins on Saturday presented a written argument urging the repeal of the labor provisions of the Transportation Act and the restoration of the plan of mediation and arbitration provided by the Newlands act. The latter has not been repealed but the United States Board of Mediation and Conciliation has been allowed to go out of existence by failure to make any appropriation for it. They also told the senator that they were receiving numerous reports of locomotives and cars in unsafe condition and that the trainmen might refuse to take out trains for this reason. Senator Cummins indicated that he might be willing to have the Transportation Act amended so as to provide more specifically for a "living wage," including a definition of a living wage, and also to make the orders of the Labor Board enforceable. He said the law now, at least by implication, contemplates a living wage and that he had no doubt the board had taken it into consideration in its decision.

Menace to Mail Service Past

Postmaster General Work announced on July 20 that any menace endangering the delivery of mails arising out of the strike of railway shopmen had passed. Except in isolated instances where local trains have been annulled and motor truck transportation has been substituted, he said, no emergencies have arisen recently and few are expected in the future. Since the outbreak of the strike the Postmaster General has received innumerable offers from private sources volunteering automobiles, trucks and aeroplanes.

"We will have no train service between Deleon and Cross Plains (Texas) until we get protection for men who will work at Deleon," was stated in a message received on July 20 by the Post Office Department from General Manager Whitenton of the Missouri, Kansas & Texas. "Also there will be no service between Stamford and Rotan," he continued. "The United States marshal is not furnishing deputies to protect our workmen at Deleon and as a result men will not go there to work. Service generally is going to depreciate unless the question of protection is settled and men given an opportunity to work who are so inclined."

The Post Office Department arranged for truck service between Deleon and Cross Plains, and the statement of Whitenton was placed with the Department of Justice for action.

Superintendent of Railway Mail Service W. G. Van Dervoort, Seattle, announced that the following Northern Pacific trains were discontinued: Trains 422 and 423 between Seattle and Moclips, Wash.; trains 593 and 594 between Centralia and South Bend, Wash.; two trains between Bellingham and Seattle; two trains between Kansaskat and Tacoma; two trains between Lewistown and Spokane; two trains between Dayton and Pasco; two trains between North Bend and Seattle; two trains between Missoula and Wallace, Mont.

Superintendent of Railway Mail Service A. A. Fisher, Washington division, reported that the Norfolk Southern had reduced train service between Belhaven and Mackeys, N. C., from six times a week to three times a week.

Superintendent of Railway Mail Service S. A. Cisler, St. Louis, stated that but 20 United States marshals were on duty at Hannibal, Mo., where the shops of the Missouri, Kansas & Texas are located, and that some minor conflicts had occurred between the marshals and the strikers at that point. Cisler stated that there was no immediate prospect of opening the shops, or resuming train service on the M. K. & T. between Hannibal and Moberly. The Wabash was still running trains through Hannibal by continuing the run of engine crews to Springfield, Ill., and Kansas City, Mo. The superintendent said that the Wabash had only 20 days' supply of coal, but he knew of no shortage on other roads.

A. F. of L. Urges Joint Conferences

Invitation to the federal government to "take the one step which labor believes effective" in settlement of both coal and railroad strikes was extended by President Samuel Compers of the American Federation of Labor on July 21.

"We invite the federal government," he said, "to see to it that employers and workers come together. The government has done everything except this one logical, necessary thing. The government has threatened a great deal. It has talked about troops and about the rights of the public. It has not talked effectively about conference and it has had little or nothing to say about the rights of the workers. Labor calls upon the government to talk about conference between employers and workers, both in the coal industry and in the railroad shop strike.

"The President has talked about the similarity of his action and the action of President Roosevelt in the anthracite strike. There is no parallel. The Colonel told the operators to get into conference with the union and he fixed a time limit for that conference to begin. President Harding has not told the mine owners to get into conference.

"Conference is the thing that is needed. Let there be less talking about force and coercion. It is un-American and it will have no good effect. American workers are the most efficient workers in the world, but they will not work under duress. They will not enter into involuntary servitude in violation of the constitution.

"Labor asks for conference with the employers. If the government wishes results, if it wishes operation of mines and railroads let it adopt the only course that can secure those results. Let it exert its tremendous influence to bring the employers into conference with the representatives of the workers.

"If the government cares more about sustaining the reputation of its helpless and all but defunct Railroad Labor Board, if it cares more about a costly and ineffective military show than it does about justice and results, then it is on the right track.

"But labor urges the government to come back to a constructive and sane viewpoint. Labor invites the government of the United States to bring about conference between workers and employers. Labor will enter conferences in every case in absolute good faith and unless employers are absolute bourbons and autocrats the strikes can quickly be adjusted and production and transportation put into effective operation."

Telegrams of support, sympathy and co-operation were sent on July 22 to President Bert M. Jewell of the A. F. of L. Railway Employees' Department and to President John L. Lewis of the United Mine Workers by the joint legislative conference, composed of the legislative representatives of the American Federation of Labor and of all national and international unions in Washington. The conference is composed of more than 50 representatives of labor organizations.

That the railroad shopmen have been preparing for this strike since April, 1921, and waited 15 months because of a desire to "accumulate enough grievances" was asserted by P. J. Conlon, vice-president of the International Union of Machinists, in a speech to a meeting of strikers in Washington on Sunday. At that time it was learned, he said, that the national agreements were to be abolished. "It generally takes from 30 to 60 days to make a shop strike effective," he said, "but before this one had been on ten days more than 250 trains had been cancelled, the West Virginia non-union mines had been bottled up, and the iron and steel industries were crying for help. And we have hardly started yet."

Labor Board Works to Prevent Spread of Strike

Following the Labor Board's announcement, quoted in last week's *Railway Age*, to the effect that it had found irreconcilable differences between the railroads and the shopmen on strike and that, therefore, its efforts at settlement of the controversy had ended, Washington became the center of interest because of the expressed desire of the present administration to end, if possible, the twin coal and rail strikes. The Labor Board's activities since July 20, when Chairman Ben W. Hooper announced the end of its efforts to bring the railroads and the striking shopmen together, have been confined largely to conferences with government officers including President Harding and Secretary of Labor James J. Davis and to efforts to prevent the spread of the strike to other classes of employees on several of the large carriers.

On July 21 Chairman Hooper was summoned to Washington by President Harding for a conference on the strike situation. Following this meeting, Chairman Hooper said:

"I have gone over the whole situation very thoroughly with the President, undertaking to give him the history of the controversy in every phase down to the present time. I do not feel at liberty to discuss details of the things talked about."

At the same time W. L. McMenimen, member of the labor group on the board; B. M. Jewell, head of the Federated Shop Crafts; the leaders of the seven shopmen's organizations involved in the strike; Arthur S. Nelson, Department of Labor Commissioner of Conciliation, and Timothy Healy, head of the firemen and oilers' union, were summoned to Mooseheart, Ill., by Secretary of Labor Davis for conference on the strike situation. Following this meeting, Secretary Davis announced that he believed "the strike could be settled if the roads would give the striking shopmen their seniority rights and there was a re-hearing by the Labor Board on other disputed questions." Secretary Davis said he believed the matter of establishing national adjustment boards "could be adjusted" and asserted that in his opinion the contract question "does not stand in the way of an agreement." He also admitted that every angle of the situation had been discussed with Mr. Jewell and the other labor leaders and that the general complaint was that the carriers did not accept the decisions of the Labor Board, while the employees in nearly every instance have abided by these decisions. He later talked with President Harding, submitting a report of the information he had gathered.

Jewell Cites Adjustment Board Controversy as Real Issue in Strike

Prior to these conferences, Mr. Jewell issued a statement in answer to the railroad's contention on seniority, accusing the latter of camouflaging their real objection to the union's stated terms of peace. The railroads' position that they cannot restore the seniority rights of the strikers if they should return to work is not "sincere," according to Mr. Jewell.

"The real stumbling block is our demand for a central board of adjustment as outlined in the Transportation Act," he declared. "The railroads know they cannot justify their fight against the national adjustment board before the public. The board would take working rule disputes off the hands of the Labor Board, except in cases of appeal, and leave the board free to devote practically all its time to wage questions."

In support of his demand for a national adjustment board, Mr. Jewell enumerated the following arguments:

"(1) Conditions of shop work are practically the same in all sections of the country and the character of the work is the same. Car and locomotive repairs are the same and must be made in about the same manner everywhere.

"(2) Uniform national rules have been promulgated by the Labor Board.

"(3) If these rules are interpreted and applied differently by different adjustment boards, a mass of conflicting cases eventually would be presented to the Labor Board.

"(4) Since uniform interpretation and application is desirable and will be the result of final decisions by the Labor Board, it is inefficient to establish several intermediate boards who will create inharmonious rulings which the Board must harmonize.

"(5) Regional boards would impose unfair expense and duplication of efforts upon labor organizations, requiring a representative of the six crafts on each adjustment board, thus requiring payment of expenses amounting annually to a large sum.

"(6) Since a national labor board has been established, thus insuring a national code of rules and working conditions, an intermediary court should be organized on the same basis logically and efficiently."

In commenting on the adjustment board issue, William H. Finley, president of the Chicago & North Western, said:

"The strike was declared against a decision of the Labor Board involving only wages and working rules in which no mention whatever, directly or indirectly, was made of a board of adjustment, national, regional or otherwise. The creation of such a board was never mentioned officially in the hearing of the shopmen's case and is in every way foreign to the issues now involved.

"The railroads are accused of opposing the formation of a national board of adjustment. How can the railroads oppose a matter to which they have never been asked to agree?

"Regional boards of adjustment have been formed by the railroads and employees in the train service, but the question of forming such boards or a national board of adjustment in connection with the shopmen has never been put up to the railroads.

"There is no connection whatever between the present strike and a national board of adjustment and by no stretch of the imagination can such a connection be construed. It is merely an attempt on the part of persons without a just cause to introduce purely irrelevant matter."

Maintenance of Way Men Approve Leader's Action

The spread of the strike of maintenance of way employees was finally ended when the grand lodge officers of the Brotherhood of Maintenance of Way Employees and Railway Shop Laborers voted their support of the course taken by E. F. Grable, president of that organization, in withholding a strike order. The fear that the general chairmen would censure Mr. Grable for having accepted compromises and that an "outlaw" strike might follow, failed to develop. The various district leaders reported concessions or progress obtained in local conferences with various railroads. Following the meeting, however, Mr. Grable announced that any road which refuses to confer with the unions' representative would immediately face a walkout of its maintenance of way employees.

Some interesting sidelights on the administration's attitude towards the strike and its settlement were given by Mr. Grable, who, after conferences with members of the Labor Board, said:

"I have received advice that Senator Cummins, chairman of the Interstate Commerce Committee of the Senate, is going to hold hearings immediately on disputed points in the labor provisions of the transportation act, principally to ascertain how the law may be amended so that the living wage principle would be made clear so that every employee would be granted a living wage.

"I advised the board of instructions I issued and sent to each of the general chairmen throughout the United States to immediately open negotiations with their respective roads on rules, working conditions and wages and if they cannot be satisfactorily adjusted, to submit these disputed matters to the board. The first of these new disputes has been received by the board coming from the Chicago, Milwaukee & St. Paul. The officials on that road set aside the 30-day clause in the existing agreement in order to meet with our representatives to negotiate the matters in dispute and forward the unadjusted matters to the board.

"This is the first of many disputed submissions on these subjects which the board will receive very shortly and I respectfully requested the board to give me their assurance that these cases will be set for a hearing at an early date and I have received assurance of the board that this will be done. I have also requested the board that any further decision on these new disputes, more favorable to the men, be retroactive to July 1."

Numerous Conferences Held

Numerous conferences between members of the Labor Board, particularly Mr. McMenimen and Chairman Hooper and the leaders of the national and system organizations of employees who have been threatening to walk out, have been held during the past week, representing the continuing effort of the Board to prevent a spread of the present strike. The result of these conferences have been for the most part to hold the employees involved in line and the efforts of the Board in that direction have been successful. Largely through work of this nature, strikes of station employees, signalmen, clerical and maintenance of way forces on several large carriers have been averted. For instance, the clerical forces on the Chicago & North Western, who have been threatening to strike for some time, have settled their dispute largely through the efforts of Mr. McMenimen. Many other similar disputes of system extent have likewise been settled during the past week by agreement with the carriers involved. At the present time, therefore, there seems to be little likelihood of a spread of the strike, although conferences are continuing, looking to the avoidance of such a contingency.

Approximately 300 general chairmen of the Brotherhood of Railway and Steamship Clerks, Freight Handlers, express and Station Employees met in Chicago on July 26 to discuss the strike situation and formulate their plans for the future. Headed by E. H. Fitzgerald, president of the organization, a delegation met with certain members of the Labor Board behind closed doors, discussing, it is reported, the grievances of these employees concerning the Board's recent wage decision and certain working conditions. The clerks' general chairman subsequently adopted a resolution warning that they would resort to their "economic power" if grievances are not adjusted. However, at the same time they took action which will end the recurrent rumors of a general walk-out of clerical forces.

That new organizations of shopmen are being formed on various Eastern and Western carriers is indicated in telegrams and letters, which are being received at the Labor Board from newly created organizations asking that body for recognition under the Transportation Act.

Situation in East Improves Rapidly

EXCEPT AS concerns the developments at Washington, interest in the railway shopmen's strike in the east has been divided during the past week between the discussion relative to seniority and the outcome of the Baltimore & Ohio's conferences which began on Tuesday with the representatives of the shop crafts relative to a separate settlement.

The railroads in the eastern district apparently have the strike situation well in hand insofar as concerns operation. Latest reports are to the effect that forces have been recruited to between 50 and 60 per cent of normal and the situation is characterized by its continuing improvement. Passenger and fast freight schedules are generally being operated on time. Such delays as have occurred have been given publicity by the shop crafts organizations, but for the most part the delays have been only those such as would occur under more normal conditions. Reports are also to the effect that slow freight is being handled currently with certain exceptions. One of these is the Baltimore & Ohio, which, however, during the past week, reports considerable improvement over the preceding week. The Chesapeake & Ohio and the Norfolk & Western with a combination of a clerks' strike and a shopmen's strike have been handicapped to the extent that on the latter, for instance, the coal movement is running at present between 50 and 60 per cent of the unusually heavy movement in June. Coal loadings in the Pocahontas district for the week ending July 15—the latest figure reported—were only 22,174 cars, as compared with about 31,000 cars a week in June.

The Question of Seniority

The question of seniority is at present the outstanding feature in the strike in the eastern district as it is in the western district and in Washington. The subject is a leading one for discussion at the meeting of the Eastern Presidents' Committee, of which L. F. Loree, president of the Delaware & Hudson, is chairman. The position of the committee is given in the following statement which appeared over the signatures of the various railroads in newspapers in important centers, beginning Wednesday morning:

"Seniority"

What is this question of "Seniority" that is being discussed in connection with the railroad strike?

All employees on railroads are accorded seniority of service, if otherwise competent. This means that the senior employees are entitled to choice of work, and when it becomes necessary temporarily to reduce forces that the junior men are released and the senior employees retained.

A strike was ordered by union officers who have no connection with any railroad. Many employees, in compliance with the order, quit their jobs and left the railroad service, and many did not leave but remained loyally at work, accepting the Government Labor Board decision.

There are thousands of such men who must, under the rules of fair dealings as well as the rules of seniority, be protected and supported. To discharge these men would be ingratitude of the grossest sort.

In addition to those thousands who remained in service, other thousands who wanted to work have been employed in good faith. The new employees in a great many cases left other employment with the understanding that if competent, they would be retained in their present position.

These men—those who remained and those who enlisted—have kept the trains in operation and the needs and the comfort of the people supplied.

It is submitted that to ask the railroads now to set aside these loyal men and replace them with the men who left, is to ask the railroads as well as the Government, which is concerned through the action of the U. S. Railroad Labor Board, to be disloyal to these thousands of loyal men.

Optimistic Attitude

The attitude of the railroad managements towards the strike situation is rather apparently characterized by its increasing optimism. The executives apparently feel that the railroads have approached or will soon reach the point where they can say that the roads have won the strike. They draw attention particularly to the fact that the roads have succeeded in recruiting their forces to a satisfactory degree and they emphasize the fact that interruptions and delays of traffic have been kept at a minimum. The opinion is expressed in many quarters, however, that there is one unsatisfactory feature in the situation. It seems to be the idea that the strike would be settled more promptly if the railroads could be left to work out the matter themselves. It is realized that it was the duty of the Labor Board and of the administration to take whatever steps they could to settle the strike. It is, on the other hand, felt that each announcement of further steps to be taken by the Labor Board or the administration is looked upon with hope by the strikers with the result that the latter decide to wait for developments. It is, therefore, felt that if the government authorities would adopt a hands-off attitude the men would see that they have nothing further to gain by waiting and would return to work in increasing numbers.

Baltimore & Ohio Holds Conferences

Another interesting factor which has received comment is the attitude of the American Federation of Labor notably with respect to its statements in favor of the strikers which have been issued by President Gompers. The fact that the A. F. of L. has found it advisable to take a part in the strike in this fashion is regarded in many quarters as a sign that the strike is not going as well as the shop crafts organizations would desire and as a response to a call for much needed support and assistance.

Representatives of the striking shop crafts organizations

met in conference with C. W. Galloway, vice-president, in charge of operation of the Baltimore & Ohio, in Baltimore on Tuesday. The conference was held at the invitation of the management. The representatives of the Baltimore & Ohio System Federation received permission from the Railroad Employees' Department of the A. F. of L. in a telegram which read: "Conference will be permitted, but no action is authorized." It was understood that no matter what agreement is reached during the conference it will have to be referred to the employees' department for ratification.

The Tuesday meeting began at 2 o'clock and adjourned at 6:30 until Wednesday morning. The following statement was issued by the Baltimore & Ohio Tuesday evening: "The meeting was devoted to a general discussion of the wage reduction and the various rules and working conditions as handed down by the Labor Board. No conclusions were reached. . . . The discussion was harmonious."

The conference was still in session on Thursday.

Prior to the meeting Vice-President Galloway declared that he went into the meeting with an open mind in regard to seniority rights. President Daniel Willard in a statement issued prior to the conference said:

There are no matters in controversy between the Baltimore & Ohio Company and its employees that cannot in my opinion be settled and settled promptly by a conference called for that purpose. The Baltimore & Ohio Company would much prefer to keep in its employ the men who have been in its service, many of them for years, and who are familiar with its working conditions and requirements, and I am confident that if a conference could be had between representatives of the men and the officers of

Orr in the Chicago Tribune

A Little Sacrifice on His Part Would Help

this company, that the present unfortunate situation could be quickly cleared up, and the company earnestly invites the men to join in a conference for this purpose.

Unless those who left their positions are willing to return to work without further delay, or are willing and able to promptly join in such a conference as is suggested, it will be the duty of the Baltimore & Ohio Company to take such other steps as may be necessary and still possible in order to resume normal operations. I feel confident that if a conference can be arranged and if the parties to such conference are willing to approach the matter in a spirit of fairness and with a sincere desire to effect a settlement, a prompt and satisfactory conclusion can be reached. The Baltimore & Ohio Company, for which I am authorized to speak, will approach the matter in that spirit. The public has a right to expect all of us to make every reasonable effort to bring about an early settlement of this controversy in order that we may thereby be enabled to give to the public the service which it has a right to demand and expect.

On Wednesday evening Vice-President Galloway submitted to President Harding a copy of the road's proposals.

Southern Says It Has No Quarrel with Men

"We have no quarrel with our men. . . . We have issued no ultimatum nor have we employed any man to take a striker's place." These sentences are from a communication addressed to the striking shopmen on the Southern Railway by President Fairfax Harrison. The letter said in part:

"I have the greatest sympathy with our men in their respect for their fraternal obligation. Some of those now on strike, in obedience to a call from without our ranks, are my old and tried friends. My effort during a difficult ten days has been to keep the door open for all to return to work with honor. We have issued no ultimatum nor have we employed any man to take a striker's place. The only new men we have employed have been common laborers to do work deserted through sympathy or otherwise by men whose organizations are not on strike.

"The work of turning engines and current repairs necessary to keep the railroad running (and as everyone has seen, it has been kept running) has been done by officers and their clerical forces. On their behalf and my own I am glad to testify that the striking employees, with few exceptions, have not molested them unlawfully. The cases of violence and sabotage which we have experienced have generally been traced to a few youthful adventurers and it has often developed that they were never on our pay roll.

"All of this is testimony that we have no quarrel with our men. More than that, I have myself had during the past week on the road many assurances that the great majority of the men have no quarrel with us. In this situation I have hoped that, having recorded their impressive protest against the award of the Labor Board, the men would see the wisdom of returning to work and accepting the Labor Board's invitation to go into a rehearing of their grievances. Of course, if law means anything, that is the only way the Labor Board can now deal with the question.

"Having said this much, it is only fair to add that, if it shall be necessary, we will undertake to run the railroad without the aid of those on strike. Unless the men soon return to work we shall deem it our duty to the public to put others in their places and invoke all the authority of the United States to protect the newcomers in their work. That protection has been offered."

Number Now Employed 60.6 Per Cent

Following a meeting Monday of the eastern Presidents' Conference, L. F. Loree issued a statement in which he said in part:

"The last information, for the month of April 1, 1922, of the Interstate Commerce Commission gives as employed on the railroads of the United States in the six shop crafts 351,834 men. In order to furnish work to as many as possible of the men the roads exerted great efforts, in some cases working a part of the force only in alternate weeks and in others greatly reducing the hours of labor, so that these forces were not averaging more than 40 hours each week and in numbers were much greater than were needed. The figures available indicate that on June 30 on the roads in the eastern traffic region there were in service about 145,872 men.

"From such sources of information as we have there are now employed in this region 88,404 men, not including the foremen, or 60.6 per cent, and as these men are working full time the actual work performed will compare favorably with that before the walkout. Especially is this true if we consider that there is a full complement of foremen and their assistants and that the efficiency has been greatly increased by the elimination of many rules designed to restrict output and the fact that one willing mechanic now does the work that formerly was taken up in routine by several, with the consequent delays.

"It may, therefore, be said that, so far as the eastern region is involved, the possibility of the strikers tying up the railroads has passed. What remains to be done is to preserve the public peace, to protect the old men and incorporate these new men in the communities where they are located, gradually recruiting the forces to normal through the employment of additional men or the return of the former employees for whom places can still be found."

Traffic Moving Without Interruption

Reports from individual roads in nearly all cases show a gradually increased percentage of shop forces at work and in practically every instance the statement is made that conditions show a marked improvement. The strikers' organizations have made much in their publicity concerning delays reported to passenger and fast freight trains, but they have not shown how much of the delay may be due to the strike as distinguished from delay which might occur under normal conditions. The strikers' publicity has also had a great deal to say concerning equipment condition notably with respect to an alleged failure to keep motive

power in proper shape, but it is noticed that in general trains are being handled without unusual difficulty.

Recruiting continues in good volume, the railroads emphasizing that they have had sufficient men to permit of careful selection. An interesting feature is the advertising for men in the newspapers published in eastern industrial centers by roads such as the Denver & Rio Grand Western, the Great Northern, etc. The statement is made in some quarters that striking shopmen in large numbers are being hired on other roads.

The spokesman for the eastern roads is John G. Walber, secretary of the Bureau of Information of Eastern Railways. The information given out by Mr. Walber, however, has been of a general and rather interpretive character. The following reports have been given the *Railway Age* by individual roads, in most cases in response to telegraphic or other requests.

Atlantic Coast Line

This company now has forces at work in place of striking shopmen equivalent to about 40 per cent of the forces employed just prior to the strike. Both passenger and freight service are normal. Forces are being recruited daily and the road reports that it will soon be able to resume all normal maintenance work.

Baltimore & Ohio

This company reports continued improvement. Many old employees are returning to the service. On July 21 the company reported a movement of 20,000 cars and gains in the number of employees at 32 points on its system. On that date it was announced that no more daily bulletins would be issued by the company until the result of the conference with striking employees, which began on July 25, was ascertained.

Bangor & Aroostook

This company is working a force of 317 men in its shops, compared with a normal force of 337—making its present labor strength 94 per cent of that of pre-strike days. Furthermore, of the present force but 11 are returned strikers. No delays or interruptions to any class of traffic have occurred which could be charged to the strike.

Boston & Albany

On July 26 this company reported as follows:

"Our conditions continue to improve. No interruption in freight or passenger service."

Boston & Maine

This company's present shop forces number in excess of 50 per cent of normal. There have been no unusual interruption to traffic, either passenger or freight, and conditions are said to generally satisfactory.

Buffalo, Rochester & Pittsburgh

Of this company's normal force of motive power mechanics, 50 per cent were working on July 26 as were 29 per cent of its car department mechanics and laborers, making 41 per cent of the shop employees taken as a whole. The company reports that it has had no interruptions to movement and that traffic conditions show daily improvement.

Central of Georgia

A force of 785 men is now employed in this company's shops, representing 38 per cent of pre-strike strength. There has been no interruption to traffic, all freight being received and handled on time and passenger trains run according to schedule. No trains have been annulled. Conditions are reported as steadily improving.

Central of New Jersey

This road has a shop force of 2,416 men, out of a pre-strike total of 5,013. There have been no delays to trains on its lines chargeable to the strike. The company has no embargoes against any classes of traffic and is accepting all the business offered. Conditions are reported as steadily improving.

Chesapeake & Ohio

Some new men are being employed to take the places of striking shopmen. Positions of clerks made vacant by the walkout which occurred on July 20 are being rapidly filled.

Delaware, Lackawanna & Western

The Lackawanna reports a rapidly improving situation. It has suffered no delays to traffic since the strike began.

Erie

Prior to the strike 9,450 men were employed by the contractors who operate this company's shops. The present force is 5,280 and of these 2,010 are old employees. There have been no interruptions to traffic on this road and conditions are very noticeably improved. During the first three weeks of July the road moved 243,612 loaded cars, a total comparable to that for the same period in June, and is accepting all business offered to it. Its suburban passenger trains are operating 95 per cent on time. The road has made no move toward the formation of a union among its present forces. There has been no destruction to property, although one man was killed in a minor disturbance at Hornell, N. Y., last week. Injunctions have been secured by the company at the following points: Jersey City, Hornell, Salamanca, Cleveland, Galion, Huntington, Meadville, Brier Hill and Kent. These injunctions are said to have been effective in breaking up picketing. State troopers are guarding company property at Port Jervis, N. Y., Susquehanna, Pa., and Hornell, N. Y. The road has plenty of equipment and has suffered no congestion of traffic.

Lehigh Valley

"The Lehigh Valley has shown notable improvement since the last report. A few old men have returned to work but in addition the management has been able to recruit a considerable force of competent machinists, boilermakers, etc. This, with the fact that the Lehigh Valley has never been compelled to close its Easton back shop, because of the loyalty of the men there, has enabled the road to operate all its freight and passenger service without interruption.

"In accordance with the suggestion of the Labor Board a number of employees who remained loyal, together with some of the new men, have started a shop crafts organization and considerable progress has been made with it. The management, however, has taken no active part in its formation."

Maine Central

On the morning of July 26 the road had a total of 616 men working out of a total on June 30 of 1,502. Of the present force 227 are old men and 389 are new employees. Mail, passenger and freight service has been fully maintained. The number of workmen increasing daily.

New York Central

This company on Thursday in a statement giving the reasons why "it is impossible that the striking shopmen be taken back with restoration of their former seniority" gave also the following figures as to the number of men affected: "20,000 shop workers of all classes were on the payrolls on June 30 and were affected by the strike call on the New York Central Railroad. On July 26 a total of 15,000 men were working in these positions and of these forces at present working, 57 per cent are old employees and 43 per cent are new workers employed since the strike."

New York, New Haven & Hartford

This company continues to maintain normal movement of freight and passenger traffic. Its force of skilled mechanics is being increased daily by the employment of new men and the road reports that its forces are rapidly approaching normal. Some delay to passenger trains has been reported during the past week due to storms, one of which caused washouts at Providence, R. I., on the night of July 23.

Norfolk & Western

This company tells the *Railway Age* of the situation on its lines as follows:

"In so far as strike of clerks is concerned, it amounts to nothing. There has been no interference with the orderly conduct of the business on this account and the positions vacated by them have been largely filled. With reference to strike of shopmen, some of the older employees have returned to service and we are hiring new men, being careful to select competent and desirable ones. Of course, traffic is to some extent affected, more particularly with reference to coal loading. Coal movement is probably between 50 and 60 per cent of the June movement which was abnormally large."

Pennsylvania

On July 25 this company issued a statement which read:

"The most favorable situation that has existed on the Pennsylvania System at any time since the shopmen's strike began on July 1, was disclosed in today's reports from all regions of the system. Consistent and satisfactory gains were shown in the forces of every region.

"The total number of shopmen actually working on the entire system is 42,836, an increase, as compared with a week ago, of 1,851. An average week-day force under normal conditions would be approximately 55,000.

"The Eastern Region and the Altoona Works combined have

made a net gain, as compared with a week ago, of 420 men actually working; the Central Region has gained 746 men; the Northwestern Region, 331 men; the Southwestern Region, 354 men.

"The movement of freight, during the week just ended, was the heaviest that has been handled on the Pennsylvania System since the closing week in March last, when coal traffic was abnormally high in anticipation of the suspension in mining. The total number of freight cars dispatched last week was 734,872, and this total would have been considerably larger but for the fact that the current movement of coal is only approximately one-third of normal.

"From the point of view of on-time performance, the freight movement last week, of arranged and scheduled service, was practically 100 per cent perfect. Promptness of dispatching was considerably above normal, and unusually good records were made in the return of empty refrigerator and stock cars in order that the transportation of food supplies could be maintained uninterruptedly.

"Normal on-time performance was maintained in passenger service throughout all portions of the system. Last week showed the heaviest seashore and summer resort traffic of any period thus far during the present season, the volume of that class of travel being approximately 5 per cent greater than during the corresponding week a year ago.

"At no time since the strike began has any train movement, either passenger or freight, been canceled or interfered with, by any developments connected with the strike, on any portion of the Pennsylvania System."

Philadelphia & Reading

Publicity from the shopmen's organizations on Wednesday said that 1,000 Reading shopmen walked out that morning at Philadelphia, Harrisburg, Allentown and Tamaqua in sympathy with the strike on other roads. It was explained that the walkout took place at this late date because the majority of the shop workers on the Reading are affiliated with the American Federation of Railroad Workers and the present strikers had previously remained at work because of the majority agreement. Inquiry addressed to the Reading management brought out the following details:

"After special effort on part of A. F. of L. this (Wednesday) morning, at various points on system, there are 318 men out, of a total of 8,040, or less than 4 per cent."

Richmond, Fredericksburg & Potomac

Of a normal shop force of 981, this road now has 668 employees. There have been no interruptions to traffic and conditions are said to be improving as the strength of forces approaches normal.

Southern Railway

The Southern Railway has made a separate agreement with its clerks, who had been threatening to go on strike and has proposed a conference with representatives of its shop employees. The Southern had not issued any ultimatum setting a date by which the strikers must return in order to retain their seniority and it has made no effort to employ new men.

Virginian

This road reports as follows:

"We have not undertaken to open back shops because of excellent condition of our power when strike was called. We have about 60 per cent of our normal force at work in roundhouses. We have had little or no interference with traffic except in maintaining our heavy pusher engines. This we have overcome and will soon be normal at all points. We are getting men from various sections of the country and some of our old men are returning to work."

Western Maryland

This company, which has its shop work done by contractors, reports conditions normal, none of the contractors' employees having left the service on account of the July 1 strike. The road reports all traffic being handled currently and "in addition to" its own business "traffic of other railroads is being diverted via the Western Maryland."

The Strike Situation in the West

The fourth week of the strike bore a less turbulent aspect on the western roads than those preceding. The disorders on the part of the strikers seem to have subsided to a great extent while those outbreaks which occurred were of a less serious nature than in the preceding weeks. This was due, in large measure, to state and federal intervention and the injunctions which have been granted the roads. The suspension of train service was much greater than heretofore, but most of this was due to the shortage of fuel. It is estimated that the total withdrawal of trains at the present time is approximately 300.

Included in the list of roads curtailing service was the Pere Marquette which removed 20 trains and shortened the runs of many others; the St. Louis-San Francisco dropped two trains between Birmingham and Memphis and the Wabash two between Detroit and St. Louis, two between Toledo and Fort Wayne and two between St. Louis and Decatur, Ill. The Chicago & North Western dropped seven trains on the Milwaukee division, ten Chicago suburban, and other trains on its western lines. The Kansas City Southern removed four; the Missouri, Kansas & Texas dropped its Katy Flier between Waco, Houston and Galveston, and merged six other trains. The Great Northern dropped a number of short run and branch line trains. The Chicago & Eastern Illinois is reported to have dropped 11 trains from its schedule. The Grand Trunk removed 16 trains, principally on its Michigan lines, four of which ran between Chicago and Detroit. The Ann Arbor has also dropped several trains from its schedule.

The gloomy cast that this curtailment gave the situation on the roads was offset, however, by the greatly increased recruiting of men to fill the places of those who went on strike. Sufficient men are available to fill all vacant positions and with the continued progress of recruiting the roads should have a full complement of men within a short time.

A number of restraining injunctions were granted. The Missouri Pacific and the St. Louis-San Francisco secured temporary injunctions at Kansas City, Mo.; the Pere Marquette at Detroit; the Baltimore & Ohio and the Louisville & Nashville at East St. Louis; the Wabash at St. Louis and the Great Northern at St. Paul were also granted temporary injunctions. The injunctions granted the Chicago, Burlington & Quincy at Keokuk, Iowa and Chicago were made permanent and others were granted the Erie and the Chicago, Indianapolis & Louisville at Hammond, Ind. The Pullman Company, declaring that its employees were walking out in sympathy with the striking railway shopmen, also secured a restraining order against interference with its shops throughout the country.

State troops are on strike duty in nine states at the present time, but are encountering little disorder. Dispatching of state troops to centers of disorder was necessary in Kansas and Texas. Militia was ordered to Hoisington, Kansas, to do guard duty at the Missouri Pacific shops where rioting broke out last week and to Denison, Tex., where fresh outbreaks occurred. The situation at Denison had quieted for several days, and it was believed that troops would not be needed, but recent outbreaks forced Governor Neff to declare a state of martial law at that place, and to send troops to enforce the proclamation. The governor also issued two other proclamations placing the strike situation at Childress and Sherman under provisions of the "open port" law. State rangers will take charge at these places.

The situation on the Western lines, on July 25, may be summarized as follows: All freight is being moved as offered while passenger trains are being operated normally. Large numbers of men are being added to the shop forces and the number at work ranges from 23 to 75 per cent of the normal forces on the different roads. Freight car loadings reported for the first two weeks of July, as compared with the same weeks of last year, show increases ranging from 6 per cent to 53 per cent, the average being about 25 per cent. Railway fuel receipts are said to be satisfactory. Out of 22,644 cars of coal purchased by the lines with head-

quarters at Chicago since June 7, for delivery up to August 31, 60 per cent has already been received. This is in addition to the coal in storage.

The situation on a number of individual roads is reported below:

Atchison, Topeka & Santa Fe

The Atchison, Topeka & Santa Fe had 52 per cent of its normal force at work on July 25. No trains have been annulled nor have any embargos been issued against any kind of traffic. Both freight and passenger business have been better during the first three weeks of July than during the first three weeks in June. Eighty-seven per cent of the trains have arrived at their terminals on time since the strike started. At the Topeka shops, the number of cars repaired during the first three weeks of the strike averaged 44 per day, as against 74 per day for the corresponding period in June, but for the five days ending July 22, 77 cars were repaired per day, a gain of three per day over the average number repaired during the corresponding period in June, before the strike.

Chicago, Burlington & Quincy

Recruiting has been progressing steadily on the Chicago, Burlington & Quincy since July 10, 125 to 150 men being hired per day. The highest enrollment up to the present time was on July 24, when 455 men were employed, the greatest proportion of whom were skilled mechanics.

Cleveland, Cincinnati, Chicago & St. Louis

The Big Four is operating without serious difficulties, and is handling all traffic promptly. Passenger trains are running on time and recruiting is progressing favorably.

Denver & Rio Grande Western

This company has recruited a force of 324 men, its pre-strike enrollment being 2,400. Employment has been progressing in good shape, especially during the past week.

Great Northern

This company reports conditions improving daily. On July 26 163 more men were working than on the previous day. The embargo has been raised in Montana and if the road is given necessary protection it says that it will be able to furnish sufficient men at Wolf Point, Havre, Whitefish and Troy to relieve the situation at an early date. The matter of securing protection in Montana has been up to this time the greatest hindrance the company has had. On July 25, 2,333 men were working out of a total pre-strike force of 9,253.

Illinois Central

Conditions on this road are rapidly approaching normal, 9,514 shopmen being at work on July 24, as compared with a pre-strike force of 12,701. Little picketing or trouble with strikers is being experienced.

Kansas City Southern

The Kansas City Southern with a shop force of approximately 15 per cent of normal is moving traffic normally. Men are being added daily and no serious disturbances have been encountered.

Missouri, Kansas & Texas

The Missouri, Kansas & Texas, with a normal force of 4,200 men, has 1,300 at work. New men are being employed daily. A number of disturbances in Texas necessitated the calling out of troops.

Missouri Pacific

This company has a working force between 25 and 30 per cent of normal. There has been some tampering with engines and machinery on the part of strikers, but business and traffic movements are in a good condition.

Nashville, Chattanooga & St. Louis

This company reports 1,687 men at work out of a normal force of 2,500. Only slight labor disturbances have been encountered.

St. Louis-San Francisco

The situation is improving. A 30 per cent of normal force is handling a heavy freight business without serious delays.

Southern Pacific

The Southern Pacific System with a normal complement of 9,000 reports 7,438 now working. Strikers have caused much trouble by picketing and intimidation. Full freight and passenger schedules are being maintained and other classes of employees are remaining neutral. In a telegram to Chairman Kruttschnitt, President Sproule made clear the road's attitude on the question of restoring seniority rights to strikers. This telegram, which was made public in New York on July 26, follows:

"Press dispatches carry suggestions which leave the inference that negotiations may now be in progress between government and labor leaders that might result in strikers returning to work with their senority rights unimpaired. So far as the Pacific system is concerned there is no need for such concession. We told the 5,000 men who stayed with us that their loyalty would be respected and their senority rights, thus improved, would be protected.

"On the other hand, we have announced to the men who quit work that such of them as resumed work with us will do so as new men, taking their seniority from date and hour they resumed work. In employment of new men the question almost invariably asked has been answered by giving assurance that we will not displace them in order to take back deserters.

"Our officers unite in judgment that the backbone of the strike has been broken. We are constantly gaining accessions to workers and expect to have a high-grade labor organization for the Pacific system as a result which will be far more satisfactory to ourselves, to the government and to the men than under the disloyal labor leadership which has thrived upon unbalance to the detriment of the men and the whole country.

"Our officers unite in conviction that to bring deserters back by granting them restoration of their seniority rights would be for them the equivalent of winning the strike, because of surrender by the managements and the government, and in doing so the real intention of the labor leaders is to create such a condition as will make it impossible for the railroads of the country to win another strike, because men could not be found who would either stay with the company or take employment, if, after hardships of strike, they were to be displaced by strikers, who would show them but dastardly consideration as soon as they got into power again.

"We can, and will, win this strike on basis of Labor Board decision, which was the pretext for the strike; and the point of greatest importance at this time is that decision of Labor Board be sustained without tarnishing their authority by compromise."

Union Pacific

This system has approximately 5,000 men employed in its shops, which constitutes 75 per cent of its normal force. A full schedule of passenger trains is being operated and freight is handled without delay.

Marcus in the New York Times

Nero

Colorado & Southern Assisted by Coal Strike

Beginning Late in May Coal Loadings Commenced to Be Much Ahead of Last Year's

THE COLORADO & SOUTHERN Lines operate a total of 1,809 miles of railroad of which 134 is operated under lease or contract. It also owns 132 miles which it does not operate. The system's main line extends from Orin, Wyo., where connection is made with the Chicago, Burlington & Quincy south through Cheyenne, Denver, Colorado Springs, Pueblo, Trinidad, etc., and thence southeast across the panhandle of Texas to Fort Worth. The system is divided into three main parts. The Colorado & Southern, operating 1,099 miles, includes the northern part of the system. The Fort Worth & Denver City, 454 miles, operates that part from the Texas state line, Texline, to Fort Worth. The Wichita Valley Lines, 256 miles, operate a line southwest from Wichita Falls. The system is tied together financially by the Colorado & Southern's ownership of practically all the capital stock of the other two companies. The Burlington has controlled the Colorado & Southern since 1908, this being exercised by majority stock control. On December 31, 1920 the Burlington owned $23,657,500 of the C. & S. $31,000,000 common stock, $1,130,000 of the first preferred and $6,078,700 second preferred, the C. & S. preferred issues totaling $17,000,000.

The Colorado & Southern figures are reported separately for the three companies. In 1921 the parent company had an income balance transferred to profit and loss of $870,156. This compared with $1,926,066 in 1920 or with $1,103,946 in 1919. Dividends for the year totaled $680,000, this including 4 per cent on each of the two preferred issues. A dividend of 3 per cent, amounting to $930,000, was declared on the common shares. This was the first common dividend since 1912; it was paid from surplus. Outstanding features in the 1921 income account were an increase in receipts in the form of dividends and miscellaneous interest from $1,352,530 in 1920 to $1,923,140 in 1921 and a decrease of about $120,000 in the credit balance for equipment hire. Details concerning the income from operations are discussed below.

The Fort Worth & Denver City reported an income balance for the year of $2,075,079, which compared with $836,898 in 1920 and $676,325 in 1919. Interest disbursements in 1921 were $916,466; in 1920, $639,152. The Wichita Valley had a net for 1921 of $178,122; in 1920 of $143,386.

While the Colorado & Southern annual report shows separate figures for the three constituent companies, it also gives a selection of certain grouped figures. These show that in 1921 as compared with 1920 the operating revenues of the three companies decreased $4,930,059 or 15.8 per cent. The operating expenses decreased $6,387,732 or 24.03 per cent. Net revenue from railway operations increased $1,457,673 or 25.62 per cent and net railway operating income increased $1,918,534 or 49.74 per cent. The system's operating ratio in 1921 was 72.80 per cent; in 1920, 81.77 per cent. The interesting feature is that whereas the net railway operating income of the Colorado & Southern decreased $931,308, that of the Fort Worth & Denver City increased $2,572,228. The latter company had a decrease of $1,814,290 in its operating revenues and a decrease of $3,985,067 in operating expenses; it operated at 66.27 in 1921 as compared with 87.44 in 1920.

These details are possibly better shown in the figures of net railway operating income. The Colorado & Southern had a standard return of $2,481,212; in 1920 it had a net after rentals of $2,835,102; in 1921 its net after rentals was $1,903,794, a decrease of $931,308. The Fort Worth & Denver City had a standard return of $1,891,386. In 1920 it had a net after rentals of $884,885; in 1921 it earned $3,457,113, an increase of $2,572,228. The Wichita Valley increased its net after rentals from $136,791 in 1920 to $414,404 in 1920.

The Colorado & Southern's tonnage in 1921 was 49.30 per cent bituminous coal. Products of agriculture made up 17.92 per cent. The tonnage of all commodities totaled 4,753,055 which compared with 6,789,747 in 1920. The decreases in tonnage were general although coal got more than its share of the falling off. There was an increase in products of agriculture.

The Fort Worth & Denver City in 1921 moved 2,851,717 revenue tons; in 1920, 3,441,773. Of the 1921 tonnage 30.83 per cent was products of agriculture; the tonnage of this commodity did not increase greatly over 1920 but the percentage did; in 1920 it was only 25.17 per cent. Bituminous coal made up 17.11 per cent as compared with 21.78 per cent in 1920; the 1921 tonnage was 487,936; the 1920 figure was 749,623. Refined petroleum made up 454,643 tons in 1921, 15.94 per cent; in 1920, it made up 461,177 tons, 13.40 per cent.

The Wichita Valley tonnage in 1921 was 385,456. In 1920 it was 472,020. In 1921 products of agriculture made up 34.60 per cent; 133,380 tons, as compared with 171,832 tons or 34.6 per cent in 1920. Bituminous coal in 1921 made up only 10.90 per cent. Refined petroleum made up 69,168 tons or 17.94 per cent.

The Colorado & Southern owns the Colorado Springs & Cripple Creek District. This line it leased to another company for operation. The road has been in the hands of a receiver but the line has not been operated for some time, and no plan has been advanced for its reorganization. The entire capital stock which is owned by the Colorado & South-

COLORADO & SOUTHERN LINES—RAILWAY OPERATING INCOME

	Colorado & Southern		Fort Worth & Denver City		Wichita Valley	
	1921	1920	1921	1920	1921	1920
Railway operating revenues:						
Freight	$9,897,761	$11,934,164	$8,027,522	$8,337,901	$1,269,502	$1,215,504
Passenger	2,394,205	3,023,812	2,725,418	4,083,553	362,134	521,140
Total railway operating revenues	13,223,220	16,223,954	11,334,958	13,149,248	1,723,110	1,838,145
Railway operating expenses:						
Maintenance of way and structures	1,993,464	2,587,479	1,190,946	2,052,406	315,684	443,817
Maintenance of equipment	2,981,257	3,427,673	2,096,648	2,939,397	138,498	182,057
Traffic	146,129	145,867	126,825	96,794	406	966
Transportation	4,703,027	5,678,460	3,590,665	5,891,300	624,866	804,450
Total railway operating expenses	10,523,890	12,572,507	7,512,206	11,497,273	1,097,987	1,452,036
Net revenue from railway operations	2,699,330	3,651,447	3,822,752	1,651,976	625,123	386,110
Railway tax accruals	758,972	880,123	385,026	388,336	70,121	70,870
Railway operating income	1,932,714	2,768,526	3,434,990	1,262,207	554,650	315,160
Equipment rents (net)	33,480	124,257	21,523	Dr. 374,709	Dr. 155,430	Dr. 186,378
Joint facility rents (net)	Dr. 62,400	Dr. 57,681	601	Dr. 2,612	15,183	8,008
Net railway operating income	1,903,794	2,835,102	3,457,113	884,885	414,404	136,791

ern has been determined to be worthless and the C. & S. profit and loss account for 1921 shows a debit charge of $1,397,013 representing the book value of the capital stock and certificates of indebtedness of the Colorado Springs & Cripple Creek District Railway Company.

The fortunes of the Trinity & Brazos Valley, in which the Colorado & Southern and the Rock Island each have a half interest, were in 1921 quite the opposite, this more pleasant state of affairs being due to the business derived from the opening of the Mexia (Texas) oil field and, according to the C. & S. annual report, to the "good management of the receiver." The T. & B. V. in 1921 had total operating revenues of $3,501,010 as compared with $2,273,445 in 1920 and its net railway operating income for 1921 was $288,066 as compared with a deficit in 1920 of $645,513.

The Colorado & Southern has been assisted rather than hurt by the coal strike due to the manner in which the Colorado mines are operating. This improvement, however, was not in evidence until late in May. Coal loadings in March—before the beginning of the strike—ran about 1,400 cars weekly. In April they averaged about 550 weekly. They increased gradually in May and figures for recent weeks have approached 1,300. Coal loadings at this time last year approximated 1,000 weekly. The effect has been reflected in total loadings. In the week ended July 1, the total loadings of all commodities were 2,088 as compared with 1,602 for the same week last year. Traffic received from connections for the same week totaled 1,701 cars as compared with 786.

The latest figures for net ton-miles (revenue and non-revenue freight) are those for April and the four months, the 1922 four months total being 232,153,000 as compared with 247,995,000 in 1921. These figures are not particularly favorable but should show some improvement with the inclusion of the June or later figures. Net after rentals figures are available for May. For the five months ending May 31 the net this year was $564,508 as compared with $852,147 in the same period of last year. The Fort Worth & Denver City figures are much more favorable. For the first five months of 1922 that company has made a net after rentals of $916,218 as compared with $1,086,513 in the first five months of 1921. Its tonnage is also running behind that of last year, the four months net ton-mile figures being for 1922, 150,137,000 and for 1921, 180,919,000.

TWELVE STEAMERS are now engaged in carrying iron ore from Newfoundland to Germany via Rotterdam, and it is estimated that about 750,000 tons will have been taken across by the end of the year.

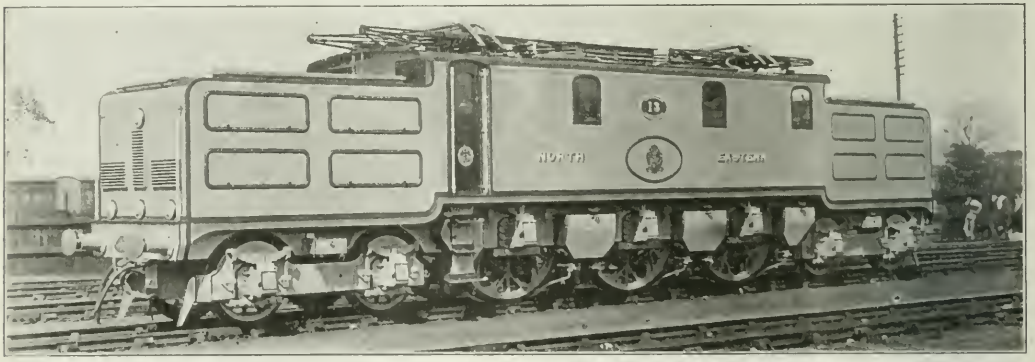
North Eastern Railway, England, Tries Out New Electric Locomotive

A NEW TYPE of electric locomotive for high speed passenger service, which has a symmetrical wheel arrangement and unusually large driving wheels, is being tried out on the North Eastern Railway in England. The locomotive was designed by Sir Vincent L. Raven, chief mechanical engineer, North Eastern Railway, the mechanical parts were built by the Locomotive Works at Darlington and the electrical equipment was supplied by the Metropolitan-Vickers Company. Only one locomotive has been built.

The locomotive is designed to haul a 450-ton express passenger train at an average speed of 65 miles an hour on level tangent track. The running gear is designed for a maximum safe speed of 90 miles an hour without doing damage to the mechanical parts of the locomotive, which is of the 4-6-4 type and consists of main frames mounted on three driving axles with three pairs of driving wheels 6 ft. 8 in. in diameter, and a four-wheel truck at each end. The cab and sloping ends are rigidly fixed to the main frames, and are provided with the necessary supporting members for carrying the auxiliary and control equipment.

GENERAL DIMENSIONS OF NORTH EASTERN PASSENGER LOCOMOTIVES

Wheel arrangement	4—6—4
Electrical system	Direct Current
Voltage	1,500
Length over all	53 ft. 6 in.
Width over all	8 ft. 10 in.
Height, pantograph locked down	13 ft. 0 ½ in.
Driving wheel diameter	80 in.
Pony wheel diameter	43¼ in.
Rigid Wheel base	16 ft. 0 in.
Weight of locomotive	102 tons
Weight per driving axle	18 tons 10 cwts.
One hour rating—Tractive effort	15,900 lb.
Speed	43 m.p.h.
Horse-power	1,800
Continuous rating—Tractive effort	9,480 lb.
Speed	51.5 m.p.h.
Horse-power	1,300



High-Speed, 1,500-Volt, Direct Current Electric Passenger Locomotive Built for the North Eastern Railway

The current is collected from the overhead trolley by pantographs mounted on the roof at each end of the center compartment. The main traction motors, which are of the twin-armature type, are rigidly fixed to the main frame of the locomotive, and transmit the torque to a gear wheel mounted on a hollow shaft or quill. The connection between the quill and driving wheels is through springs. The high tension apparatus is located in one of the sloping ends; the other sloping end contains an electric boiler for supplying steam for train heating.

The capacity of the locomotive is 1,800 hp. one hour rating, or 1,260 hp. continuous rating.

The locomotive was built for running on the main line, but at present trials can only be carried out on the Newport-Shildon branch, which has the same voltage which the locomotive is designed for.

The satisfactory result of the trial clearly indicated that the full horse-power for which the locomotive was designed could be developed. The test further proved that the heavy grades on this line could be dealt with in the manner anticipated. The results of the trial showed that, when this locomotive is put on the main line, it will be able to take the heavy passenger traffic up the grades at a higher speed than steam locomotives are able to do at the present time, and that it will be able to maintain a faster schedule without running excessive speeds on the level and down grade.

Great Northern Ore Traffic Will Help 1922 Net

Ore Loadings Increasing Rapidly After Long Period at Low Level —Totaled 10,149 Week Ending July 1

When, in March, the Great Northern directors changed the dividend payments on the preferred stock from a quarterly to a semi-annual basis, there was much uncertainty in financial circles as to whether the company would be able to maintain the seven per cent rate. This uncertainty was due not only to the statements issued at the time by the chairman of the board, but also to the rather poor earnings which the Great Northern was then reporting and had been reporting over an extended period of time. A few weeks ago the directors declared a semi-annual dividend of 3½ per cent, thus maintaining the regular seven per cent dividend rate. It is not difficult to give the declaration of the regular dividend even more importance than that it retained the regular rate. We believe that future earnings reports will show that it will have marked the long hoped for change in Great Northern fortunes. The outstanding reason for this opinion is that the Great Northern has within the last month begun to move iron ore in rapidly increasing volume. This, combined with the expansion of traffic in other classes of tonnage and the fact that Great Northern is operating on a very economical basis, should be reflected in the future monthly earnings statements.

It was primarily the Burlington's extra dividends which brought the Great Northern through in 1921. There accrued to the Great Northern, Burlington dividend payments amounting to $21,809,560. In addition, the Great Northern shows in its 1921 income statement the sum of $7,233,100 interest on bonds of the Spokane, Portland & Seattle, representing accruals for the period from March 1, 1915, to March 1, 1920, of which, it is noted, $1,005,379 has been paid. The net railway operating income for the year was $12,866,411. The income statement shows a balance after the seven per cent dividends and appropriations to sinking and other reserve funds of $10,982,668. In 1920 the income balance was $1,815,497.

The net railway operating income of $12,866,411 in 1921 represented a marked increase over 1920, but it was less than one-half the figure that was set for the Great Northern's standard return during federal control, which was $28,613,045. During federal control and continuing until quite recently the Great Northern showed extremely poor net earnings. In 1918 its net after rentals was about $11,978,800. In 1919 it reported about $12,459,620 and in 1920 it was but $3,000,000, the total for those three years being less than the standard return for one year.

Operating Expenses Decreased 29.36 Per Cent

The 1921 result was brought about by very drastic economies. As compared with 1920, the road in 1921 carried 40.72 per cent less revenue tons and 32.61 less revenue ton-miles. Its freight revenues were decreased 16.78 per cent and its gross operating revenues 17.36 per cent. On the other hand, it reduced its operating expenses 29.36 per cent. Maintenance of way expenses were reduced 46.09 per cent; maintenance of equipment, 21.18 per cent and transportation 27.28 per cent. There were but few roads that were confronted with a situation quite as difficult as was the Great Northern's in 1921, and there were few that came through with better results under comparable circumstances.

The revenue tonnage in 1921 was 19,533,134 as compared with 32,948,292 in 1920, the reduction being 13,415,158 tons. The average haul in 1921 was 293.91 miles; in 1920, 258.55. This explains why it was that the revenue ton-miles, 5,740,921,478, represented a reduction of 32.61 per cent, whereas the reduction in revenue tons was 40.7 per cent. The tonnage that suffered most strikingly was iron ore. In 1920 the Great Northern moved 299,471 cars and 14,755,241 tons of iron ore; in 1921 it moved but 90,824 cars and 5,048,120 tons, the reduction in this important commodity being, therefore, something like 65 per cent. Forest products in 1921 made up 2,597,018 tons as against 3,804,135 tons in 1920. In the case of farm products there was an increase, notably in wheat, the 1921 tonnage of the latter being 2,548,124 as against 1,928,737 in 1920.

The 1921 freight revenues were $74,700,241. In 1920 they were $89,760,845, the reduction being $15,060,605 or 16.78 per cent. Total revenues were $101,317,204, as compared with $122,597,865 in 1920, the reduction being $21,280,661 or 17.36 per cent. The reductions in operating expenses, which amounted to $33,450,202 or 29.36 per cent, were as follows:

	1921	1920	Decrease	Per cent
Maintenance of way.....	$13,865,917	$25,718,561	$11,852,644	46.09
Maintenance of equipment.	21,075,308	26,739,434	5,664,126	21.18
Transportation	40,494,719	55,684,548	15,189,829	27.28
Total	80,496,913	113,947,115	33,450,202	29.36

In 1921 the operating ratio was 79.45; in 1920 the Great Northern operated at 92.94. Now, of course, the first reason for the sharp decreases in expenses in 1921 as compared with 1920 was the fact that the 1920 expenses were abnormally high. A second reason was the severe decline in traffic, but the outstanding factor is that the Great Northern was able to take its situation in hand and bring things back to a more normal basis. The striking feature in the reduction in expenses is the decrease of 46.09 per cent in maintenance of way. It is worth noting, first, that in 1920 as compared with 1919 the road had an increase in this item of 41.61 per cent. Second, while the 1921 reduction was due to some extent to the decreased traffic, the annual report also says, "contributing factors were the favorable weather conditions and the improved individual performance of the employees. The tie and rail renewals in 1921 amounted to $2,496,160 as compared with $2,629,583 in 1920, practically the same for both years. There was no curtailment of the renewal of ties and rails and the track was maintained up to standard. The company, however, suspended certain other work, such as cutting grass and weeds and removal of snow and ice,

the effect of which was only transitory and which did not impair the road for safe operation."

Improvement in First Four Months

The idea was expressed above that Great Northern earnings should show a marked improvement in coming months. The latest earnings report we have at this writing is that for May and the first five months of 1922. The statement shows gross of $33,487,954 for the five months as compared with $33,455,184 in the first five months of 1921. Expenses were $28,937,099 as compared with $32,653,805 in the same period of last year, which indicates that the economy effected in 1921 is being continued. The result was a net after rentals for the first five months of this year of $2,208,792 as against a deficit after rentals last year of $2,799,145, an improvement of over $5,000,000. The May operating ratio was 81.3; for the four months it was 86.5. The traffic figures show a similar improvement. For the first five months of 1922 the Great Northern moved 2,538,545,000 net ton-miles (including revenue and non-revenue freight) as compared with 2,162,584,000 net ton-miles in the first five months of 1921, which shows that the revival of business has finally reached the Great Northern. The traffic on this system does not run large in the early part of the year. If, however, the road thus improved its position in the months of light traffic, the situation augurs well for the heavy traffic months later in the year.

Ore Loadings Show Rapid Increase

Although the June earnings figures are not yet available, the indications are that they will be much better than those for May. They will unquestionably show the effect of increasing ore traffic. After a long period characterized by the small amount of this tonnage, this traffic has again begun to move and in rapidly increasing volume. It began about the middle of April at the opening of the season of navigation on the Great Lakes. Prior to that time the ore loadings ran less than 100 cars weekly. In the week ending April 15 they were only 166 cars; the following week they jumped to 1,138 and for the week ending April 29 they were 2,006. There was a progressive increase during May. For the week of May 20 the figure was 2,436; for that of May 27, 3,460. The June figures showed the following favorable results: Week ending June 3—4,387; June 10—6,479; June 17—7,066; June 24—8,961; July 1—10,149. This last figure begins to approach normal business levels. In 1920, when tonnage was running heavy, weekly loadings of ore were at a rate of 10,000 cars weekly. In September they reached over 11,000. Ore in 1920 made up over 44 per cent of the Great Northern's total tonnage so the relative importance of the ore traffic will be readily appreciated. It has already been noted that the 1921 ore tonnage was about 65 per cent less than that of 1920; in May and June, 1921, ore loadings were running about 4,000 cars weekly. The rapidity of the present increase in ore traffic is a factor to be watched with interest as it will have a most important effect on Great Northern results.

In addition to ore, the Great Northern is also showing improvement in other commodities. Forest products this year have been ahead of the 1921 loadings for some months. The week ending June 24 was a typical week in this respect, the loadings of forest products being 2,749 cars as compared with 1,627 for the same week of last year. Grain loadings are ahead of last year. Coal is, comparatively speaking, not an important commodity to the Great Northern. The loadings have been, however, ahead of last year, the loadings during the past three months ranging from 400 to 900 cars a week. Total loadings of all commodities have been running slightly ahead of the loadings for the comparable weeks of last year, that is up to the beginning of June, when the great increase in ore loadings began to put the 1922 figures much ahead. The figures show the totals to be as follows: For week ending June 3, 13,375 as compared with 11,976 for the same week last year; June 10, 16,468 compared with 13,446; June 17, 17,061 compared with 12,273; June 24, 18,978 compared with 12,878. It will be a matter for surprise, it would seem, if the June earnings should not show some rather striking figures.

The Great Northern, taking things as a whole, seems to have finally made a change for the better. Its traffic is rapidly increasing, especially in its two important classes of ore and forest products, and the fact that the tonnage is being handled on a more economical basis should show in the size of the figure of net railway operating income. It is, of course, a question whether the road will be able in 1922 to restore its position to that of before the war when it was able to operate at 60 per cent, but there can be no question that the 1922 results will be strikingly better than those of 1921.

There may be some adverse effect from the present shopmen's strike. In the first five months of this year, however, the Great Northern earned practically $5,000,000 more net than it did in the first five months of 1921. It may, of course, not be able to keep up this record throughout the year, but it is presumably safe to assume that the system will earn $10,000,000 more in 1922 than in 1921. If this proves to be the case the net railway operating income for this year will approximate $23,000,000. Other income will bring this up to $25,000,000 or $26,000,000. As the fixed charges are $8,000,000 this will leave $17,000,000 or $18,000,000, or practically seven per cent on the stock. The evidence is that the poor earnings of the federal control period can be regarded as having been definitely left behind. The seven per cent dividend now seems to be safe.

The Southern Pacific received from the Union Pacific at Ogden 580,000 tons of freight and delivered to the Union Pacific at Ogden 1,332,000 tons of freight in the year 1921, William Sproule, president of the Southern Pacific, pointed out in a recent statement.

"Contrast this with the Sunset Route about which so much has been said," Mr. Sproule continued. "In 1921 we delivered at El Paso to the Sunset Route 348,000 tons of freight and received from them 412,000 tons of freight, showing how little figure the El Paso route cuts in comparison with the Southern Pacific's great contribution to the Ogden route."

P. & A. Photo

When a Ferry Boat Crashed Into a Car Float Under Brooklyn Bridge, New York

Danish Railroads Benefit From Tie Preservation*

Careful Records of Renewals Over Long Period Demonstrate Advantages of Timber Treatment

RATIONAL IMPREGNATION of railway ties was introduced in Denmark over 30 years ago by starting a plant in the provincial town of Koge on the Baltic coast. During the first five or six years the activity of the plant was very restricted as only the state railways employed impregnation and that only as applied to the roads on the island of Zealand. In 1899 the second plant was built at Horsens and at the present time all railways in Denmark with a single exception use pressure treated ties.

Various Preservatives Have Been Used

A mixture of zinc chloride and creosote oil has been used from the first in Denmark for timber treatment. During the war, however, it became necessary to resort to treatment with dinitrophenol, sodium-silico-fluoride and crude naphthalene. Both dinitrophenol and sodium-silico-fluoride are salts soluble in water. Both substances possess good decay-preventing qualities, but their defect, as in the case of all salts used for impregnation, is that in the course of time they leach out. There is also to be considered the inconvenience arising from their use by reason of the fact that the wood after full-cell impregnation is heavy and wet, and must remain piled for a considerable time before it can be used. Another difficulty in the use of sodium-silico-fluoride is that it is hard to dissolve, necessitating the use of very warm liquid to obtain sufficient penetration.

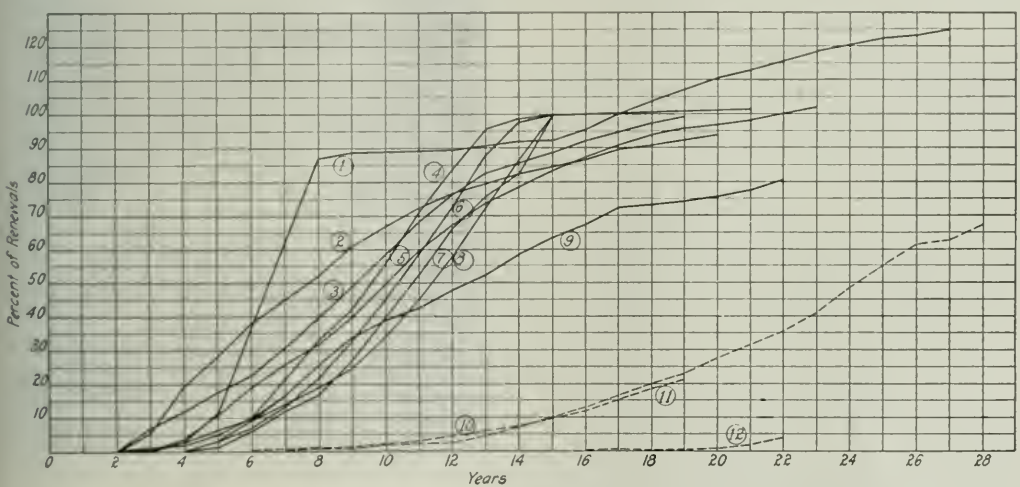
As is known, the various salts are not adapted for impregnation to beech. Only tar oil should be used for this species of wood, whereby it acquires an excellent durability. For lack of tar oil a limited number of beech ties were impregnated with crude naphthalene. Naphthalene, however, was found too difficult to handle since it stiffens even at quite high temperatures and the treatment of beech with it was soon discontinued.

Tie Renewals

The Danish State Railways Administration has for years kept record of the renewals of impregnated ties from year to year. The number of renewals show also the number of ties taken out during the year. An essential number of these ties are, however, presumably untreated, since of late years they have not been kept separate. However, the figures from which the accompanying curves were made represent in the main the true conditions.

The renewals represent both beech and pine. For 1908 the beech ties were impregnated with a mixture of chloride of zinc and tar oil, a practice affecting the renewal unfavorably since these beech ties have lasted hardly more than 10 years. The beech ties are now impregnated exclusively with tar oil and the result is an excellent tie, provided it has no red heartwood. In renewal, all ties are considered damaged which have been renewed for mechanical reasons.

In the reports of the State Railways, in the peninsula of Jutland and the island of Funen, the number of ties



Renewals of Untreated and Treated Pine and Beech Ties on the Danish Railways

1. Originally built with green Pomeranian pine ties. Renewals made with treated Pomeranian pine ties.
2. Originally built with green Swedish pine ties.
3. Originally built with green Swedish pine ties. Renewals made with treated Pomeranian pine ties.
4. Originally built with green Swedish pine ties. Renewals made with treated Pomeranian pine ties.
5. Originally built with green Swedish pine ties. Renewals made with specially treated Pomeranian pine ties.
6. Originally built with green Swedish pine ties.
7. Built with green Swedish pine ties. Renewals made with treated Pomeranian pine ties.
8. Originally built with green Swedish pine ties. Renewals made with treated Pomeranian pine ties.
9. Originally built with green Swedish pine ties. Renewals made with treated Pomeranian pine ties.
10. Average renewals of treated pine ties, as well as some beech, years 1889-1918.
11. Originally built with Pomeranian pine ties.
12. Originally built with treated 5-in. by 10-in. Dantzig pine ties.

*From a paper by A. Collatrop, of Denmark, translated by M. P. Jensen, and Published by the United States Forest Products Laboratory, Madison, Wis.

renewed annually was estimated in accordance with the number of ties in stock at the close of the fiscal year with the following results:

In 1897-1898	6.77	per cent
In 1898-1899	7.24	per cent
In. 1899-1900	6.50	per cent
In 1900-1901	6.53	per cent
In 1901-1902	8.23	per cent

In 1900 the treating plant at Horsens was started and the annual renewals in recent fiscal years for the Danish Kingdom are as follows:

In 1913-1914	3.20	per cent
In 1914-1915	3.05	per cent
In 1915-1916	2.98	per cent
In 1916-1917	3.11	per cent
In 1917-1918	2.50	per cent
In 1918-1919	2.26	per cent
In 1919-1920	2.48	per cent

These records show among other things that in the renewals for ordinary maintenance of late years only about 115,000 ties have been used, as compared with 300,000, which would have had to have been renewed if the annual renewal requirements had remained as high as they were initially. While this result is due, to a certain extent of course, to the many improvements in surface construction of late years, as tie plates, better ballast, use of screw-spikes, etc., it is principally the result of impregnation.

The Records for Certain Roads

In addition to the information on tie renewals to be obtained from the accompanying chart the following statements may well be noted respecting certain roads: The Slangerup Railway was opened for traffic on April 20, 1906. Originally constructed with 53,700, 6-in. by 8-in. by 8 ft. ties impregnated with zinc-chloride and tar oil, there have been exchanged in renewals 338 ties, or 0.63 per cent after 14 years of service.

That portion of the Naestved-Praestoe-Mern Railway, opened for traffic on March 20, 1900, was laid with 9,889 6¼ in. by 8¼ in. untreated Swedish pine ties and 22,344 impregnated Swedish pine ties of the same size. After 20 years of traffic over this section there has been a renewal of 10 per cent of the impregnated ties and 84 per cent of the untreated ties. That portion of the same line opened for traffic on November 16, 1913, was laid with 17,200, 6-in. by 8-in. by 8 ft. Pomeranian pine ties impregnated with tar oil. Of these none have yet been renewed.

The Odense-Norre-Broby Railway, opened for traffic October 3, 1906, was originally constructed with about 75,000 Pomeranian pine ties impregnated with zinc-chloride and tar oil. After 13½ years of service no renewals had been made. The Langeland Railway, opened for traffic on October 5, 1911, was originally constructed with about 54,000 Pomeranian pine ties, impregnated with tar oil, of which only 50 ties have been renewed.

As compared with the renewal records of these roads, records for the Veile-Vandel-Grinsted Railway, opened for traffic on September 10, 1897, and constructed with about 40,000 6-in. by 8-in. by 8-ft. untreated Swedish pine ties, are as follows:

After 4 years	1	per cent renewal
After 5 years	4	per cent renewal
After 6 years	7	per cent renewal
After 7 years	11	per cent renewal
After 8 years	16	per cent renewal
After 9 years	20	per cent renewal
After 10 years	26	per cent renewal
After 11 years	32	per cent renewal
After 12 years	37	per cent renewal
After 13 years	43	per cent renewal
After 14 years	49	per cent renewal
After 15 years	55	per cent renewal
After 16 years	61	per cent renewal
After 17 years	67	per cent renewal
After 18 years	74	per cent renewal
After 19 years	90	per cent renewal
After 20 years	93	per cent renewal
After 21 years	98	per cent renewal
After 22 years	102	per cent renewal

The renewals have been made principally with impregnated pine ties and the record of renewals is similar to that of several other roads.

Changes in Design of Elvin Stoker

In the original design of the Elvin Stoker a screw conveyor was used to carry the coal forward from the tender to the screw conveyor that delivers it to the elevator. In machines now being constructed the Elvin Mechanical Stoker Company, New York, is applying an improved type of chain belt feeder combined with a reciprocating crusher.

The feeder consists of four endless drag chains in a wide, shallow trough. The rate at which coal is delivered to the stoker is governed by the speed of the chains. They are fed forward intermittently at any rate required by the operator, delivering coal at any desired rate up to the maximum capacity of about seven tons per hour.

Coal which does not require crushing passes through four slots just back of the main crusher jaws, leaving the crusher to handle only the coal which requires breaking in order to reduce it to the proper size for the stoker shovels. No slide plates are used over the chains as the feeder operates under a full load of coal with a relatively small consumption of

A View of Feeder and Crusher with Tender Deck Removed

power. There is no possibility of injury to anyone walking back in the tender as the maximum speed of the chains is only about six feet per minute.

The crusher has a single crushing roll which revolves backward and forward through a partial revolution. The crusher is ahead of the coal gates and is not covered even when the tank is full of coal, being in plain view at all times during operation. Any obstruction in the crusher will stop the entire machine thus making its presence known. By reversing the stoker engine the crusher jaws can be opened allowing the foreign matter to be removed. The cover plate over the crusher is normally set at an angle to form a guard; when laid flat it forms a shovel plate for shoveling coal by hand on sidings or at terminals.

In order to compensate for the variable loads which are imposed by the crusher the stoker engine has been provided with a simple and compact governor apparatus. This operates on the hydraulic principle utilizing the varied pressure from a small gear pump to operate a balanced piston control valve. By means of the governor the stoker speed is maintained at any rate desired by the operator regardless of whether the fuel supply consists of slack coal or lumps or a mixture of both.

General News Department

Sleeping cars are now in use on the Alaska railroad, according to a recent press dispatch from Anchorage. Anchorage is 114 miles north of Seward. From there the sleepers are said to be in use to Fairbanks, the northern terminus of the road. Passengers will be allowed the use of the cars at division points where, heretofore, they had to sleep in "roadhouses." According to the latest time table of the road, as given in the Official Guide, passengers going from Anchorage to Fairbanks have to stop over night at Curry, 135 miles from Anchorage and again at McKinley Park, 99 miles from Curry. From McKinley Park to Fairbanks the distance is 120 miles.

L. & N. Veterans Receive Medals

Veteran employees of the Louisville & Nashville, at a meeting in Nashville, Tenn., on June 27 were presented with medals recognizing their length of service. Large numbers of officers as well as of employees, together with families and friends, attended the ceremony in the Young Men's Christian Association Building. An address was given by Rev. J. H. Parsons. The medals are of five different kinds—bronze, silver, silver with colored enamel, gold with colored enamel and gold with diamonds, the most costly going to the men of longest service. The total number awarded was 292, as follows: to employees over 45 years in service three; 25 to 45 years, 22; 25 to 35 years, 34; 15 to 25 years, 233.

County Seats Without Railroads

Traveling inspectors for the Missouri state boards have recently reported that of the 114 county seats in that state, 25 are without railroad facilities of any sort while several others have only meagre train service. The majority of the county seats in question are in the central and south central part of the state and only one of the 25 has more than 1,000 inhabitants. The largest county seat without railroad connections is Lebanon, Laclede county, with a population of 2,848, while the smallest is Danville, in Montgomery county, with 76. The most inconvenient county seat to reach is Gainesville, Ozark county, which is 43 miles from West Plains, the nearest railroad point.

Six Killed in Frisco Head-on Collision

Six persons were killed and a number injured when St. Louis-San Francisco passenger trains No. 2 "Texas Special," eastbound, and No. 9 "Meteor," westbound, met in a head-on collision at 3:47 a. m. on July 22, at Logan, Mo., where No. 2 was waiting on the main track. The wreck was the result of the engineer of train No. 9 failing to observe orders to take the siding at Logan, as well as disregarding the automatic signals. He had received orders at Billings, Mo., five miles east of Logan, but overlooked them and ran past the block signal, into No. 2, which was standing clear of the switch. He was killed, as were five passengers, all of the same family.

D. T. & I. Proposes Stock Ownership by Employees

The Detroit, Toledo & Ironton, Mr. Ford's railroad, on July 19, petitioned the Michigan Public Utilities Commission for permission to issue certificates of indebtedness up to $1,000,000, which will be sold only to its employees, the request stating that the purpose of the certificates is to "promote a sense of participation in the company, its welfare and its earnings." According to the present plan the certificates are to be issued in $100 denominations and will be non-negotiable. The company has 2,225 employees, with average earnings of $185 a month. The proposal is that these employees shall pay five per cent of their earnings month by month until the securities are settled for in full. The rate of interest will be determined by the board of directors of the company, although no set interest will be guaranteed. The funds derived from the money paid by the employees will be invested at the discretion of the directors.

The request to the utilities commission to sanction the issue of these certificates raises a new question. The Interstate Commerce Commission claims to exercise jurisdiction over the issue of railroad securities, and the Michigan Public Utilities Commission contends that it is vested by state law with authority over all issues of securities by Michigan railroads. The Detroit, Toledo & Ironton first went to the Interstate Commerce Commission to get authority to issue the certificates and the latter suggested that the case would be facilitated by getting an informal approval of the Michigan commission, and the latter now has the petition.

British Train Control Report

A limited number of copies of the report recently issued by the Ministry of Transport on automatic train control—a 33 page pamphlet, including appendices—will be available at the New York office of the *Railway Age* at 50 cents a copy.

The report, which was abstracted in the *Railway Age* of July 8, page 80 and July 22, page 149, is signed by the following:

Col. J. W. Pringle, Chief Inspecting Officer, Chairman.
W. C. Aefield, Signal Supt., Midland Ry.
E. C. Cox, Supt. S. E. & Chatham Ry.
Maj. C. H. W. Edmonds.
H. N. Gresley, Locomotive Engineer (superintendent of motive power), Great Northern Ry.
Maj. G. L. Hall, Inspecting Officer.
Hon. J. H. Thomas, General Secretary, National Union of Railwaymen.
Sir Robert Turnbull, director, L. & N. W. Ry.

The report says that the cost of the committee's inquiry, including the cost of printing the report, was £75 2s. 6d. ($334).

Prompt Settlement of Freight Claims

C. M. MacDonald, freight claim agent of the Boston & Maine, reports that during the first five months of this year 65 per cent of the freight claims paid by his office were settled within 30 days; 12,000 being thus settled, out of a total of 18,544. Another 18 per cent was settled within 90 days, and about 3,000, or 17 per cent, were over 90 days in course of settlement. In this connection it is to be noted that here, as in the other departments of railroad operation, the person in immediate charge frequently finds himself in some degree thwarted by governmental regulations. The claim agent who wishes to expedite matters may often be justified in paying a claim before the claimant has furnished full and legal proof that the amount is due him; but under the rulings of the Interstate Commerce Commission it is necessary in all cases that the investigation of a claim shall be thorough, "and must disclose a lawful basis for payment before the claim is adjusted." This requirement applies, of course, in the case of every one of the several carriers that may be interested in a claim.

On the Boston & Maine there has also been a noticeable improvement in the freight service, resulting in a smaller number of claims being presented. At the close of business on December 31, 1920, there were outstanding 8,042 loss and damage claims; one year later the total was 3,929, and on May 31, 1922, the number unsettled was but 2,980. This last number is 63 per cent less than the total at the end of 1920. There has been also a marked decrease in the gross amount paid on claims, although this is partly due to the lower level of commodity prices at the present time as compared with a year ago. The percentage of loss and damage payments to gross freight revenue, for the first five months of 1922, was 1.21, whereas that for the twelve months of 1921 was 2.46, a reduction of more than one-half; and freight revenues for the five months of 1922 was greater than that for the same five months in 1921.

I. C. C. Audits Orient's Books

Six auditors from the Interstate Commerce Commission are making an examination of the books of the Kansas City, Mexico & Orient. The auditing is being done at the request of W. T. Kemper, the receiver of that road, for the purpose of answering charges by the employees that the road has not been operated economically. The Orient must cease operation, its officers assert, unless employees accept voluntary wage cuts and other financial relief is obtained.

Roads Intervene in M. B. & S. Suit

An attack on the foreclosure proceedings brought by the Continental & Commercial Trust & Savings Bank, Chicago, against the Muscatine, Burlington & Southern to collect $517,000 has been directed against this bank by 23 railroads in an amended petition filed in the District Court at Muscatine, Ia. Various Muscatine attorneys have also joined the railroads in challenging the seniority of the claims of the financial institution.

The railroads, each an intervener in the foreclosure litigation, whose total claims against the Iowa road are believed to aggregate in excess of $200,000, charge that during the time the indebtedness was incurred the carrier in question and the bank, together with William P. Kopf, as trustee, were the actual owners. In line with this contention, the railroads concerned maintain that the mortgage held by the bank has no precedence over their claims. The trustees, it is asserted in the amended petition, were holders of all the capital stock of the Muscatine, Burlington & Southern and were the owners of the bonds. It is added that they likewise were the equitable owners of the road's obligations. The court is asked to have the bank's claims adjudged inferior to those of the railroads.

Claims Against Government for Fires Occurring Under Federal Control

An investigation is now being conducted by a federal grand jury at Duluth, Minn., to determine the validity of claims amounting to $2,000,000, filed against the government in connection with losses from forest fires in the Cloquet, Moose Lake, Automba, Lawler and Kettle river districts of that state, which are said to have been started by sparks from a locomotive in October, 1918, when the railroads were under federal control These fires resulted in a loss of 400 lives, and property damage of approximately $40,000,000, on which a number of claims already have been settled.

Legal questions regarding the liability of the individual railroads, their insurance companies, and the government, developed with the filing of the claims. The liability of the government, however, for losses due to the fires was established in an opinion handed down by the Minnesota supreme court on July 22, 1921. The decision directly affected claims of 276 people, all residents of the city of Cloquet, Minn. The claims had been filed against James C. Davis, as agent for the president of the United States under the Transportation Act, and while their claims aggregated but $1,000,000, other claims indirectly depending upon the outcome of the test cases, aggregated $35,000,000 to $40,000,000. The cases were tried first before five St. Louis county judges by stipulation and without jury, to determine the issue of liability. The five judges concluded that the director general's negligence caused the destruction of the property. Subsequently to facilitate carrying the case to a higher court, a district court at Duluth fixed the amount of damage in a specified case. The director general of railroads then moved for a new trial or amended findings, but the motion was denied and the appeal was taken to the supreme court, which sustained the findings of the lower court Under the act of February 28, 1922, was fixed as the last date on which claims could be filed against the director general: In all, it was estimated nearly 5,000 claims were filed. Suits were filed in St. Louis, Carlton, Aitkin and Pine counties. Non-residents who owned burnt-over timber land were among those who failed to file claims. A corps of claim agents acting for the government, has carried on extensive negotiations with the claimants in settling claims. Under an agreement made in 1921, settlements were made on the basis of 50 per cent of the appraised losses in each case, but they were without power to settle except where suit has been brought. Thousands of the claims have been settled in that way

Traffic News

The Pennsylvania has inaugurated new 22-hour train service between Chicago and New York in the establishment of the "Gotham Limited," which leaves Union Station, beginning July 16, will leave Chicago at 8:10 p. m. and arrive in New York at 7:10 p. m. the next day.

A sub-committee of the United States Shipping Board has gone west to hold a series of hearings at Chicago, Ill., Portland, Ore., Seattle, Wash., and San Francisco and Los Angeles, Calif., on the question whether or not adequate American flag tonnage facilities exist to warrant the enforcement of section 28 of the merchant marine act. They will be accompanied by an attorney examiner of the Interstate Commerce Commission.

The Chicago & Eastern Illinois has placed in effect round-trip summer tourist fares from Chicago to New York and Boston, via the "Dixie Flyer" to Jacksonville, Fla.; thence to Charleston, S. C., where connection is made with the Clyde Steamship Company for the remainder of the journey to New York. The return trip may be made from New York or Boston by any direct route to Chicago, including rail or steamship service. The tickets are limited to 60 days with the privilege of stop-overs at all points.

Rail Motor Bus on the Northern Pacific

A rail motor bus is to be put in operation on the Fargo & Southwestern branch of the Northern Pacific, to run between Fargo, N. D., and Lisbon, 56 miles. The Northern Pacific has experimented with a motor car on its subsidiary line, the Gilmore & Pittsburgh, but this will be the first car of this sort to run on the Northern Pacific proper. The car was built by the International Motor Truck Company, and has a seating capacity of 40 passengers.

"Message Exchange" at Grand Central Terminal

A "Message Exchange" is the latest innovation in the Grand Central Terminal, New York; a large booth where a clerk will attend to all sorts of passengers' wants, especially requests to send (or receive) a telephone message when the passenger has not time to attend to it himself; and a corps of uniformed attendants, wearing green caps, who are stationed at numerous places throughout the waiting rooms and upper and lower concourses, and perform the same functions. The uniform fee is ten cents. Written messages, telegrams, etc., are forwarded, or received and held to await the addressee. Another innovation is Polk's Information Bureau, adjacent to the regular information bureau, on the upper level. Polk is publisher of directories in various cities and his specialty is hunting up addresses. A city directory placed on a public shelf where everybody can have access to it is a convenience which, at the Grand Central Terminal, is classed as an impossible accomplishment. People who, when in a hurry will tear out a page or two from the book and carry them off, come along too frequently.

To Ascertain Cost of Various Classes of Mail

Fifteen inspectors representing the various inspection divisions and fifteen officers representing the various railway mail service divisions assembled on July 24 at the Post Office Department to secure direct instructions upon the process to be followed by the post offices in securing data upon which to make an ascertainment showing the cost of carrying and handling the different classes of mail matter. The Committee on Cost Ascertainment has charge of the instructions and the 30 inspectors and railway mail service officers gathered in their office. After receiving this instruction, which deals particularly with the weighing and counting of the number of pieces of mail matter of each class, these officers were to return to their districts and give an intensive course at the 61 central accounting offices and at the 50 large post offices of the country, 30 of which, however, are central accounting offices.

They will also superintend the work in the field, which is scheduled to begin September 18 and continue for 30 days in every post office in the United States.

According to the program, the tabulating and compiling of statistics after consolidations have been made in central accounting offices, will be done at the department in Washington by experts. The final and completed report, with the ascertainment of cost, will not be ready for submission to the Joint Commission of Congress on Postal Service by Postmaster General Work before sometime in February or March, 1923. Among other results the findings will show the cost of carrying parcel post packages. It is believed that the Department has been losing heavily on this particular class of mail matter. The last survey of this sort was submitted to Congress by the Post Office Department in 1909. It did not, however, result in any legislation.

The Commission has suspended from July 25 until November 22, the operation of schedules which propose to increase rates applicable on carload traffic, moving between industries on various lines in the Chicago district.

Coal Production

Under the influence of the railway shopmen's strike coal production is rapidly declining, according to the weekly bulletin of the Geological Survey. Traffic congestion has interfered with the placement of empty cars at non-union mines, and the weekly output of coal is already running 1,700,000 tons below the high point reached late in June. Preliminary reports for the week of July 17-22 indicate that production cannot exceed 3,600,000 tons, against a minimum of 3,575,000 tons in the third week of the strike and a maximum of 5,363,000 tons in the twelfth week.

In comparison with normal years the present deficit in production is even more marked. Final returns on the fifteenth week of the strike (July 10-15) show 4,114,000 tons of bituminous coal and 31,000 tons of anthracite, a total for all coal of 4,145,000 tons. In the corresponding week of 1921, the total quantity raised—anthracite and bituminous—was 9,280,000 tons; in 1920 it was 11,500,000 tons. In other words, considering anthracite and bituminous coal as a common source of supply, the present weekly output is from 5,000,000 to 6,000,000 tons below normal.

The trend of production is shown by the cars loaded daily. On Monday railroads reported loading 12,657 cars, a decrease of 2,437 cars below the preceding Monday. By Thursday loadings had dropped to 10,800 cars, the lowest on any Thursday since the strike began. On some days it had been as high as 17,000.

The cause of the decrease is said to have been unmistakably traffic congestion on railroads serving non-union fields. In the Southern West Virginia and Eastern Kentucky from which the bulk of the country's supply during the strike has come, almost every field reported acute transportation disability. In Virginia, Western Kentucky and Tennessee the interruption of car supply was less serious and in Alabama and the Far West increased.

The reports so far received indicate no significant change in the number of men at work. Production in non-union Pennsylvania during first half of the week showed a slight decrease from the week preceding.

The bulletin says that the accumulation of unbilled coal in cars at the mines has now been so far reduced that it no longer constitutes a significant factor in the reserve of coal above ground. The estimated production of bituminous coal from the first of the year to July 15 has been 195,644,000 net tons, as compared with 210,030,000 in the corresponding period of 1921. Cumulative dumpings at the lake ports for the same period now stand at 4,244,095 tons, as compared with 11,907,210 in 1921 and 5,376,150 in 1920 when this movement was so delayed that priority orders were issued to hasten it later in the year.

A new weekly statistical service is inaugurated by the Geological Survey, showing weekly shipments from each of the producing fields. The figures are based on reports furnished by the railroads, giving the number of cars loaded for shipment at the mines on each railroad division.

TOURIST TRAFFIC left in Canada, in 1921, about $18,000,000, according to J. B. Harkin, National Park Commissioner, in an address before the Canadian Good Roads Association. This was more than twice the sum which had been expended during the year on the parks (which had been one of the attractions drawing the tourists). In 1920, 99,000 American automobiles entered Canada, and in 1921 about 150,000.

Commission and Court News

Interstate Commerce Commission

Records of Time of Employees on Duty and of the Movement of Trains are to be kept by railroads on forms prescribed by the commission in order of May 2, 1921; but by an order issued on July 1, 1922, this requirement does not go into effect until August 30, 1922.

Commission Denies Further Reduction in Livestock Rates

The Interstate Commerce Commission, in a decision made public on July 21, after further argument on the complaint filed by the National Livestock Shippers' League, et al., has declined to order a further reduction in western livestock rates beyond the reductions made last fall on its recommendation and made permanent in its recent decision in the general rate reduction case. The opinion is by Commissioner Hall. Commissioners McChord, Cox, Potter and Campbell dissented on the ground that the rates should be further reduced. In its decision of last August the commission expressed the view that carriers should reduce by 20 per cent all livestock rates in western territory, except those on horses and mules, which were higher than 50 cents. The carriers made the reduction without an order. Subsequently the complainants, represented by S. H. Cowan and Clifford Thorne, asked that the reduction be extended to rates less than 50 cents, which the commission denied. In the general reduction on agricultural products made by the railroads on January 1 the rates less than 50 cents were reduced 10 per cent, effective for six months and this was made permanent by the general decision.

Commissioner McChord said that far more substantial reductions of all the livestock rates should be made without delay. Commissioner Potter also expressed the opinion that the commission should now make such reductions in livestock rates as would have been made if in addition to making the temporary reductions permanent, it had permitted livestock to share in the general reductions.

State Commissions

The Alabama Public Service Commission on July 11, ordered all railroads operating in Alabama to reduce their passenger fares from 3.6 cents per mile to 3 cents and to sell 1,000-mile books at the rate of 2.12 cents per mile, effective August 15. This order followed an investigation which has been conducted by that body since the first of this year. The commission stated that the railroads have failed to show that a reduction would not stimulate travel in Alabama.

The California Railroad Commission has issued a statement to the effect that it will co-operate to the fullest extent of its ability with the public utility commissions of other states in resisting the efforts of the railroads to increase by ten billion dollars or more the tentative valuations of the roads which were established by the Interstate Commerce Commission for rate making purposes. This announcement was authorized by the state commission, following a conference of the middle-western and western states held at Des Moines, Iowa, on July 6 and 7. "The Esch-Cummins Act," this commission states, "provides that railroad rates must be based on the value of the roads as found by the Interstate Commerce Commission. A tentative estimate of the value of all the railroads in the United States amounts to approximately $20,000,000,000. It is estimated that if the claims made by the railroads were allowed in full, the valuation tentatively fixed by the Interstate Commerce Commission would be increased by about 50 per cent, or in the neighborhood of ten billion dollars. If 5 per cent is taken as the minimum rate of return, it is apparent that a difference of $10,000,000,000 in the valuation will mean a difference in railroad and passenger rates of $500,000,000 a year. These figures show the great importance of these valuation proceedings."

Court News

Passenger Sitting on Steps of Car Negligent

The Massachusetts Supreme Judicial Court holds that a passenger who sits on the step of the platform of a moving car on a steam railroad with his foot extending beyond the line of the car, so that it comes in contact with a signal about six inches from the edge of the lowest step, is negligent, although the cars on the train are crowded, and a submission of the case to the jury is not required, notwithstanding the Massachusetts statute making contributing negligence an affirmative defense.—Daly v. Boston, R. B. & L. (Mass.), 134 N. E. 376.

Discriminating Drainage Assessment

In a suit to enjoin excessive drainage assessments the Circuit Court of Appeals, Eighth Circuit, holds that the assessment on a railroad of half the cost of an improvement which would increase land values at least $250,000, in a district of 12,000 acres, in which the railroad owned only 40.43 acres and 3.61 miles of track, constructed for the most part on high fills and a trestle and above overflow, was a discrimination so palpable and arbitrary as to amount to a denial of the equal protection of the law.—Thomas v. K. C. S., 277 Fed. 708.

Notice of Arrival of Goods, If Duly Mailed, is "Duly Sent"

The conditions of liability while goods are retained after arrival, as stipulated in the bill of lading, are controlling. A bill of lading, limiting liability to that of warehousemen after notice of arrival, provided that the notice of arrival might be "duly sent or given." The Court of Appeals of District of Columbia holds that "duly sent" means sent in a regular and approved manner, and it is sufficient if notice is deposited in the post office in a stamped and properly addressed envelope, though it is never received.—Peavey v. P., B. & W., 277 Fed. 333.

Barred Suit Under Employers' Liability Act Not Revived by Transportation Act

The Minnesota Supreme Court holds that the provision in the Transportation Act that the period of federal control shall not be computed as part of the period of limitations in actions against interstate carriers on claims arising prior to federal control does not apply to causes of action under the Federal Employers' Liability Act which had become barred by failure to bring suit within the allotted two years, and were not existing rights of action at the date of passage of the Transportation Act.—Kannellos v. Great Northern (Minn.), 186 N. W. 389.

Delay in Transporting Live Stock —Reasons Not Good Excuses

The Kansas Supreme Court holds that under the state statute requiring railroads to transport live stock without delay and at a rate of speed averaging 15 miles an hour, unless prevented by unavoidable accident, the following causes given for delay are not excusable: allowing trains to pass; track blocked by trains; waiting for block; taking water and coal, inspecting train; lunch for train crew; waiting for engine; cutting out helper; hot box, sparks from brake shoe; removal of team rod; loading stock for other shippers.—Anderson v. Hines (Kan.), 203 Pac. 726.

B. L. Provision Against Liability of Loss from Strikes

A provision in a bill of lading that the carrier shall not be liable for loss or damage "from riots or strikes" is binding upon the shipper. It is, however, held to be incumbent on a carrier setting up a strike as a defense to show that notwithstanding the strike it had used every reasonable effort to preserve the shipper's property, to prevent its being damaged, and to cause it to be transported to its destination. (This question as to where the burden of proof rests, upon the issue of a strike as an excusing condition, is suggested but not decided in Pennsylvania v. Olivit Bros., 243 U. S. 574, 37 Sup. Ct. 468).—American Fruit Distributors v. Hines (Cal. App.), 203 Pac. 821.

Foreign Railway News

Spanish Railway Electrification

London.

It is reported that the Compania Valencia de Tranvias y Ferrocarriles intends to electrify some of the railway lines it operates, in all amounting to about 45 miles. The headquarters of the company are in the Calle Orilla del Rio, Valencia.

Germany Building Rolling Stock

London.

Germany is making progress in the construction of rolling stock. Already the 150,000 freight cars and the 5,000 locomotives delivered to France by Germany after the armistice have been replaced by new equipment and it is estimated that by August 1, 1922, the German railways will be in exactly the same position as they were at the outbreak of war as regards the quantity of rolling stock and even better off as regards the quality.

Safety of Travel in Russia

London.

A Times (London) correspondent states that from reports published by the statistical department of the Bolshevist Commissariat for Communications, 427 passengers and 526 employees were killed in accidents on the railways of Russia during the year 1921. Moreover, 1,159 employees and passengers were taken from the trains and shot during the same period by order of the Revolutionary Tribunal.

French Railways Measures Against Accidents

London

M. le Troequer, Minister of Public Works, recently made a statement on the prospects of French railways. He believes that they have practically recovered from the worst of the difficulties through which they have been passing as a result of the war. "If nothing intervenes to thwart our efforts," he said, "in twenty years from now all the railways south of the Loire will be running by electricity. Over half the area the familiar black smoke will have vanished and we shall be saving nearly 3,000,000 tons of coal. The waterfalls of the Pyrenees, the Alps and the central range will all give their share of 'white coal.'" After careful consideration the minister has chosen a single type of current, 1,500 volts d. c., which will be used exclusively for electrification in France.

With regard to the safety of passengers, M. le Troequer states that two measures have been taken up which cannot fail of success. The first is that all the French systems will very shortly be provided with audible cab signals, so that a driver can no longer run past the disc without being aware of it. The second is that all passenger cars will be lighted by electricity.

Britain Gets Big Japanese Electrical Order

London.

The Imperial Government Railways of Japan have just placed with The English Electric Company for their Dick-Kerr Works at Preston an order for 34 complete electric locomotives of a total value of upwards of £500,000. This represents the whole requirements of locomotives up to the end of 1923 for those sections of the main line railways which the Japanese government has decided to electrify at once. The order, it is said, was obtained in the face of keen foreign competition, particularly from America.

Eight of the locomotives now ordered are for heavy express passenger service. They are of the 2-C-C-2 (i.e. 4-6-6-4) type. Their weight is approximately 96 (long) tons and they are designed to haul a 415-ton train at a balancing speed of about 60 miles per hour. Each locomotive is equipped with 6 motors, each rated at 306 h.p. at 500 volts, the motors being connected in two groups of three in permanent series on a trolley voltage

of 1,500 volts. The control equipment is of the standard "English Electric" cam-shaft multiple unit type.

Of the remaining locomotives, nine are for local passenger service and 17 for heavy freight service. These 26 are all of the 4-4 type and will weigh approximately 56 tons each. They are equipped with four motors similar to those on the express passenger locomotives, but in this case the motors will be connected in two pairs in permanent series. Here too the control is the standard "English Electric" multiple unit type. The locomotives for local passenger service are designed to haul a 315-ton train and the freight locomotives a 600-ton train, the balancing speeds being about 55 and 40 miles per hour respectively.

Further Reductions in British Freight Rates

Effective August 1, by agreement between the managements of the railways of England and Wales and shippers, freight rates are to be reduced as follows:

Coal, Coke and Patent Fuel—Increase over pre-war rate to be reduced from 75 per cent to 60 per cent, flat rate from 3d. per to 2d. per ton and maximum addition to remain at 3s. 6d.

Iron Ore, Limestone, etc., for Blast Furnace and Steel Works—Flat rate to be reduced from 3d. per ton to 2d.; percentage increase over pre-war to remain at 50 per cent and maximum addition to remain at 2s.

Manure and Lime for Agriculture—Flat rate to be reduced from 9d per ton to 4d., percentage increase remaining at 50.

Iron and Steel—Flat rate reduced from 6d. per ton to 4d., percentage increase remaining at 75.

Rolling Stock—Percentage increase to be reduced from 100 per cent to 75 per cent and flat rate from 6d. to 4d. per ton.

Livestock at Carload Rates—Percentage increase reduced from 100 to 75 and flat rates from 2s. per car to 1s.

Livestock at Head Rates—Percentage increase reduced from 100 per cent to 75.

Small Parcels—Percentage increase reduced from 150 per cent to 100 per cent.

Returned Empties—Percentage increase reduced from 100 to 75.

Certain other basic commodities bear similar reductions.

Westinghouse Ships Large Order to France

The Westinghouse Electric & Manufacturing Company recently shipped 32 carloads of electrical equipment—transformers and lightning arresters—to the Midi Railway (France). This material weighed over 800 tons and is part of an order totaling over $1,000,000 for this railway which is pushing its electrification program.

The lines of the Midi Railway are mostly located in the South of France north of the Pyrenees. As far back as 1906 the management of the railways commenced an exhaustive study of the electrification of this part of the system, having in mind the utilization of the water power available on the northern slopes of the Pyrenees. By 1914 four sections had been electrified with single phase current at 12,000 volts and 16.67 cycles, but all work was stopped at the outbreak of the war.

The French early in the war lost practically all their coal fields to the Germans. This more than anything emphasized the necessity of developing the water power resources of the country and electrifying the railroads wherever it could be economically done. Thus on the cessation of hostilities one of the first acts of the government was to send a technical commission abroad to study existing electrified railways.

The commission, after visiting Switzerland, Italy and America, recommended that 1,500 volts, direct current, be adopted as the standard for the electrification of all French railroads, and the Midi Railways Company, in conformity with this decision, immediately resumed the work interrupted by the war on this new basis. The sections already electrified at 12,000 volts will be changed to 1,500 volts direct current, so as to have a uniform system throughout.

Argentine Rate Controversy Not Yet Settled

Buenos Aires.

The controversy between the foreign-owned railways with the government over the question of increased rates has not yet been decided. A committee has been appointed by the government to study the rate situation, but, until this body reports, all rates are to remain at previous levels and the companies have been called upon to refund amounts charged in excess of these levels.

This reimbursement involves many difficulties. In first place, the companies are not at all willing to refund the extra sums collected (which in some instances amount to several million pesos). They must, however, comply with the decision of the public authorities and they seem to have come gradually to the decision to refund 70 per cent of the sums in point. The attitude taken up by the companies in this emergency is not, however, a uniform one, as some of them want to return but 50 per cent, and a few do not consider at all the possibility of a reimbursement.

There are three companies, whose general managers held recently a meeting with a view of adopting a common policy: the Buenos Aires & Pacific, the Southern Argentine and the Western Argentine. The first two companies were inclined to refund 70 per cent and the Western was willing to pay back the full sums in point. They have finally adopted the proposition moved by the Pacific and Southern.

The settlement of this question of reimbursement seems likely to take several months. The railway companies have to deal with opposite forces in the shape of associations like the Cereal Exporters' Association (Centro de Exportadores de Cereales) which in this occasion represents not only the large exporting firms forming the association itself, but also the brokers and the agriculturists of the provinces. The members of the "Centro" referred to have decided not to accept less than 70 per cent from the railways, for their own account as well as for the brokers and the sellers' account. It is to be anticipated, however, that the railways and the cereal exporters will find a satisfactory solution, as their reciprocal interests command a close collaboration with each other.

Railway Ties in China

There are both present and future market possibilities for selling American railway ties in China, according to Trade Commissioner Frank Rhea at Peking. Steel and concrete ties are used, but the demand is mostly for wooden ties. While concrete ties are quite satisfactory where there is a well-ballasted railroad, as is the case with the Canton-Knowloon, which runs through a territory not subject to freezing, and therefore has no heaving of track in the wintertime which would cause breakage of these ties, conclusions are that this tie is entirely too expensive to compete with the wooden tie which is imported into China. On the Canton-Samshui Railway use has been made of a Belgian steel tie, and while this was very expensive it has been reasonably satisfactory, especially as this railway has light traffic and also very light wheel loads. The meter gage Yunnan Railway is all laid with steel ties. The Shantung Railway was originally laid with a German-designed steel tie, but many of these were removed during the Japanese administration and replaced by wooden ties.

Northwestern American and Canadian timber is used very generally and is reported to give better results than either the Japanese or Manchurian timbers. In South China, however, the Australian, Indian, or Philippine hardwoods are said to give better service. This is because the wood resists the attack of the white ants, which are very destructive to railway ties in that section. Humidity also affects the ties in that territory to an extent. Most of North China has light rainfall and most of this during the summertime. This condition probably does not affect the life of railway ties, although the opinion is expressed that in such territory as the western end of the Peking-Suiyuan Railway extending into the Mongolian territory, it would increase the life rather than shorten it.

The usual dimensions for railway ties are 8 ft. by 9 by 6 in. Bridge ties, as a rule, are 10 ft. by 9 by 8 in. There are very few creosoted ties in use in China. The Chinese government railways, such as Peking-Hankow Railway, Tientsin-Pukow Railway, etc., treat their ties in their own creosoting plants. Treated ties will probably be used in the future as they become better known.

Tenders are usually called for by the railways concerned and terms of payment arranged by the railway. Payment is probably the most difficult situation at present, as the Chinese railways will give the business to whoever will give them the longest credit almost regardless of price. American exporters may deal directly with the several railway purchasing departments. A great deal of this business, however, is handled through commission houses. American species are included in official and semiofficial invitations for tenders.

Equipment and Supplies

Locomotives

THE UNION PACIFIC is inquiring for 55 Mountain type and 15 Santa Fe type locomotives.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE is inquiring for 5 Mikado type and 2 Pacific type locomotives.

THE TUCKERTON RAILROAD is having one locomotive repaired at the shops of the Baldwin Locomotive Works.

THE ERIE will have repairs made to 15 locomotives, including Santa Fe and Mikado types at the shops of the Baldwin Locomotive Works.

THE NEW YORK, NEW HAVEN & HARTFORD will have repairs made to 25 locomotives at the shops of the Baldwin Locomotive Works and to 10 locomotives at the shops of the American Locomotive Company.

THE CHESAPEAKE & OHIO will receive bids until 12 o'clock noon July 29, at Richmond, Va., for general repairs to three Mallet compound locomotives. Bids will also be received until 12 o'clock noon August 11 for general repairs to 50 locomotives.

THE NEW YORK CENTRAL announced on Thursday that in anticipation of the motive power requirements of 1923 and to protect the expected traffic needs of the winter in the territory served by the New York Central lines, orders have just been placed for the construction of 150 modern freight locomotives. The locomotives are to be the Mikado type, identical in design with Michigan Central locomotive 8,000, described in the *Railway Age* of July 22. It is understood that the order has been divided equally between the American Locomotive Company and the Lima Locomotive Works, Inc.

Freight Cars

THE NEW YORK CENTRAL is inquiring for 50 King-Lawson air dump cars.

THE LEHIGH & NEW ENGLAND has renewed its inquiry for 100, 50-ton gondola cars.

THE CHICAGO, BURLINGTON & QUINCY, reported in the *Railway Age* of July 22 as inquiring for repairs to 500 box cars, will have these cars repaired at the shops of the Streator Car Company.

THE CHICAGO, BURLINGTON & QUINCY reported in the *Railway Age* of July 22 as inquiring for repairs to 500 box cars and 500 steel gondolas, has placed on order for the latter with the American Car & Foundry Company and is expected to place an order for the box cars this week.

THE ILLINOIS CENTRAL, reported in the *Railway Age* of July 15, as inquiring for 2,000 gondola cars, has ordered 1,000 from the Pullman Company, 500 from the American Car & Foundry Company, 500 from the Mt. Vernon Car Manufacturing Company, 500 from the Bettendorf Company and 500 from the Western Steel Car & Foundry Company.

Passenger Cars

THE WAR DEPARTMENT AIR SERVICE is inquiring for one steel baggage car.

THE NORTHERN PACIFIC has ordered 70 express refrigerator cars from the American Car & Foundry Company.

THE MARYLAND & PENNSYLVANIA has ordered two passenger motor cars and two trailers from the Russell Company, Kenosha, Wis.

THE PITTSBURGH & WEST VIRGINIA is inquiring for 2, 60-ft. steel baggage cars, 1, 70-ft. steel baggage and mail, 1, 70-ft. steel passenger, baggage and mail.

Iron and Steel

THE KANSAS CITY SOUTHERN has placed an order with the McClintic-Marshall Construction Company for 1,900 tons of steel to be used in the construction of a bridge over the Arkansas river at Redlands, Okla.

Track Specialties

THE SOUTHERN PACIFIC is inquiring for 2,500 kegs of spikes.

THE ERIE is inquiring for 5,000 kegs of spikes.

THE MISSOURI, KANSAS & TEXAS is inquiring for 2,500 kegs of standard track spikes.

Miscellaneous

THE NEW YORK CENTRAL will receive bids until October 1 for its requirements of fuel oil, gasoline, kerosene, lubricating oil, grease and tallow candles.

THE NEW YORK CENTRAL will receive bids until 12 o'clock noon, August 3, for structural steel, castings and railings for bridge repairs and non-composite lead paper insulated covered cable.

THE CHICAGO & NORTH WESTERN has placed an order with the Graver Corporation for a Graver type "K" ground-operated water softener to be installed at Boone, Iowa. This plant will have a treating capacity of 23,000 gal. of water per hour.

Signaling

THE CANADIAN NATIONAL has ordered from the Federal Signal Company an electro-mechanical interlocking plant for Smith Falls, Ont.

THE ST. LOUIS-SAN FRANCISCO has ordered from the Federal Signal Company a 28-lever interlocking machine and the necessary materials for the rebuilding of the interlocking plant at Claremore, Okla.

THE NORFOLK & WESTERN has placed an order with the France Manufacturing Company, Cleveland, Ohio, for 470 mechanical type rectifiers, for use in charging storage batteries on the signal system between Phoebe, Va., and Bedford, Norfolk division, and between Lamberts Point, Va., and bridge eight, Norfolk terminal.

THE ATLANTA & WEST POINT has awarded a contract to the Union Switch & Signal Company for the materials for the installation of 16 miles of absolute-permissive block signaling on its main line between LaGrange, Ga., and West Point. These signals will be Style S 3-position, low voltage. Installation will be by railroad forces.

Trade Publications

ARCHITECTS' SPECIFICATION HANDBOOK.—The Truscon Laboratories, Detroit, Mich., have issued a loose-leaf handbook of specifications of 108 pages of 8½ in. by 11 in. size covering the use of Truscon waterproofing and dampproofing products, floor hardeners, enamels, paints and varnishes. The book is conveniently prepared for ready use by architects and engineers.

ADZING AND BORING CROSS-TIES.—The Century Wood Preserving Company, Pittsburgh, Pa., has issued a large size, 8-page bulletin, illustrated, devoted to the adzing and boring of cross-ties before treatment. The bulletin discusses the advantages of adzing and boring all cross-ties before treatment and shows by text and illustrations, the different methods which can be used. The machinery for this class of work is also described as well as a typical plant layout.

Supply Trade News

The refinancing plan of the **Lima Locomotive Works, Inc.**, as noted in the *Railway Age* of July 1, was adopted by the board of directors and approved at a special meeting of the stockholders in Richmond, Va., on July 14.

The Mid-West Engineering Sales Company, Masonic Temple, Cedar Rapids, Iowa, has been appointed representative in eastern Iowa of the **Conveyors' Corporation of America**, 326 West Madison street, Chicago, for the sale of American trolley carriers.

A. A. Murphy has been appointed resident sales manager of the industrial and railway paint and varnish division of the **E. I. du Pont de Nemours & Co., Inc.**, Wilmington, Del. He will be located at the new office the paint and varnish division has opened at 30 Church street, New York City.

Johns-Manville, Inc., New York, will build a new plant in Canada at Asbestos, Quebec, for the manufacture of asbestos. Work is to be started at once on the plant and is expected to be completed in about six months. The plant will cost over $1,000,000 and will give employment to about 300 people. The company has taken over the Bennett-Martin mine at Thetford Mines, Que.

A. C. Haberkorn, formerly Detroit branch manager of Manning, Maxwell & Moore, Inc., and the Biggs-Watterson Co., and **E. E. Wood**, former sales manager of the Jones & Lamson Machine Co., have formed a partnership under the name of **Haberkorn & Wood**, with an office and warehouse at 620 E. Hancock avenue, Detroit, Mich., to handle a line of machine tools, cutting oils and compounds, also permanent mould aluminum alloy castings.

F. W. Carter, assistant manager of the heavy traction division, railway department, of the Westinghouse Electric & Manufacturing Company, has resigned to become president of the **Louisville Frog & Switch Company**, Louisville, Ky. Mr. Carter was graduated in electrical engineering from the Virginia Military Institute in 1912 and in the same year entered the employ of the Westinghouse Company on the graduate student course. Between 1912 and 1916 he filled several important assignments and then took up heavy traction work in the New York office. In 1917 Mr. Carter entered the first Plattsburg Camp and was ordered immediately to France where he served with the Rainbow division until July 28, 1918, when he was severely wounded in action at Chateau-Thiery and later was honored with the D. S. C. After returning from the service Mr. Carter again entered the railway sales department at East Pittsburgh in charge of heavy traction negotiations. The Louisville Frog & Switch Company, of which Mr. Carter will be president, manufacture manganese frogs, crossings, switches, signals and other railway specialties.

F. W. Carter

G. A. Blackmore, vice-president of the **Union Switch & Signal Company**, Swissvale, Pa., has been elected first vice-president and general manager. He entered the service of the Union Switch & Signal Company in July, 1896, and in 1901, he was made chief clerk of the engineering and estimating department at Swissvale. In July, 1904, he was transferred to New York where he was engaged in work on the Interborough Rapid Transit Subways, the New York terminal of the Pennsylvania Railroad and other large signaling projects. In March, 1909, he was appointed assistant eastern manager with headquarters in New York and in April, 1911, was made eastern manager in charge of the New York, Montreal and Atlanta offices, and of sales and construction. He was appointed general sales manager of the Union Company in 1915, and his headquarters transferred to Swissvale, remaining in this capacity until January, 1917, when he was elected vice-president. He now assumes the additional duties of general manager.

Attorney General Approves Steel Merger

In response to a Senate resolution Attorney General Daugherty has transmitted to the Senate a report stating that in his opinion the merger of the Bethlehem and Lackawanna steel companies and the proposed merger of the Midvale, Republic and Inland companies are not in violation of the Sherman, Clayton or Webb laws and that there is no reason to believe that restraint of trade or monopolistic control will result. He did not express his opinion as to whether they are in violation of the federal trade act. The Federal Trade Commission is conducting an investigation on this point in accordance with the Senate resolution.

Globe Seamless Steel Tubes Company to be Sold

Negotiations are now under way and are expected to be completed soon for the sale of the Globe Seamless Steel Tubes Company, Milwaukee, Wis., manufacturers of stationary boilers and of steel tubes for use in locomotives. This company has been owned principally by W. Renshaw, Chicago, president, and L. Fitch, Milwaukee, vice-president and secretary, both of whom will retire. The new interests will be headed by R. P. Lamont, president of the American Steel Foundries, Chicago; P. J. Kalman, president of the P. J. Kalman Company, St. Paul, Minn., of the Bliss & Laughlin, Inc., Harvey, Ill., and of the Hudson Motor Company of Illinois; and by **F. J. O'Brien**, vice-president and general manager of the Globe Seamless Steel Tubes Company, who will continue in active charge of that business. The company at present maintains sales offices in New York, Chicago, Detroit, Mich., Atlanta, Ga.; Houston, Tex.; Portland, Ore; and San Francisco.

The Consolidated Machine Tool Corporation of America

The Consolidated Machine Tool Corporation of America, with general offices at 17 East Forty-second street, New York City, is a consolidation of the Betts Machine Company, Rochester, N. Y.; Ingle Machine Company, Rochester, N.Y.; Hilles & Jones Company, Wilmington, Del.; Modern Tool Company, Erie, Pa.; the Newton Machine Tool Works, Inc., Philadelphia, Pa.; the Colburn Machine Tool Company, Cleveland, Ohio, and the Dale Machinery Company, Inc., New York City and Chicago, Ill. The company's capital stock includes $10,000,000 preferred stock of $100.00 par value and 200,000 shares of common stock with no par value.

W. H. Marshall, formerly president of the American Locomotive Company, is chairman of the board of directors of the new company and C. K. Lassiter, formerly vice-president of the American Locomotive Company in charge of operations, is president of the new company. H. J. Bailey, H. W. Breckenridge, H. W. Champion, J. J. Dale and A. H. Ingle are vice-presidents; O. D. Miller, treasurer; and R. R. Lassiter, secretary. The directors include W. H. Marshall, C. K. Lassiter, H. J. Bailey, formerly president Hilles & Jones Company, B. J. Baker of B. J. Baker & Company, bankers, H. W. Breckenridge, formerly vice-president of the Colburn Machine Tool Company, Lawrence Chamberlain, president of Lawrence Chamberlain & Co., bankers; H. W. Champion, formerly president of the Newton Machine Tool Works, Inc.; J. J. Dale, president of the Dale Machinery Company; T. Allen Hilles, A. H. Ingle, formerly president of the Betts Machine Company and Ingle Machine Company, and F. D. Payne, formerly manager of Modern Tool Company.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company has awarded a contract to the Bates & Rogers Construction Co., Chicago, for the construction of a 38-mile cut off between Ellinor, Kan., and Eldorado. A belt line also will be constructed around the city of Eldorado, which, with other trackage, will total 5½ miles additional. The project will shorten the present route by 13.65 miles. The estimated cost is $3,046,000.

ATCHISON, TOPEKA & SANTA FE.—This company has applied to the Interstate Commerce Commission for authority for the construction of two branches, one from a point 1.7 miles south of Burbank, Okla., 6.24 miles in a northeasterly direction, and one from Denoya, Okla., east 2.97 miles.

BOARD OF PUBLIC WORKS of the city and county of San Francisco, Cal., opened bids on July 26, for the construction of a plate girder bridge at Six-bit gulch; for the construction of abutments and piers for this bridge, and for the grading of a roadway involved in the relocation of tracks, all on the Hetch Hetchy railroad.

CHICAGO, BURLINGTON & QUINCY.—This company, which was reported in the *Railway Age* of July 8, page 86, as calling for bids for the construction of a two-story brick addition to its freight house at Burlington, Iowa., has awarded the contract for this work to the T. S. Leake Construction Company, Chicago.

ILLINOIS CENTRAL.—This company has awarded a contract to the Fred R. Jones Company, Cleveland, Ohio, for the laying of approximately three miles of spur tracks in Louisville, Ky., to connect with the Standard Oil Company properties in that city, the work to cost approximately $100,000. This same company has awarded a contract to the Merrill Road Improvement Company, Vicksburg, Miss., for raising the grade and paving freight house approaches at Vicksburg, Miss., at an estimated cost of $25,000.

MAGMA ARIZONA.—This company has awarded a contract to Twohy Brothers, Phoenix, Ariz., for improvements on its line to include extensive grade revision work and the re-laying of 35 miles of track.

MISSOURI PACIFIC.—This company has awarded a contract to the T. S. Leake Construction Company, Chicago, for the construction of a car repair shed at Sedalia, Mo., to cost approximately $25,000.

PENNSYLVANIA.—This company is receiving bids for the construction of an overhead bridge at Leaman Place, Pa. The approximate quantities are as follows: 1,200 cu. yd. foundation excavation; 2,200 cu. yd. foundation and abutment masonry; 250 cu. yd. concrete bridge floor including reinforcement; and 375 sq. yd. paving on bridge. The work will be in charge of D. P. Pugh, assistant engineer, Norristown, Pa.

WABASH.—This company, which was reported in the *Railway Age* of March 4 as having been ordered by the Missouri Public Service Commission to construct a new freight station and to remodel its present passenger station, at Kirksville, Mo., has awarded a contract for this work to the T. S. Leake Construction Company, Chicago.

THE PANAMA LIMITED, which is operated between Chicago and New Orleans, La., as the Illinois Central's de luxe train, has completed one of the best "on time" records in its history. During the 12 months ending May 31 this train arrived in Chicago on time every day, while southbound, it arrived in New Orleans on time 361 days out of the year. The suburban trains of the Illinois Central to and from Chicago have been 99 per cent on time for the same period. This service runs 370 trains to handle an average of about 75,000 passengers a day. Approximately 60,000 of these passengers are carried during the morning and evening rush periods on their way to and from work.

Railway Financial News

BOSTON & MAINE.—*Injunction Petition Denied.*—Justice Crosby, of the Superior Court at Boston, Mass., has denied the petition of Edmund C. Codman for an injunction to restrain directors of the Boston & Maine and the New York Central, as operators of the Boston & Albany, from carrying out an alleged scheme to obtain "illegal control over the Boston & Maine."

CANADIAN NATIONAL RAILWAYS.—*Directors Resign.*—President D. B. Hanna on July 21 gave out the following statement:

> At a meeting of the board of directors of the Canadian National Railways, held yesterday, the members of that board tendered their resignations to the government.
>
> These resignations are preliminary to the appointment of the single board of directors which will succeed the separate boards of the Canadian National Railways and the Grand Trunk Railway. This will afford the government a free hand in the selection of the new directors.
>
> Such selection may not be completed immediately, but in the meantime the interest of the Government Railways will not suffer, as the present directors will continue to act until their resignations have been formally accepted.

CAROLINA, CLINCHFIELD & OHIO.—*Annual Report.*—The income account for the year ended December 31, 1921, compares as follows:

	1921	1920
Operating revenues	$7,464,112	$6,524,755
Operating expenses	5,320,170	4,982,121
Net operating revenues	2,143,942	1,342,634
Taxes	440,000	365,000
Railway operating income	1,702,140	1,176,868
Net railway operating income	2,492,298	*2,318,716
Total non-operating income	116,247	481,275
Gross income	2,608,545	2,799,991
Interest on funded debt	1,187,582	1,187,904
Total deductions	1,622,117	1,914,767
Net income (exclusive of interest on income debentures)	986,428	.....
Interest on income debentures	262,830	.....
Net income	723,608	885,224

*Includes corporate expenses for January and February, and covers ten months' operations, March 1 to December 31, 1920.

CHOWCHILLA PACIFIC.—*Asks Authority to Sell Property.*—This company has asked permission of the Railroad Commission of California to sell its entire property to Frank G. Drum for an agreed price of $730,000. This road extends from Chowchilla, Cal., a station on the Southern Pacific, to Dairyland, a distance of about 10 miles.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*Call for Deposit of Stock.*—The protective committee for the preferred stock has issued a call for the deposit of the stock with the committee. The letter sent to the stockholders was occasioned by the recent ruling of the Interstate Commerce Commission approving the offer by the New York Central to change its stock on equal terms for the preferred stock of the Cleveland, Cincinnati, Chicago & St. Louis. The committee opposes the exchange, contrasting the earnings of the Cleveland, Cincinnati, Chicago & St. Louis available for preferred stock with the earnings of the New York Central available for dividends, and comparing the assets of the two roads. It is asserted also that by acquiring the majority of Cleveland, Cincinnati, Chicago & St. Louis preferred stock the New York Central would be able to control the issue of bonded debt and negotiation of leases involving an increase in fixed charges.

The protective committee is headed by Edwin G. Merrill, president of the New York Life Insurance and Trust Company, and includes George E. Roosevelt of Roosevelt & Son, and Willis D. Wood of Ladd & Wood, New York.

COLORADO & SOUTHERN.—*Annual Report.*—This company's annual report for 1921 is reviewed in an article on another page of this issue entitled "Colorado & Southern Assisted by Coal Strike." See also excerpts from annual report on adjacent pages.

DENVER & RIO GRANDE WESTERN.—*Receivership.*—Joseph H. Young, president of the Denver & Rio Grande Western, was appointed receiver for the road in the Federal District Court at Denver, Colo., on July 21. The receiver was petitioned by the New York Trust Company and the Bankers Trust Company of New York, trustees for holders of defaulted mortgage bonds.

Richard Sutro, chairman of the committee of the adjustment

mortgage 7 per cent bondholders of the Denver & Rio Grande, in commenting on the appointment of a receiver said:

Application for a receiver made by New York Trust Company as trustee under a mortgage came as the result of many months of efforts and negotiations between our committee and its counsel and trustee and its counsel. Our committee considered that interests of the property and of all bondholders would best be served by a receivership.

An adjustment bondholders have substantial interest in the treatment which is accorded the refunding bonds. Among other things $7,005,000 refunding bonds are pledged as collateral under adjustment mortgage and there are in addition about $31,000,000 refunding bonds outstanding. Interest of adjustment bonds in refunding bond situation is a large one and as important as the interest represented by any committee. Adjustment bonds are entitled to protection and standing accordingly.

The Bankers Trust Company, with whom we have been in conference concerning this matter, as trustee for refunding bondholders, also appeared and supported the application for a receiver.

Interest has been unpaid on the adjustment bonds since April 1, 1921, and on refunding bonds since August 1, 1921.

Now that the court has taken the property under its protection, the committee of which I am chairman, feels that earnings will be available for rehabilitation of the road and eventually for interest, instead of being received by an alleged owner (new Denver & Rio Grande Railroad) which claims not to be liable for payment of principal and interest of any of the bonds upon the roads.

We accordingly look confidently to eventual readjustment whereby the bondholders will secure equitable treatment.

Alvin W. Krech, president of the Equitable Trust Company, and chairman of the Western Pacific, which bought the old Denver & Rio Grande, said that he had no idea of what would be done with the property following the naming of a receiver. The offer to bondholders, he said, of a plan of reorganization was rejected through their failure to deposit a sufficient number of bonds. As far as the Western Pacific is concerned, Mr. Krech declared, the offer will probably be withdrawn.

EL DORADO & SANTA FE.—*Authorized to Construct New Lines and Issue Stock.*—The Interstate Commerce Commission has issued a certificate authorizing this company to construct three new lines totalling 43½ miles connecting with the Atchison, Topeka & Santa Fe in Chase and Butler counties, Kan., and has also authorized the company to issue $50,000 of stock. The Atchison, Topeka & Santa Fe was also authorized to acquire control of the company by purchase of its stock and by lease.

FONDA, JOHNSTOWN & GLOVERSVILLE.—*Annual Report.*—The income account for the year ended December 31, 1921, compares as follows:

	1921	1920
Miles operated	89	89
Operating revenues	$1,355,659	$1,431,562
Operating expenses	865,245	920,880
Net from railway operations	490,415	510,683
Railway tax accruals	71,065	53,896
Operating income	430,919	463,478
Gross income	484,269	503,903
Deductions from gross income	383,147	392,327
Net income	101,122	111,576
Dividends on preferred stock	30,000	30,000
Balance to profit and loss	71,122	81,576

GRAND TRUNK.—*Directors Resign.*—Sir Joseph Flavelle, chairman of the board, president H. G. Kelly and A. J. Mitchell have resigned, and the resignations of J. N. Dupuis and E. L. Newcombe, K. C., are expected.

The resignation of the directors of the Grand Trunk, like those of the Canadian National directors do not take effect immediately. The purpose of the resignations is to give the Minister of Railways a free hand in the selection of the new board.

GREAT NORTHERN.—*Annual Report.*—This company's annual report for 1921 is reviewed in an article on another page of this issue entitled "Great Northern Ore Traffic Will Help 1922 Net." See also excerpts from annual report on adjacent pages.

NEW YORK CENTRAL.—*Authorized to Acquire Control.*—The Interstate Commerce Commission has authorized the acquisition of control of the Toledo & Ohio Central and the Kanawha & Michigan and their leased properties, by lease, on condition that none of the lessees shall dispose of any of the stock of the lessor now owned by it without the approval of the commission.

NEW YORK CENTRAL.—*Exchange of Stock Opposed.*—See Cleveland, Cincinnati, Chicago & St. Louis.

PITTSBURGH, CINCINNATI, CHICAGO & ST. LOUIS.—*Dividend Declared.*—The directors at a special meeting on Wednesday declared a dividend on the company's capital stock covering the period from January, 1921, to July, 1922, at the rate of 4 per cent per annum, being in the aggregate 6 per cent for the period.

The dividend is payable August 15, to stock of record August 7, out of rental to be received by the Pittsburgh, Cincinnati, Chicago & St. Louis from the Pennsylvania Railroad Company under the terms of the lease of its railroad property.

TENNESSEE CENTRAL.—*Authorized to Issue Securities.*—The Interstate Commerce Commission has authorized an issue of $3,000,000 of common stock in respect of the purchase price of the Tennessee Central Railroad, $1,700,000 of which is to be acquired and pledged as security for a loan of $563,000 from the government, also an issue of $1,500,000 of first mortgage 6 per cent gold bonds in respect of the purchase price, $850,000 to be acquired and pledged as further security for the loan, and $563,000 also to be pledged with the Secretary of the Treasury. The company is also authorized to assume liability in respect of $850,000 of promissory notes given by the stock and bond subscribers in respect of the purchase price, also to be deposited as security for the loan, and to assume obligation in respect of $210,000 of equipment trust certificates.

TENNESSEE CENTRAL.—*Mortgaged.*—This company has mortgaged all its properties to the American Trust Company, of Nashville, Tenn., for $3,000,000.

TOLEDO & OHIO CENTRAL.—*Annual Report.*—The income account for the year ended December 31, 1921, compares as follows:

	1921	*1920
Miles operated	504	503
Operating revenues	$10,711,986	.....
Operating expenses	8,425,297	.....
Net from railway operations	2,286,689	.....
Railway tax accruals	693,590	.....
Railway operating income	1,591,223	.....
Net railway operating income	1,858,993	A $2,193,342
Total other income	371,112	663,041
Gross income	2,230,105	2,856,383
Interest on funded debt	1,247,276	1,246,838
Total deductions from gross income	1,571,236	1,615,390
Surplus for the year	658,869	1,240,993

*Items not shown are not comparable. See note A.
A Includes compensation for January and February, guarantee, March to August and net railway operating income—corporate—September to December.

ULSTER & DELAWARE.—*Annual Report.*—The income account for the year ended December 31, 1921, compares as follows:

	1921	1920
Mileage operated	129	129
Operating revenues	$1,747,687	$1,324,180
Operating expenses	1,379,815	1,745,831
Net from railway operations	367,872	Def. 421,651
Railway tax accruals	82,659	59,576
Total operating income	285,214	Def. 481,177
Total non-operating income	Def. 32,192	690,538
Gross income	253,021	209,361
Interest on funded debt	140,000	140,000
Total deductions	247,295	225,709
Net corporate income	5,727	Def. 16,348

WASHINGTON, BRANDYWINE & POINT LOOKOUT.—*Authorized to Issue Stock.*—This company has been authorized by the Interstate Commerce Commission to issue $431,400 of stock for the purpose of continuing the construction of its line from Mechanicsville to Point Lookout, Md.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements and has paid out to the several roads the following amounts:

Missouri, Kansas & Texas	$5,000,000
Wichita Falls & Northwestern	3,500
Union Passenger Depot Company of Galveston	35,000
Northern Pacific Terminal Company of Oregon	26,500
Salina Northern	3,500

Dividends Declared

Buffalo, Rochester & Pittsburgh.—Common, $2.00, semi-annually; preferred, $3.00, semi-annually; both payable August 15 to holders of record August 5.

Illinois Central.—Preferred, $1.10, quarterly, payable September 1 to holders of record August 4. Common, 1¾ per cent, quarterly, payable September 1 to holders of record August 4.

Pennsylvania.—$.50, quarterly, payable August 31 to holders of record August 1.

Pittsburgh, Cincinnati, Chicago & St. Louis.—4 per cent, payable August 15 to holders of record August 7.

Trend of Railway Stock and Bonds Prices

	July 25	Last Week	Last Year
Average price of 20 representative railway stocks	67.23	67.05	56.34
Average price of 20 representative railway bonds	87.82	87.78	74.10

Annual Reports

Colorado & Southern Railway Company—Twenty-third Annual Report

Chicago, January 2, 1922.

To the Stockholders of The Colorado and Southern Railway Company:

Herewith is submitted the Twenty-third Annual Report of your Board of Directors for the year ended December 31, 1921, setting forth comparative statements for the fiscal period of The Colorado and Southern Railway Company, Fort Worth and Denver City Railway Company and The Wichita Valley Railway Company.

THE COLORADO AND SOUTHERN RAILWAY COMPANY

Comparative Statement of Corporate Income, Years Ended December, 31

1921		1920
....	.............Standard Return.............	$413,535.30†
	RAILWAY OPERATING REVENUES.	
$9,897,760.91	.... Freight	$10,212,960.99*
2,394,204.57	.... Passenger	2,656,946.46*
173,036.35	.... Mail	136,820.29*
207,046.69	.... Express	235,162.17*
309,960.20	........All other transportation..........	319,228.16*
203,300.72	..............Incidental	228,111.58*
37,910.48	.............Joint facility...............	27,511.22*
$13,223,219.92	....Total railway operating revenues....	$13,816,740.87*
	RAILWAY OPERATING EXPENSES.	
$1,993,464.39	....Maintenance of way and structures....	$2,376,876.44*
2,981,257.36	.... Maintenance of equipment...	3,168,450.11*
146,129.21	.... Traffic	125,689.84*
4,703,027.10	.... Transportation	5,020,565.67*
108,556.88	.........Miscellaneous operations.........	113,64[illegible] [illegible]*
603,157.23	.... General	541,574.34*
11,701.88	Cr..Transportation for investment—Cr..Cr.	3,899.65*
$10,523,890.29	.....Total railway operating expenses.....	$11,343,898.95*
$2,699,329.63	.... Net	$2,887,377.22*
$758,972.23	.........Railway tax accruals..........	$784,224.89§
7,642.99	......Uncollectible railway revenues......	3,159.60*
$1,932,714.41	Railway operating income (includes ..two months of standard return of 1920)	$2,099,992.73*
	NON-OPERATING INCOME.	$150,978.36*
$33,479.72	.........Equipment rents (Net).........	$150,978.36*
62,399.74	Dr......Joint facility rents (Net)......Dr.	33,268.51*
62,799.86	...........Miscellaneous rents...........	59,462.00
1,923,140.37	...Dividends and miscellaneous interest...	1,352,530.15
1,779.44 ‡Dr.	........Miscellaneous income..........	509,161.76‡
....	(Estimated amount due under Guaranty, ...Transportation Act. 1920)........	959,687.98
$1,955,240.77	.......Total non-operating income.......	$2,998,551.74
$3,887,955.18	..............Gross income..............	$5,098,544.47
	DEDUCTIONS FROM GROSS INCOME.	
$112,510.32	..........Miscellaneous rents...........	$112,398.06
2,139,025.50	.........Interest on funded debt.........	2,140,438.47
102.07	........Interest on unfunded debt........	1,988.88
13,603.56	..Amortization of discount on funded debt..	13,573.93
72,558.16	......‡Miscellaneous income charges......	224,078.83‡
$2,337,799.61	....Total deductions from gross income....	$2,492,478.17
$1,550,155.57	..............Net income...............	$2,606,066.30
	DISPOSITION OF NET INCOME	
$680,000.00	.... Dividends	$680,000.00
$680,000.00	......Total appropriations of income......	$680,000.00
$870,155.57	Income balance transferred to profit and loss	$1,926,066.30

FORT WORTH AND DENVER CITY RAILWAY COMPANY

Comparative Statement of Corporate Income, Years Ended December 31

1921		1920
....	.............Standard return.............	$315,[illegible]31.08†
	RAILWAY OPERATING REVENUES	
$8,027,52[illegible].23	.... Freight	$7,175,940.38*
2,725,417.53	.... Passenger	3,457,155.07*
141,903.80	.... Mail	134,023.17*
184,899.50	.... Express	15[illegible],697.28*
91,609.80	. All other transportation	103,563.70*
162,041.79	..... Incidental	174,157.19*
1,563.60	. Joint facility	348.12*
$11,334,958.25	.. Total railway operating revenues ...	$11,196,884.91*
	RAILWAY OPERATING EXPENSES.	
$1,190,946.41	....Maintenance of way and structures.. .	$1,863,733.33*
2,096,648.06	........Maintenance of equipment	2,66[illegible],996.15*
136,8[illegible]5.19	.... Traffic	[illegible],521.65*
3,5[illegible],665.40	.... Transportation	5,31[illegible],[illegible]43.20*
84,348.66	......Miscellaneous operations	8[illegible],048.8[illegible]*
426,[illegible]3.84	.... General .	385,483.06*
14,131.73	Cr. Transportation for investment Cr..Cr	16,[illegible]02.70*
$7,512,205.83	....Total railway operating expenses	$10,383,617.51*
[illegible]2,75[illegible].42	... . Net	$[illegible],1[illegible]8,498.48*
$385,025.76	. Railway tax accruals..	$333,160.75§
2,73[illegible]	Uncollectible railway revenues .	[illegible],6[illegible].14*
$3,434,9[illegible]9.62	Railway operating income (includes two months of standard return of 1920).	$7[illegible],[illegible]7[illegible].20*

THE WICHITA VALLEY RAILWAY COMPANY

Comparative Statement of Corporate Income, Years Ended December 31

1921		1920
....	.............Standard return.............	$58,727.84†
	RAILWAY OPERATING REVENUES.	
$1,269,502.04	.... Freight	$1,015,016.63*
362,133.65	.... Passenger	436,800.54*
27,367.12	.... Mail	23,458.49*
44,764.15	.... Express	34,859.40*
5,851.66	........All other transportation..........	4,445.97*
13,491.71	.... Incidental	11,851.43*
$1,723,110.33	.....Total railway operating revenues.....	$1,526,432.46*
	RAILWAY OPERATING EXPENSES	
$315,683.99	....Maintenance of way and structures.. .	$397,228.24*
138,497.80	........Maintenance of equipment..... .	189,565.04*
406.18	.... Traffic	1,262.95*
624,865.60	.... Transportation	764,243.71*
19,317.11	.... General	19,577.20*
783.79	Cr...Transportation for investment—Cr ..	450.50*
$1,097,986.89	....Total railway operating expenses....	$1,372,327.64*
$625,123.44	.... Net	$212,832.66*
$70,120.97	..........Railway tax accruals..........	$57,120.48§
352.14	......Uncollectible railway revenues......	553.63*
$554,650.33	Railway operating income (includes two ....months of standard return of 1920)....	$155,158.55*
	NON-OPERATING INCOME.	
$155,429.72	Dr......Equipment rents (Net)......Dr.	$169,755.4[illegible]*
15,183.45	........Joint facility rents (Net)........	8,433.00*
2,584.21	...........Miscellaneous rents...........	3,345.89
7,036.65	Dividends and miscellaneous interest..	4,389.48
4,508.45	..........‡Miscellaneous income.........	132,673.03‡
......	(Estimated amount due under Guaranty, ...Transportation Act, 1920)........	270,738.12
$126,116.96	Dr... Total non-operating income......	$249,824.10
$4[illegible]8,533.37	. . ..Gross income	$404,982.65
	DEDUCTIONS FROM GROSS INCOME	
$203,39[illegible].80	. ...Miscellaneous rents..........	$203,392.80
38,450.00	.........Interest on funded debt.....	38,450.00
[illegible]01	.. Interest on unfunded debt..... .	....
8,536.[illegible]	... ‡Miscellaneous income charges .	19,753.53‡
$[illegible]50,411.04	Total deductions from gross income .	$261,596.33
$178,122.33	Income balance transferred to profit and loss	$143,386.32

†January and February, 1920.
*Ten months. §Ten months except war taxes which are included for twelve months.
‡Includes "Lap over" items credited and charged by Federal Administration.

Thirty-Third Report of the Great Northern Railway Company

To the Stockholders:

The Board of Directors submits the following report for the year ended December 31, 1921.

CAPITAL STOCK

There has been no change during the year in the authorized share capital, same remaining at $250,000,000, of which there had been issued to December 31, 1921, $249,478,250.00.

FUNDED DEBT.

There has been an increase of $7,319,500 in the bonded indebtedness of the Company in the hands of the public, made up as follows:

By issue of the Company's General Mortgage 7 per cent Gold Bonds, Series "A" dated July 1, 1921, maturing July 1, 1936		$215,227,000.00
Less		
N. P.-G. N., C. B. & Q. Collateral 4 per cent joint bonds, matured and paid July 1, 1921, $215,227,000, (1. N. Ry. Co.'s proportion one-half	$107,613,500.00	
St. P. M. & M. Ry Co. Consolidated Mortgage bonds redeemed through the operation of the Sinking Fund	67,000.00	
		107,686,500.00
Net increase		$7,319,500.00

Under date of March 31, 1921, the Chicago, Burlington & Quincy Railroad Company made distribution of a stock dividend of 600,000 shares of par value of $100 each. The dividend upon the stock pledged under the Trust Indenture securing N. P.-G. N., C. B. & Q. Collateral 4 per cent joint bonds, aggregated 582,539 shares which were issued to the Guaranty Trust Company, Trustee under the joint indenture, increasing the security thereunder to 1,658,674 shares, of which one-half is owned by the Great Northern Railway Company, and one-half by the Northern Pacific Railway Company.

In order to secure funds with which to pay off and discharge the above described joint bonds, the Board of Directors of this Company at meeting held March 22, 1921, authorized the execution, with the Northern Pacific Railway Company, of a joint indenture to be dated July 1, 1921, for the issue of $230,000,000 in bonds to be known as Northern Pacific-Great Northern Joint 15-Year 6½ per cent Convertible Gold Bonds, dated July 1, 1921, maturing July 1, 1936, and secured by deposit with The First National Bank of the City of New York as Trustee under the joint indenture, 1,658,674 shares of the capital stock of the Chicago, Burlington & Quincy Railroad Company; $33,000,000 Northern Pacific Railway Company Refunding and Improvement 6 per cent. Mortgage Bonds, Series "B," maturing July 1, 2047; and $33,000,000 Great Northern Railway Company General Mortgage 7 per cent. Gold Bonds, Series "A," maturing July 1, 1936, the joint bonds being convertible, par for par, into bonds of the respective Railway Companies to the amount of $115,000,000 each. The indenture provides for the release of the above security upon a pro rata basis upon conversion of the joint bonds into the bonds of either of the Railway Companies. The Interstate Commerce Commission approved this plan on April 21, 1921.

The entire issue of the joint 6½ per cent. bonds was subscribed for by a syndicate represented by J. P. Morgan & Company and The First National Bank of the City of New York at price of 91½ per cent. and payment made therefor on May 16, 1921.

The amount required to pay and discharge the joint 4 per cent. bonds on July 1, 1921, aggregating $215,227,000, was obtained as follows:

From sale of the joint 6½ per cent. bonds, $230,000,000 at		
91½ per cent		$210,450,000.00
Less expenses covering fees, taxes, printing, authentication, etc., to Dec. 31, 1921		335,963.27
Net proceeds		$210,114,036.73
Provided by the railway companies from other sources		5,112,963.27
Total		$215,227,000.00

The conversions of joint 6½ per cent. gold bonds during the period May 15, 1921, to December 31, 1921, were as follows:

Into Great Northern Ry. Co. General Mortgage 7 per cent. Gold Bonds, Series "A"	$115,000,000.00
Into Northern Pacific Ry. Co., Refunding and Improvement 6 per cent. Bonds, Series "B"	9,950,400.00
Unconverted December 31, 1921 (N. P. Ry. Co. proportion)	105,049,600.00
Total	$230,000,000.00

The burden of interest to the Great Northern Railway Company in the issue of its 7 per cent. bonds by way of conversion as against the interest on the Northern Pacific Railway Company's proportion of the joint debt whether represented by the remaining joint 6½ per cent. or by the 6 per cent. bonds issued or which may be issued by the Northern Pacific Railway Company by way of conversion is claimed by the Great Northern Railway Company to be subject to equalization as a part of the cost of the joint financing. The Northern Pacific Railway Company opposes this claim and matter has been submitted to arbitration.

In order to have a more comprehensive and satisfactory mortgage to secure the issue of the series of 7 per cent. bonds above referred to, and also to secure the issue of other bonds for the purpose of future enlargement, improvement, extension, and equipment of the Company's properties, the Company executed and delivered to The First National Bank of the City of New York as Trustee, its mortgage dated January 1, 1921, to secure the issue of its General Mortgage Bonds.

The indenture provides for the issue of bonds in series dated July 1, 1921, maturing on dates subsequent to June 30, 1936, and on or prior to July 1, 2121, with interest rates, and such special provisions as the Board of Directors or the Executive Committee shall determine, and limited in amount, including bonds reserved to retire prior debt, to three times the then outstanding capital stock of the Company. Provision was made for the closing of the Company's First and Refunding Gold Bond Mortgage at $72,000,000, of which $35,668,000 are in the hands of the public, and $36,332,000 pledged under the indenture. Provision was also made for the issue at once of $140,000,000, Series "A," 7 per cent. bonds, dated July 1, 1921, and maturing July 1, 1936, of which $33,000,000 were pledged under N. P.-G. N. Joint 15-Year Convertible Gold Bond Mortgage, and $107,000,000 held for conversion purposes, and in case of same being so used that the Chicago, Burlington & Quincy Railroad Company stock released from the lien of the joint indenture as result of such conversion should be pledged with the Trustee of this indenture.

By the conversion of $115,000,000 of the joint 6½ per cent. bonds into General Mortgage Gold Bonds of this Company there were released from the lien of the joint indenture 829,337 shares of stock of the Chicago, Burlington & Quincy Railroad Company, which were immediately pledged with the Trustees of the indenture of January 1, 1921, and $33,000,000 of this Company's General Mortgage 7 per cent Gold Bonds, of which $8,000,000 (together with the $107,000,000 mentioned above) have been used in conversion and $25,000,000 placed in the Treasury of the Company for use as collateral or for sale.

GENERAL

The Interstate Commerce Commission approved the Company's plan for financing the purchase of five hundred 40-ton refrigerator cars, one steam lighter and one convertible pile driver and crane at an estimated cost of $1,172,450, one-half of which amount was to be secured from the United States Government under Section 210 of the Transportation Act, 1920, the balance to be obtained from other sources. The loan of $586,000 received from the Government is evidenced by fourteen notes of $39,000 each, maturing annually beginning September 1, 1922, and ending September 1, 1935, and one note for $40,000 maturing September 1, 1936, bearing interest at the rate of six per cent. per annum payable semi-annually. This loan is secured by the deposit with the Treasury Department of the United States of $780,000, par value, Great Northern Railway Company General Mortgage 7 per cent. Gold Bonds. The balance of the funds required was procured by the issue of the Company's 6½ per cent. Equipment Gold Notes, Series "A," dated August 1, 1921 in the principal sum of $606,000, payable in six annual installments of $101,000 each, beginning August 1, 1926, and ending August 1, 1931. These notes were sold at 97½ per cent., the Company realizing $590,850.

The details of expenditures for Equipment are given in the report of the President.

There was expended for Investment in road, the sum of $2,971,489.14 of which $2,965,810.05 was for Additions and Betterments, and $5,679.09 for Improvements on leased railway property.

The records of the Pension Department show the following:

Number of pensioners December 31, 1920	129	
Employes added to roll during the year	40	
Pensioners died during the year	16	
Number of pensioners December 31, 1921	144	
Pensions paid during the year		$49,683.04
Pensions paid September 16, 1916, to December 31, 1921		166,854.91

Work was continued during the year in connection with Federal Valuation of this Company's property. Conferences on the tentative land and accounting reports were held by the Company with the Interstate Commerce Commission and many differences adjusted. It is expected that the Company will shortly receive revised engineering, land and accounting reports to be followed by the tentative valuation. This tentative valuation will then become the subject of hearings before the Commission and its examiners. Data are being compiled for use in such hearings, and every possible effort as being made to see that the final values when determined shall be just and fair.

As stated in last year's report, the Company filed with the Interstate Commerce Commission its claim for deficit due under the guaranty provisions of the Transportation Act, 1920, and had received as partial payment thereon $12,500,000. It is expected that a final settlement with the Government will be effected during the current year.

An additional amount of $91,054.40 has been received from the Director General due to the revision of the annual rental, as mentioned in last year's report.

The Board respectfully calls the attention of the Stockholders to the reports of the President, of the Comptroller, with customary balance sheet and statistical tables, and of the Land Commissioner.

For the Board of Directors.

LOUIS W. HILL, *Chairman.*

April 30, 1922.

REPORT OF PRESIDENT.

To the Board of Directors:

Herewith report for the fiscal year ended December 31, 1921:

REVENUES, OPERATING EXPENSES, VOLUME OF TRAFFIC, ETC.

Gross Operating Revenues for the year were $101,317,203.81, a decrease of $21,280,661.40, or 17.3581 per cent. as compared with last year, while the decrease in Operating Expenses was 29.3559 per cent. The various amounts making the increases and decreases and the percentage for each, as compared with last year, are as follows:

Revenue from transportation	Increase or decrease	Amount	Per cent.
Freight	Decrease	$15,060,604.56	16.7786
Passenger	Decrease	$4,090,745.58	19.9053
Mail	Decrease	320,789.05	10.0948
Express	Decrease	538,356.60	17.9544
Sleeping car, Parlor and chair car, Excess baggage, and other passenger-train revenue	Increase	23,111.65	1.6276
Total Passenger service train revenue	Decrease	$4,926,779.58	17.5036
Switching, Special service train, and Other freight-train revenue	Decrease	143,537.83	17.9439
Total revenue from transportation	Decrease	$20,130,921.97	16.9583
Revenue from Operations other than Transportation	Decrease	1,149,739.43	29.5576
Gross operating revenues	Decrease	$21,280,661.40	17.3581

Operating Expenses	Increase or decrease	Amount	Per cent.
Maintenance of way and structures	Decrease	$11,852,643.55	46.0859
Maintenance of equipment	Decrease	5,664,126.18	21.1827
Traffic expenses	Increase	369,322.38	29.9737
Transportation expenses	Decrease	15,189,829.61	27.2784
Miscellaneous operations	Decrease	544,157.43	28.1900
General expenses	Decrease	185,800.41	6.3242
Transportation for investment—Cr.	Increase	382,967.24	.....
Total operating expenses	Decrease	$33,450,202.04	29.3559
Net operating revenue	Increase	$12,169,540.64	140.6761
Taxes accrued	Decrease	1,759,041.26	17.5024
Uncollectible railway revenue	Increase	17,128.85	55.3421
Operating income	Increase	$13,911,453.05	.....

The substantial decreases in revenue during the year were due primarily to the reduction in traffic handled resulting from the post war business depression. Net ton miles, reflecting the volume of freight traffic, decreased 32.6%, and passengers carried one mile, reflecting the volume of passenger traffic, decreased 30.2%. Although the Interstate Commerce Commission ordered rate increases in August 26, 1920, full benefit of these increases was not secured because of the many reductions and readjustments in rates made necessary in 1921.

Effective March 31, 1921, rates on lumber and shingles from the northwestern states destined to Missouri River, Chicago district, and points east were reduced 6 and 7 cents per cwt. This was followed on September 10, 1921, by reductions in rates to southwestern points, including Kansas City and Oklahoma districts, in amounts varying from one to three and one-half cents per cwt. On December 24, 1921, further reductions were made in rates to points east of Chicago, including Atlantic Seaboard, ranging from one-half cent to 16½ cents per cwt.

Effective June 23, 1921, rates covering east bound movement of vegetables from northwestern states destined to points east of Chicago were reduced by amounts ranging from 17 to 33½ cents per cwt. This was followed on October 3, 1921, by reductions to points Chicago and west on the basis of taking off one-half of the general increase of August 1920. This resulted in a reduction of about 15 cents per cwt.

Effective July 21, 1921, rates for movement of apples from Washington, Montana, etc., to destinations east of Chicago were reduced to the extent of 16½ cents per cwt.

On December 15, 1921, all rates in Canada were reduced to the basis of 20 per cent. higher level than those in effect prior to September, 1920.

As a result of the falling off in tonnage handled, the rate reductions mentioned above and other rate reductions and adjustments not specifically mentioned, there was a decrease in the freight revenue of 16.7786 per cent. as compared with the previous year.

Passenger traffic decreased $4,090,745.58, or 19.9053 per cent. Rates and train service were unchanged, but the business depression prevailing in all lines of industry had its effect in reducing the passenger travel.

The immigrant movement for the year 1921 was very light as compared with former years. The unusual deflation in the price of agricultural products and the increased rates for transportation prevented many home seekers from investigating and locating in the territory served by the Company.

With respect to the decrease in operating expenses, there was a reduction of 34 per cent. in gross ton miles and 30 per cent. in passengers carried one mile, as compared with the year 1920. This reduction in traffic is reflected principally in the accounts under Transportation—Rail Line and Maintenance of Equipment. It is also partly responsible for the large decrease in Maintenance of Way and Structures, although contributing factors were the favorable weather conditions and the improved individual performance of the employes. The tie and rail renewals in 1921 amounted to $2,496,159.61, as compared with $2,629,582.56 in 1920, practically the same for both years. There was no curtailment of the renewal of ties and rails and the track was maintained up to standard. The Company, however, suspended certain other work, such as cutting grass and weeds and removal of snow and ice, the effect of which was only transitory and which did not impair the road for safe operation.

Due to conditions over which the company had no control, operating expenses were abnormally high in 1921, notwithstanding the many economies effected which resulted in substantial reductions. In 1921 the operating expenses totaled nearly 80% of gross revenues, compared with approximately 60% in 1916, the last pre-war year. The cost of coal in 1921 was $13,000,000, the price per ton amounting to two and four-tenths times as much as in 1916. On June 1, 1921, the United States Railroad Labor Board rendered a decision providing for a general decrease in wages effective July 1, 1921, which resulted in a saving of approximately $3,000,000 for the last six months of the year. Notwithstanding this fact, the payroll, 58% of the total expenses, amounted to $47,000,000, and was the largest single item of expense, the average compensation per man being two and one-seventh times as much as in 1916. The Company endeavored to reach an agreement with its employes for lower wages, but failed, and the dispute has been referred to the Labor Board, the only method of procedure under the law.

EQUIPMENT.

During the year the following equipment was received and taken into account:

Purchased:
- 500 Refrigerator cars, 40 feet long, 60,000 lbs. capacity.
- 1 Boarding car, 60 feet long, second hand.
- 1 Steam timber derrick, 38 feet long, second hand.
- 2 Automobiles.
- 2 Automobile trucks.

Built at Company Shops:
- 4 Flat cars.
- 3 Timber derricks.
- 2 Water cars.

Improvements to rolling stock have been continued, such as superheaters, power grate shakers, automatic stokers, steel cabs and pilots for locomotives, minor improvements to passenger cars to insure the comfort and safety of passengers, to comply with the law, and to secure economy in operation. Owing to the readjustment of prices the Company has found it advantageous to use fuel oil as locomotive fuel on the Western divisions and has converted, during the year, 64 locomotives from coal to oil burners.

There were taken out of service:

5 Steam locomotives.	3 Steel ore cars.
1 Passenger and baggage car.	21 Ballast cars.
3 Baggage and express cars.	11 Sand cars.
193 Box cars.	15 Caboose cars.
51 Refrigerator cars.	9 Cinder cars.
114 Stock cars.	13 Boarding cars.
43 Flat and coal cars.	2 Derrick and tool cars.
13 Wooden ore cars.	5 Other work equipment cars.

Total amount expended for equipment purchased built at shops, and for improvements to equipment in service, was $1,891,115.33. The original cost of the equipment taken out of service, conversions, and adjustments, amounted to $605,972.03, resulting in a net increase in Investment in Equipment of $1,285,143.30.

ADDITIONS AND BETTERMENTS.

The replacing of outer half of Ore Dock No. 3, consisting of 166 pockets, trestle extension and fender at outer end, also renewing in kind pile and timber approach to Dock No. 1, at Allouez, Wis. which was in progress at the close of 1920, has been completed.

The improvements made this year are: 55.5 miles automatic block signal system installed between Leavenworth and Skykomish, Wash.; 1,280 lineal feet of new steel and concrete bridges, 6,349 lineal feet of bridges filled, 121 concrete and cast iron culverts, 198.71 miles of wire right of way fence, 31.61 miles of woven wire placed upon existing fence, 10 depots, 5 mechanical coal chutes, 5 water tanks, 85 sidings and spur tracks, and 357,823 cubic yards of material moved in changes of line, widening banks, ballasting and filling bridges. There were placed upon old lines 57,332 cubic yards of concrete and riprap.

Work is in progress replacing timber dock No. 2 at Allouez, Wis., with concrete and steel dock to be ready for operation at opening of 1923 ore season; constructing new terminals at Minneapolis Junction, Minn., and at Wenatchee, Wash., installing automatic block signals upon 165 miles of road; constructing 48.5 miles new second track; and renewing 1,457 lineal feet single track snowsheds between Leavenworth and Scenic, Wash.

The number of stockholders in the Company far exceeds that of its employes. At the annual meeting in 1921, its stockholders numbered 43,023, while the average number of employes during the year was only 24,403.

Respectfully submitted,

RALPH BUDD, *President.*

COMPTROLLER'S REPORT.

MR. LOUIS W. HILL,
Chairman, Board of Directors.

DEAR SIR—

Herewith I beg to submit statements showing the result of operations of the Great Northern Railway Company for the year ended December 31, 1921.

The statements, this year, do not include the operations of the Minneapolis Western Railway Company and the Duluth Terminal Railway Company and for purposes of comparison the figures for last year have been revised to exclude the operations of those companies.

Respectfully submitted,

GEO. H. HESS, JR., *Comptroller.*

REVENUE ACCOUNT.

EXCLUDING THE OPERATIONS OF THE MINNEAPOLIS WESTERN RAILWAY COMPANY AND DULUTH TERMINAL RAILWAY COMPANY, FOR BOTH YEARS.

YEAR 1921 COMPARED WITH YEAR 1920. OPERATING REVENUES.

Class	1921 (Excluding delayed items audited in the accounts of the U. S. R. R. Administration)		1920	
Revenue from transportation	Per cent of total	Amount	Amount	Per cent of total
Freight	73.7202	$74,700,240.68	$89,760,845.24	73.2157
Passenger	16.2463	16,460,279.62	20,551,025.20	16.7630
Excess baggage	.1587	160,800.62	162,720.95	.1327
Sleeping car	.7637	773,804.63	1,112,882.40	.9078
Parlor and chair car	.0912	92,403.85	127,816.63	.1043
Mail	2.8198	2,856,978.30	3,177,767.35	2.5920
Express	2.4281	2,460,104.48	2,998,461.08	2.4458
Other passenger train	.0115	11,678.41	16,562.23	.0135
Milk	.3992	404,442.17	35.82	.0000
Switching	.5881	595,880.57	766,741.04	.6254
Special service train	.0583	59,111.13	33,514.47	.0273
Other freight train	.0014	1,398.16	327.82	.0003
Total revenue from transportation	97.2955	$98,577,122.62	$118,708,644.59	96.8272
Revenue from Operations Other than Transportation:				
Dining and buffet	.6101	$618,103.68	$873,464.53	.7124
Hotels and restaurants	.3915	396,656.20	709,101.03	.5784
Station and train privileges and train news service	.2215	224,464.01	330,018.78	.2692
Parcel room receipts	.0397	40,237.16	62,135.20	.0507
Storage — Freight and baggage	.1254	127,011.60	614,267.39	.5010
Demurrage	.1936	196,133.59	323,533.98	.2639
Telegraph and telephone	.1388	140,580.58	156,083.23	.1273
Power	.0232	23,515.98	.....	.....
Rents of buildings and other property	.1551	157,159.39	142,553.40	.1163
Miscellaneous	.8056	816,219.00	678,663.08	.5536
Total	2.7045	$2,740,081.19	$3,889,820.62	3.1728
Gross operating revenues	100.0000	$101,317,203.81	$122,597,865.21	100.0000

OPERATING EXPENSES

Class	1921		1920	
	Per cent of total	Amount	Amount	Per cent of total
Maintenance of way and structures	17.2254	$13,865,917.21	$25,718,560.76	22.5706
Maintenance of equipment	26.1815	21,075,307.76	26,739,433.94	23.4666
Traffic expenses	1.9895	1,601,477.99	1,232,155.61	1.0813
Transportation expenses	50.3059	40,494,718.56	55,684,548.17	48.8688
Miscellaneous operations	1.7220	1,386,162.27	1,930,319.70	1.6940
General expenses	3.4189	2,752,128.42	2,937,928.83	2.5783
Transportation for investment—Cr.	.8432	678,799.71	295,832.47	.2596
Total operating expenses	100.0000	$80,496,912.50	$113,947,114.54	100.0000

Per Mile of Road Operated	1921	1920
Revenue from transportation	$12,075.44	$14,522.14
Revenue from operations other than transportation	335.65	475.86
Gross operating revenues	$12,411.09	$14,998.00
Operating expenses	9,860.66	13,939.71
Net operating revenue	$2,550.43	$1,058.29
Taxes accrued	1,015.65	1,229.50
Uncollectible railway revenue	5.89	3.79
Operating income	$1,528.89	*$175.00*
Average miles of road under operation	8,163.44	8,174.28
Operating expenses, per cent of:		
Total revenue from transportation	81.66	95.99
Gross operating revenues	79.45	92.94
Operating expenses and taxes, per cent of:		
Gross operating revenue revenues	87.63	101.14

INCOME ACCOUNT

YEAR ENDED DECEMBER 31, 1921

Operating Income		
Railway operating revenues	$11,317,273.81	
Railway operating expenses	8,496,912.50	
Net revenue from railway operations	$2,820,361.31	
Railway tax accruals	8,291,233.81	
Uncollectible railway revenues	48,079.69	
Railway operating income		$12,480,987.81
Equipment rents—Net	Cr. $739,997.26	
Joint facility rents—Net	Dr. 354,574.13	385,423.13
Net railway operating income (Transportation Act)		$12,866,410.94
Non Operating Income		
Miscellaneous rent income	$456,991.40	
Miscellaneous non-operating physical property	79,508.96	
Dividend income		
C., B. & Q. R. R. stock		
Pledged	$21,809,560.00	
Other stocks	237,592.84	
	22,047,152.84	
Interest from funded securities:		
*Spokane, Portland & Seattle Ry. Co. bonds	$7,233,100.00	
Other securities	701,776.87	7,934,876.87
Income from unfunded securities and accounts	1,030,922.30	
Miscellaneous income	181,669.58	
Total non-operating income		31,731,121.95
Gross income		$44,597,532.89

Gross income (brought forward)		$44,597,532.89
Deductions from gross income		
Rent for leased lines	$13,709.54	
Miscellaneous rents	15,198.39	
Miscellaneous tax accruals	154,767.12	
Interest on funded debt		
Bonds outstanding in hands of the public	$13,[illegible].48	
N. P.—G. N. Joint 15 Year 6% Convertible Gold Bonds	132,556.04	
Equipment trust and Miscellaneous obligations	426,884.67	13,747,509.19
Interest on unfunded debt		1,161,805.69
Amortization of discount on funded debt		13,709.81
Miscellaneous income charges		1,020,707.37
Total deductions from gross income		16,127,607.11
Net income		$28,469,925.78
Disposition of net income:		
Dividend appropriations of income:		
Feb. 1, 1921, 1¾% on $249,470,600	$4,365,735.50	
May 2, 1921, 1¾% on 249,471,000	4,365,742.50	
Aug. 1, 1921, 1¾% on 249,471,200	4,365,746.00	
Nov. 1, 1921, 1¾% on 249,471,400	4,365,749.50	
Total	$17,462,973.50	
Income applied to sinking and other reserve funds	24,284.44	
Total appropriations of income		17,487,257.94
Balance, transferred to profit and loss		$10,982,667.84

*This amount represents accruals for period March 1, 1915, to March 1, 1920, of which $1,005,378.64 has been paid.

GENERAL BALANCE SHEET, December 31, 1921

INVESTMENTS.		
Investment in road and equipment:		
Road	$344,823,120.81	
Equipment	85,986,869.87	
		$430,809,990.68
Improvements on leased railway property		27,382.32
Sinking funds		6,362.87
Deposits in lieu of mortgaged property sold		32,986.77
Miscellaneous physical property		4,525,246.24
INVESTMENTS IN AFFILIATED COMPANIES.		
Stocks:		
C., B. & Q. R. R. Co.—		
Pledged	$109,114,809.76	
Other stocks	77,994,561.34	
	$187,109,371.10	
Bonds	26,787,600.50	
Notes	1,674,016.43	
Advances	11,895,973.18	
		227,466,961.21
Other investments:		
Stocks	$1,303,471.93	
Bonds	3,842,100.00	
Notes	2,812,397.28	
Miscellaneous	1,148,006.31	
		9,105,975.52
Total investments		$671,974,905.61
CURRENT ASSETS.		
Cash	$17,208,530.68	
Demand loans and deposits	35,000.00	
Time drafts and deposits	8,150,000.00	
Loans and bills receivable	14,449.59	
Traffic and car-service balances receivable	1,394,350.43	
Net balance receivable from agents and conductors	2,571,678.70	
Miscellaneous accounts receivable	12,154,252.06	
Material and supplies	9,353,962.10	
Interest and dividends receivable	6,293,552.28	
Other current assets	61,829.17	
Total current assets		$57,237,605.01
DEFERRED ASSETS.		
Working fund advances	$51,829.23	
Insurance and other funds	5,000.00	
Other deferred assets	2,702,700.00	
Total deferred assets		2,759,529.23
UNADJUSTED DEBITS.		
Rents and insurance premiums paid in advance	$52,677.88	
Discount on funded debt	592,883.98	
Other Unadjusted debits	6,464,699.61	
Total unadjusted debits		7,110,261.47
Grand Total		$739,082,301.32

STOCK.		
Capital stock	$249,478,250.00	
Less—In treasury of company	1,100.00	
	$249,477,150.00	
Premium on capital stock	81,268.44	
Total stock		$249,558,418.44
GOVERNMENTAL GRANTS.		
Grants in aid of construction		180,394.21
LONG-TERM DEBT.		
Mortgage bonds	$333,871,909.09	
Less—Held in Treasury $1,755,000.00		
Held by Mortgage Trustees 51,145,393.93		
Pledged with Treasury Department U. S. A. 23,250,000.00		
	76,150,393.93	
Outstanding in hands of public	$257,721,515.16	
Equipment trust obligations	5,200,200.00	
Miscellaneous obligations	2,776,000.00	
Non-negotiable debt to affiliated companies	519,656.55	
Total long-term debt		266,217,371.71
CURRENT LIABILITIES.		
Loans and bills payable	$21,500,000.00	
Traffic and car-service balances payable	369,331.38	
Audited accounts and wages payable	5,735,830.70	
Miscellaneous accounts payable	7,578,054.64	
Interest matured unpaid	6,805,263.62	
Dividends matured unpaid	14,453.00	
Funded debt matured unpaid	1,200.00	
Unmatured interest accrued	626,040.20	
Other current liabilities	58,605.43	
Total current liabilities		42,688,778.97
DEFERRED LIABILITIES.		
Other deferred liabilities		3,112,993.46
UNADJUSTED CREDITS.		
Tax liability	$5,147,437.34	
Insurance and casualty reserves	2,167,312.23	
Operating reserves	286,063.15	
Accrued depreciation—Road	2,193,955.23	
Accrued depreciation—Equipment	32,195,905.85	
Accrued depreciation—Miscellaneous physical property	5,719.92	
Other unadjusted credits	5,956,152.64	
Total unadjusted credits		47,952,546.36
CORPORATE SURPLUS.		
Additions to property through income and surplus	$37,457,666.38	
Funded debt retired through income and surplus	1,392,002.30	
Sinking fund reserves	25,184.55	
Appropriated surplus not specifically invested	615,862.18	
Total appropriated surplus	$39,490,715.50	
Profit and loss	89,881,082.67	
Total corporate surplus		129,371,798.17
Grand Total		$739,082,301.32

Railway Officers

Financial, Legal and Accounting

H. W. Price has been appointed auditor of the Tuckaseegee & South Eastern, effective July 31.

J. J. Cornwell has been appointed general counsel of the Baltimore & Ohio with headquarters at Baltimore, Md., succeeding **Hugh L. Bond, Jr.**, deceased.

Operating

C. O. McHugh has been appointed transportation assistant in the office of the general superintendent of the Quebec district of the Canadian Pacific with headquarters at Montreal.

D. J. Swope has been appointed acting superintendent of the Toledo-Ludington division of the Pere Marquette with headquarters at Saginaw, Mich., to succeed **F. P. Little**, granted leave of absence on account of ill health.

Purchasing and Stores

W. P. Dittoe, purchasing agent of the New York, Chicago & St. Louis, has been appointed general purchasing agent of that road and of the Lake Erie & Western.

C. M. Yohe, assistant purchasing agent of the Pittsburgh & Lake Erie with headquarters at Pittsburgh, Pa., has been promoted to purchasing agent with the same headquarters.

Special

William N. Neff, until recently chairman of the Southwestern Railroad Executives' Association, with headquarters at St. Louis, Mo., has been elected president of the International de Productos Company, with headquarters at Asuncion, Paraguay, South America, this company controlling large interests including a railroad, packing house, timber lands, live stock and boat transportation on the Paraguay river. He will leave New York on July 22, to assume his new duties. Mr. Neff was born on Aug. 11, 1874, at Lawrence, Kan. He entered the service of the Missouri Pacific in June, 1889, as a warehouse foreman and served successively as telegraph operator, agent, roadmaster's clerk and chief clerk to a division superintendent of the same road, until September, 1895. From the latter date until March, 1900, he was a telegraph operator, maintenance of way clerk, clerk in superintendent's office, chief clerk to superintendent, chief clerk to the general superintendent and assistant superintendent of the Great Northern. He left in March, 1900, to become superintendent of the St. Louis-Southwestern which position he held until June, 1901, when he was transferred to the St. Louis-Southwestern of Texas. He later became chief clerk to the president of that road and on May, 1911, he was elected vice-president and general superintendent which position he held until January, 1915, when he left to become superintendent of the Northwestern Pacific. He returned to the St. Louis-Southwestern in November, 1917, as vice-president and general manager, and from July, 1918, to March, 1919, he was general manager of the St. Louis Southwestern, the Louisiana & Arkansas, and the Illinois lines of the Missouri Pacific. During the period of federal control he was federal manager of the St. Louis Southwestern and the Louisiana & Arkansas. Since April, 1920, he has been chairman of the Southwestern Railroad Executives Association, which position he resigned recently.

W. N. Neff

Mechanical

H. A. Shepard, superintendent of telegraph of the New York, New Haven & Hartford with headquarters at New Haven, Conn., has been appointed superintendent of electric transmission and communication with the same headquarters and the position of superintendent of telegraph has been abolished. The jurisdiction of Mr. Shepard's new office will include all lines of electric communication and transmission on the system, including the electrified territory between New York and New Haven. **Charles S. Dow** has been appointed superintendent of communication with headquarters at New Haven.

General

M. H. MacLean, vice-president of the Spokane & Eastern Railway and Power Company and the Inland Empire Railroad, has been elected president with headquarters at Spokane, Wash., succeeding **George H. Taylor**, deceased. Other officers have been appointed as follows: **J. W. Esmond**, vice-president with headquarters at Chicago; **F. E. Conners**, vice-president and general manager with headquarters at Spokane; **Waldo G. Paine**, vice-president, traffic manager and treasurer with headquarters at Spokane; **L. C. Ream**, secretary and auditor with headquarters at Spokane; **Chester Corey**, assistant secretary and assistant treasurer with headqurters at Chicago; **Graves, Kizer & Graves**, general counsel with headquarters at Spokane; **F. Weidmer**, claim agent; **J. F. Gannaway**, superintendent; **J. W. Hungate**, electrical superintendent; **A. J. Mayham**, mechanical superintendent; **J. J. Daschbach**, storekeeper; **A. J. Witchel**, chief engineer with headquarters at Portland, Ore.

Obituary

Herman Paepcke, chairman of the board of directors of the Blytheville, Leachville & Arkansas Southern, died on July 22 at Chicago.

C. W. Jones, manager of the first district of the Chicago, Rock Island & Pacific, with headquarters at Des Moines, Ia., died in that city on July 22 after a long illness.

Photo by Kadel & Herbert

Train Ferry at Cork, Ireland, Loading Army Trucks for Shipment to England

EDITORIAL

Railway Age

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Selecting the Work to Be Done

Railway development has been practically at a standstill for five years and relatively little improvement work has been done for ten years. Meanwhile the traffic has continued to grow and the need for increased facilities and for improvements to reduce the cost of operation has grown likewise. As a result the roads are facing an improvement program of tremendous proportions, involving work which will yield excellent returns on the investment. In fact, the problem of the managements now is to select for first attention those projects which will yield the largest returns. The president of a large railroad, to whom a promoter had presented a plan for improvements on a certain portion of his property which he claimed would yield a return of 18 per cent on his investment, replied recently that if he had available the amount of money which this project would require, he knew of many other places on his road where he could spend it and secure an even larger return. This indicates the necessity for a close analysis of each project in the light of present traffic and other conditions to determine what it will accomplish. With this information in hand, it is possible for a management to select the projects for first action most intelligently.

The New Haven's Low-Voltage Switch Machines

On a busy railroad like the two-track portion of the New York, New Haven & Hartford main line, described in another column of this paper, the benefit derived from avoiding a stop, in the case of a long and heavy freight train, is found in two principal directions, (1) the saving of time for the freight and for following passenger trains, and (2) the saving of the additional coal which would be used in starting the freight to resume its journey. In this case both of these elements are very considerable; but the most definite word about the savings that we find in the account given to us is that they are "incalculable." This word means, usually, "too large to be calculated," and presumably is used somewhat in that sense in this place; and with some reason. Taking it more literally, as meaning that the proper methods of making the calculations are not known, or are very difficult of application, the statement may, no doubt, be accepted, at least as far as the value of time saved is concerned. If passenger trains are kept on time and if consignees of perishable freight make no complaint of delay, it is perhaps permissible to defer the task of measuring these benefits in dollars and cents —at least until the strike and its burdens are out of the way. As to the amount of coal used, while different students of the problem have reported different estimates, it is to be said, first, that the smallest estimates show quantities well worth saving and, secondly, that the New Haven ought to be able to be the first to give to the world an accurate estimate; for it has now been using electric locomotives extensively for several years, and electric power (and fuel consumption) will be more susceptible of precise measurement. One significant item in the time-estimates of the New Haven people, and one which is sometimes overlooked, is that with hand-thrown switches the time lost in leaving the side track is, if trains are very long, much more than the time lost in stopping to enter the siding. In entering, they lose five to ten minutes; in leaving, from 15 to 20. To stop an 80-car train so that the caboose shall be just clear of the switch is a trick which in practice is often very poorly executed.

Support the Foremen

The foremen in the various mechanical departments are a picked lot of men who never would have been placed in their positions had they not shown more than ordinary ability both as mechanics and as leaders. In spite of the fact that they are proportionately poorly paid, they can usually be depended upon to meet an emergency and as a class have again and again shown their loyalty to the railroad on which they are employed. These are the men who come in direct and constant contact with the rank and file of the workmen and unless they work in the interests of the higher officers and pass on a spirit of fairness and loyalty, the whole organization of the department is bound to be at least inefficient. These men have been going through a trying period during the past few weeks and most of them have been working hard and intelligently. Like all men, they are human and appreciate a little praise when work has been well done and where support is needed they like to know that they can rely upon the interest and backing of the officers higher up the line. A good foreman knows the conditions under which his men work and their needs and will stick up for his men when they are in the right, knowing that by so doing he is bound to win and to hold their co-operation. In the same way an officer should know and support the foremen reporting to him either directly or indirectly. It takes time and experience to develop a foreman and it costs money. Having found a promising man or one who has shown ability, do not allow him to become discouraged or to leave for the lack of appreciation or support.

A Locomotive That Made Good

When a railroad buys a locomotive differing radically from those in service and after testing it for scarcely more than a month, buys 150 more identically like it, no further proof is needed that the new design has made good. The order placed by the New York Central last week is one of the noteworthy events of recent years and one that is likely to have a decided effect on motive power policies and on operating practice. Few details regarding Michigan Central locomotive 8000, after which the new motive power is to be patterned, have been made public. The announcements given out by the railroad indicate that the leading features of the design are maximum power per unit of weight, minimum fuel consumption and ease of operation. Apparently a few weeks' service has shown conclusively that these objectives have been attained and, what is more important, that a locomotive meeting these requirements is also a locomotive that will make money for the road. The engineers of the railroads, the locomotive builders and the supply companies have succeeded in developing the steam locomotive into a highly efficient machine from the engineering standpoint. These improvements are often

discussed by engineers but up to this time have been too seldom applied as effectively as they might be to reduce the cost of operation. When, as in this instance, the higher officers co-operate in designing a type that will meet the operating requirements and then give the motive power a chance to perform at its best efficiency, the savings that can be effected are remarkable. The New York Central's latest type of power is likely to be the forerunner of many designs of improved locomotives.

June Earnings Statements

It is to be expected that the stockholders of the Pennsylvania received with much pleasure the June earnings reports of that company. In view of the size and importance of the Pennsylvania System the report will be received with equal satisfaction by those interested in the railroad situation generally if not in the Pennsylvania in particular. The reason is that the report for the Pennsylvania System as a whole shows a net railway operating income for the first six months of 1922 of $44,442,202, an increase of $34,788,204 over the net for the first half of 1921. The report shows a decrease of $7,386,259 in gross revenues. The reason for the increased net was the cutting of expenses in the amount of $40,609,204. Nor was this decrease due to savings in maintenance; of the total, $29,197,303 was in transportation expenses. The Pennsylvania has been making some unusually rapid strides in getting back to something like its old-time form, but one must feel that this rather caps the climax. The Pennsylvania, however, is only one of a number of roads which have issued interesting earnings reports for June. The Rock Island, for instance, reports that its June net operating revenue was the best for that month in ten years. The Baltimore & Ohio's net after rentals for the six months was $14,580,295 as compared with $7,630,464 for the first half of last year. This road reported an increase of about $2,500,000 in its operating revenues. Its maintenance expenses increased slightly but its transportation expenses, the real test of operations, were decreased nearly $8,000,000 and total expenses nearly $6,000,000. Wall street seems to be very much interested in railroad stocks just now—coal strike or shopmen's strike notwithstanding. With monthly earnings statements like these and the possibilities that many of them hold out for increased dividend rates, this interest is hardly surprising.

British Views on Automatic Stops

A correspondent asks us to give an explanation of the British train-control committee's declaration (See *Railway Age*, July 29, page 149) that train stops are more necessary at stop than at caution signals. We are not sure that we can do so. The report indicates that the committee's decisions, on this and on other points, were based on the number or percentage of collisions which during the past ten years have been due to different causes. In America the advocate of automatic train-control aims to forestall *every* cause of collision, whether it shows itself once a month or once in twenty years. The engineman who from pure absentmindedness may run past a distant signal at 50 miles an hour is constantly considered in our calculations; while in theirs the prominent example is the case of a runner who by an error of judgment runs a short distance beyond a stop signal. It is to be remembered that Englishmen take for granted that there will always be an overlap of 80 rods beyond the stop signal. Their signals are almost all manually operated, and the signalmen's rules require them to allow this; never to admit a train at *A* until the rear of the preceding train has passed a quarter mile beyond *B*. When they depend on this overlap their problem is much simplified. The American habit of mind does not recognize this feature. Another query which occurs to the American in reading this report is as to the paragraph recommending the commencement of the installation of train stop apparatus at "selected" home signals. Who shall make the selection, or on what basis, is not indicated. Considering the question from the standpoint of cost, very few can be selected anywhere at present. This difficulty is felt in England, no doubt, as badly as it is felt here. On the basis of the fundamental theory in the premises, it is desirable to safeguard a great multitude of places; for to calculate the location of the next disaster, or next dozen disasters, would be harder than to predict what building in New York or London will next be struck by lightning. We may be quite sure that the British committee has no idea of requiring the installation of automatic train-control throughout 49 locomotive divisions within the next two years. Indeed, there will be critics who will say that the Englishmen's cautiousness—which is very evident, notwithstanding the positive and progressive tone of the report—is excessive. Evidently, they were able to reach a unanimous agreement only by keeping silent on some important points. But where is the competent engineer who today would proceed any faster?

Piecemeal Ordering

So far as possible the railroads should budget their material needs, particularly for shops and enginehouses, determining how much material of a given kind will be needed in a year and placing the order all at one time. Deliveries may be arranged as convenient throughout the year, but by placing a single large order for the year, important concessions in price can be obtained. Many railroads are not adhering to this practice and the following is but one of many examples which might be cited: A manufacturer of rivet forges for both car and locomotive shops uses a special tile lining for application to the forges when the fireboxes burn out. The manufacturer gets orders for one, two, four, twelve and up to fifty tile linings, at $14.00 a lining. If purchased in car load lots, the railroads could save $4 apiece on their linings, to say nothing of reduced cost of transportation. Small orders are usually wanted in a hurry, go by express at higher cost, and must be boxed with special care to avoid chipping and breaking. Knowing the number of forges on an entire system, and the average life of firebox linings, it would be easy for any road to determine its annual consumption of tile linings and order at one time instead of placing several small orders throughout the year. Other materials should be purchased in this way with resulting economy.

In Summer Prepare for Winter

While it may seem premature at this season of the year to suggest that the railways should undertake now to prepare to cope with winter problems, less than four months remain before cold weather may be expected with its added difficulties of operation. It is particularly important that adequate steps be taken in time this year because the indications are that the railroads will be called upon to handle a traffic of record proportions during this season of adverse operating conditions. A grain crop of unusual size is to be moved, much of which must of necessity be transported after snow flies. Even more pressing will be the demand for the transportation of coal, for it is evident that the normal reserves cannot be built up before winter, and that coal must therefore move during the cold weather in much larger volume than is customary. Confronted with such a situation the forehanded railway executive will plan to remove every possible obstacle to operation

before the critical time arrives. In view of the relatively short period remaining and the special demands which are now being made on engineering and maintainance officers in common with those of other departments, it is important that attention be given to the concentration of maintenance forces on that work which will contribute in the largest measure to good track, the repair of those buildings essential to operation, the rehabilitation of important pumping stations and other facilities which, if they fail, will affect operation most adversely. Likewise, it is equally advisable that preferred attention be given to those improvement projects which will relieve congestion and facilitate operation to the exclusion, for the time being, of that work which, while perhaps equally important, will not aid in carrying the peak load of the immediate future.

Railways' Rejection of President's Plan

THE DESIRABILITY of ending the shop crafts' strike was obvious to everybody when the railway executives met in New York on Tuesday to consider President Harding's plan of settlement. The country's prosperity is being jeopardized by industrial warfare. It sorely needs industrial peace. But the railway executives rejected the President's plan with more real unanimity than we have ever known them to show upon any subject.

It is important that the public should be made to understand just why this was the case. The crux of the President's plan was that part of it which related to the seniority rights of the strikers. He proposed that they should be taken back into service with the same seniority rights that they had before they struck. The railway executives refused to do this because it would have been not only inexpedient in the long run, but positively immoral.

It would have been contrary to the highest considerations of expediency from the standpoint not only of the railways, but also of the public, because in case of future railway strikes it would have furnished everybody an incentive to strike and nobody an incentive to work. Therefore, in case of strikes in future it would have greatly increased the difficulty of preventing an interruption of transportation.

It is most desirable that railway labor controversies should be settled by arbitration and not by strikes and lockouts. But to have adopted the President's plan would have been to have discriminated against men who accepted the arbitration awards of the Railroad Labor Board and stayed at work or went to work under them and in favor of men who refused to accept the awards and struck. The heaviest blow ever dealt the cause of peaceful settlement of labor disputes in this country was dealt by President Wilson in 1916, when he supported the railroad brotherhoods in their refusal to arbitrate the question of a basic eight hour day. Another heavy blow would be dealt the cause of arbitration if men who have struck rather than accept the awards of the Labor Board should lose nothing by doing so and those who have stayed at work under the awards should gain nothing.

The worst feature of the President's plan, however, was that most railway executives could not have accepted and carried it out without committing an act of perfidy and dishonor. And the fact should not be overlooked that the Railroad Labor Board would have been a partner in this perfidy and dishonor. The existing seniority rules were adopted by the Labor Board at the instance of the labor unions themselves. As the railway executives pointed out in the resolutions they adopted Tuesday, the Chairman of the Labor Board at the time the strike was called said in a public statement, which he indicated expressed the sentiments of a majority of the board, that "it must be understood now that men who remained in the service and those who are now entering it will have rights of seniority that the board could not ignore."

The railway managements, in order to maintain operation, had to offer inducements to men to stay at work and to new men to go to work. In most cases, therefore, the managements promised and authorized their supervisory officers to promise old employees who stayed at work and new men who went to work that they would be given seniority rights and the regularity of employment which those rights carry with them. The executives of the railways could not take back the strikers with their full seniority rights without violating their own promises to men now at work and completely stultifying the supervisory officers whom they authorized and directed to hold and to employ men under the obligation of the same promises. Furthermore, the Railroad Labor Board could not consent to the railways taking back the strikers with their full seniority rights without having to eat statements bearing upon the matter repeatedly made on behalf of a majority of its members immediately before and after the strike began.

It is plain that President Harding, in proposing his plan, did not fully realize how he was asking railway officers, both high and low, to sacrifice their personal honor, and that he was profoundly impressed by the menace to the country's welfare presented by the coal strike, the shop employees' strike and thinly veiled threats from high labor union sources to call sympathetic strikes in other industries if these strikes are not settled satisfactorily to the labor leaders. By a curious coincidence President Wilson in urging the railway executives in 1916 to grant the basic eight hour day, and spokesmen of the Harding administration six years later in urging that striking railway employees be taken back with their full seniority rights, have used the same argument—namely, that the railways should accept the terms proposed to help save the country from a great disaster due to the attitude of organized labor.

If a great disaster can be averted only by railway officers violating solemn promises they have made in order to keep the railways running and thereby sacrificing their personal honor, the disaster is so near and so inevitable that no sacrifice or concession that the railways or their officers could make would avert it. But President Wilson was unduly alarmed in 1916, and some other persons are unduly alarmed now. There was no real occasion then, and there is no real occasion now, for surrender to men who refuse arbitration of differences with their employers, or who refuse to accept the results of such arbitration. On the contrary, the surrender of President Wilson and Congress to the demands of the railroad brotherhoods in 1916 has caused since then far more labor trouble than it has prevented; and a similar compliance now by the government and the railroads with the demands of the striking shop employees for reinstatement of their full seniority rights probably would cause the country to reap a harvest of dragon's teeth as large as it has reaped as a result of the passage of the Adamson Act.

The only safe course for the government is to insist upon full compliance with the awards of the Railroad Labor Board and complete protection of those who have been willing to work under those awards. The only safe and honorable course for the railway managers is to keep the promises they have made to the men without whose loyal work they could not have kept the railways running. If organized labor has become so strong and reckless that it can bring disaster on the country because the railway managers will not commit an act of perfidy and dishonor to which the government itself would be a party, then a surrender to the unreasonable demands of organized labor would prove a far greater disaster to the country than any disaster which organized labor's own acts could bring upon it. Fortunately, however, organized labor is neither so strong nor so reckless as many people believe, and if government officials would only let developments in the shop crafts' strike take their natural and logical course they would soon see that at no time has there been any basis for some of their apprehensions.

Responsibility for the Threatened Coal Shortage

THERE is going to be a coal shortage. There can be no possible question about that now. It will come no matter how soon the coal strike is settled. In fact, it is already here in some parts of the country. The only question is how serious it will become.

It has been the custom for certain spokesmen of the coal operators when a coal shortage existed, or was threatened, to try to put all the responsibility for it upon failure of the railways to move all the coal offered them. They even did this after the great coal strike in November and December, 1919. They are starting to do it again. Already they are magnifying the effects of the railroad strike upon coal production with the obvious object of fastening upon the railways all the responsibility they possibly can for the coal shortage that is coming.

The *Railway Age* does not blame the coal operators for the coal strike or its effects. But the efforts of their spokesmen to make it appear that the threatened coal shortage will be due to transportation conditions rather than to mining conditions renders it necessary to present the facts regarding developments to date.

The strike in the coal mines began on April 1. Up to that date there had been produced by the mines and moved by the railways this year 129,300,000 tons of bituminous coal. This was 28,600,000 tons more than in the same period of 1921. In the four weeks before the coal strike the average tonnage of bituminous coal moved by the railways was 10,714,000 tons. If the railways had been given opportunity to move coal at that rate until their own strike began on July 1, there would not now be any danger of a coal shortage.

But the coal strike came. In the thirteen weeks from the time it began on April 1 until the railway strike began on July 1, it reduced average weekly production from 10,714,000 tons to 4,505,000 tons. This was a reduction of 6,209,000 tons a week, which means that in these thirteen weeks the coal strike prevented the railways from moving 80,717,000 tons of bituminous coal which they easily could have moved, and would have moved, if the coal strike had not occurred.

This is what the coal strike did before the railroad strike began. What effect has the railroad strike had. In the last week before the railroad strike began the production of bituminous coal was 5,226,000 tons. The production in the next week has no significance, because it included the Fourth of July holiday. In the week ended July 15, total production was 4,114,000 tons.

Even if the entire decline in production between the week ended July 1 and that ended July 15 be attributed to transportation conditions it amounted to only 1,112,000 tons, or to less than one-fifth as much as the average weekly reduction caused by the coal strike in the thirteen weeks before the railway strike began.

If the coal strike should end today the railways could immediately increase by 100 to 150 per cent the amount of coal they are transporting, regardless of the shop employees' strike. That would not be sufficient to offset the effects already produced by the coal strike. But it would be sufficient to meet all the country's really pressing needs for fuel, except possibly in the Northwest.

If there is any industry in this country which would be justified in denouncing the coal strike and its results and everybody responsible for it, it is the railroad industry. The railroads will have their traffic demoralized by it, and because they are the largest consumers of coal will have their operating expenses increased more by it than any other industry.

The railroads have troubles enough of their own without having other people's troubles shouldered upon them. Both they and the coal operators are the objects of constant attack, but at the present time the coal industry is far more vulnerable to attack than the railroad industry. The solution of the problem of providing the country with as much coal as possible is going to require close co-operation between the railroad and the coal mining interests, and mutual recriminations will make it more difficult to bring this co-operation about.

So far as we know no criticism of the coal operators because the coal strike prevented the production and transportation of 81,000,000 tons of coal in the first thirteen weeks it was in effect has yet come from any railroad source, although it would have been easy to have found grounds for such criticism. The coal industry will be well advised if it influences those who speak for it to be as reserved in what they say about transportation conditions in future as persons connected with the railways have been in what they have said recently about conditions in the coal mining industry.

Equipment Orders in July

THE NEW YORK CENTRAL'S order for 150 locomotives of the same type as Michigan Central 8,000 described in the *Railway Age* of July 22 brought July's total locomotive purchases up to 353. This made July the biggest month in locomotive purchases so far this year; the best previous month was April when 272 locomotives were ordered. The freight car orders in July totaled 15,675, the best month so far in 1922 with two exceptions namely April and May, in which months 30,507 and 18,337 cars respectively were reported. Passenger car orders in July totaled 120. The orders to date in 1922 have now reached the following figures: Locomotives, 835; freight cars, 103,847 and passenger cars, 1,352. These are shown in tabular form by months as follows:

CAR AND LOCOMOTIVE ORDERS

Month	Locomotives	Freight Cars	Passenger Cars
January	5	7,960	235
February	8	14,721	160
March	76	5,550	25
April	272	30,507	540
May	99	18,337	235
June	22	11,097	37
July	353	15,675	120
Total 7 mos.	835	103,847	1,352

The most important locomotive order reported in July was, of course, that of the New York Central, not only on account of the size of the order, but because of the progress represented in the locomotives' design. Other important orders reported during the month were the Southern's 15 Mikado and 6 switching; the Nickel Plate's 14 Mikado; the Chicago & Eastern Illinois' 10 Mikado and 6 Pacific; the Baltimore & Ohio's 35 Mikado; the Lackawanna's 5 Pacific and 25 Mikado and the Illinois Central's 15 switching, 25 Santa Fe and 25 Mikado locomotives. There is still pending the Union Pacific's inquiry for 55 Mountain, 15 Santa Fe and 10 Mallet locomotives. There seems to be a tendency in many quarters to admit that business is good but at the same time to feel, on the whole, pessimistic over the general situation. This, however, is a rather representative list of roads. It is significant that they should have placed orders in the face of the coal strike and the railroad strike and furthermore in sufficient quantity to make July—a month when business ordinarily falls off—the best month so far this year. Favorable prices are one factor. The necessity for catching up on the small acquisitions of new power in the recent past is another. The most important reason, however, is the expectation, expressed in these orders in a very practical manner, that the prosperity we now have with us is here to stay.

One wonders how it is that people can feel pessimistic in the light of such conditions as these.

Letters to the Editor

[The Railway Age welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

The Safety Department —A Money-Maker

St. Paul, Minn.

To the Editor:

During the past few years much has been said about the safety movement on railroads and figures have been published frequently to show that there has been a large decrease in the number of persons killed and injured as a result of that movement. Little or nothing, however, has appeared to illustrate the financial saving to the carriers from the decreased casualty lists.

To the railway managers who are impelled in these times to overlook no opportunity to decrease operating expenses, it would seem that this feature is important and one on which they should be fully enlightened in order better to appreciate what their safety departments mean to them. Instead of the safety department being the obtruding semi-essential humanitarian agency it is frequently regarded, it is an organization which, on many well managed roads, has become a big money-maker and a valuable asset to the company in other ways.

Illustrative of its money-making ability, a certain western trunk line's record shows that for the first three years after its safety department was established (year 1913) the yearly average number of employee casualties was 2,546. By unceasing safety activities, a gradual and material reduction of these casualties was effected so that during the past three years (notwithstanding that there was an annual force increase of about 20 per cent as compared with the former period) the reduction averaged 703 per annum. Each compensated injury averaged $350, and 65 per cent of all of the casualties were compensated, hence this reduced casualty list meant a saving in compensation payments of $140,832 per annum—a saving which is amply verified by the official operating figures.

The total cost of conducting the safety department on that line did not exceed $12,000 per annum. The return upon this expenditure therefore was 1,173 per cent, from which, of course, should be deducted the expenditure for physical changes made in carrying out the safety program. If a liberal estimate of $50,000 per annum was allowed, the yearly profit to the railroad would be 214 per cent as the result of its safety operations.

That the safety department activities were responsible for this showing is rather conclusively confirmed by the 1921 record of employees' casualties (the best showing per 1,000 men in service for which there is a record). During that year the major portion of the force was composed of men who had long been in the service of the company and had become thoroughly imbued with the principles promulgated by safety representatives.

The above amount was a direct and tangible saving, but there was a further saving effected which, though direct, is less possible to determine, and that is the increased efficiency produced through a decrease in casualties which automatically reduced the labor turnover.

F. M. Metcalfe,
Superintendent, Safety Section, Northern Pacific

Buy Specification Paints Or Buy Results?

Dayton, O.

To the Editor:

There are many ways of approaching a problem. For instance, if a given number of cubic feet be required in a block, the block could be of several different dimensions and still the number of cubic feet contained therein would be the same. So it is with the manufacture of a gallon of paint.

Recently the writer was requested to criticize a specification in which one of the ingredients specified was found to be unnecessary. A better result would have been obtained by omitting this particular ingredient as the paint would have been easier to apply, with less wastage to the consumer and with equal or even greater durability.

Many paint manufacturers maintain a research department, taking pride in the paints they produce and carefully checking their raw materials and finished products. Surely a purchaser who buys from such a manufacturer should value very highly every provision that is made for this research and for bettering the product. The buyer is more apt to secure a superior paint, possibly at less cost, than when he submits his own specification for a given paint to the manufacturer and solicits the lowest possible bid. A manufacturer furnishing paint on this basis can have no object other than to produce a paint which will just meet specification, and cannot, therefore, take the pride in such a product that he would in a material designed by himself.

Any reputable manufacturer would object to being judged by the performance of paints made to certain specifications now in force; yet a manufacturer who would hesitate to bid upon such specification paints might lose other business which he considered desirable. It is not our intention to intimate that all specifications are bad; on the contrary, from the results of practical tests by railroads, there have been drawn up some specifications which have assisted the paint manufacturer to produce superior paint for some particular purpose. Is it not also reasonable to assume that the purchaser can receive valuable information and assistance from the experience and knowledge of the manufacturer?

If there were seven brothers operating as many different paint factories, all having equal amounts of capital invested in their businesses, it is safe to say that no two of them would make their paints upon exactly the same formulæ. And were they to figure upon supplying paints such as are required by some specifications today, it is again safe to say that no two of them would figure the same way. Differences of 100 per cent have been known in the estimate submitted by different manufacturers on a given specification.

If a purchaser of paint requested a price on specification paint from each of the brothers mentioned above, it is quite certain that if each one quoted on the specification, there would be a material difference in the prices.

Paint and varnish manufacturers might be compared to housewives making bread. Two housewives might each use the same ingredients and the same oven or "mixer," yet unquestionably one would produce a loaf superior to that of the other, though both followed the same specification or recipe. Superior ingredients do not insure a superior loaf; neither do exact proportions nor perfect ovens, but judgment and experience make the difference between good bread and poor bread.

In conclusion let us say—"give the paint manufacturer a chance to use his experience and resources." The policy of many manufacturers is to produce quality. Paint manufacturers are like manufacturers of any other product; some endeavor to produce the best that money and brains can devise, while the policy of others may be to produce paints to be sold strictly upon price, regardless of quality. Let the manufacturer use his brains, his experience and his facilities to pro-

duce results and let the purchaser benefit by the results produced

Very little has been done in an effort to establish anything approaching a close relationship between the purchasing agent, the engineer of tests and the manufacturer, but the more the manufacturer develops his business along these lines and the closer the relationship between the three upon a broad scale, the better will be the results obtained.

LANGLEY INGRAHAM.
General Sales Manager, Railway Department, The Lowe Brothers Company.

Why Speed Control Is Needed

NEW YORK CITY.

TO THE EDITOR:

I have noted with interest the editorial comments in your recent issues on the omission, by direction of the Interstate Commerce Commission, of the permissive feature in the "automatic stop" specifications, and the view expressed that this decision puts a premium upon speed control, or what is designated by inference, an incomplete or more complicated system. It is, of course, the easiest way to begin with the simplest fundamentals, but there are two sides to every question, and it may not be amiss to point out the fact that the Automatic Stop committee of the Railroad Administration, composed almost entirely of operating railway officers, specifically emphasized the need and importance of speed control in order to get trains over the road, in apparent recognition of the fact that it could be so developed as to secure the necessary freedom of movement sought by the advocates of permissive elimination of control by the engine crew, but with certain limiting conditions imperatively demanded for safe operation.

Of course, there must at all times be certain permissive possibilities in order to keep trains moving, and I would not for one moment insist that this feature is under all conditions necessarily limited to track elements under control of traffic conditions, imperative as this may be at times. But I am firmly of the opinion that free permission for an engineman simply to acknowledge the receipt of a track impulse and then cut out all automatic control, as has been sought by some proponents, would be fatal to success, for such practice could not but imperil train operation. This would afford no more protection than a simple cab signal or a track torpedo, its dangerous possibility being that the engineman, relieved from all compulsory braking, would be allowed to enter an occupied block at the speed at which he acknowledged the track impulse, or in fact at any speed to which the train could be accelerated, however unlikely he would do so.

If a frank recognition of this fact needs stress the importance of speed control, I fail to see why the Commission and its technical advisors, the Bureau of Safety, should be criticised for the elimination of a permissive feature which strikes at the root of the whole protective intent. Speed control limitation does not necessitate any serious increase in either first cost or cost of maintenance, nor does it spell undue complication. It is essential to flexibility of operation, and, properly installed, will secure not only safe reduction of operating speeds when needed, but permit the maximum of train movements with the minimum of delay. It is quite a different thing to permit an engineman to proceed under a low speed after definite warning or an enforced manual braking from allowing him to proceed under unrestricted speeds regardless of circumstances. Even without speed control definite restriction should and can be put upon manual permissive features, but whatever provision is made in this respect the use of a suitable speed control equipment will simplify and safeguard the entire operation.

FRANK J. SPRAGUE,
President, Sprague Safety Control & Signal Corporation.

A Joint Bureau of Research

NEW YORK.

TO THE EDITOR:

In your issue of May 6 you publish a letter from Professor A. J. Weishardt of the University of Arizona with a heading "Why Not Have a Joint Bureau of Research?"

Out of Arizona comes a ray of sunshine which if appropriated by the railroads will be to their very great advantage. Ways and means of cutting corners and effecting economies have never been sought after as vigorously by the railroads as they are today.

In a number of years' experience in contact with the accounting officers of the railroads it is our observation that the accounting officer in most every instance is interested in what his brother accounting officer on some other road is doing when this information is brought to him.

Why not have a joint bureau of research and where an accounting officer has by reason of a system installed, or by an installation of a mechanical device made, effected economies and ironed out wrinkles in accounting procedure why should information regarding this not be passed along the line by the bureau?

This leads us to quote from an article by Frank Nay, formerly comptroller of the Rock Island, addressed to the president of the R. A. O. A. in which he says:

> I express the hope that we may all take more time to co-operate with our brother accounting officers in the two ways which you set forth, viz., in presenting to the association the problems which have perplexed us, over which we may be "stewing," while our brother accounting officers across the way have already reached the solution; and, second, with due modesty, presenting certain methods and practices which we have found to be helpful, economical and efficient which may be just what our brother accounting officers would like to know about.

Again the same writer says:

> Our work is done in offices in the top stories in buildings. . . . Rarely do we meet our own brother officers outside of the circle of a certain half dozen with whom we come in contact regularly. . . . Without the constantly broadening influences of contact with people outside of our own department and outside of railroad service, as is the case with nearly all other departments of railroad operations, it is no wonder that we do sometimes become narrow.

While the high cost of travel does not affect the railroad official as it does the general public, it is a fact that he does not visit with his fellow accounting officers as frequently as he well might.

It is not on the largest system that we find at all times the best and most economical accounting procedure, but many times the officer in the little road, by reason of necessity, has effected economies that are well worth while. Here is where your bureau of research would bring out in detail this procedure and apply it to similar departments of other railroads.

The bureau of research could be well appealed to by the higher railroad officials to check up any department in their system which they thought might be improved upon, and also to confirm the practicality of recommendations for an installation asked for by some of their department heads.

Where a mechanical device is offered to a railroad officer today his first question is, "What can I save in the way of clerical help by its use?" At times it is impossible to save a clerk, but many clerk hours can be saved and the expensive overtime eliminated; to say nothing of the work being handled more correctly and in a better manner.

A joint bureau of research properly equipped would be one of the best investments the railroads could make.

SUBSCRIBER.

THE CANADIAN PACIFIC announces that it has opened an office in Vienna, Austria. Prepaid tickets may be purchased in the United States and Canada for west-bound trips

A New Building of Solid Sheet of Glass

Santa Fe Completes Modern Shops at Albuquerque

Large Locomotive Repair Building Embodies Numerous New Features of Construction

The Atchison, Topeka & Santa Fe is now engaged in an extensive program of rehabilitation of its extensive locomotive repair facilities at Albuquerque, N. M., which involves the expenditure of more than $2,500,000. The most important unit in the new layout is a large machine shop 239 ft. wide and 604 ft. long, which has just been completed and placed in operation. This building, which with its equipment cost approximately $1,750,000, is indicative of the trend of modern shop building construction. Conspicuous among the newer features is the large proportion of the wall and roof areas which are of glass construction, affording light and ventilation to an unusual degree.

The Flue Shop Is Typical of the Smaller Buildings

Albuquerque is one of the most important locomotive repair points on the Santa Fe, being located at the junction of the El Paso line and the low grade main transcontinental freight line with the main line between Chicago and the Pacific coast. These lines are important main traffic arteries over which the largest locomotives of the system are operated.

The first shops were built at Albuquerque in 1881 soon after the main line was extended west to the coast. The more important buildings erected at that time consisted of a machine shop, a boiler shop and a blacksmith shop, all of which were constructed of red sandstone walls, supporting frame trusses and tile roofs. All of the other buildings were of frame construction with the exception of the enginehouse, which was of white stone.

The Old Layout Was Outgrown

It became apparent several years ago that this layout had become inadequate and consideration was given to the construction of entirely new facilities. The studies made at that time indicated that the best arrangement would be secured by constructing the new facilities on the present location. To that end, additional land was acquired in 1913 and several units of the new layout were constructed in 1914 and 1915. These consisted of a reinforced concrete carpenter shop and storehouse, a frame coaling station, a frame car repair shed and three lavatories of brick construction. The tracks were also rearranged at the same time to conform with the new design. In 1917, a blacksmith shop 80 ft. wide and 306 ft. long was built of steel and brick and another lavatory was added.

The Doors, Open and Closed

Following the outbreak of the war, further work was held up until 1920, when it was decided to construct a new machine shop and five small special buildings. The program called for the construction first of a pattern storage building and a flue shop and a contract was let for the building of these structures in June, 1920. Upon their completion work was commenced on the clearing of the site for the new ma-

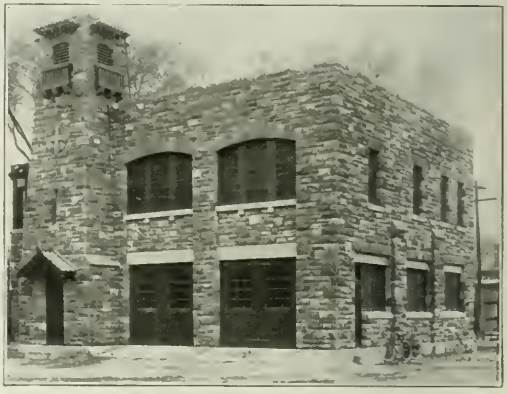
chine shop south of the transfer table which area had been occupied by the boiler shop, the blacksmith shop and several other buildings of frame and adobe construction. The equipment in the boiler shop was moved temporarily into the blacksmith shop, which arrangement permitted all work to be carried on north of the transfer table and left the space south of it for the use of the contractors engaged in building the new machine shop. In December, 1920, work was commenced on three other small buildings, a locomotive cab painting shop, a waste cleaning building and a fire department building. Early in 1921 a concrete babbitt shop was also built, while changes were made in the present power plant to enable it to carry the increased load from the new shop.

Showing the Skylight Construction

Locomotive Repair Shop Most Important Structure

The principal interest in the improvements at this point centers in the locomotive repair shop. This building, which covers a ground area of 3.5 acres, is divided into four bays. The erecting bay, which is 90 ft. wide and 57 ft. high from floor to underside of trusses, is located adjacent to the transfer table. Adjoining this section is a heavy machine bay, 65 ft. in width, and light machine and bench bays, each 40 ft. in width beyond. The heavy and light machine bays are 35 ft. in height, while a balcony extends over the entire bench bay with a small mezzanine floor 88 ft. long between it and the main floor.

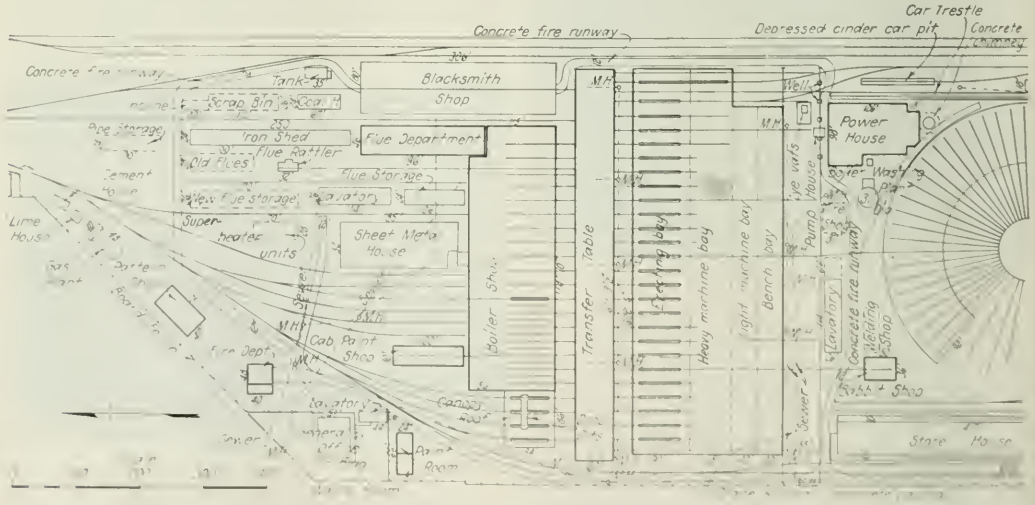
The building is of steel frame construction supported on concrete piers. The end walls are of concrete construction with liberal provision for steel sash, while the sides are almost entirely of sash. The roof consists of double sheathing, carried on steel roof trusses and covered with five-ply Barrett Specification roofing.



The Fire Station Is Unique in Appearance

The columns supporting the erecting bay and the traveling cranes are supported on creosoted wooden piling designed to carry a load of 16 tons. A total of 836 piles were used, for which an average penetration of 26 ft. 4 in. was secured. At other points the concrete footings rest on a thick stratum of stiff adobe and are designed for a loading of 3,000 lb. per sq. ft.

The most noteworthy feature of this building is the large area of wall which has been given over to Truscon steel sash and glass construction. The two sides of the building are of glass from sill to cornice, while liberal use of the same construction has prevailed in the ends. The glass in the



Layout of the New and Old Buildings—

sides is placed in a plane four inches beyond the face of the structural members, thus presenting an almost unbroken surface of glass. This arrangement simplified the construction details and protects the steel work from outside exposure. "Solite," factory ribbed glass, made by the Streator Glass Co., Streator, Ill., was used in panes 14 in. by 20 in. All fronts of steel sash are equipped with ventilating sash which are opened and closed by mechanical operating devices, which work in sections of four panels 288 ft. in length. Approximately 14 per cent of the wall area above the doors in the sides of the building is equipped with this ventilating sash.

To supplement the natural illumination from the sides, A-shaped sky-lights have been installed at intervals of 22 ft. over the heavy and light machine bays and the balcony floor. These lights are glazed with ¼ in. Penticor ribbed wire glass, made by the Mississippi Wire Glass Co., New York, which bars the direct rays of the sun.

The upper portions on one-half of the sash area in these skylights are arranged to be opened and closed mechanically.

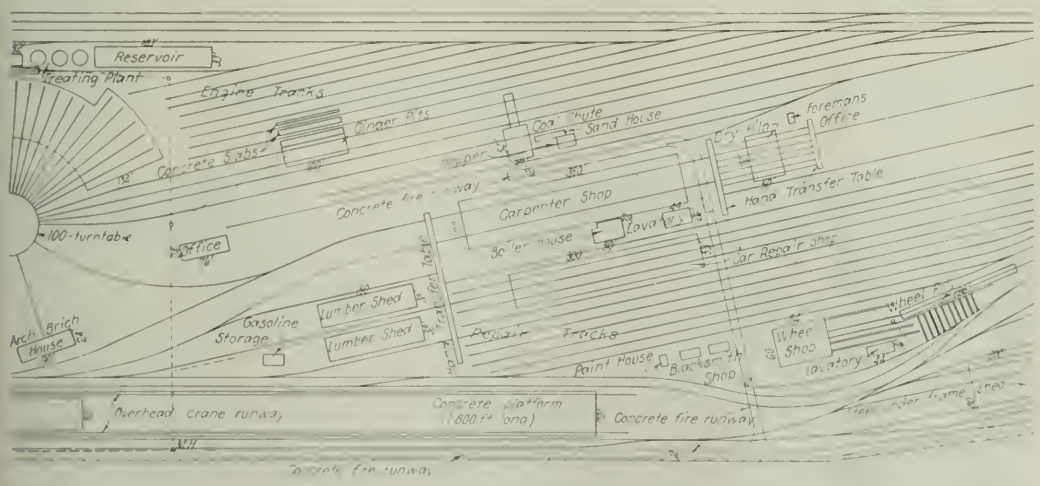
Artificial ventilation and heat are provided through two fan rooms placed on the roof of the heavy machine bay, adjacent to the erecting shop and opening into it. Each of these rooms contains two electric fans, of the Buffalo Forge type, one of 90,700 cu. ft. and the other of 68,000 cu. ft. air capacity per minute. These fans force the air through heating coils from which it is distributed through the shop by means of a series of main ducts encircling the building with small branches leading down the columns and discharging the air at a level of seven feet above the floor. When the temperature is such that the full capacity of the fans is not required, one or more can be shut down. The ventilating system has a capacity sufficient to change the air in the entire shop building three times in an hour.

The Old Machine Shop Differs Radically from the New

Artificial illumination is secured in the erecting bay by a direct system of electric lighting with sockets for portable lamps in the pits. Other bays are lighted by incandescent lamps.

Another special feature of this building is the use of three-inch Kreolite creosoted wood blocks on a six-inch concrete base as a floor. This concrete sub-floor was finished to a true surface and primed with a one-eighth-inch bituminous coating upon which the blocks were laid. Pitch was squeezed in the cracks between the blocks, effectively waterproofing them. Of the nearly four acres of floor area in this building, 123,916 square feet, or nearly three acres, is of wood block construction, all of which was furnished by Jennison & Wright, Toledo, Ohio.

Another new development in this shop is the type of door construction provided in the north wall of the erecting bay, through which locomotives pass to the transfer platform.



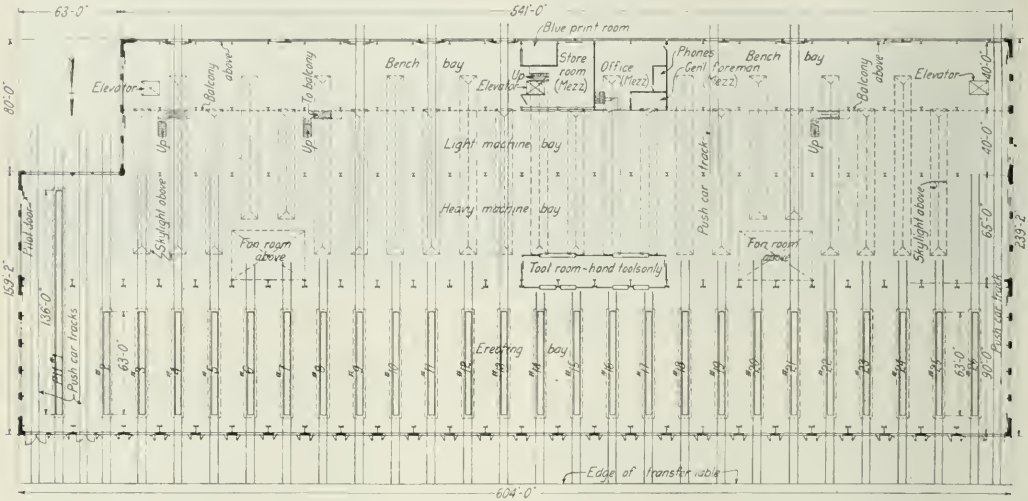
New Buildings Shown in Heavy Lines

These doors, which are of Truscon design, with Richards Wilcox hardware, are 8 feet wide and 18 feet high. They are of bifold design and open outward with a maximum projection of only slightly over four feet. When open they are held in place by means of latched posts. They are glazed with ¼-in. wire glass. These doors are built with a heavy drawn steel tubing frame and are supported on rollers on overhead tracks, causing them to operate unusually easily for doors of this size. Smaller pilot doors 2 ft. 6 in. wide and 6 ft. 3 in. high are provided in a number of these doors for pedestrian use.

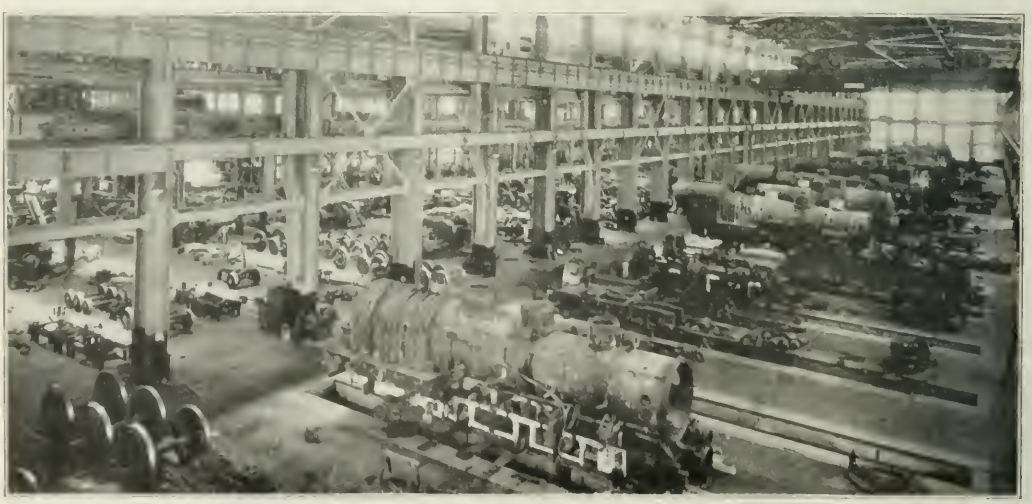
The erecting bay contains 26 concrete engine repair pits 63 ft. long, 43 in. wide at the bottom and 48 in. wide at the top and 2 ft. 8 in. to 3 ft. deep. These pits are fitted with slots containing connections for various power, gas and light sockets for portable lamps. The tracks over these pits and three push car trucks extend through the folding doors in the north wall to the transfer table.

A special feature of the equipment of this building is the liberal installation of cranes, all of which were furnished by Manning, Maxwell & Moore, Inc., New York. A 250-ton, and two 15-ton electric cranes have been installed in the erecting bay. Two 15-ton cranes have been erected in the heavy machine bay and two 2½-ton floor-controlled cranes have been placed in the bench bay. The light machine bay is served by a five-ton monorail crane, in addition to which automatic power-driven jib cranes serve individual machines when required. A crane runway has also been provided outside of and around the south side of the building, extending 50 ft. beyond the west wall. This crane, which has a 55-ft. span, serves a storage yard to be paved with concrete.

More than 60 new tools are included in the equipment of



The Layout of the Shop



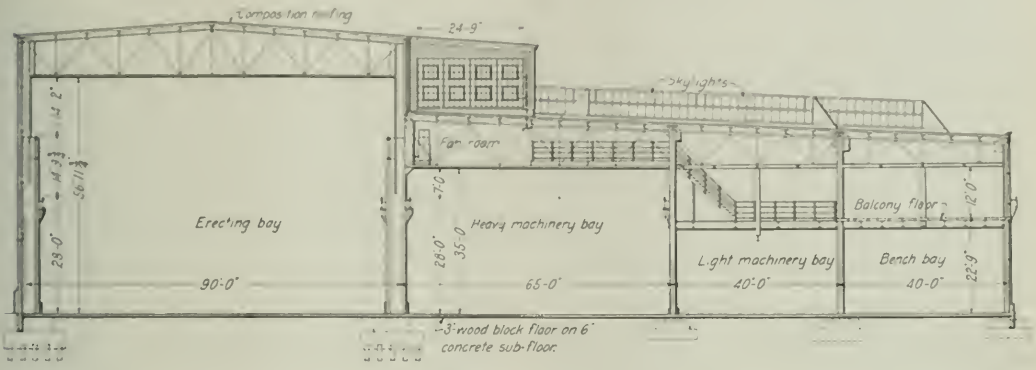
Looking Across the Erecting Bay into the Heavy and Light Machine Bays

the new shop. Among these are 15 engine lathes, two of which are portable, a car-wheel lathe and a double-head car axle lathe, two vertical and one horizontal turret lathes, one 100-in. boring mill and four of smaller size, five radial drill presses, one double-head and five single head shapers, three slotters, one piston rod, and one guide grinder, three double-head dry grinders and two single wet tool grinders, and, among others, several tools for the tin shop.

The exterior steel sash and doors of the building are painted with Tocholith in a dark green, while the steel frame interior is painted with Toch Bros. battleship gray in enamel. The underside of the roof and the interior walls are painted with Pratt & Lamberts' Lyt-All mill enamel.

Wash rooms fitted with Lyon metallic lockers for 800 men, together with a brass room, a headlight room, an electric shop and an apprentice school room are located on the balcony, while the file room, storeroom and office are on the mezzanine floor. Three Otis electric elevators and stairways connect these floors.

Work on this building was commenced on October 28, 1920. The driving of the fundation piles was completed on January 19, 1921, and the foundations early in March, 7,401 cu. yds. of concrete and 9,286 cu. yds. of excavation being handled. The steel erection was begun on March 6 and finished on June 2, 3,849 tons being placed in position in this interval by the American Bridge Co., which also fabri-



Section Through the Main Shop Building

cated the steel. The building itself was practically completed by January 1, while the machinery was in place and the shop in operation in June of this year.

Several Other Buildings Also Added

Other buildings which have been completed at this point include a flue shop, 46 ft. by 196 ft. in area, a cab paint shop 36 ft. by 122 ft., a pattern shop 40 ft. by 70 ft., a waste

The Large Areas of Glass Are Evident Here

cleaning shop 24 ft. by 66 ft., a babbitt shop 36 ft. by 50 ft. and a fire department building 40 ft. by 47 ft. All of these structures except the fire station are one-story in height and of reinforced concrete construction. The latter building is constructed of stone salvaged from buildings which have been dismantled and is two stories high. Additions have also been made to the power house and a chimney 230 ft. high has been erected. A new transfer table 60 ft. by 611 ft. is now under construction between the new machine shop and a projected boiler shop.

As now planned, this latter building will be 416 ft. long and 140 ft. wide, with drop pits outside the west end to be covered by a steel and concrete canopy 80 ft. square. The construction of the new boiler shop will be along the same general lines as the machine shop. Other projected improvements include a complete system of concrete fire runways about the yard, a welding shop, a dry kiln of 300,000 ft. b. m. capacity and extensions to certain of the lavatories.

These structures have been designed by E. A. Harrison, architect of the Santa Fe System, under the immediate supervision of C. F. W. Felt, chief engineer system, and G. W. Harris, assistant chief engineer system, A. F. Robinson, bridge engineer system, co-operating in the design of the structural steel. The construction of the buildings was carried on under the supervision of F. M. Bisbee, chief engineer Western lines, with W. M. Holm resident engineer on the ground. The work of installing the machinery and piping was handled under the jurisdiction of B. P. Phelps, engineer shop extensions, while all electrical installations were in charge of C. E. Nutter, electrical engineer of the Santa Fe.

The contractor for the main locomotive repair shop was Joseph E. Nelson & Sons, Chicago. C. A. Fellows, Los Angeles, Cal., was the contractor for the remainder of the buildings.

Freight Car Loading

WASHINGTON, D. C.

REPORTS received by the Car Service Division of the American Railway Association show that despite the railway strike the total loading of all commodities, other than coal, during the week which ended on July 22, was the heaviest for this season of the year of any in the history of the carriers, and within nine-tenths of 1 per cent of the peak of October 15, 1920.

During that week 861,124 cars were loaded with revenue freight, an increase of 217 cars over the preceding week and an increase of 73,090 cars over the corresponding week last year. Compared with the corresponding week in 1920, however, total loadings for the week of July 22, this year showed a decrease of 67,294 cars. Omitting coal loadings, the loading of all other commodities during the week of July 22, this year totaled 785,064 cars, which was an increase over the total for the same commodities during the same week two years ago of 58,236 cars.

Grain and grain products totaled 57,566 cars, an increase of 8,655 cars over the previous week. This was a decrease of 7,149 cars compared with the corresponding week last year, but an increase of 22,089 cars over the corresponding week in 1920. Loadings for the week, however, were the highest since the week of September 3, 1921.

Coal loadings totaled 76,060 cars, a reduction of 1,274 cars under the previous week. Compared with the same week last year this was a decrease of 73,745 cars, and with the same week two years ago a decrease of 125,530 cars. Coke loadings amounted to 9,949 cars, a gain of 251 cars over the preceding week. It also was an increase of 6,179 over the same week last year, but 3,178 below two years ago. Live stock loadings totaled 27,455 cars, a reduction of 2,761 compared with the preceding week. However, that this was an increase of 3,199 cars compared with the same week last year, and an increase of 1,345 cars over the same week in 1920.

Merchandise and miscellaneous freight, totaled 567,165 cars, 300 cars less than the week before. This exceeded the corresponding week last year by 98,342 cars, and the corresponding week in 1920 by 50,480 cars. Forest products totaled 58,512 cars, a gain over the week before of 391 cars. This also was a gain of 15,454 cars over the same week last year, and 397 cars over two years ago. Ore loadings totaled 64,417 cars, 4,745 cars less than the previous week. While this was an increase of 30,810 cars above last year, it was a decrease of 12,897 cars under two years ago.

Compared by districts, the reports show an increase over the week before in the total loading of all commodities in the Eastern, Allegheny and Southwestern districts, while the Pocahontas, Southern, Northwestern and Centralwestern districts reported decreases. Compared with the corresponding week last year all showed increases with the exception of the Pocahontas and Southwestern districts.

The car surplus was reduced during the period July 15-23 to 203,322, and shortages amounting to 15,366 were reported from various sections. The surplus included 35,145 box cars and 141,430 coal cars, while the shortages included 8,330 box cars and 3,597 coal cars.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS. COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, JULY 22, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year, 1922	Corresponding year, 1921	Corresponding year, 1920
Eastern	1922	11,673	2,622	8,547	1,873	5,399	8,051	69,886	92,964	201,015		
	1921	10,228	2,526	41,066	793	4,258	3,023	56,365	70,678		188,937	228,161
Allegheny	1922	4,082	2,429	16,962	4,460	3,131	12,535	49,204	77,147	169,950		
	1921	4,171	2,502	44,723	1,857	2,401	7,093	42,584	51,486		156,817	189,129
Pocahontas	1922	253	200	19,037	269	1,363	27	5,141	4,200	30,490		
	1921	254	203	19,884	81	1,349	22	5,105	3,805		30,703	34,639
Southern	1922	5,160	2,155	15,440	835	18,586	1,117	36,333	37,544	117,170		
	1921	5,515	1,919	19,171	250	13,245	184	35,332	33,611		109,447	126,335
Northwestern	1922	11,641	8,074	8,170	1,917	15,225	40,266	30,216	42,372	157,911		
	1921	11,371	6,632	6,423	469	10,583	21,878	27,151	32,975		117,482	163,391
Central Western	1922	18,003	9,335	4,900	411	6,897	2,012	33,395	47,528	122,181		
	1921	23,721	8,311	14,105	160	5,496	698	30,600	38,434		121,525	126,282
Southwestern	1922	6,754	2,640	3,004	184	7,911	409	15,305	25,900	62,107		
	1921	9,435	2,163	4,233	160	5,726	709	15,075	25,622		63,123	60,481
Total Western Dists.	1922	36,398	20,049	16,071	2,512	30,033	42,687	78,946	115,800	342,499		
	1921	44,527	17,106	24,761	789	21,805	23,285	72,826	97,031		302,130	350,154
Total, All Roads	1922	57,566	27,455	76,060	9,949	58,512	64,417	239,510	327,655	861,124		
	1921	64,715	24,756	149,805	3,770	43,058	33,607	212,212	256,611		788,034	
	1920	35,477	26,110	201,590	13,147	58,115	77,314	186,209	330,476			928,418
Increase Compared	1921		3,199		6,179	15,454	30,810	27,298	71,044	73,090		
Decrease Compared	1921	7,149		73,745								
Increase Compared	1920	22,089	1,345			397		53,301				
Decrease Compared	1920			125,530	3,178		12,897		2,921	67,294		
July 22	1922	57,566	27,455	76,060	9,949	58,512	64,417	239,510	327,655	861,124	788,034	928,418
July 15	1922	48,911	30,216	77,334	9,698	58,121	69,162	241,160	326,285	860,907	774,884	942,851
July 8	1922	35,247	21,847	68,996	9,665	44,736	55,729	210,140	271,939	718,319	640,535	796,191
July 1	1922	41,897	28,546	94,748	10,361	61,422	64,776	247,111	328,035	876,896	776,079	891,621
June 24	1922	38,411	29,934	96,960	9,466	64,071	61,284	249,193	325,337	877,856	775,447	911,503

Executives Flatly Reject Harding Peace Proposal

Rail Carriers Refuse Absolutely to Restore Shop Strikers' Seniority—Unions Accept Plan

MEMBER ROADS OF the Association of Railway Executives meeting in New York on Tuesday rejected President Harding's proposals for a settlement of the shopmen's strike. The rejection was unanimous. It was based on the third of three suggestions contained in a letter from the President to T. DeWitt Cuyler, chairman of the Association. This suggestion was that all strikers be returned to service "with seniority and other rights unimpaired." The executives held that they could not with honor accept this part of the President's program, since it would involve a breach of faith with men now at work in the strikers' places who have been promised "that their services would be retained regardless of the settlement of the strike, with all the rights appertaining to such employment, including that of seniority under the working rules and regulations previously approved by the Labor Board." Special reference was made in the executives' reply to the President's letter to a statement made by Chairman Hooper of the Labor Board in the early days of the strike which said that "It must be understood now that men who remained in the service and those who are now entering it will have rights of seniority that the Board could not ignore." The President's letter to Mr. Cuyler contained three proposals which were briefly: (1) that executives and shopmen agree to recognize the validity of all decisions of the Labor Board: (2) that the carriers withdraw all lawsuits growing out of the strike and that Labor Board decisions involved in the strike be taken to the Labor Board for a rehearing, and (3) that all employees now on strike be returned to their former positions with seniority and other rights unimpaired.

The executives accepted the first two proposals with conditions, these being in the case of (1) that the roads reserved the right to question in the courts the validity of any order of the Board which they believed beyond its jurisdiction and in the case of (2) with the understanding that the strike is first called off, that the unions pledge themselves against any form of violence "since otherwise it be impossible to consider the dismissal of injunctions" necessary to protect railroad property.

The third measure was flatly rejected. Moreover, the executives showed their astonishment when it was read that the President should make a suggestion of its character. Last Thursday Chairman Cuyler called on President Harding and discussed with him possible means of bringing the strike to a close. After the conference Mr. Cuyler called a special meeting of member roads of the association to be held in New York on Tuesday. This meeting was to consider a plan to be presented to Mr. Cuyler by the President and it was the general understanding that the plan would be such that Mr. Cuyler would recommend its adoption. No official statement was issued, however, concerning the form which the President's suggestions would take. It is understood in fact that no particular plan was talked over at the conference between Mr. Cuyler and the President. Later, however, the understanding was given out that settlement of the seniority issue was to be contained in a provision somewhat as follows: The shopmen who remained in service were to have seniority over returning strikers, and employees hired since the beginning of the strike were to acquire seniority only in accordance with the length of their service.

This plan would presumably have been acceptable to some of the executives, and it was the general impression that the issue would result in no small amount of discussion at the executives' meeting. Possible conflict of opinion among the executives, however, was not realized. When it was learned that the President's proposal was so far reaching the opinion against it was unanimous. The resolution rejecting the president's suggestion was passed with two dissenting votes —by a vote of 205 to 2—both of these being cast by L. F. Loree, voting as president of the Delaware & Hudson and as chairman of the board of the Kansas City Southern. Mr. Loree dissented on the ground that the rejection was not sufficiently strong.

The full text of the President's letter and of the executives' resolution in reply will be found on an adjacent page.

Immediately after the meeting the resolution was wired to the President at Washington. Secretary of Commerce Hoover was at the meeting to give the viewpoint of the Administration on the strike issue. He expressed the view that the Administration was feeling great anxiety about the labor situation and desired a prompt settlement.

The Situation at Washington

That the President had reached in his own mind a basis for "a compromise settlement" of the railroad strike, which was to be put in writing and submitted to the railway executives at their meeting in New York on Tuesday and to the shop crafts at a meeting of their general committee in Chicago on Tuesday or Wednesday was officially announced at the White House Friday afternoon after a series of conferences which the President had held with Thomas DeWitt Cuyler, chairman of the Association of Railway Executives and W. W. Atterbury, vice-president of the Pennsylvania, representing the railroads, and B. M. Jewell, president of the Railway Employees' Department of the American Federation of Labor, and the heads of seven unions on strike. The President was represented as confident that "the plan would meet the situation in a way that cannot be denied" but it was stated that the details could not be divulged and that the plan had not yet been completely formulated but would be on the following day. He had also expressed confidence that the coal situation would be met.

The fact that the President had a plan to propose was also announced to the press by the labor leaders a few minutes before the official announcement from the White House, as they left the President after a final conference. They also stated positively that there would be no separate settlements with individual roads. This referred to the fact that the proposal of the Baltimore & Ohio had been submitted to the President through Senator Watson.

The meeting of the member roads of the Association of Railway Executives at New York on Tuesday, for the purpose of considering whether the railroads would make any concessions to settle the strike, in accordance with the wishes of the President, was called by Chairman Cuyler following a conference with President Harding at the White House, Thursday evening and after the President had spent the day in conference with Mr. Cuyler and the heads of the labor organizations now on strike. While Mr. Cuyler said that no definite basis of settlement had been proposed and that the President had made no definite request of the railroads, it was understood that he had expressed to them his very great anxiety that some method of settlement be reached that would end the strike without a long-drawn out fight. The President had begun conferring with the direct parties to the controversy, after having previously dealt through Chairman Hooper of the Labor Board, members of his cabinet and senators as intermediaries, by meeting on Wednesday

Text of President Harding's Suggestions for Ending Shopmen's Strike and the Reply by the Railway Executives

The President's Letter

THE WHITE HOUSE, Washington, July 31, 1922.

MY DEAR MR. CUYLER:

I am writing to convey to you the terms of agreement, as I understand them, upon which the railway managers and united shopcraft workers are to agree, preliminary to calling off the existing strike.

First—Railway managers and workmen are to agree to recognize the validity of all decisions of the Railroad Labor Board, and to faithfully carry out such decisions as contemplated by the law.

Second—The carriers will withdraw all lawsuits growing out of the strike, and Railroad Labor Board decisions which have been involved in the strike may be taken, in the exercise of recognized rights by either party, to the Railroad Labor Board for rehearing.

Third—All employees now on strike to be returned to work and to their former positions with seniority and other rights unimpaired. The representatives of the carriers and the representatives of the organizations especially agree that there will be no discrimination by either party against the employees who did or did not strike.

In view of the things said in our personal interview, it is hardly necessary for me to emphasize my belief in the wisdom of the railway managers accepting this compromise in order to bring the strike to an end. I have made a very full appraisal of all the embarrassments involved in making the seniority restoration. It has seemed to me that the proposition that the order of things on the day the strike began be restored, and that both employers and workers agree against discrimination toward either those who struck or did not strike, will leave to the managers only the difficult problem of dealing with the new men employed. It would be futile for me to attempt to point the way of most easily solving that difficulty. I have only attempted to appraise the situation from the larger viewpoint. It seems to me that such a settlement brings, first of all, the restoration to normal operations in transportation for which the country is calling. In the second place, it establishes definitely the full recognition of the Railroad Labor Board by all parties concerned. I have not specifically stated it in the terms of settlement, but, of course, the abandonment of the contract system, in accordance with the decision of the board, is to be expected on the part of all railroads. It is wholly unthinkable that the Railroad Labor Board can be made a useful agency of the Government in maintaining industrial peace in the railway service unless employers and workers are both prompt and unquestioning in their acceptance of its decisions. I think it is more desirable than I know how to express to have established the unchallenged authority of the Railroad Labor Board, because we must do those things which are necessary to bring about the recognition of suitable authority to decide and end such disputes as menace the continuity of transportation.

You are at liberty to present the situation as I have outlined it to you, and I hope you will convey to the members my deep conviction that this dispute must be brought to an early termination. I need hardly add that I have reason to believe these terms will be accepted by the workers. If there is good reason why the managers cannot accept, they will be obligated to open direct negotiations or assume full responsibility for the situation. With very best regards, I am, very truly yours. WARREN G. HARDING.

T. DeWitt Cuyler, Chairman, Association of Railway Executives, Waldorf-Astoria Hotel, New York City, N. Y.

The Executives' Reply

ASSOCIATION OF RAILWAY EXECUTIVES, 61 BROADWAY, NEW YORK.

Resolved, (1) That we accept the first recommendation of the President, reading as follows:

First—Railway managers and workmen are to agree to recognize the validity of all decisions of the Railroad Labor Board, and to faithfully carry out such decisions as contemplated by the law.

with the understanding that this is not intended to preclude any party to a controversy from proceeding by legal action to question the validity of any order of the board on the ground that jurisdiction and authority to make the order was not conferred by the statutes creating the Board and defining its authority

(2) That we accept the second proposal of the President, reading as follows:

Second—The carriers will withdraw all lawsuits growing out of the strike, and Railroad Labor Board decisions which have been involved in the strike may be taken, in the exercise of recognized rights by either party, to the Railroad Labor Board for rehearing.

with the understanding that the strike is first called off, and the representatives of the strikers pledge themselves and the strikers against violence in any form against the men now at work and the property of the carriers, since otherwise it would be impossible to consider the dismissal of injunctions and other legal measures necessary to protect such persons and property from the violence and intimidation of the character resorted to in many localities since the strike was called.

(3) That it is impossible to agree to the first sentence of the third proposal of the President, the whole of which reads as follows:

Third—All employees now on strike to be returned to work and to their former positions with seniority and other rights unimpaired. The representatives of the carriers and the representatives of the organizations especially agree that there will be no discrimination by either party against the employees who did or did not strike.

The railroad executives and managers agree entirely with the President's statement in his letter that "It

is wholly unthinkable that the Railroad Labor Board can be made a useful agency of the Government in maintaining industrial peace in the railway service unless employers and workers are both prompt and unquestioning in their acceptance of its decisions. I think it is more desirable than I know how to express to have established the unchallenged authority of the Railroad Labor Board, because we must do those things which are necessary to bring about the recognition of suitable authority to decide and end such disputes as menace the continuity of transportation."

By this language the President has expressed with great force and clearness the policy which we advocate. But the decisions of the Railroad Labor Board were flouted and defied by the six organizations comprising the Federated Shop Crafts; the strike was called to take effect July 1, 1922, and even the summons of the Board to appear with the railroad executives before the Labor Board, after the strike was called and before it took effect, was contemptuously ignored by the leaders of the strikers, who refused to attend the hearing. Thereupon it became the plain duty of the railroads actively and vigorously to undertake to uphold the orderly processes for the adjustment of industrial disputes contemplated by the statute creating the Labor Board, and represented by the decisions of that Board against which the strike in question was directed, and at the same time continue to the best of their ability to discharge their duty to the public as common carriers.

Many men in the service refused to join the strike and in so doing were assured of the seniority rights accruing to them and of the permanence of their positions. On some important lines 50 per cent or more refused to join the strike. To these old loyal employees have been added thousands of new men who were employed and could be secured only upon a definite promise that their services would be retained regardless of the settlement of the strike, with all the rights appertaining to such employment, including that of seniority under the working rules and regulations previously approved by the Railroad Labor Board. We especially point out that a refusal to the old men who remained in the service and to the new men who accepted service of the rights of seniority incident to their employment would have just the opposite effect to that desired by the President, and would most seriously discredit the Labor Board. The Board itself prescribed the rules of seniority under which the men referred to have secured their seniority rights, and the railroad companies have neither the legal nor moral right to deprive these men of those rights. By public utterances since the strike began the Board has recognized and emphasized these rights, and to deny them now would, instead of upholding the authority of the Labor Board, overthrow its rules and discredit its authority.

The Chairman of the Labor Board at the time the strike was called made the following public statement:

> Upon one question the striking employees should not be deceived. Their leader has said that the strikers are no longer employees of the railways, and they have thus automatically abandoned all the rights they possess under their agreements and under the decisions of the board, including their seniority. This is not the board's action. It is their own.
>
> Many carriers are giving their former employees the opportunity to re-enter the service within a limited time. It must be understood now that men who remained in the service and those who are now entering it will have rights of seniority that the board could not ignore.

The chairman of the board's statement that this is an individual utterance, but it expresses, in substance, the sentiments of a large majority of the members of the Railroad Labor Board was justified by formal action of the Board taken in its resolution of July 3, 1922, which stated, among other things, as follows:

> Be it further resolved, That the employees remaining in the service and the new ones entering same, be accorded the application and benefit of the outstanding wage and rule decisions of the Railroad Labor Board, until they are amended or modified by agreements with said employees, arrived at in conformity with the Transportation act, or by decision of this board, and
>
> Be it further resolved, That if it be assumed that the employees who leave the service of the carrier because of their dissatisfaction with any decision of the Labor Board are within their rights in so doing, it must likewise be conceded that the men who remain in the service and those who enter it anew are within their rights in accepting such employment; that they are not strike-breakers seeking to impose the arbitrary will of an employer on employees; that they have the moral as well as the legal right to engage in such service of the American public to avoid interruption of indispensible railway transportation, and that they are entitled to the protection of every department and branch of the Government, State and national.

It must be understood that any proposal that employees now on strike shall be permitted to return to the service, without impairment to their seniority, is merely another way of suggesting that those men who took employment in this crisis in good faith, relying on the promises of the railroads to protect them in their positions, these promises being justified by the authoritative utterances of the Labor Board, and thus have made possible the continued operation of the railroads, shall now be sacrificed in favor of men now on strike, who not only brought about the crisis, but, by their own action and declaration, are no longer employees of the railways, under the jurisdiction of the United States Railroad Labor Board, or subject to the application of the Transportation Act.

In addition to the necessity of upholding the Labor Board, and maintaining the pledges made by the railroads to the men now at work, there is the practical effect on the supervisory officers of a violation of the pledges they were authorized to make. Their discouragement and demoralization would be far more disastrous than this or any other strike. Much harm has already been done by repeated publication of rumors in recent days that the loyal men and the new men are to be sacrificed to the strikers. This has discouraged new men from accepting employment in as great numbers as would come forward if certain that the pledges given would be fulfilled. Such published rumors only delay the complete collapse of the strike.

In view of the above, it is submitted that the striking former employees cannot be given preference to employees at present in the service without doing violence to every principle of right and justice involved in this matter and without the grossest breach of faith on the part of the railroads to the men at present in their service. Under these circumstances, it becomes apparent that the railroads cannot consider any settlement of the present strike which does not provide protection in their present employment both to the loyal employees who remained in the service and to the new employees entering it.

with General Atterbury, who had said that the Pennsylvania would be guided on the seniority question by the determination of its employees.

On Thursday morning he conferred for over an hour with Mr. Cuyler, who said he would remain in the city awaiting the pleasure of the President. From 11:00 in the morning until nearly six, with an intermission for luncheon, the President met with B. M. Jewell, president of the Railway Employees' Department of the American Federation of Labor, and the officers of the seven organizations on strike who had come from Chicago for the purpose. While it was stated at the White House that they had not been invited to a conference with the President it is understood the visit may have been arranged by Secretary of Labor Davis who had met with Mr. Jewell at Mooseheart on July 22. Secretary Hoover joined the conference for a short time toward its close.

The labor leaders on emerging from the conference declined to say what had been discussed except that they had gone over the entire situation with the President and had expressed their views and that they were remaining in the city over night, whereas they had earlier announced their intention to return to Chicago immediately after the conference. They indicated that they were barred from answering questions of the newspaper men by the request of the President. It was understood that they were staying over to await possible results from the second conference between the President and Mr. Cuyler in the evening which lasted for two hours. While there had been reports that at least a tentative proposal for a settlement had been made during the day Mr. Cuyler said that he had no definite proposal to place before the meeting on Tuesday and in reply to a question as to whether the President had requested the roads to yield on their position of declining to subordinate their new employees or those who had remained loyal to the strikers in point of seniority, he said that the President had made no request of any kind. The conference, he said, had been devoted to a general survey of the situation but he could not report what he or the President had said. He would place the views of the President before the meeting but would not attempt to predict the outcome.

The labor leaders who accompanied Mr. Jewell to the White House were: W. H. Johnston, president of the International Union of Machinists; J. A. Franklin, president of the International Union of Boiler Makers; M. F. Ryan, president of the Brotherhood of Railway Carmen; James Burns, vice-president of the Sheet Metal Workers' International Alliance; Edward Evans, vice-president of the Brotherhood of Electrical Workers; James Kline, president of the International Brotherhood of Blacksmiths, and Timothy Healy, president of the International Brotherhood of Stationary Firemen and Oilers.

Mr. Jewell held another conference with the President on Friday morning and in the afternon he saw the President again accompanied by Mr. Johnston and Mr. Franklin, who made the announcement as they came out that the President would submit a plan.

It is understood that there was considerable difference of opinion among the President's cabinet advisors over the question as to whether he should demand that the railroads take back the strikers with full seniority rights if they would agree to call off the strike pending a rehearing of the wage question. Some of them have been inclined to consider this question a mere technicality, failing to appreciate its effect in the case of the large number of roads that have been able to retain or recruit a considerable percentage of a normal force. It was suggested that a possible basis of settlement would be for the strike to be called off and the men to return to work with an understanding that the seniority question would be submitted to the Labor Board as a new dispute.

The President's plan, as given out at the White House for the first time on Tuesday noon, caused considerable surprise because the proposed surrender of the seniority question was so much more complete than had been indicated in the newspaper forecasts. While government officials had freely predicted that the plan would be accepted by both sides, in other quarters it had been assumed that this optimism must have been based on some feature of the plan which had not been published or upon the idea that some assurances would be given to the railroads of legislation to prevent a recurrence.

Lack of Balance in President's Plan

In proposing to settle the railroad strike by a compromise, President Harding was actuated by two primary motives—the desire to increase coal production and to strengthen the authority of the Labor Board. The most direct object, undoubtedly, was to make it easier to deal with the coal situation in which the President's plan of arbitration was rejected by the miners' union. Although the railroad strike has not yet interfered very seriously with commerce in general, as indicated by the fact that car loadings during the second and third weeks of July were only 15,000 to 17,000 cars less than during the last two weeks of June, the effect of the railroads originating most of the present supply of coal was becoming very serious, especially when added to the difficulty of car shortage and congestion that had begun to develop even before the railroad strike. The week of maximum coal production since the strike began was that ending June 24, when it reached 5,363,000 tons. There was a drop in the following week ascribed to railroad disability, followed by a sharper drop during the first three weeks of July after the calling of the shopmen's strike. There was an increase to about 3,900,000 tons during last week but this had not been shown by the time the President formulated his plan for settling the railroad strike, and preliminary reports indicate only a small further increase during the present week. Following failure of the efforts to settle the coal strike it then became necessary to try to meet the situation as well as possible by setting up the organization to distribute the available coal to the most essential consumers and it was the hope that if the railroad strike could be terminated the production of coal from the non-union mines and such union mines as could be opened might be gradually increased until it could at least supply the most essential requirements and possibly amount to enough to gradually break the strike.

Aside from the question of expediency presented by the coal shortage, the President also apparently saw an opportunity to strengthen the authority of the Labor Board, without waiting for "teeth" to be furnished by new legislation, by inducing both sides to recognize hereafter the validity of all its decisions.

The lack of balance in the President's plan seems to have arisen from his failure to appreciate the importance of the seniority issue and the fact that the roads that were most anxious to settle the strike, because they have not been able to recruit a sufficiently large force to replace the strikers, and to whom, therefore, the return of the strikers with only a promise of a rehearing might be regarded as a concession on the part of the unions, were not the ones to which the seniority question was an acutely practical one. Many of them had not issued any ultimatums to the strikers and would be able to take back all their old men with full seniority, without in any way displacing or breaking faith with new employees. On the other hand, to roads located in districts having an industrial population to draw from, that had been able to retain and recruit a large percentage of a normal force, a calling off of the strike represented no concession on the part of the unions and an agreement to take the strikers back with unimpaired seniority would raise a very practical question of how to use both the old and the new men unless they were to

break faith with the new employees. To roads of this class the proposed compromise meant that, after they had beaten Mr. Jewell and, they hoped, in such a way as to make him very reluctant to call another strike in the near future, he was asking that his men be taken back, with only the loss of the month's work which they had spurned; that the men who had remained loyal should receive no reward except the overtime they had earned and the ill-will of the strikers who would naturally blame them for their own lack of success, and that the new men be treated as "scabs" in spite of the Labor Board resolution.

No statement was forthcoming from the White House on Wednesday as to the President's next move. Secretary Hoover reported to him in the morning on his return from the New York meeting but said he could not say whether the President would reply to the letter from the railway executives.

A resolution was introduced in the Senate on August 1 by Senator Harrison for Senator King of Utah directing the Interstate Commerce Commission to make an immediate investigation of charges made by the unions that locomotives were being used without federal inspection in violation of the law. It was referred to the committee on interstate commerce.

Unions Accept President's Plan

The shop crafts' leaders meeting in Chicago voted on Wednesday to accept President Harding's peace proposals, conditioned, however, upon recognition of the unions' interpretation of the settlement suggestions. President Harding was apprised of the acceptance by the shopmen's leaders in a lengthy telegram emphasizing the shop crafts' demand for the establishment of a national board of adjustment and reluctantly accepting the other issues.

The message read as follows:

"The representatives of the employes feel themselves under obligation to support every proper effort on the part of the Government to bring about or to preserve the uninterrupted operation of the transportation industry. The stubborn refusal of the railway executives to establish a board of adjustment, as contemplated by law, in order to settle efficiently disputes over rules and working conditions between the carriers and their employes; the continued refusal of railways, representing over a quarter of the mileage of Class I railroads, to comply with the decisions of the Railroad Labor Board against the practice of contracting out work and shops; the persistent campaign to deny to the railway employes just and reasonable wages, to impose upon them unfair working conditions and to disintegrate their organizations, all in cumulative effect rendered service by railway employes under the terms and conditions to be effective July 1, 1922, intolerable to over 95 per cent. of these employes, who, therefore, voted to suspend work.

"It is now proposed that the return to work, temporarily accepting wages and working conditions which they feel to be unjust, with reliance upon the following program for redress of grievances:

"'First—Railway managers and workmen are to agree to recognize the validity of all decisions of the Railroad Labor Board, and to faithfully carry out such decisions as contemplated by law.'

"The employes have always taken the position that as long as they continued to render service they should abide by the rules and working conditions and accept the wages agreed upon by proper negotiation or determined by the Labor Board after a hearing of a dispute upon any of these matters. They respectfully point out again that violations of law and refusals to comply with decisions of the Labor Board have been exhibited only by the railway managements, and that it has been universally admitted that the employes, in exercising their right to suspend work upon non-acceptable conditions, were neither violating the law nor the decisions of the board.

Quotes Case of Pennsylvania

"We understand that the recognition of the validity of all decisions by the Railroad Labor Board, as contemplated by the law, means, for example, that in the case of the Pennsylvania Railroad, all employes will return to work under the wages and working conditions established in the decisions of the Labor Board, and that the sole question of 'validity' pending is the authority of the Labor Board to determine, as in Decision No. 218, the method of selecting accredited representatives of the employes, assuming that the railroad has appealed from the decision of the United States Circuit Court of Appeals, which sustained the action of the Labor Board.

"'Second—The carriers will withdraw all lawsuits growing out of the strike, and the Railroad Labor Board decisions which have been involved in the strike may be taken, in the exercise of recognized rights by either party, to the Railroad Labor Board for rehearing.'

"It is our understanding that the representatives of the employes, upon seeking a rehearing of the controverted decisions concerning wages and working conditions, will be afforded a prompt rehearing and decision by the Labor Board. We assume also that the practically unanimous action of the employes in electing to suspend work and in continuing this suspension under the sanction of, and in accordance with the laws of their national organizations, has ended any captious questioning as to who are the properly accredited spokesmen of the vast majority of railway employes.

"We desire to call attention to the orderly and disciplined conduct of these employes under difficult conditions, which has demonstrated the indispensable value of their national organizations in aid of the effective adjustment of controversies and the efficient conduct of the industry.

"'Third—All employes now on strike to be returned to work and to their former positions with seniority and other rights unimpaired. The representatives of the carriers and of the organizations especially agree that there will be no discrimination by either party against the employes who did or did not strike.'

"We are glad to observe that the obvious justice of this proposition has been accepted. It would certainly be a wholesale injustice of unparalleled extent if hundreds of thousands of experienced men, who have given four to forty years' service, and whose value to the transportation industry is proportioned to the length of their service should be placed in a position of inferiority to a limited number of men who have been employed as substitutes for these experienced railroad workers. The demand that such a wrong should be perpetrated as a penalty against men who have exercised a fundamental and admitted right not to render service under non-acceptable conditions, was so unfair that we could not believe it would receive the sanction of any impartial judgment.

"We understand the language 'all employes now on strike' to include all employes who hold seniority rights under the rules agreed upon between the carriers and the organizations of employes or as promulgated by the United States Railroad Labor Board. It should be understood that in acting favorably upon the proposals for settlement of the pending controversies, the representatives of the organized employes feel that they are making concessions and sanctioning sacrifices on the part of the employes which entitle them to the highest consideration and to recognition as law-abiding American citizens, who are ready and willing to do all in their power, even beyond that which is strictly reasonable, in order to promote industrial peace and to further the uninterrupted flow of the commerce of the nation.

"We see evidence of little sacrifice required on the part of the managements to whom like proposals have been submitted. They will suffer no loss in abandoning a host of futile lawsuits, complaining of wrongs which have never been committed. It is understood that the Labor Board must confirm its previously announced position and that the railways must abandon the condemned practice of contracting out work and shops and restore the employes to their former status. It should be noted that this practice is not only a violation of the transportation act and of the decisions of the board, but, as shown by many decisions of the courts, in violation of the charter obligations of the railroads and would have been unlawful without the passage of the transportation act or any action by the Labor Board.

"We understand that an effort will be made to insure the setting up of a board of adjustment, but inasmuch as such a board can function effectively only with the full co-operation of both managements and employe, we can look merely with hope, and not with certainty for the establishment of this 'essential part of the machinery to decide disputes between the carriers and their employes.' In the meantime, upon advice from you of the expressed acceptance of your terms of agreement contained in your telegram of July 31, by all carriers, we will take the responsibility of directing the employes to return to work, and upon the confidence that by action of the Labor Board upon rehearing of the recent controverted decisions a delayed justice will be rendered to the employes in the matter of wages and working conditions.

"We should certainly assume that the railways executives, in their own obvious interest, eventually will accept the proposals made, unless their counsels are dominated sufficiently by anti-labor forces to resist even the pressure of public opinion exerted through your high office, and to carry on to the bitter end a nihilistic policy of attempting to destroy the self-respecting, democratic institutions of organized labor. We can hardly believe that such a counsel of folly will finally prevail within the railroad managements.

"It, therefore, appears that upon the organizations of railway executives and employes rests the immediate responsibility of serving the public interests in bringing about a resumption of efficient operation of the railroads. Under pressure of this respon-

sibility we have voted, by the required constitutional majority, to accept the terms of agreement which you have submitted to us. We accept reluctantly, it is true, but commit ourselves to carry out the terms of settlement in utmost good faith and in aid of the general welfare. If these proposals fail to bring about the results which you desire, the responsibility of failure will not rest upon the representatives of the organized employes."

Ben W. Hooper, chairman, and A. O. Wharton, labor member of the Railroad Labor Board, attended the opening session of the shopmen's meeting. The former is reported as directly representing President Harding, occupying the same place in the Chicago meetings that Secretary Hoover occupied in the meeting of the executives at New York.

Insofar as the Railroad Labor Board is concerned no further steps to bring about the settlement of the dispute have been made. E. F. Grable, president of the maintenance of way brotherhood, has filed approximately 35 disputes on various carriers with the Board, all of them involving questions of wages and working conditions. This action follows the Labor Board's assurance to Mr. Grable that it would hear at any time disputes over wages or working conditions which the men felt were justified by the changes in the economic factors governing these questions.

Baltimore & Ohio Negotiations Fail

The negotiations of the Baltimore & Ohio with representatives of the Federated Shop Crafts looking to a possible separate agreement as to the strike ended on July 28 in failure to arrive at the desired result. This conference began on Tuesday and lasted until Friday. Announcement of the failure to come to an agreement was made on Friday in a statement issued from the office of C. W. Galloway, vice-president in charge of operation. The statement made public for the first time the plan which the railroad submitted as a basis for the negotiations. Mr. Galloway's statement follows:

The Baltimore & Ohio management met the committee representing the Federated Shop Crafts on the Baltimore & Ohio Railroad, in conference on Tuesday, July 25, and again on Wednesday, July 26. The meeting on Tuesday was devoted to a general discussion of all the questions involved. At the meeting on Wednesday the committee assured us that they had authority to order the men on the Baltimore & Ohio back to work provided a proposition satisfactory to them was submitted, and at their request for a specific answer to the proposition submitted by them, the following memorandum was handed to them:

MEMORANDUM

"Taking up the questions in the order in which they were discussed yesterday, and in reply to your request for some definite expression from the Baltimore & Ohio Management on the particular points raised by your Committee, you are advised as follows:

First: Request for National Board of Adjustment.

"You are reminded that the question of National Board of Adjustment was not a factor in the issuance of the strike order and has only been injected into the question since the strike occurred, consequently it is hardly a proper matter for negotiation in connection with reaching an understanding that would result in the resumption of service. However, as pointed out to your Committee it is our belief that a National Board of Adjustment is unnecessary and would not correct the conditions of which you complain, for the reasons which I endeavor to specifically set forth. The Baltimore & Ohio is willing however to set up a Board of Adjustment or reviewing board for the Baltimore & Ohio System, to be composed of its own employees and representatives of the Management, believing that this direct dealing between the men and the Management will go far towards an early adjustment of any differences that might arise and which could properly be referred to such a Board; or, if the employees are unwilling to have an individual Board of Adjustment, then the Baltimore & Ohio is willing to join with other companies in the Eastern Region in the establishment of a Regional Board of Adjustment on a basis similar to that governing the Train Service Board of Adjustment of the Eastern Railroads composing that Board.

Second: Request for Restoration of Overtime Rules in Existence Prior to July First.

Third: Request to Restore the Wages in Effect Prior to July First.

"With the understanding that the men now on strike will promptly report for service under the rules and working conditions as now prescribed by the United States Railroad Labor Board and which will remain in effect until or unless changed by the Labor Board or by mutual agreement between the Company and the men, the Baltimore & Ohio is willing to join in a conference with representatives of its employees to discuss these questions, and failing to reach an understanding, join in submission of the questions to the Labor Board for their consideration in accordance with the terms of the Transportation Act.

Fourth: Request That Seniority Be Restored to the Men Who Have Left the Service.

"The men who withdrew from the service of the Baltimore & Ohio at 10.00 o'clock A. M., July first, and those who have left since and who have not returned and who have not in the meantime committed any overt acts against the law of the land, will be taken back at the rates of pay and under the rules now in effect for their respective crafts, the question of wages and rules to be taken up for discussion in the manner outlined above.

"Men who, through pernicious activities or by the commission of overt acts during the period of this strike, have made themselves objectionable, will have charges preferred against them and be given a trial in accordance with the discipline rules of the shop crafts.

"It is not the purpose of the Baltimore & Ohio Company to ignore the loyalty of those who have continued in its service or the rights of those who have entered the service since the strike was called, and it is fair to state that the position of your organizations, as has been expressed, is that the men who have left the service are not employees of the railroads and therefore are outside the jurisdiction of the Labor Board. Aside from any other commitments or assurances to the employees who have remained in the service under their recognized right to work, the matter of seniority does not present an insurmountable situation, but as pointed out to you in our conference, it is one that can be very readily adjusted to the mutual satisfaction of all concerned and without surrender of principle on the part of either and is one that will be given prompt consideration by the officers of the Baltimore & Ohio Company and an earnest effort made to adjust all matters of that character on the basis of equity and fairness and in a manner that we firmly believe will ultimately prove satisfactory to both sides and be looked upon as fair and decent by every interest.

"If, at the end of 30 days any individual cases have not been adjusted in a manner that would be considered satisfactory to the employees we are willing to have such cases submitted for decision to a Committee to be selected, upon which the company and the men will have equal representation.

"We desire to emphasize the fact that the question of rates of pay and rules and working conditions, suggested in the forepart of this memorandum to be handled in accordance with the provisions of the Transportation Act, narrows the questions in dispute down to that of seniority, so far as the Baltimore & Ohio is concerned, and on that question we have pointed out how it may be disposed of in a fair and honorable manner.

"While much has been said in objection to the leasing of engine and shop facilities to outside contractors, this has not been in question on the Baltimore & Ohio, but in order to make the matter clear to its employees, the Baltimore & Ohio Company is willing to refrain from such action so long as the employees affected are willing to accept the wages and abide by the working conditions prescribed by the Labor Board or mutually agreed to in conference with the company.

"In concluding this memorandum, let me again remind you of the fact that the relations between the Baltimore & Ohio and its employees have for many years been pleasant, and I am hopeful that in considering this question, due consideration will be given to this, and the employees will see the reasonableness of the opportunity to resume service."

Conference with the committee was resumed this afternoon (July 28) when they advised us that our proposition was declined, which terminates all negotiations and our proposal is consequently withdrawn.

Of course, I regret the failure of these negotiations, being hopeful that the Baltimore & Ohio, first by seeking conference and then offering basis for negotiating a settlement which we believe to be fair and equitable to all parties under the circumstances, would indicate to the men the sincerity of purpose on our part that would justify acceptance of our terms, at least as a basis for discussion, but now that the negotiations have failed the Baltimore & Ohio will continue vigorously to build up its forces with a view to restoring normal conditions as early as possible.

Southern Invites Strikers to Return

The Southern Railway on Wednesday invited its striking shopmen to return to work with full seniority rights unimpaired, on the basis of the President's proposals for a settlement. In a statement to the employees Vice-President H. W. Miller said:

"The policy of the management of the Southern Railway system has been to create no conditions pending a termination of the strike that would embarrass the company, its employes or the public, and with this end in view no ultimatum has been issued to the men, no promises have been made, no new men have been employed and no writs of injunction have been invoked. There is therefore now no obstacle of the company's creation to prevent its men returning to work under the President's proposal as of their former seniority. The shop crafts committee on the Southern has been invited to confer on this basis."

L. E. Jeffries, vice-president of the Southern had explained the company's purpose to President Harding on Tuesday.

The Southern, from the beginning of the strike, has adopted a policy different from that of the other roads. It has not attempted to fill the places of the strikers and no ultimatum was given them to return by a certain date or forfeit their seniority and other rights.

Strike Situation in the East

The strike situation in the East during the past week continued its gradual improvement. It was too early at the time of going to press to determine the full effect of the rejection of the President's proposal as to seniority rights by the Association of Railway Executives. It was the general impression, however, that the strong stand taken by the executives would serve to encourage the men now at work and possibly assist in the recruiting of new men. Whether it would serve to induce men now on strike to return to work in large numbers is still to be determined.

Several of the carriers promptly posted on bulletin boards notices concerning the stand on seniority, the purport of these notices being to renew and strengthen the promises made to the loyal employees.

The notice posted on Pennsylvania Railroad bulletin boards was signed by Vice-President W. W. Atterbury and read as follows:

August 1, 1922.

To the employees of the Pennsylvania System, the old men who have remained loyal, and to the new men who have entered our service, and who jointly have enabled the railroad and its officers to perform its duty in a full and efficient manner:

I give you my personal assurance that my obligation to you under our agreements will be fully carried out.

Those agreements fully protect the old and new men in their seniority and the terms of the agreement cannot be changed except by mutual consent.

Strike Situation in the West

In the West the strike's fifth week was one of increased activity. The roads continued to devote their efforts to the upbuilding of the working personnel while the strikers retaliated with violence. The week previous to July 27 saw but few isolated outbreaks but on this date strikers in many centers throughout the country resorted to violence, but after several days of widespread outbreaks the violence subsided. The nature of the violence changed to some extent from that of the first weeks of the strike. The previous acts were directed at the railroads in an attempt to prevent the operation of the shops, and now that these acts are prevented by the injunctions secured by the roads, the strikers are aiming their attacks at individual workers in an attempt to intimidate them.

On July 27, a Pullman car occupied by sleeping non-union shopmen was dynamited in the yards of the Chicago, Indianapolis & Louisville at Bloomington, Ind., the car being badly damaged but none of the occupants being injured. On the same day a special guard in the yards of the Atchison, Topeka & Santa Fe at San Bernardino, Cal., was shot and killed; two Malesus, Tenn., shopmen died from bullet wounds received when unidentified men fired at them as they were returning from work, and workers were kidnapped and beaten at Galesburg, Ill., Chicago, Aurora, Burlington, Ia., and Memphis, Tenn. Three workers were assaulted at Janesville, Wis., and 30 non-union mechanics quit their work at Milwaukee when shots were fired at them.

On July 28, Chicago became the scene of further violence and two strikers were shot in a clash between one hundred striking shopmen and fifty workers at the Burnside yards of the Illinois Central. Numerous other sluggings and stonings occurred in Chicago on the same day. A non-union shop worker at Roseville, Cal., was carried out of town in an automobile, beaten and warned to stop work. A deputy federal marshal on guard at the Missouri Pacific roundhouse at Jefferson City, Mo., was slugged by three men after he had been called from the building. Striking shopmen of the Mobile & Ohio were said to have taken charge of the shops at West Point, Miss., and driven out new men who had been employed. At St. Louis two guards of the Missouri Pacific and a blacksmith of the Terminal railroad were stoned and beaten by men believed to have been strikers.

Western railroads whose headquarters are in Chicago report continued improvement. Substantial increases in the number of shop employees at work on the western railroads were recorded and in addition, all of these railroads reported that they were handling a heavy freight traffic without serious delays and that the operation of passenger trains continues normal.

Atchison, Topeka & Santa Fe

On the Atchison, Topeka & Santa Fe the shop forces were approximately 60 per cent. of normal on August 1.

Chicago, Burlington & Quincy

The total number of men at work in the shops of the Chicago, Burlington & Quincy was approximately 50 per cent. of normal on August 1.

Chicago, Milwaukee & St. Paul

The Chicago, Milwaukee & St. Paul reports that conditions on that road are improving steadily, approximately 4,300 shop employes being at work at various points along the line.

Denver & Rio Grande Western

This company reports that 467 men are at work in its shops—an increase of 256 over the number reported in last week's *Railway Age*. Operating conditions are said to be practically normal, and many strikers are returning to their posts.

Illinois Central

The Illinois Central had 10,698 shopmen at work on August 1, as compared with a normal force of 12,701. This compares with 8,149 on July 14 and 9,514 on July 24. That the strike has had no effect on the passenger traffic of this road is shown by the report that 98.2 per cent. of the Illinois Central passenger trains were on time during the month of July.

Kansas City Southern

The Kansas City Southern has increased its shop forces to 374 men, or almost double the number employed July 26, and new men are being added daily. The Missouri, Kansas & Texas is making substantial progress; 1,550 men, or approximately 37 per cent. of normal forces, are at work.

Missouri Pacific

Of this company's normal shop forces, approximately one-third are at work and the movement of traffic is said to be fair.

Nashville, Chattanooga & St. Louis

The Nashville, Chattanooga & St. Louis has 1,797 men at work, 87 per cent. of its normal force.

Chicago Car Strike Places Pressure on Steam Roads

The steam roads entering Chicago were again forced to handle the bulk of the city's local transportation business on Tuesday of this week when a strike of 20,000 employees of the street railway and elevated lines tied up the regular channels of traffic. However, experiences with like situations for three days in June, 1915, and for four days in July, 1919, found the carriers prepared to meet the increased burden placed upon them. The number of persons using suburban service daily has been variously estimated in the past, but no late accurate figures are available at the present writing. The estimated daily traffic handled by the roads during the 1915 strike was 625,000, and it is not believed that this number will be exceeded during the present walkout as a larger number of street vehicles were pressed into immediate service with the beginning of the strike. Owing to the perfected arrangements the traffic is being handled with much less congestion than in the other two emergencies. One factor which tended to help the situation was that the strike was threatened and expected for more than two weeks, thus giving the railroads plenty of time to complete their arrangements. The traffic did not reach its maximum until Tuesday evening or Wednesday morning,

which enabled the traffic officers to test their plans. As it was, little overcrowding was noted, while some of the roads actually provided more equipment than was necessary.

By far the largest part of the crowd is being carried by the Illinois Central and the Chicago & North Western. These roads normally carry the bulk of the suburban traffic since their lines traverse the more highly developed residence sections of the city from which most of the down-town workers are drawn.

The Chicago & North Western which normally handles about 60,000 passengers averaged 110,000 in and out of city during first day of the strike. Trains were rushed back and forth as quickly as possible during the rush hours. The Illinois Central usually hauls about 75,000 suburbanites daily but this number was increased to 150,000 on the first day of the strike and a gradual increase beyond this figure was in evidence each succeeding day. In place of the normal 378 trains operated daily, 592 were placed in running by this road with the start of the strike. The Chicago, Milwaukee & St. Paul added 17 suburban trains to its schedule and reports a heavy increase in its traffic. The Chicago, Rock Island & Pacific added 5 train crews and all the coaches available to take care of its suburban traffic which was increased by more than 50 per cent, its normal business being 4,000 passengers. The Chicago & Western Indiana added 15 extra trains and estimates its increase in traffic to be more than 60 per cent. The Chicago Burlington & Quincy and the Pennsylvania added no extra suburban trains to their service although both these roads added local stops to their schedules and increased the lengths of their trains. The New York Central was not forced to increase its service to any great extent as the majority of the people now using the line use it also under normal conditions. The Chicago, Aurora & Elgin and the Chicago, North Shore & Milwaukee are both operating but are not permitted by union labor to make local stops.

In most cases extra train service was provided by abandoning the regular suburban schedules and substituting a shuttle service under which trains are run as fast as traffic conditions permit. In handling the passengers at terminals little difficulty was encountered in disposing of the crowds arriving at the stations during the rush hours in the morning.

The use of long trains with capacity crowds makes it unpracticable for the trainmen to collect cash fares, consequently the passengers were required to buy trip or commutation tickets before entering trains, and to avoid interference with the regular through business of the ticket offices, liberal use is being made of temporary ticket booths for the sale of suburban tickets. Several of the roads avoided the collection of fares on incoming trains by fencing off the platforms at the local stations and taking or punching the tickets as the passengers passed on to the platform.

Railroad Shop Wages 32 Per Cent Above Outside Industries

A comparison of the wages of railroad shopmen with the wages paid to employees in foundries and machine shops in other industries, prepared by the National Industrial Conference Board, New York, shows that the average hourly earnings of the railroad employees stand at least 25 per cent and weekly earnings at least 32 per cent above those paid to men performing practically identical work in privately controlled plants. Railroad skilled shop mechanics include machinists, boiler makers, blacksmiths, sheet metal workers, and electrical workers, whose duties in the railroad shops are practically identical with the duties of men employed in commercial foundries and machine shops.

The National Industrial Conference Board has just completed a survey of the wages of employees of foundry and machine shops other than railroad, which shows that the average earnings of skilled labor stood at 56.1 cents on January 1, 1922. In a statement given out by the Board on July 2, the average hourly earnings of railroad skilled shop labor was shown to be 70.1 cents under the new wage rates, this being based on the hourly rate of 70 cents laid down by the Labor Board, and a working week of 48.06 hours.

The hourly wages of skilled mechanics employed by the railroads are therefore 25 per cent higher than those paid skilled mechanical employees of all the other industries in the country at the first of the year. Wage rates in private industry, moreover, have declined in the past six months, so that the comparative position of railroad shopmen and other shop workers in private industry in probably at present more marked than here shown. The National Industrial Conference Board's report covers the wages of 388,560 men employed in 1,338 plants, or 73 per cent of all the wage earners in foundries and machine shops as shown by the United States Census of Manufactures in 1919, and can therefore be regarded as thoroughly representative of the conditions existing in foundries and machine shops throughout the country.

Railroad Wages Almost Equal to Peak Wages in Industries

Studies by the Board show that the average hourly earnings of skilled shop labor in privately controlled plants rose from 30.4 cents per hour in 1914 to 71.3 cents in September, 1920. On January 1 of the present year, these wages had declined to 56.1 cents per hour. The railroad shopmen's wages rose during the war period from 29.8 cents per hour in 1914, to 86.4 cents per hour at the peak in November, 1920, and despite two wage cuts ordered by the Labor Board, the wages of the striking shopmen have been reduced to a point which is only 1.2 cents per hour below the rates paid to shopmen in other industries at the peak of the industrial inflation.

Weekly Wages Even More Favorable

A comparison of the weekly wages of the two classes of employees shows a situation which is even more favorable to the railroad shopmen than in the case of hourly earnings. This aspect of the matter is important, as weekly earnings constitute a much better basis for judging the comparative status of the two groups of workers than do hourly earnings. The statement of the National Industrial Conference Board referred to above, estimated the average weekly earnings of skilled railroad mechanics to be $33.67, under the reduced rates recently established by the Railroad Labor Board. The weekly wages of foundry and machine shop employees, however, on January 1, 1922, were $25.08, giving the railroad employees a clear advantage of 32 per cent in weekly earnings over the earnings of men performing work identical with their own, but in the shops of privately controlled companies. Since a decline in wages of outside shop workers has taken place since the first of the year, the position of the railroad shopmen is even more favorable.

The employees of the foundry and machine shop industry are shown to have been working an average of 44.7 hours per week on January 1, while it is estimated that on the basis of the average number of hours worked per week since September, 1919, the rail shopmen will average 48.06 hours. Statements have recently appeared which purport to show that any comparison of the estimated earnings of railroad employees for 1922 with the actual earnings of 1914 are unfavorable to the employees because of the fewer hours of work performed in 1914 on account of the severe industrial depression of that year. The figures published by the Interstate Commerce Commission, however, show that in 1914, the average number of hours of work per week for railroad shopmen was 51.4 or nearly three hours per week more than the estimate of 48.06 hours for 1922.

In 1914, moreover, the average working day of railroad shopmen was nominally ten hours but fell to the lower figure by reason of lack of business. Since that time the nominal week has been reduced by the insistence of the unions to 48 hours or 8 hours per day, with a 6-day week, and the attempt is now being made to use this fact to make the real earnings of railroad employees appear to be less than they were in the year 1914.

The result is, therefore, that railroad shopmen are in a more advantageous position than they were in 1914, in three ways. First, That their hours of employment have been reduced, giving them more time for leisure and recreation; second, that their economic status, even under the new wage cuts, is 10 per cent higher than eight years ago, and third, that the average weekly wages of railroad shopmen are at least 32 per cent higher than those of men doing the same work but employed by other industries, where wages are regulated by the supply and demand for labor.

Remote Operation of Switches on the New Haven

Highly Satisfactory Results Reported After Four Years' Experience with 28 Low-Voltage Machines

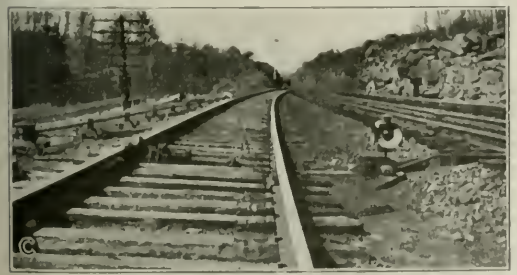
The New York, New Haven & Hartford has now been using an extensive installation of low-voltage switch machines for about four years, with marked satisfaction. The introduction of this important economy on the main line of the New Haven was the subject of an article in the *Railway Age* of April 19, 1918, page 1041. The low-voltage machine is one that can be operated in isolated situations and from a long distance, at small operating cost. West of New Haven, Conn. and east of Readville, Mass., this line is four-track and completely signaled; but between New Haven and Readville, 147 miles (mostly two-track), there are 16 stations where, until this improvement was installed, the movement of the heavy freight traffic of the line was greatly hampered by the necessity of using passing tracks which could be entered only by means of hand-thrown switches.

Switches at East Haven, Conn., New York, New Haven & Hartford—Looking East

The cost of establishing and operating interlockings for these sidings with current at 110 volts would be excessive, either nearby or at remote locations; but by operating the switches (and signals) by low-voltage machines, requiring no power supply but a small battery, and from the nearest signal tower, having either mechanical or power interlocking, an economical combination is accomplished. The only disadvantage of the low-voltage machine, its slowness, is no disadvantage at all, for in these situations the signalman always has two or three minutes, or longer, in which to perform the operations necessary for moving a train to or from the siding.

The approximate locations of the remote controlled switches are shown by dots on the sketch map. The first location, starting eastward from New Haven, is at East Haven, six miles from New Haven. Altogether there are 11 facing-point switches and 17 trailing points. The maximum distance between a tower and a switch is 7,300 ft. Throughout the main line, Harlem River to Boston, the signalmen in the towers now control every switch, either facing or trailing, which connects the main line with a passing siding and also every switch of the cross-overs which connect two main tracks that are operated in the same direction.

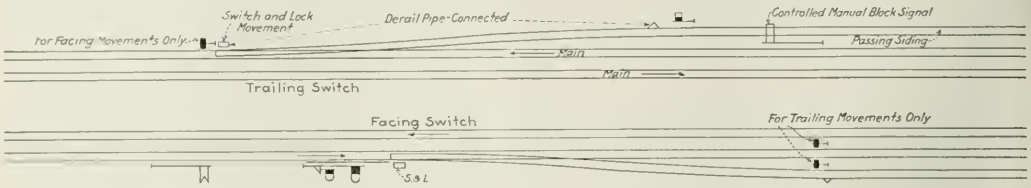
The illustration, *A*, shows an electric switch and lock movement, the battery, the relay housing and the pipe line to the derail, at a facing point switch. The next view, *B*,



Switches with Remote Control at East Haven, Connecticut—Looking West

shows a similar equipment installed for the operation of a trailing switch.

The other two views show (*C*) the derail and the target (both pipe connected from the switch) shown in *A*; and (*D*) a facing and a trailing switch nearly opposite each



Passing Sidings, New York, New Haven & Hartford—Switches and Signals Operated from Remote Tower

other, one on the eastbound track and the other on the westbound.

In the drawing showing typical facing and trailing layouts, it will be noted that the facing switch is provided with a high-speed main line signal, and a dwarf signal for the diverging route; and that the approach to these signals is regulated by a distant signal. The trailing switch is protected by an absolute block signal both on the main line and from the siding. These signals are operated from the tower and are under the control of the block system. With the distant signal controlled from the tower the speed of trains approaching the stop signal can at all times be regulated from the tower.

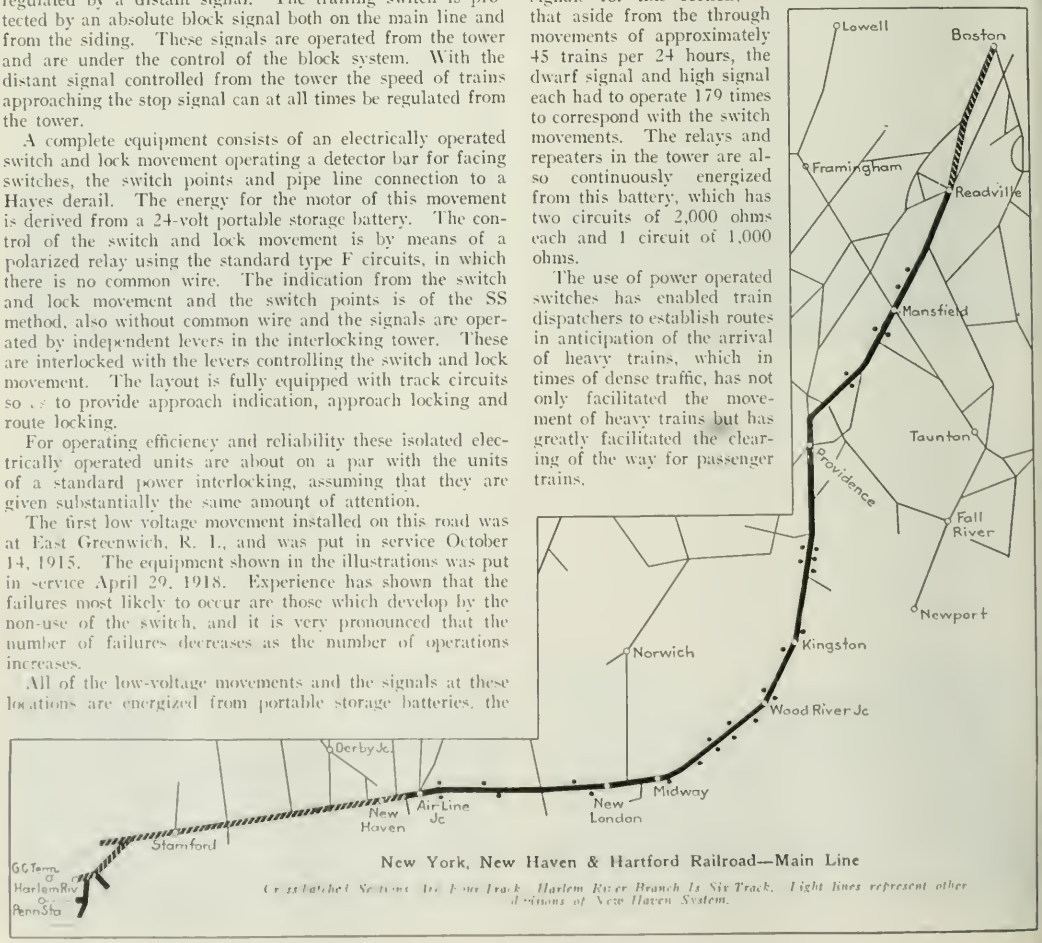
A complete equipment consists of an electrically operated switch and lock movement operating a detector bar for facing switches, the switch points and pipe line connection to a Hayes derail. The energy for the motor of this movement is derived from a 24-volt portable storage battery. The control of the switch and lock movement is by means of a polarized relay using the standard type F circuits, in which there is no common wire. The indication from the switch and lock movement and the switch points is of the SS method, also without common wire and the signals are operated by independent levers in the interlocking tower. These are interlocked with the levers controlling the switch and lock movement. The layout is fully equipped with track circuits so as to provide approach indication, approach locking and route locking.

For operating efficiency and reliability these isolated electrically operated units are about on a par with the units of a standard power interlocking, assuming that they are given substantially the same amount of attention.

The first low voltage movement installed on this road was at East Greenwich, R. I., and was put in service October 14, 1915. The equipment shown in the illustrations was put in service April 29, 1918. Experience has shown that the failures most likely to occur are those which develop by the non-use of the switch, and it is very pronounced that the number of failures decreases as the number of operations increases.

All of the low-voltage movements and the signals at these locations are energized from portable storage batteries, the battery being taken to the division headquarters periodically for recharging. The frequency of recharging depends mainly upon the number of switch operations and the climatic conditions. A test made in 1918 at one facing switch is perhaps a criterion for the average condition. At this point a storage battery having 56 ampere-hour capacity on intermittent discharge was put into service August 26, 1918; volts per cell 2.2, specific gravity 1210. The battery was taken out of service October 1, 1918. The number of switch movements from August 26 to October 1 was 358. In addition to this load the battery also energized the automatic signals for this section, so that aside from the through movements of approximately 45 trains per 24 hours, the dwarf signal and high signal each had to operate 179 times to correspond with the switch movements. The relays and repeaters in the tower are also continuously energized from this battery, which has two circuits of 2,000 ohms each and 1 circuit of 1,000 ohms.

The use of power operated switches has enabled train dispatchers to establish routes in anticipation of the arrival of heavy trains, which in times of dense traffic, has not only facilitated the movement of heavy trains but has greatly facilitated the clearing of the way for passenger trains.



New York, New Haven & Hartford Railroad—Main Line

Cross-hatched Sections Are Four Track. Harlem River Branch Is Six Track. Light lines represent other divisions of New Haven System.

When Equipment Renewals Become an Investment

Expenditures Requiring Retirement of Old and Reinstatement of Rebuilt Units Under I. C. C. Rules

By George W. Bashaw

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THE VALUATION ACT and the requirements of the Interstate Commerce Commission as contained in Order No. 3, second revised issue, require a different treatment of reconstructed equipment from that which has generally been the practice. Carriers have generally treated all rehabilitation and renewals as repairs and charged the expenses to operation. If this practice is continued it will result in violations of the commission's instructions and the loss of a vast amount in the investment from which no return may be expected.

The instructions of the Interstate Commerce Commission relative to accounting for equipment renewals* reads as follows:

> When the cost of renewals to be made to any unit of equipment will constitute the major portion of its value as renewed, the equipment, when taken out of service, shall be considered as retired and accounted for as provided in the preceding paragraph, and for the purpose of this classification the renewed equipment shall be considered an addition and the appraised cost thereof shall be included in the account appropriate for the cost of the equipment. In no case shall the charge for the renewed equipment exceed the cost (at current market prices of labor and material) of new equipment of similar type, equal capacity and equal expectation of life in service, less a suitable allowance on account of the second hand parts remaining therein.

The determination of just how extensive renewals must be before they cease to be repairs, chargeable to operating expenses, and become rebuilding, requiring the retirement of the old unit and reinstatement of the rebuilt unit in the property account at an appraised value, has been the subject of considerable discussion, and is a matter in which both the accounting and mechanical departments are interested.

The present rule, in all probability, is an adaptation of a somewhat similar rule appearing in the Classification of Expenditures for Additions and Betterments, first revised issue, effective July 1, 1910, which reads in part as follows:

> When any equipment is in such physical condition that it must be practically rebuilt in order to fit it for service, or when any equipment requires repairs which, if made, would constitute the major portion of its value, it should, when taken out of service, be considered as retired and be written out of the accounts. * * *

It is apparent that the end sought is the proper determination of the question as to when repairs are of sufficient magnitude to constitute a virtual rebuilding of the unit. The rule in the old classification was, perhaps, more specific with respect to the end sought than the present rule. The present rule in making the money costs of the renewals the gage for determining whether the unit shall be retired was probably an acceptable substitute to be applied under conditions obtaining when the present classification for investment was issued in 1914. At that time there was little or no fluctuation in the market for equipment and the terms "value" and "cost" were approximately synonymous. Since the increases in prices of labor and materials we cannot use the terms interchangeably in the interpretation of these instructions. Such an interpretation would lead to the unjustifiable result of accounting for minor equipment repairs as if they constituted rebuilding when a very small portion of the physical unit would actually be renewed.

It is evident, then, that the word "value" as it occurs in the instructions now in force should be interpreted to mean current value and not original or book value. Therefore, for the purpose of determining what course to take in accounting for the cost of heavy repairs to a unit of equipment, a comparison should be made as to all costs involved in the repairs, including additions and betterments, and the appraised value as rebuilt. If the cost of renewals, including additions and betterments will constitute more than 50 per cent of the appraised current value as rebuilt, then the retirement instructions are applicable.

Because this subject has never been given the place to which its importance entitles it, the mechanical department as well as the accounting department will need to make a careful study of the problem if the practices introduced are to get results. After considerable inquiry it is found that many carriers have introduced formulæ which cannot be interpreted by the forces who must apply them and others employ systems which are so cumbersome as to be beyond the capacity of the forces to handle intelligently.

It is the purpose of this article to introduce a method which will be easy to apply in practice with little or no extra expense. It has as its central feature the development of a table or tables showing for each class or series of equipment an amount in dollars which, if spent in direct labor and material at one shopping, exclusive of additions and betterments, will constitute the renewal of a major portion of a unit, within the meaning of the Interstate Commerce Commission's instructions.

Reproduction New

The first step in the development of this method is to ascertain or estimate the current cost to reproduce or rebuild the equipment new. This can be done and has been done in many cases by the use of the Equipment Committee method adopted by the President's Conference Committee. The figures so obtained must be modified according to the trend of prices in order to find a reasonably correct current price. The current price has been trended forward by the Equipment Committee to June 30, 1920, but unfortunately the work has been suspended since that date. It is hoped that this committee can keep these prices current because of the constant use to which they may be put. In the absence of figures supported by sales data, we can reasonably estimate the modifying factor by the general trend of commodity prices, together with any recent sales which are available. The American Railway Association rules for finding the current value or cost to replace new can be used for freight cars and similar equipment in Account 57 in the absence of better prices.

The current reproduction cost is the prime factor in the method proposed, or in any other, because in order to meet the requirements of the classification it is necessary that the rebuilt unit shall not exceed the current cost new.

What Constitutes a Major Portion of the Value as Rebuilt

The determination of this question is the most difficult part of the whole task. It cannot be left to the accounting or

*See page 33 of the current issue of the Classification of Investment in Road and Equipment of Steam Roads, prescribed by the Interstate Commerce Commission.

mechanical department forces for settlement as each case arises if consistent results are to be obtained.

Major renewals are generally construed to mean more than 50 per cent of the current value of a unit of equipment as rebuilt, and not of a like unit new. The current value of the second hand portions is less than their value new. The solution of the problem depends on the appraised values assigned to the "major portion renewed" and to the "second hand portion remaining therein."

There can be no objection to assigning 51 per cent as the lower limit of what constitutes a major portion. Similarly, there can be no vital objection to assigning 70 per cent of the current value new as the service value of the second hand portion remaining. There may be a few cases where wrecks rquire the rebuilding of new cars, in which a rating of 70 per cent as the condition of the old parts may be considered less than the circumstances would warrant. These cases may require the use of a different appraisal if of sufficient importance. But a factor of 70 per cent can be applied to equipment over seven years old, because as a general rule equipment must be maintained up to this standard to be serviceable.

It is proposed then to determine the amount of money which, when spent on a given unit, will equal 51 per cent of its value as rebuilt and will, therefore, determine the point at and above which the unit must be retired and reinstated in the property account at its appraised cost after reconstruction.

If we let

Current value of a new unit = 100
Major portion renewed = 51 per cent of the value of the unit as rebuilt
Service value of second hand portions used will = 49 per cent of the value of the unit as rebuilt
Service condition of second hand portions = 70 per cent of their current value new
Current value new of old parts used = X
Current value of renewals = Y
Value of unit as rebuilt = Z

Then

(1) $X + Y = 100$
(2) $.70X + Y = Z$
(3) $Y = 51Z$
(4) $.70X + .51Z = Z$
(5) $X = \frac{.49Z}{.70}$

Substituting the value of X and Y in (1), we have:

$Z = 82.65$

Substituting the value of Z in (5) we find that

$X = 57.9$
$Y = 42.1$

That is, if 42.1 per cent of the current cost new of a unit of equipment is expended at one shopping for repairs and renewals, it will amount to 51 per cent of the value as rebuilt, consideration being given to the depreciated condition of the second hand parts remaining. Likewise the service value of the rebuilt unit as it leaves the shops will be 82.65 per cent of the current value of a complete new unit and the current value, new, of the old parts retained will be 57.9 per cent of the value of an entire new unit. The percentage representing the value remaining in the second hand portions may be varied for use with equipment less than six or seven years old.

The money expenditure obtained by this process will contain such overhead elements of cost as store expense on material and shop expense on labor. The element of profit may be neglected for the reason that, as a general rule, it will cost the railroad company as much to build the equipment as it would to purchase from the manufacturer. We cannot well include the element of profit in the cost to the railroad company.

Where circumstances will permit the elimination of shop and store expenses it is by all means advisable not to complicate the estimate by including these elements. Our tables should be prepared so as to show only the direct labor and material costs which will constitute a major renewal. We should also know within reasonable limits what is the labor and material ratio in connection with the reconstruction of various classes of equipment. From an investigation of the latter, it has been found that for locomotives and passenger cars the ratio is approximately 70 per cent for labor and 30 per cent for material. For freight cars labor is 40 per cent and material 60 per cent. If we assume then, that store expense is five per cent and shop expense 20 per cent, the factor to cover labor and material only would be as follows:

For Locomotive and Passenger Cars

Material	42.1 × .30 × .95	= 12.00
Labor	42.1 × .70 × .80	= 23.57
Per cent of current cost new		= 35.57

For Freight Train Cars

Material	42.1 × .60 × .95	= 24.00
Labor	42.1 × .40 × .80	= 13.47
Per cent of current cost new		= 37.47

It is obvious that considerable fluctuation in the labor and material ratio will not distort the factor for various classes of equipment to any appreciable extent,—certainly not enough to affect the figures as a seasonable appraisal of the amount which will constitute a 51 per cent renewal. Similarly, a considerable variation in store and shop expense would have very little bearing on the general result.

Tables for Shop Use in Rebuilding Equipment

Having derived these factors for the different classes of equipment, we may now proceed with the construction of tables which will show the direct labor and material cost, exclusive of additions and betterments, constituting a 51 per cent renewal. The values for the tables are derived by making up a list of current prices new and multiplying each of these values by one of the factors derived above. In the sample table shown it will be noted that the reproduction value has been omitted in order to avoid confusion when the table is used in the shops. The reproduction value may be readily obtained by multiplying the figure given in the table by the reciprocal of the factor used in building up the table, i.e., 2.67 in the case of freight cars and 2.81 in the case of locomotives or passenger cars.

Cost of Labor and Material Per Car Which Must Not Be Exceeded at One Shopping Without Obtaining Authorities for Retiring Old and Reinstating Rebuilt Unit

Car Series	Kind	Amount in Dollars	Car Series	Kind	Amount in Dollars
15000-15987	Coal	360	29800-29824	Coke	455
16000-16258	Coal	460	29908-29922	Coke	375
17000-17098	Coal	400	17400-17494	Flat	500
17100-17186	Coal	445	20000-20339	Flat	310
17500-17999	Coal	475	20341-20463	Flat	320
18100-18198	Coal	530	20500-20598	Flat	415
18200-18323	Coal	520	21000-21249	Flat	520
18274-18271	Coal	540	29000-29249	Ore	535
27000-27499	Coal	500	31000-31199	Ref.	665
28000-28499	Coal	590	10007-10187	Stock	380
40000-41000	Coal	610	35000-36004	Stock	470
41001-43349	Coal	615	37000-37499	Stock	560
26475-26749	Coke	575	37500-37599	Stock	575
26750-26999	Coke	625			

Note—This table to be modified as the change in equipment prices will warrant.

Rebuilding Involving Additions and Betterments

Very often extensive improvements are made in connection with heavy renewals and, instead of treating these improvements under the accounting provisions of the investment classification for additions and betterments, the old unit should be retired and the improved and reconstructed one reinstated in the property account under the provisions for major portions renewed. When such cases arise a comparison must be made between all costs in connection with repairs, including the additions and betterments, and the appraised value of the improved unit as rebuilt. With the table giving the expenditures for a 51 per cent renewal of the unit without additions and betterments as a base, the problem is to determine what per cent of the total cost of the additions and betterments must be added to the amounts

shown in the table. The additions and betterments are worth exclusive of store and shop expense:

For Locomotives and Passenger Cars

Material portion	..	60 × 95	= 57 00
Labor portion	..	40 × 80	= 32 00
Total per cent of new			89 00

For Freight Cars

Material portion	..	60 × 95	= 57 00
Labor portion	..	40 × 80	= 32 00
Total per cent of new			89 00

Now, if we wish to take into account 51 per cent of the total cost of the additions and betterments in the rebuilt unit, for the direct cost of labor and material we must add 84.50 × .51, or 43 per cent for locomotives and passenger cars, and 89.00 × .51, or 45 per cent for freight cars.

In case additions and betterments are involved, then, add 43 per cent or 45 per cent, as the case may be, of the net cost of the additions and betterments to the amount shown in the table to obtain the total expenditure for labor and material which must not be exceeded without authorities to retire from and reinstate in the property accounts.

Value of the Rebuilt Unit

What has been said heretofore is applicable only to the determination of whether a unit is to be considered as rebuilt or simply repaired. The value at which the rebuilt unit is to be entered on the books must be based on the costs to the carrier. These costs are made up of the following elements:

(a) The estimated original cost of that portion of the old unit used in reconstructing the new, less a suitable allowance for depreciation. If the original cost of the old unit is a depreciated one, then no allowance may be made on this account because this would result in an unduly low appraisal for this portion. In other words, we should not doubly depreciate the second hand portion.

(b) The actual current cost of renewals, including the conditioning and repair of old parts used.

(c) The cost of additions and betterments, if any.

The first of these elements alone needs discussion. This can best be determined from an analysis of the actual charges for those portions referred to in (b) and (c).

We have seen that an expenditure for labor and material equal to 35.57 per cent of the cost new for locomotives and passenger cars and 37.47 per cent for freight cars is equivalent to the use of 57.9 per cent of the old unit. Similarly, eliminating store and shop expense, 84.5 per cent and 89 per cent respectively, of the cost new, will represent complete reconstruction. Hence, the increase in expenditures for labor and material from a 51 per cent renewal to a 100 per cent one, exclusive of overheads, will be:

For locomotive and passenger cars: $\frac{84.50 - 35.57}{35.57} = 1.375$ times.

For freight train cars: $\frac{89 - 37.47}{37.47} = 1.375$ times.

There is no difference in the factor produced for the various classes of equipment, and by dividing this factor by 57.9, an increment is obtained by which to construct a table of factors equivalent to the various proportions of the old unit used, as obtained from the amount of money spent, which can be used for any class of equipment. If 1.000 be assigned as the factor where 57.9 per cent of the old unit is used, the factor for complete reconstruction will be 2.375, and the variations between these extremes are as shown in the table given below.

When rebuilt without additions and betterments, this table of factors is used for finding the cost of the second hand portions as follows: Suppose the cost to rebuild a car for renewals and repairing second hand parts used is $700. Look in the table showing the labor and material expenditure equivalent to a 51 per cent renewal, and suppose it to be $570. Then 700 is 1.890 times 370 and the factor 1.890 in the table corresponds to 20 per cent of the old unit used.

Suppose that a unit of equipment is rebuilt at a total cost of $675, of which $200 is for additions and betterments and $475 for renewals and conditioning. If the car is of the same series as that just considered the factor would be equal to 475 divided by 370, or 1.283, which is equivalent to the use of 46 per cent of the old unit.

Factors for Ascertaining Per Cent of Old Unit Used in Rebuilt Equipment

Per Cent of Old Unit Used	Factor	Per Cent of Old Unit Used	Factor	Per Cent of Old Unit Used	Factor
57.9	1.000	38	1.472	18	1.947
57	1.021	37	1.496	17	1.971
56	1.045	36	1.520	16	1.995
55	1.069	35	1.544	15	2.019
54	1.092	34	1.567	14	2.042
53	1.116	33	1.591	13	2.066
52	1.140	32	1.615	12	2.090
51	1.164	31	1.639	11	2.114
50	1.187	30	1.662	10	2.137
49	1.211	29	1.686	9	2.161
48	1.235	28	1.710	8	2.185
47	1.259	27	1.734	7	2.209
46	1.282	26	1.757	6	2.232
45	1.306	25	1.781	5	2.256
44	1.330	24	1.804	4	2.280
43	1.354	23	1.829	3	2.304
42	1.377	22	1.852	2	2.327
41	1.401	21	1.876	1	2.351
40	1.425	20	1.900	0	2.375
39	1.449	19	1.924	..	.....

Knowing the percentage of old unit used, it is reasonable to say that the cost of the old parts used is that per cent of the total cost of the old unit as carried in the accounts of the carrier. We can further say that its condition in the unit as rebuilt will not be less than 70 per cent as a fair estimate. Then, if the car cost is carried on the books at $900, the value in the two cases cited is 900 × .20 × .70 = $126, and 900 × .46 × .70 = $298.80, respectively.

Some roads attempt to value the second hand portion on the basis of its condition before the process of repairs begins. The rule referred to in the classification does not contemplate any such treatment, but intends that the appraisal shall be based on the condition of this part of the unit as finally turned out of the shop. Of course the use of 70 per cent condition for old parts is susceptible of variation on the part of each carrier to suit conditions. But if 70 per cent is used in determining whether or not the repairs constitute a major renewal, the same conditioning factor should be applied here for the sake of consistency.

Incidentally, this method of estimating the extent to which old parts are used in the reconstructed unit may also be of service in estimating scrap and salvage since, if we use 40 per cent in reconstruction, 60 per cent will be scrap or parts returned to the store. When scrap credits are distributed over the accounts, the amount estimated on this basis may be credited to retirements as shown in the estimate.

Incidental Costs Chargeable to Operating Expenses

The supervising forces should be educated thoroughly in what constitutes charges to operating expenses, for, if these costs are included in the charges for renewals, an exaggerated reconstruction cost will result.

First, there are the operating expenses pertaining to the retirement of the old unit, which occur under the A. F. E. for the retirement. The appropriate operating expense account for equipment retirements should be charged with the expense of scrapping old parts, removing old material and all other analogous processes in preparing for the actual rebuilding operations under the A. F. E. for reconstruction. The latter may have operating expenses charged with such items as the removal of material incident to repairs which were overlooked under the authority for retirement.

The important point in administering the system here proposed is to get the master mechanic to estimate and report

whether the renewals and repairs required on any unit of equipment will come within the amount shown in the tables prepared for his use. These officers and their supervising forces can generally be depended on to know from experience what their heavy repairs will amount to within reasonable limits. If they have reason to believe the amount shown will be exceeded, certainly they can go into the matter in sufficient detail to settle the question with reasonable accuracy. In their estimates, care should be taken to eliminate costs chargeable to operating expenses. An occasional check by some member of the executive staff may be necessary to ascertain whether the mechanical department is making reasonable efforts to comply with the instructions issued. In initiating this or any other method, it will be necessary to educate the forces dealing directly with it, but eventually the system should take care of itself.

Authority for Expenditures

Two authorities are required, one to retire the old unit, and one to reinstate the rebuilt unit in the property account. In order to secure uniformity of results and efficiency in handling, one man should be charged with the responsibility for making up all authorities of this character. The requests for authorities should contain all necessary information, such as the cost of renewals, additions and betterments, incidental operating expenses and probable amount of salvage or scrap. From this information both of the A. F. E.'s may be prepared. Freight cars should be handled in groups if found practical to do so, because of the amount of clerical work involved in individual treatment.

The following example illustrates the method of preparing detailed estimates for retirements and reinstatement:

DETAILED ESTIMATE FOR RETIRING LOCOMOTIVE 1101

Retirement		
Ledger value, credit Account 51		$9,000.00
Salvage		
Accrued depreciation, debit accrued depreciation		5,000.00
*Parts to be used in rebuilding debit material		2,250.00
Scrap, debit material		930.00
Total		$8,180.00
Costs Chargeable to Retirements		
Ledger value	$9,000.00	
Less Salvage	8,180.00	
		$820.00
Incidental Costs Chargeable to Retirements		
Labor dismantling	$200.00	
Shop Expense	40.00	
Material used in dismantling	20.00	
Store Expense	1.00	261.00
Total Debit Account 310		$1,081.00

DETAILED ESTIMATE FOR INCLUDING LOCOMOTIVE 1101 IN THE ACCOUNTS

Property Added:	
Value of second hand parts used (found by method set forth above, and rated as 70 per cent new)	$3,140.00
†Labor used in reconstruction	10,500.00
Shop expense	2,100.00
†Material used in reconstructing	4,500.00
Store Expense	225.00
Total, Charge Account 51	$20,465.00

*Experience has shown that this material is generally worth 50 per cent of its value new before repairs are made. The mechanical forces should be required, however, to give this value in their request for A. F. E. in order that the estimator may check up his work.

†The labor and material includes replacing in kind as well as addition and betterment work

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IN DANE COUNTY, Wisconsin, Judge E. R. Stevens, in the Circuit Court has reversed a recent ruling of the state railroad commission which ordered the Chicago & North Western to rebuild an industrial spur track at Beloit, which it had removed more than a year ago. Judge Stevens held that the state railroad law does not compel railroads to build spur tracks to accommodate single industries.

Cummins Investigation Completed

WASHINGTON, D. C.

THE TAKING of testimony in the general investigation of the railroad situation by the Senate committee on interstate commerce, which was begun early last year, was completed on July 26 by the filing of a statement of S. Davies Warfield, president of the National Association of Owners of Railroad Securities, urging legislation to put into effect the plan which the association has been advocating for co-ordinating railroad facilities under the direction of the National Railway Service Corporation. Senator Cummins, chairman of the committee, will prepare a report on the investigation but it probably will not be completed before the next session of Congress.

Mr. Warfield said that permanent standing conference committees have been named by the National Association of Owners of Railroad Securities and by the Association of Railway Executives to discuss the proposals for pooling interchange freight cars under a central agency, advocated by representatives of the security owners before the Interstate Commerce Commission in February last.

A tentative bill was presented for the Federal incorporation of the National Railway Service Corporation. This is the agency of a public character, operating without profit, organized by the association of security owners under state charter to demonstrate its feasibility and economic necessity, and which has financed equipment for a number of carriers. Under federal charter, he said, its operations and usefulness would be extended.

Advantages of this agency for also financing the rebuilding of freight cars without cash margin from the carriers were also set forth.

"As a result of correspondence," Mr. Warfield stated, "a committee was appointed consisting of the chairmen of the four railroad groups and the chairman of the Advisory Committee of the Association of Executives to meet a committee named by the association of security owners to discuss its proposals." At a conference no objection was found by the Railroad Committee, it is stated, to the use of the Service Corporation by carriers so desiring, for financing equipment, new or rebuilt, or to the federal incorporation thereof. The proposals for pooling freight cars were deferred but will be immediately presented before the permanent Railroad Conference Committee recently appointed. Senator Cummins requested a copy of the proposals for car pooling also, as he had been waiting for all available data to close the hearings.

In the statement to the Senate Committee, Mr. Warfield made an urgent appeal to maintain the provisions of Section 15a of the Transportation Act as a necessity to adequate rail transportation.

Mr. Warfield said the attempt to provide for traffic inequalities through the consolidation of all the railroads into a few large systems is utterly impracticable. He contends that to lay out territories so that competing newly consolidated large railroad systems operating therein will earn alike, "cannot be done," and that "the necessary results of competition would be varied earnings among the systems." He said the inequalities between traffic territories could be provided for, other than through Section 15a, only by the "drastic method of consolidating all the railroads of the country into one large system," and that the full use of the Service Corporation in connection with the provisions of Section 15a of the Act, will produce much greater savings than from the large consolidations, which should remain permissive.

The members of the Railroad Conference Committee are: T. DeWitt Cuyler, Chairman; Howard Elliott, L. F. Loree, W. B. Storey and Daniel Willard. The members of the security owners' Conference Committee are: S. Davies Warfield, Chairman; George E. Brock, Haley Fiske, Darwin P. Kingsley and John J. Pulleyn.

Rock Island's June Report Best in Ten Years

System Earned 2.95 Per Cent on Stock in 1921; June Net Operating Revenue $2,699,212

The Rock Island's recently issued monthly report for June shows a net operating revenue of $2,699,212. This compared with a figure for May of $1,832,158 and with a figure for June a year ago of $2,032,656. The report shows also that the corporate net after fixed charges for the month was $988,643 which compared with $395,220 for June last year. For the six months' period the corporate net after fixed charges was $9,477. Up to the end of June a year ago the system had suffered a deficit after fixed charges of $397,167.

With reference to this monthly report Charles Hayden, chairman of the Rock Island board of directors, has issued a statement saying:

"The results for June we consider very satisfactory. The net operating revenue is the largest net operating revenue we have had for the month of June in the past ten years. The ratio of operating expense to operating revenues, namely 76.01, is substantially better than was our 1921 ratio. We estimate that the loss in freight revenue for the first six months of 1922, due to the reduction in rates which was made effective January last, on grain and livestock, amounts to about $3,000,000."

Outside of the fact that the June report shows the largest net operating revenue for June in a period of ten years, the next most interesting detail is that the June results finally succeeded in putting 1922 ahead of 1921 from the standpoint of corporate net income. Up to the end of May, 1922 was not showing quite as favorable results as last year. For the first five months of 1922 there was a corporate deficit after fixed charges of $979,166 which compared with a deficit in the same period of 1921 of $792,387. The fact that the figure after fixed charges in the earlier part of the Rock Island year's earnings is shown in red as it was up to May is somewhat of secondary importance. The Rock Island earnings are much better in the latter part of the year than in the first part.

In the annual report for the year 1921, President J. E. Gorman's opening paragraph read:

"We are very happy to advise you that, after the payment of all fixed charges and taxes during the year, the company showed a balance of income available for dividends on the preferred stock, leaving a surplus credited to profit and loss of $2,212,564, equivalent to 2.95 per cent on the common stock. While this is not as much as the property should earn, and as we believe it will earn when conditions have been readjusted, it is so much better than the result of operations during federal control that we consider it a most creditable showing. The Rock Island is one of the few railroads in its territory which in 1921 showed an increase in freight earnings; and, although present conditions are not so favorable as in 1921 towards an increase in gross earnings, we will make every effort to maintain the enthusiasm on the part of the operating staff and the friendly relations with the shipping public which that fact manifests."

Best Year Since 1917

The Rock Island's balance after payment of preferred dividends was in 1921, as noted, $2,212,564. This compared with $1,095,670 in 1920. The per cent earned on common stock in 1921—2.95 per cent—compared with 1.46 per cent in 1920. The reason for the improvement was the manner in which earnings held up—there was an increase of 4.24 per cent in freight revenues—combined with a reduction of 14.10 per cent in operating expenses. This situation resulted in an improvement in net revenue from railway operations from $10,527,448 in 1920 to $26,318,967 in 1921, or 150 per cent, more than sufficient to supply the place taken in 1920 by the standard return and guaranty. The Rock Island's net available for dividends in 1921 was the best since 1917; it was not as good as in 1917 or 1916.

One of Few Roads to Increase Freight Earnings

The road's good fortune in having in 1921 an increase in freight revenues which permitted it to realize on the reduction made in its operating expenses makes it an exception from the majority of the country's railroads. Most of the railways were able, in 1921, to effect drastic economies in their operating expenses, but the larger proportion were unable to realize in adequate measure on the reduction in expenses because of the severe falling off in traffic which they experienced. The Class I railroads, as a whole, suffered a decline in 1921 as compared in 1920 of 9.4 per cent in freight earnings. There were, however, a fairly large number of carriers which had larger freight earnings in 1921 than 1920. Most of these lines were in the east. The Rock Island was one of the few in its territory, as Mr. Gorman points out, to have this good fortune.

This makes it important to ascertain why the Rock Island should not have suffered from the general decline in the freight earnings. The first reason was the increase in earnings per ton-mile; the second, the manner in which the road was helped by a large increase in its tonnage of wheat, perishables and oil. The total tons carried in 1921 were actually less than in 1920. The figure for 1921 was 25,924,576 tons as compared with 29,867,233 tons in 1920, a decrease of 13.20 per cent. The revenue ton-miles were 6,857,672,913 as compared with 7,885,424,422. In spite of this reduction in tons and tons one mile, the freight revenues totaled in 1921, $99,000,440 as compared with $94,973,798 in 1920, an increase of 4.24 per cent. The fact that there was an increase in freight revenues with a reduction in tons one mile is explained largely by the freight rate increases which became effective during the year 1921; the rate per ton-mile in 1921 was 1.44 cents as compared with 1.20 cents in the preceding year.

Increased Freight Earnings—Decreased Ton-Miles

The figures of tons carried, given above, show a decrease of 3,942,657 tons as between 1921 and 1920. The larger part of this reduction came in coal, other products of mines, lumber and manufactures. On the other hand, there was a very decided increase in products of agriculture; namely, 1,276,443 tons or 14.64 per cent. Products of agriculture which totaled 24.22 per cent of the total tonnage in 1920, made up 32.83 per cent of the tonnage in 1921. There was an increase in tonnage of crude petroleum of 109.06 per cent.

An analysis of this situation will bring out some of the interesting railway developments which have been taking place in the central west and southwest during the past year or, in fact, several years. These factors have been treated in the reviews of the operations of some of the other roads, so a brief resumé is all that is necessary at this time. Reference is made to the three factors of increased traffic in perishables, the oil business and, as a special feature of 1921, to the wheat traffic. Some of the roads have been affected by one or the other of these factors—the Rock Island, as we have noted, by all three.

1921 Wheat Traffic Big Factor

First as to wheat. It will be remembered that in nearly every week of 1921 the car loadings of grain were in excess of the loadings for the comparable week of 1920—a fact

which applied to no other leading commodity. The reason was the fact that the 1920 crop, held on the farms in 1920, was offered for 1921 movement. There was further a large export demand, an interesting feature of which was the tendency to move the grain to the Gulf ports rather than to the Atlantic seaboard with resulting advantage to the lines serving the Gulf. The effect on the Rock Island was marked. Wheat in 1921 constituted 11.53 per cent of the total tonnage of the road as compared with 6.52 per cent in 1920. There was an actual increase of over 1,000,000 tons in wheat traffic, or 53.61 per cent over 1920—the 1921 tonnage being 2,988,922. Similarly corn, which in 1921 made up 6.40 per cent of the total tonnage, showed an increase over 1920 of 49.85 per cent. The grain traffic, incidentally, is one of the uncertain features of 1922, primarily because of the reduction in grain rates reference to which is made in Chairman Hayden's statement quoted above.

The Rock Island has a very large tonnage in fruits and vegetables, it having a special position in that connection because of being a part of the traffic route from California constituted by the Southern Pacific, the El Paso & Southwestern and the Rock Island. This tonnage moved in heavy volume in 1921, the tonnage of citrous fruits being 18.85 per cent greater than in 1920, and other fresh fruits, 26.55 per cent greater.

Increase of 109.06 Per Cent in Crude Petroleum

The Rock Island, in 1920, handled crude petroleum amounting to a total tonnage of 287,405. In 1921 it carried 600,849 tons, or more than double that amount. This means that the Rock Island, in the space of one year, has become an oil carrier of some importance. The details are given in President Gorman's remarks as follows:

"The most important development along these lines of the company for many years was the increase in traffic obtained from the discovery of oil fields adjacent to our lines. In January, 1921, the first oil well was brought in at Eldorado, Ark., and since that time 479 producing wells have been brought in in that field, of which 462 were oil wells. The aggregate daily production from the field has been about 38,000 barrels. Up to January 31, 1922, 3,855,840 barrels had been moved by rail, of which your company hauled approximately 88 per cent. Our right-of-way extends throughout the length of the field, about 12 miles. While no great production has been developed on this right-of-way, the company has profited greatly from the traffic development. In 1920 the earnings of the El Dorado station on all freight traffic were about $300,000, and in 1921 about $2,700,000. Of course, the future of any oil field is uncertain, but we have been very much gratified over this development.

"There have been new oil developments also in the vicinity of Duncan and Walter, Okla.

"The field of Mexia, Tex., which was developed in 1921, promises to be a much larger producing field than the El Dorado field. This is located on the Trinity & Brazos Valley line, of which your company is one-half owner, the other half being owned by the Colorado & Southern Railway Company. The Trinity & Brazos Valley has been a losing venture for many years, and it is with great satisfaction that we observe this oil development along its lines."

Maintenance

It was noted above that the Rock Island freight revenues in 1921 were 4.24 per cent in excess of freight revenues for 1920, due to the increase in earnings per ton-mile. The passenger revenues, however, experienced a reduction of 13.46 per cent. The total operating revenues, $139,272,024, compared with $142,026,152, a reduction of 1.94 per cent. As against this reduction of less than 2 per cent in operating revenues, there was a reduction of 14.10 per cent in operating expenses. The operating expenses in 1921 totaled $112,953,057, as compared with $131,498,704 in 1920. Reductions were made of 20.76 per cent in maintenance of way; 17.50 per cent in maintenance of equipment and 11.32 per cent in transportation.

With reference to the reduction in maintenance expenses, the figures show that the average number of ties renewed per mile of track in 1921 were 232 as against 255 in 1920. Figures with reference to rail show that there were laid 54.19 miles of 100-lb. and 234.80 miles of 90-lb. rail, as compared with 99.88 and 131.30 miles respectively in 1920. Track miles of new ballast show 47.07 for 1921, as compared with 17.40 in 1920; track reballasted was 148.99 miles as compared with 164.51 miles. Although these figures give varying comparisons with 1920, it appears that the savings in maintenance expenses were not due to reductions in the standards of maintenance.

The Rock Island appears to be in good shape insofar as concerns maintenance of equipment. Its percentage of bad-order cars on July 1 was only 10.5 per cent as compared with the country's average of 14.3. The percentage of unserviceable locomotives was 11.4.

I. C. C. Prevents Reduction in Ex-Lake Ore Rates

Washington, D. C.

The Interstate Commerce Commission in its decision handed down on July 27 in the trunk-line and ex-lake iron ore rate cases has exercised its authority to prevent a reduction in rates asked by the railroads on the ground that the reduction would not only be unreasonable in relation to other rates and cast an undue burden upon other traffic but would tend to jeopardize a 5.75 per cent return. The commission says the reduction on ex-lake ore rates, which it declined to allow to become effective, would not result in increased revenues but in substantial reduction, probably more than $3,000,000 per annum, and that the record does not justify the conclusion that increases in movement will result from such reductions sufficient to offset the reduction in rates. The railroads took the position that the lower rates would increase their revenues and Commissioner Potter vigorously dissented from the majority opinion, saying that their judgment is probably better than the commission's and "in individual instances of this kind they are entitled to have it prevail."

By tariffs filed to become effective April 1 and at later dates the railroads had proposed to reduce the rates on iron ore in carloads from mines and tidewater ports to points in trunk line territory 28 per cent and from Lake Erie ports to interior furnace points in central and trunk line territories 20 per cent. Protests were filed by iron and steel interests at Buffalo on the ground of discrimination and the operation of the tariffs was suspended by the commission. Practically all other iron and steel companies having furnaces in the territory wherein the rates would apply appeared at the hearing in support of the proposed reductions.

In October, 1921, reductions of about 28 per cent were made in both the eastern trunk lines and ex-lake ore rates limited to expire December 31, 1921. The carriers applied to the commission for authority to extend this period for an additional three months, which was denied. A large part of the decision is taken up by comparisons of rates and a discussion of the complications caused by the fact that no change was made in ex-lake ore rates at the time of the Railroad Administration increase in 1918 and that no further increase was made in the rates to the upper lake ports following the commission's order in Ex Parte 74. The commission finds that no undue prejudice is caused protestants by permitting the suspended rates on ore in eastern trunk line territory to go into effect.

As to the ex-lake rates, the Buffalo interests, representing 22 blast furnaces out of a total of 200, were the sole protestants. They objected to the proposed reduced rates on iron ore for the benefit of their competitors without a simultaneous and corresponding reduction in the rates on coal

and coke to Buffalo. The commission points out that the proposal is now to reduce the ex-lake rates by twice the percentage that rates on other traffic were reduced by its general decision effective on July 1. It also says that the proposal of the carriers in this case to single out only one of the raw materials for the manufacture of pig iron and to leave unchanged the general level of rates on all other raw materials used for the same purpose does not contemplate the same principle as the plan of equalizing the assembling cost of raw materials which it had previously held unlawful, but that in other respects it is equally indefensible, and in the absence of some showing that the ex-lake rates on ore are relatively high compared with other rates on ore with rates on traffic in general, further reductions at this time would appear to be out of harmony with its finding in the general rate reduction case.

The opinion points out that in the general rate case shippers generally contended that reductions in rates would stimulate traffic, while the carriers in general controverted this argument, but as to the suspended ore rates they claim that lower rates would stimulate movement and perhaps in the aggregate produce as much for the carriers as will the existing rates or even more. In this connection the commission refers to the car loading figures showing an increase of about 45 per cent in the number of cars of ore loaded in the Eastern, Allegheny and Pocahontas districts in the five weeks ended July 1 as compared with the corresponding period of the previous year, whereas for the United States as a whole the increase was almost 80 per cent.

After calling attention to the fact that in accordance with the transportation act it has recently determined that 5.75 per cent will be a fair return and that it had made a 10 per cent general reduction, the commission says:

Those rates became effective July 1, 1922, and included reductions of 10 per cent in all of the ore rates here under consideration except those which had been reduced 10 per cent or more since the general increase of 1920. While the record contains no conclusive estimate of the effect of the additional reductions proposed on ex-lake ore, we are persuaded that they will not result in increased net revenues to the carriers, but in substantial reduction, probably more than $3,000,000 per annum. The record does not justify the conclusion that increases in movement will result from such reductions sufficient to offset the reduction in rate.

We, therefore, find the suspended rates on ex-lake ore unreasonable and unlawful, and by order shall require their cancellation. We find them unreasonable and unlawful for the reason that in relation to rates in general and in relation to rates closely affiliated, such as on coal, they would tend to cast an undue burden upon other traffic that they would be unduly prejudicial to ore traffic from mines to eastern trunk-line territory, so far as the same carriers participate in the interstate carriage of both ex-lake and local mine ore traffic; that they are unlawful inasmuch as their establishment would jeopardize the rates on a large volume of other heavy-loading low-grade traffic which we have initiated under the authority of section 15a of the interstate commerce act with the intent that the carriers in the rate groups by us established shall "under honest, efficient and economical management and reasonable expenditures for maintenance of way, structures ad equipment, earn an aggregate annual net railway operating income equal, as nearly as may be, to a fair return upon the aggregate value of the railway property of such carriers held for and used in the service of transportation." This rate of annual return we have fixed at 5.75 per cent, a rate of return which certain of the respondents have protested as inadequate, and which, if our judgment upon the effect of the proposed reduction in ex-lake ore rates is correct, the carriers are hereby likely to further reduce and jeopardize. We have only recently rejected tariffs of certain of the respondents intended to establish on three days' notice a further 10 per cent reduction over the 28 per cent reduction already in effect in some of the eastern and import rates, notably the rate from Constable Hook to Bethlehem. We mention this fact in connection with the reductions on ex-lake ore here proposed by the carriers, in order to make clear that in our judgment our authority under section 15a, in the exercise of our power to prescribe just and reasonable rates to "initiate, modify, establish or adjust" rates is not a mere transitory authority to establish in the first instance a general rate structure calculated to produce a fair return, but is a continuing authority to see that such a rate structure shall not be undermined and its purpose thwarted by new rates, either increases or reductions, proposed by particular carriers for the purpose of augmenting the traffic on certain carrier lines, or on certain descriptions of traffic, or for immediate and special benefit of particular persons, companies, firms, corporations, localities, or particular descriptions of traffic, in disregard of the more general and seemingly inevitable consequences of such rates newly proposed. To upset or seriously to menace a general structure lawfully established suffices to make proposed rates calculated to effect such a disruption unreasonable and unlawful.

Commissioner Potter said:

As to the alleged undue burden on other traffic: The proposed rates on ex-lake ore to the various groups shown in the majority report would yield from 6.1 to 11.6 mills per long ton per mile. Generally speaking, the movement is regular at least throughout the season of navigation, and in large volume per unit movement. The return movement of coal and other commodities is heavy. The cost of handling is low. There are innumerable rates on practically all roads throughout the United States which yield to carriers a lower return per ton-mile on traffic handled at higher cost. The proposed rates would be remunerative. The position of the carriers affected is that their net revenues would be increased by putting these rates into effect. It is obvious that anything that makes for a reduction of the cost of pig iron may through stimulation of industrial activity reach much farther than would now be apparent to us. The carriers think it would be good traffic policy to put in these rates. We should not on the record in this case condemn their conclusions and force ours upon them. We are not responsible initially for the details of traffic policy in railroad management and we are not equipped for that job.

As to the finding that the proposed rates would imperil the returns to which the carriers are entitled: The carriers do not think they would. Their judgment is probably better than ours and in individual instances of this kind they are entitled to have it prevail. In working out their conclusion they have available much information of which necessarily we are ignorant. The majority report claims no more than that the proposed rates "are likely to further reduce and jeopardize" a 5.75 per cent return. This apprehension, conflicting as it does with the deliberate judgment of the carriers, does not justify the interference of the majority view. Our condemnation of reductions in rates should have a better foundation in certainty as to what the results would be.

As to the undue prejudice against mines in the eastern trunk-line territory: The suspended rates not being unduly low, if their relationship to the present rates from mines to eastern trunk-line territory would unduly prejudice such mines that fact does not justify the withholding of our approval. The extent of the undue prejudice should be determined and its removal as a part of the adjustment should be required by appropriate order. Speaking as of prior to *Reduced rates*, 1922, as does the majority report, a reduction of the ex-lake or rate 20 per cent would be approximately 25 cents per ton and aggregate approximately $9,000,000 per year, based on the 1920 movement. Such reduction would reduce the cost of pig iron approximately 50 cents per ton and correspondingly reduce the cost of iron and steel products produced therefrom.

The total 1920 movement of ore from mines in eastern trunk-line territory was approximately 2,096,000 tons. The protection afforded these ores by denying the proposed ex-lake reduction is 25 cents per ton or an aggregate of $524,000 on the total movement. The protection of the eastern mines to the extent of $524,000 is by the majority report made to cost the consumers of products of iron ore $9,000,000. To put it another way, in order to protect the eastern ores to the extent of 25 cents per ton the consumers of ore products are to be compelled to pay in excess of what they otherwise should more than $4 per ton on the ore produced by the local mines. I can see no justice in such action. We are not called upon to subsidize the eastern mines out of the funds of consumers generally of the products of iron ore. If the local mines are entitled to protection to the extent of 25 cents per ton, some means should be found which would not cost the consumers $4 per ton. It is to be noted, too, that the higher cost of pig iron continued by refusing the proposed reduction will naturally affect the cost to the consumer of products of import ore so that the aggregate amount which the consuming public would pay on the basis of the majority report to protect the eastern mines to the extent of $524,000 will be much in excess of $9,000,000. The interstate commerce act requires no such relation of ward and guardian between the local mines and this commission as the majority report recognizes. . . .

Our function is to see that traffic moves under fair rates and that competing industries bear a proper relation to one another. In performing the function we should put into effect a remunerative rate which carriers desire, and if that rate would cause undue prejudice, deal with competing rates as facts and conditions warrant.

C. C. & O. Net Expands with Non-Union Coal Traffic

Six Months Net Railway Operating Income Is $1,506,416 This Year; $962,718 Last Year

The Carolina, Clinchfield & Ohio operates a line from Elkhorn City, Ky. to Spartanburg, S. C. Its mileage totals 291 of which nearly all is main line. Of the company's total revenues, about 55 to 60 per cent are derived from the transportation of bituminous coal. This coal originates in the Clinchfield district and the normal method of operation is to move the coal in heavy train loads —in 1921 the revenue train load was 1,228 tons—to Spartanburg where delivery is made to the Southern for movement to tidewater at Charleston. Normal interest in C. C. & O. matters results from its high engineering standards and its general method of heavy train loading and economical operation. At present there is a special interest in the property's operation because of the manner in which it is receiving benefit from the coal strike. The Clinchfield district is non-union. The coal loadings on the C. C. & O. are at present running about 1,950 cars weekly whereas a year ago at this time they were averaging about 1,200 cars weekly. While, as was above noted, the greater part of the C. C. & O. coal movement is south to Spartanburg, at present there is a heavy movement to the industrial districts to the north which are not now receiving coal from their usual sources. This new movement is to Elkhorn City where the coal is turned over to the Chesapeake & Ohio for movement beyond.

Accentuates Improvement

The result has been to accentuate an improvement in C. C. & O. net earnings which dates back to 1920. The property had a standard return of $1,758,957. In 1918, it earned for the government a net railway operating income of $1,162,282. In 1919 its net railway operating income was $1,497,762. In 1920, however, the figure was $2,489,561 and in 1921 it was $2,492,298. The result of the increased coal movement is especially evident in the 1922 six months' figures. The gross income for the first six months of this year has totaled $3,863,255 as compared with $3,581,721 in the first half of last year. The net after rentals for the six months was $1,506,416 this year as compared with $962,718 for the same period last year. In the first half of 1921 the C. C. & O. operated at a ratio of 79.80. For the whole year its ratio was 71.28. The figure for the first six months of 1922 was brought down to 66.05.

The 1921 Results

The C. C. & O. in 1921, as is shown in its recently issued annual report had less gross than in 1920 but increased net due to the savings in operating expenses. It is realizing on this saving in operating expenses at present because of the increase in coal tonnage from the non-union field which it serves. The 1921 gross revenues totaled $7,464,112 of which $4,024,728 or 53.92 per cent was from coal traffic and $2,765,419 or 37.05 per cent was from merchandise freight. In 1920, gross revenues were $7,560,880 of which $4,478,865 or 59.24 per cent was from coal. The operating expenses in 1921 totaled $5,320,171 as compared with $5,-991,271 in 1920. The operating ratio was 71.28 which compared with 79.24 in 1920. This figure of 71.28 was the best since 1917 in which year the road operated at 57.18. In 1921 the C. C. & O. ratio of transportation expenses to revenues was but 27.93 as compared with 33.68 in 1920. It is interesting to observe that prior to the war the road used to have an operating ratio of about 50 or a transportation ratio approximating 20. Increased traffic has compensated for the fact that these results are not being obtained today.

The total revenue tonnage in 1921 was 4,887,990 as compared with 5,890,136 in 1920 and the revenue ton mileage was 817,962,370 as compared with 904,765,779 in the preceding year. The annual report shows separately the figures of tons and ton miles for coal and merchandise. The 1921 figures show a coal tonnage of 3,326,264 as compared with 4,261,427 in 1920. The coal ton mileage in 1921 was 620,-794,859. One of the most interesting figures is that of coal tons one mile per mile of road which in 1921 was 2,133,243 which one would suggest is the outstanding feature of Clinchfield operations. It is further brought out that the average haul on coal in 1921 was 186.63 miles whereas merchandise freight has a haul of but 126.25 miles. Coal receipts per ton per mile in 1921 were 0.65 cents; merchandise, 1.40 cents and all freight, 0.83 cents.

High Coal Traffic Density

Thus the figures bring out the relative importance of the coal tonnage. They show the high traffic density of the coal tonnage which has always been a feature of C. C. & O. operations. Naturally with such a predominance of coal tonnage and considering the high engineering standards to which the line was built we should also expect to find a heavy train and car load. The 1921 average train load was 1,228, the highest in the South. The average car load was 41.92. It is interesting to observe that both of these figures represent increases over 1920 in spite of the falling off in traffic. The C. C. & O. owns 67 freight locomotives, the average tractive effort of which is 69,360 lb. Of these, 38 are Mallets including 21 of the 2-6-6-2 type with an average tractive effort of 73,859 lb. and 17 of the 2-8-8-2 type with an average tractive effort of 102,359 lb. The larger part of the line is laid with 85-lb. rail, in fact all but about 50 miles laid with 100-lb. Over one-half the total mileage is ballasted with rock, the rest with slag or stone and slag mixed.

The Carolina, Clinchfield & Ohio's capitalization includes $25,000,000 common stock, $11,500,000 preferred, and $27,-241,000 long-term debt. There are also outstanding $6,-854,000 equipment trusts. This gives a rather high capitalization per mile—considerably exceeding $200,000 per mile. Interest charges, including interest on the six per cent income debentures, now total not quite $2,000,000 annually. In 1921 the company had a corporate net after fixed charges of $723,608. Figures for years immediately preceding were: 1920, $885,224; 1919, $314,298; 1918, $449,908. The corporate surplus on December 31, 1921 was $4,680,680. The company paid 3 per cent on its preferred in 1913 and 6 per cent in 1914 but none since; no dividends have ever been paid on the common. The outstanding feature is that while it is true that the company has a high capitalization per mile its economical method of operation as embodied in the heavy train load and high coal traffic density enable it to meet that fact to the extent that it is able to yield a sizeable margin over the heavy fixed charges. The 1922 annual report will undoubtedly be of special interest because of the present heavy movement of non-union coal.

Excursion Trains bearing harvesters for the Western prairies have begun to arrive at Winnipeg, Manitoba. It is said that the farmers want 41,000 men and that the pay will be $3.50 a day for harvesters and $4 for threshers.

Administration's Coal Distribution Plan in Effect

Henry B. Spencer Appointed Federal Coal Distributor—Production Shows Slight Recovery

WASHINGTON, D. C.

WITH THE APPOINTMENT by the President of Henry B. Spencer to act temporarily as federal coal distributor as the administrative member of the coal distribution committee, the federal government's machinery for regulating the distribution of coal during the period of shortage began functioning actively on Monday. Mr. Spencer is president of the Fruit Growers' Express, was formerly vice-president of the Southern Railway, director of the Division of Purchases of the Railroad Administration during the war, and had charge of national coal distribution at the time of the 1919 strike after the dissolution of the old Fuel Administration.

Secretary Hoover has stated that the announcement referring to Mr. Spencer as coal "administrator" represented a typographical error, and that he should be called fuel distributor because it was not proposed to set up an entire fuel administration. He emphasized the decentralization of the plan, pointing out that the federal government will concern itself mainly with seeing that each state gets its fair quota of the available coal and that the distribution within the states and the prevention of local profiteering is within the responsibility of the state governments. He also pointed out that until coal production is largely increased, as by the settlement of the coal strike, the priority orders given to mines will cover practically all of their production and that these orders will be directed from Washington. He has requested all bunkering companies to furnish a bunker supply only to the next port of call and that foreign ships should bunker for the round trip at their home port. Canada has also been requested to import for its own safety. The governors of the principal states concerned have already undertaken to erect the necessary administration to control profiteering and distribution of coal within their states and most of the state commissions have sent telegrams to Commissioner Aitchison of the Interstate Commerce Commission promising their co-operation in accordance with his telegram.

Fuel Distributor, Not Fuel Administrator

Secretary Hoover, as chairman of the President's Fuel Distribution Committee, has announced that the plan of coal distribution communicated to different governors embraces the following principles:

The federal government will limit its activities in coal distribution entirely to interstate questions. Mr. Spencer has been appointed fuel distributor, not fuel administrator, because the federal distribution is concerned with coal distribution between the different states, not with coal administration in the sense of the war organization.

The control of coal distribution to individual consumers within the state boundaries is entirely in the hands of state authorities except for railway coal.

The methods of handling coal for railways responsible to the Interstate Commerce Commission will be determined directly from Washington in maintaining interstate commerce.

Distribution problems vary in different groups of states; that is in New England, Middle Atlantic, Southern, Middle West, Northern Lake states, Intermountain and Pacific states. The last two groups are able to look after themselves and are not now embraced in active administration.

Each state outside the latter groups has been requested to canvass its situation as to stocks and requirements in order of the priority in different classes—public utilities, public institutions, households, and industrial coal.

Each state has been asked to make such rules and regulations as it may see fit to control speculation and distribution within the boundaries of the state. It has been suggested that the co-operation of their state wholesale and retail coal dealers' associations should be secured. The federal government has no authority and can exert none in this matter beyond moral pressure.

Each state that must import coal from other states has been asked to create a central state agency or committee for the purchase or guarantee of purchases of coal that may be imported into the state from other states or from abroad, all coal to be consigned to an agency designated by the state. By this arrangement a great deal more mobility is given the state authorities in shifting coal to meet its local emergencies. Furthermore, this arrangement will remedy the financial impossibility of asking coal producers to ship to strange consumers whose reliability must be established. The repudiation of coal during the last strike caused great losses and litigation.

The federal fuel distributor will place these state central purchasing agencies or committees in contact with the coal producers in states of coal surplus and will undertake to see that coal is sold to the central purchasing agencies at a fair price. The state purchasing agencies will indicate the destinations within the states to which coal is to be shipped.

The federal distribution will prorate the available supplies between states following the general basis of priorities declared by the Interstate Commerce Commission.

Where coal is already flowing through natural channels to priority concerns approved by the state agencies, it will continue, but it will form part of the state quota.

The whole plan is one of complete decentralization into the hands of the state authorities, the federal agencies acting solely in interstate commerce.

The governors of the following states have already undertaken to erect the necessary administration to control profiteering and distribution of coal within their states:

Ohio, Indiana, Illinois, Michigan, Wisconsin, North Dakota, Minnesota, Maine, Massachusetts, New Hampshire, Connecticut, Rhode Island, New York, New Jersey, Maryland, Pennsylvania, West Virginia, Iowa, Oklahoma, Florida, Kentucky, Tennessee, and Louisiana. Kansas has already an establishment under its industrial court. It is not considered necessary to establish coal control in the Inter Mountain and Pacific states as they have supplies of coal and fuel oil.

The following have so far been designated as members of the advisory committee of operators from the producing coal districts under the chairmanship of C. E. Bockus of Virginia: E. L. Douglass of Kentucky, George S. Francis of Pennsylvania, E. C. Mahan of Tennessee, W. J. Magee of West Virginia, E. E. White, West Virginia, also C. E. Tuttle to advise as to Lake and Northwest movement, and LeBaron S. Willard to advise on bunker and tidewater movement.

Coal Production

Returns received by the Geological Survey on coal output in the seventeenth week of the strike (July 24-29) give the first test of the response to the invitation to reopen mines. There had been a slight recovery as compared with the sixteenth week. Production was running at the rate of 3,900,000 tons against 3,700,000 tons the week before. The increase is said to be due partly to more men at work in Pennsylvania, partly to improved car supply in Southern West Virginia, and partly to heavier shipments from Ala-

bama and the Far West. Production of anthracite remains practically zero.

Loadings on Monday, July 24, were 13,083 cars. This was 417 cars above the preceding Monday, but 3,664 cars below the last Monday before the shopmen's strike. On Tuesday and Wednesday loadings declined, but on Thursday a slight recovery was noted. The trend of production is indicated by the following statement of cars loaded daily.

	12th week	13th week	14th week	15th week	16th week	17th week
Monday ...	11,445	15,311	16,747	11,039	15,094	12,666	13,083
Tuesday ..	11,019	16,622	15,748	334	12,909	10,821	11,861
Wednesday .	11,437	17,032	15,656	11,979	12,398	10,932	11,383
Thursday ..	11,090	16,432	16,402	14,521	11,593	10,805	11,760
Friday	11,296	16,073	15,980	14,631	11,606	10,623	....
Saturday ..	8,888	13,993	12,603	12,523	9,694	9,864	....

It thus appears likely that the total output for the seventeenth week will be less than 4,000,000 tons, probably only 3,900,000 tons. In the lowest week of the strike 3,575,000 tons were produced and in the highest week (June 19-24), 5,363,000 tons. The decrease since June is said to be attributable to traffic congestion resulting from the shopmen's strike. In the Middle Appalachian region, the congestion is still acute, although a slight improvement over last week has been reported from certain districts.

Normal production at this season, including anthracite, is from 9,500,000 to 12,000,000 tons.

No Indication of Increased Production

There was said to be no indication of increased production in response to the invitation to reopen mines in any of the strongly organized districts. More coal is coming out of the former non-union fields of Pennsylvania, and a little more from the Fairmont and Kanawha districts of West Virginia, but the additional supply from these sources is not yet significant in comparison with the requirements of the country.

The all-rail movement of anthracite to New England increased to 433 cars during the third week in July. Bituminous shipments, however, decreased to 445 cars. In addition to this movement through the rail gateways of Maybrook, Harlem River, Albany, Rotterdam, Troy and Mechanicsville, one car of anthracite and four cars of bituminous coal were forwarded through Rouses Point.

Shipments of bituminous coal through Hampton Roads continue to decline steadily. A total of 294,563 net tons was dumped in the week ended July 22, against 355,993 tons in the week preceding, a decrease of more than 17 per cent.

Lake shipments continued to decline during the week ended July 23. A total of 144,952 tons was dumped over the Lake Erie piers, of which 126,150 tons were cargo coal, and 18,802 tons were vessel fuel. In the corresponding week in 1921, 766,436 tons were dumped. Shipments to Buffalo and other lower Lake Erie ports have practically ceased and but 961 tons were shipped to such points. Of the 4,200,151 tons of cargo coal dumped during the present season to date, 844,169 tons, or 20 per cent, have been shipped to destinations not ordinarily taking Lake coal.

More than a million tons of coal will be moving from Wales and the East Coast of England by September 1, according to figures compiled by J. Barstow Smull, vice-president, United States Shipping Board Emergency Fleet Corporation, in charge of allocations and charters. "The Shipping Board has already chartered 50 of its vessels to import coal from the British Isles, and by September 1, a million tons will be moving to this country," he said. "The 50 vessels operated through the Shipping Board will carry approximately 400,000 tons, and with the charters made abroad there will be moving to this country the above quantity within the next 30 days."

Contact between the Federal Coal Distribution Committee and the railroads is maintained through M. J. Gormley, chairman of the Car Service Division of the American Railway Association. Information as to the fuel needs of the railroads is to be collected by a committee of purchasing agents representing the Eastern, Southern, Western and Southwestern regions and consisting of B. P. Phillippe, assistant purchasing agent of the Pennsylvania, chairman; F. H. Fechtig, purchasing agent of the Atlantic Coast Line; E. A. Clifford, assistant general purchasing agent of the Atchison, Topeka & Santa Fe, and W. G. O'Fallon, purchasing agent of the Terminal Railroad Association of St. Louis. Mr. Spencer has established his office in the building occupied by the Car Service Division, which is also across the street from that of the Interstate Commerce Commission.

The Norfolk & Western and Chesapeake & Ohio on July 27 issued embargoes against all freight except the classes given preference and priority by Service Order No. 23 of the commission.

Organization and Plan for Coal Distribution

Fuel Distributor Spencer on Wednesday announced the following organization and plan for the distribution of fuel in the existing emergency:

(1) The President's Fuel Distribution Committee, consisting of Secretary of Commerce Hoover, Chairman; Attorney-General Daugherty, Secretary of the Interior Fall, Commissioner Aitchison, Interstate Commerce Commission; Federal Fuel Distributor Spencer.

(2) The federal fuel distribution will be set up in Washington for the purpose of directing the distribution of available supplies among the railways, federal institutions and states, consisting of an Administrative Committee, as follows:

H. B. Spencer, Federal Fuel Distributor, Chairman; Samuel Porcher, railroad fuel; Le Baron S. Willard, tidewater coal; J. N. Snider, New England and Eastern; C. E. Tuttle, Lake coal; George F. MacGregor, Southwestern region; E. M. Durham, Jr., Southeastern region; E. W. Thornley, manager of orders; F. G. Tryon, Geological Survey; Lt. Com. E. A. Cobey (S. C.), U. S. Navy; M. J. Gormley, American Railway Association; J. C. Roth, interstate Commerce Commission; D. R. MacLeod, secretary to the committee.

The Coal Operators' Advisory Committee will consist of C. E. Bockus, Chairman, Virginia; E. E. White, Southern West Virginia; E. C. Mahan, South Appalachian; E. L. Douglas, Eastern Kentucky; William J. Magee, High Volatile District of Southern West Virginia; George R. Francis, Pennsylvania.

(3) Creation of district committees in the principal producing districts east of the Mississippi for the purpose of distributing orders from the Federal Fuel Distributor among the mines, consisting of a representative of Federal Fuel Distributor, Interstate Commerce Commission, coal operators, railroads. District headquarters have been established as follows: Norton, Va.; Bluefield, W. Va.; Huntington, W. Va.; Knoxville, Tenn.; Louisville, Ky.; Birmingham, Ala.

Pending the completion of this organization, three intermediate stages will ensue:

(a) Continuation of their normal ordinary business by the operators.

(b) Priority buyers, in accordance with I. C. C. Service Order No. 23, will gradually encroach upon operators' business.

(c) Coal orders placed through the Federal Fuel Distributor for railway purposes and state committees will gradually absorb the total output of the mines.

(4) Creation of a Fuel Committee by each Governor, the orders from whom will be sent to the Federal Fuel Distibutor, at Washington, and thence out to the district committees, and the Governors have been asked to create organizations in each state, with the following duties:

(a) To report at once the consumption of coal in their state in the different categories—utilities, household, industries, etc.

(b) To furnish a statement showing:

1. A list of those who should receive priority coal for current use, not for storage, in the order of emergency of their need.

2. Nature of consumer, whether public utility or whatnot.

3. Character of coal required, including source from which consumer previously obtained his supply.

4. Name of coal operator with whom he does business, if in the present producing field.

5. Weekly supply needed by such consumer.

6. Number of weeks' stock he now has in hand.

(c) To set up a single consignee in each state on behalf of all coal shipped into that state on orders from the governor's

committee, through the Federal Fuel Distributor. The governor's committee will become responsible for payment for all coal shipped into the state and will put up advance bank deposit to cover same, which depository will honor sight draft with weight certificate, car number, etc., this being practically an f. o. b. sale.

(d) The governor's committee will distribute coal made available to him according to their judgment of the respective needs in the state, and is at liberty to reconsign or to move coal after it has reached points in the state.

The governor's committee would naturally proceed in this distribution according to the rotation of public necessity:

1. Public utilities and public institutions.
2. Household coal.
3. Industries manufacturing public necessities.
4. Industries in general.

(e) In order to effect proper distribution, governor's committees will find it advantageous to secure the co-operation of the wholesale and retail dealers within their states.

(f) Governor's committees are entirely responsible for the prevention of profiteering and extortion in the sale and distribution of coal within their states.

(6) Shipments of coal by the Lakes to the states of Minnesota, North Dakota, South Dakota, Northern Wisconsin, Northern Michigan and Canada shall operate through the Ore and Coal Exchange of Cleveland. Orders for such coal on contracts in existence will come through, or be approved by, the Federal Fuel Distributor to the District Committees. It is the purpose to inaugurate a regular weekly movement of coal to this trade. The division of such coal between states or receiving points must be indicated from the Federal Fuel Distributor.

(7) Coal operators will continue to function individually in respect to filing their ordinary business or priority orders that may come to them under the I. C. C. Service Order No. 23 until such time as orders that have been received by the District Committees from the Federal Fuel Distributor supplant their capacity.

Upon receipt of orders for coal from the Federal Fuel Distributor in Washington the service agent of the Interstate Commerce Commission on the District Committee will issue an order upon the recommendation of the representative of the Federal Fuel Distributor to the railroads to place the cars for the coal shipment.

This order will be delivered to the representative of the railway on the District Committee for transmission to the proper officer of the railway for execution.

The District Committee will specify the mines from which the coal shall be shipped. The representative of the Federal Fuel Distributor will, subject to a guarantee of payment which shall be satisfactory to the mine operator, with due regard to the Hoover fair price, allocate such orders to the various mines in the district.

Representative of the railroads on the District Committee will report to the Service Agent of the Interstate Commerce Commission the number of cars shipped daily under the order.

The District Committee will report to the Federal Fuel Distributor at Washington shipments made.

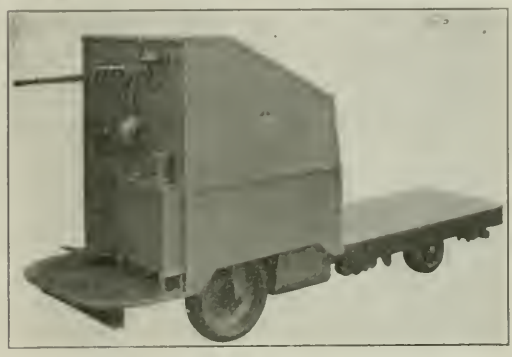
(8) Distribution of fuel for the railroads will be gradually concentrated in the hands of a Railroad Coal Committee, composed of coal buyers from the different railway groups.

Railway Coal Committee—B. P. Phillippe, Chairman, representing Eastern group; E. A. Clifford, representing Western group; F. H. Fechtig, representing Southern group; W. G. O'Fallon, representing Southwestern group.

This committee will sit in Washington (718 18th street, N. W.) and the needs of the different railroads with respect to coal will be checked and passed upon by it and applications for emergency coal for railroad use will be made to it for action by the Federal Fuel Distributor.

A Gas-Operated Industrial Truck With Elevating Platform

An elevating platform on a gas-engine-operated industrial truck is a new development in the industrial equipment field that has been added to the line of gas engine trucks manufactured by the Clark Truck Tractor Company, Buchanan, Mich. The truck has a platform 54 in. by 26 in. with a minimum height above the floor of 11 in. This can be raised to 16 in. through the agency of the lifting mechanism which consists of a system of toggles operated by a rack and pinion gear from an hydraulic cylinder. The lifting mechanism is designed for a maximum working load of 4,000 lb. and is equipped with a pressure release so that the mechanism becomes inoperative if an attempt is made to lift a load in excess of that weight. The car has a total length of 9 ft. and a total width of 3 ft., and can be operated with a turning radius of 8½ ft. The drive wheels which are under the platform are 10-in. diameter rubber-tired wheels, spaced 20 in. center to center, while the steering wheels are 16 in. in diameter, spaced 26 in. center to center. These steering wheels are mounted with a pivoted connection at



All Operating Control Levers Are Conveniently Located for the Driver

the center of the frame so that a three-point suspension is obtained which eliminates distortion in the frame of the truck when passing over uneven floors.

The entire operating mechanism is enclosed in a hood at the operator's end of the truck. The power plant consists of a 15-hp. four-cylinder tractor engine with planetary type transmission to the drive wheels. The control is effected by a small hand lever mounted in a standard H gate. The clutch and brake are combined in a foot lever on the oper-

The Elevating Platform Adds Greatly to the Labor Saving Possibilities of the Truck

ator's platform which is automatically in the braked position when it is not pressed down by the operator's foot. The truck has two speeds in each direction, the maximum being six miles per hour. The operation of elevating motion in either direction can be completed in eight seconds, the lifting mechanism being equipped with automatic stops at both ends of the travel. It is said that the car will travel up a 12-per cent grade under full load.

General News Department

By a Washout at East Chatham, N. Y., due to a cloudburst, on July 28, the Boston & Albany was blocked for about 36 hours. The roadbed was badly damaged nearly all the way for about five miles.

Glenn E. Plumb, counsel for the principal railroad labor organizations in matters pertaining to legislation and cases before the Interstate Commerce Commission, and the author of the Plumb plan for government ownership of the railroads and their operation for the benefit of the employees, died at Washington on August 1 after an illness of several months.

The American Association of Railroad Superintendents will indefinitely postpone the convention scheduled to be held in Kansas City on August 23, 24, 25, for which full arrangements had been made. The industrial atmosphere is such that it is the unanimous opinion of the executive committee that even if the strikes are called off shortly, it would be too late to hold a successful meeting, as members would be busy for some time in getting things back to normal.

Preliminary Compilation of Railway Earnings

One hundred and 87 Class I railroads that had filed their earnings reports with the Interstate Commerce Commission by Wednesday had a net railway operating income for June of $73,726,800, as compared with $48,844,000 in June, 1921.

Clerks Buy Building Site

The Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees, has purchased a prominent tract of land in Cincinnati, Ohio, for $200,000 and is preparing plans to construct a seven-story building, to cost about $350,000.

Big Demand for Bus Permits

Owing to the curtailment of passenger service on a number of roads because of the coal shortage and the railroad strike, state public utilities commissions have been flooded of late with petitions from motor bus companies requesting certificates of public convenience to operate stage lines over the highways. There are 25 petitions of this nature on docket with the Illinois Commerce Commission and other state commissions report similar activity along this line.

Illinois Central Conserves by Reweighing

One month of reweighing and inspection of less than car load freight on the Illinois Central increased the revenues of that company $11,610. Of the shipments reweighed, 11.6 per cent were corrected, resulting in an increase in revenue of $3,860, while 2,777 of the 31,729 shipments inspected were found incorrectly described, and the resulting corrections added $7,750 to the company's revenue. It is said that the tendency toward incorrect description of freight and the consequent loss in revenue is greater now than in years past.

Traveling Passenger Agents

F. R. Perry, General Agent of the Canadian Pacific, New York City, and president of the American Association of Traveling Passenger Agents, states that the annual convention of that association will be held in September in the Canadian Pacific Rockies. The first business session will be held at Calgary, Alberta, on September 12. The night of the 13th will be spent at Banff, and the 14th and 15th at Lake Louise. The members, on special trains, will then proceed through the Canadian Rockies in daylight, and the convention will adjourn at Seattle on September 20.

Roby & Northern Sold

The Roby & Northern, a railroad extending from Roby, Tex., to North Roby, a distance of five miles, was sold last week to J. D. McCall and J. L. Blain of Dallas, Tex., who purchased 55 per cent of the stock of the road. The road is valued by the Texas Railroad Commission at $75,000 to $100,000. It owns one locomotive, two motor cars, two freight, one passenger and six miscellaneous cars. Trains are operated on regular schedules daily between the two towns. It is said that plans are being made for improvements with possible extensions and the purchase of new equipment.

Iowa Rail Valuations

After months of wrangling between the railroads and the Iowa railroad commissioners the assessed valuations of the railroads in that state were finally fixed by the state executive council on July 26, after it was settled that the railroads would contest the alleged excessive valuation, placed against them for taxation purpose. As the figures now stand, the value per mile of the leading railroads is as follows: Chicago, Burlington & Quincy, $36,000; Chicago Great Western, $30,000; Chicago, Milwaukee & St. Paul, $33,000; Chicago & North Western, $38,000; Chicago Rock Island & Pacific, $30,400; Illinois Central, $30,500; Minneapolis & St. Louis, $20,000; Wabash, $20,000.

Fifty-seven Per Cent Looked

Automobile drivers are actually becoming more careful. This is the conclusion of the Safety Department of the Southern Railway from a check at three crossings on the Dixie Highway in Kentucky. The checkers found:

Number of vehicles passing over crossings	967
Number stopped before crossing tracks	221
Number where driver looked in one direction	354
Number where driver looked in both directions	555
Number where driver crossed without taking any precautions	58
Number crossed at speed exceeding twenty miles per hour	28

This check discloses that one driver out of every four actually stopped to make sure that no trains were approaching and 57 per cent looked in both directions. Only 6 per cent crossed without taking any precaution whatever.

New Railroad Legislation in 1921

J. E. Fairbanks, general secretary of the American Railway Association, speaking for the committee on relations of railway operation to legislation, reports that in the year 1921 a total of 166 laws were enacted by the legislatures of one state or another on subjects relating to railway operation. The number of bills of this class introduced was 588; so that something over one-fourth of those introduced succeeded in gaining the approval of the legislators and the executives. Mr. Fairbanks' statement consists of a table showing, for each state, the number of bills introduced and the number enacted, under each one of 97 classes and sub-classes. California enacted 13 laws; Iowa, 10; Minnesota, 14; South Dakota, 12, and other states lesser numbers.

Unsafe Practices in Handling Explosives

Numerous important suggestions for avoiding danger from explosive and inflammable articles are contained in Bulletin No. 56 recently issued by the Bureau of Explosives. One of the most important matters discussed is the handling of casinghead gasoline. In spite of the wide publicity given to the dangerous character of this commodity after the disastrous explosions at Ardmore, Okla., in 1915, and at Memphis, Tenn., in 1921, three accidents occurred during May and June as results of failure to observe the rules of the bureau. The bulletin again calls attention to the necessity for relieving internal pressure through the safety valve before dome covers are removed and for cooling cars in

case the pressure rises and gas is discharged through the valve. Other causes of accidents noted in the bulletin are the storage of black powder at too short a distance from a car storage yard and disregard of a smoldering fire while handling a car of naphtha involved in a wreck.

Pullman Car Tax in Wisconsin Upheld

The Wisconsin Supreme Court recently upheld the State Tax Commission's assessment against the Pullman Company and ordered payment of back taxes amounting to nearly $200,000, accumulated since the case was commenced in the Dane County Circuit Court in 1913. Justice Jones reversed the lower court's decision and directed a judgment for the state, sustaining the constitutionality of the statute governing the valuation of railroad property. He said: "It is our conclusion that neither the statute in question nor the methods pursued by the commission were in violation of any of the provisions of the state or federal constitutions; that the assessment made by the commission was not excessive or unjust; and that it should be sustained." The Pullman Company was assessed $21,268 as its tax for 1913, paid $10,728 of that amount and refused to pay the remainder and has continued to refuse in like manner during the following years up to the present, claiming that the state had assessed intangible property outside of Wisconsin.

All Cattle Shipments in Utah Subject to Inspection

The attorney general of Utah has rendered an opinion relative to the law governing the transportation of cattle by rail in that state, in which he contends that all shipments of cattle and horses are subject to a brand inspection prior to shipping, and that no railroad can lawfully accept cattle for shipment until the certificate of inspection is presented. The purpose of the brand inspection is to prevent the theft of cattle. Railroad agents state that with the law reading as it does, they have had no option but to accept cattle for shipment on a statement by the owner that he is shipping them for grazing purposes only, for which an exception is made in the state brand inspection law. The attorney general differs with this view, which leaves a big loophole for the benefit of the cattle thief. He stated: "It is my opinion that it was clearly the intent of the legislature that the phraseology 'other than for grazing purposes' should apply only in case of driving animals from the state or from one county to another; and such a phrase was never intended to apply where animals are shipped by rail, even though they are only to be shipped from one county to another."

Will Attempt to Keep M. D. & G. Intact

The attorney general of Arkansas has been instructed by the railroad commission to be in readiness, as soon as the sale of the road is effected, to file suits to prevent the dismantling of any part of the Memphis, Dallas & Gulf. The Interstate Commerce Commission recently granted permission to the receivers to abandon parts of the line, this overruling former action on the part of the Arkansas commission, which denied a like petition several months ago after extensive hearings. The petition alleged that the branch could not be operated at a profit, but the Arkansas commissioners contended that because of an increase in truck farming and other industries in the section the road was necessary as an outlet to the markets; and they held that a better division of the overhead expenses would permit a profit on the branch. The receiver appealed to the Interstate Commerce Commission and recently obtained a decision favorable to junking. The Arkansas commission, however, contends that the road operates only in intrastate traffic and that therefore the Interstate Commerce Commission has no jurisdiction. The sale will be held in St. Louis, Mo., August 18.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

Air Brake Association.—F. M. Nellis, 165 Broadway, New York City. Next convention, May, 1923, Denver, Colo. Exhibit by Air Brake Appliance Association.

Air Brake Appliance Association.—J. F. Gettrust, The Ashton Valve Company, 318 W. Washington St., Chicago. Meeting with Air Brake Association.

American Association of Demurrage Officers.—F. A. Pontious, Supervisor of Demurrage and Storage, C. & N. W. Ry., Chicago.

American Association of Dining Car Superintendents.—L. A. Stone, C. & E. I. Ry., Chicago. Annual meeting, Oct. 17-20, San Francisco, Cal.

American Association of Engineers.—C. E. Drayer, 63 E. Adams St., Chicago.

American Association of General Baggage Agents.—E. L. Duncan, 332 So. Michigan Ave., Chicago.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 10 and 11, Seelbach Hotel, Louisville, Ky.

American Association of Railroad Superintendents.—J. Rothschild, Room 400 Union Station, St. Louis, Mo. Next convention, August 23-25, 1922, Kansas City, Mo.

American Electric Railway Association.—J. W. Welsh, 8 W. 40th St., New York.

American Railroad Master Tinners', Coppersmiths' and Pipe Fitters' Association.—C. Borcherdt, 252 North Hamlin Ave., Chicago, Ill.

American Railway Association.—J. E. Fairbanks, General Secretary, 75 Church St., New York, N. Y. Annual meeting, November, 1922.
Division 1.—Operating.
Freight Station Section (Including former activities of American Association of Freight Agents). R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.
Medical and Surgical Section. J. C. Caviston, 75 Church St., New York.
Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association). J. C. Caviston, 75 Church St., New York, N. Y.
Telegraph and Telephone Section (including former activities of the Association of Railway Telegraph Superintendents). W. A. Fairbanks, 75 Church St., New York, N. Y. Annual meeting, September 20-22, 1922, Colorado Springs, Colo.
Safety Section. J. C. Caviston, 75 Church St., New York.
Division II—Transportation (including former activities of the Association of Transportation and Car Accounting Officers). G. W. Covert, 431 South Dearborn St., Chicago, Ill.
Division III—Traffic, J. Gottschalk, 143 Liberty St., New York.
Division IV—Engineering, E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Exhibit by National Railway Appliances Association.
Construction and Maintenance Section. E. H. Fritch.
Electrical Section. E. H. Fritch.
Signal Section (including former activities of the Railway Signal Association). H. S. Balliet, 75 Church St., New York, N. Y.
Division V.—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Exhibit by Railway Supply Manufacturers' Association.
Equipment Painting Section (Including former activities of the Master Car and Locomotive Painters' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill.
Division VI—Purchases and Stores (including former activities of the Railway Storekeepers' Association).
Division VII—Freight Claims (including former activities of the Freight Claim Association). Lewis Pilcher, 431 South Dearborn St., Chicago, Ill.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Next convention October 17-19, 1922, Cincinnati, Ohio. Exhibit by Bridge and Building Supply Men's Association.

American Railway Development Association.—A. Leckie, Industrial Agent Kansas City Southern Ry., Kansas City, Mo.

American Railway Engineering Association.—(Works in co-operation with the American Railway Association, Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Exhibit by National Railway Appliance Association.

American Railway Master Mechanics' Association.—(See American Railway Association, Division V.)

American Railway Tool Foremen's Association.—R. D. Fletcher, 1145 East Marquette Road, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.

American Short Line Railroad Association.—T. F. Whittelsey, Union Trust Bldg., Washington, D. C.

American Society for Steel Treating.—W. H. Eiseman, 1600 Prospect Ave., Cleveland, Ohio. Annual convention, Oct. 2-7, 1922, General Motors Building, Detroit, Mich.

American Society for Testing Materials.—C. L. Warwick, University of Pennsylvania, Philadelphia, Pa.

American Society of Civil Engineers.—Prof. J. H. Dunlap, University of Iowa, Iowa City, Ia. Regular meetings 1st and 3d Wednesdays in month, except July and August, 33 W. 39th St., New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York.
Railroad Division—A. F. Stuebing, Manager Editor, Railway Mechanical Engineer, Woolworth Bldg., New York.

American Train Dispatchers' Association.—C. L. Darling, 1310-1311 Mallers Bldg., Chicago, Ill. Next convention, June 18, 1923, Chicago.

American Wood Preservers' Association.—S. D. Cooper, A. T. & S. Fe R. R., Topeka, Kan. Next meeting, January 23, 1923, New Orleans, La.

Association of Railway Claim Agents.—H. D. Morris, Northern Pacific R. R., St. Paul, Minn.

Association of Railway Electrical Engineers.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

Association of Railway Executives.—Thomas De Witt Cuyler (chairman), 61 Broadway, New York, N. Y.

Association of Railway Supply Men.—A. W. Clokey, 1658 McCormick Bldg., Chicago. Meeting with International Railway General Foremen's Association.

Association of Railway Telegraph Superintendents.—(See American Railway Association, Division I.)

Association of Transportation and Car Accounting Officers.—(See American Railway Association, Division II.)

Bridge and Building Supply Men's Association.—D. J. Higgins, American Valve & Meter Company, 332 S. Michigan Ave., Chicago. Meeting with convention of American Railway Bridge and Building Ass'n.

Canadian Railway Club.—W. A. Booth, 53 Rushbrook St., Montreal, Que.

Car Foremen's Association of Chicago.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, New Morrison Hotel, Chicago.

(*Continued on page 268*)

Operating Statistics of Large Steam Roads — Selected Items for the Month of May, 1922,

Region, road and year		Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross. Excluding locomotive and tender	Ton-miles (thousands): Net. Revenue and non-revenue	Average number of locomotives on line daily: Serviceable	Un-serviceable	Per cent unserviceable	Stored
New England Region:													
Boston & Albany	1922	394	222,396	240,298	27,634	4,829	70.2	226,960	81,785	115	27	19.0	...
	1921	394	246,513	266,860	31,010	4,464	63.4	242,334	95,605	125	29	18.8	...
Boston & Maine	1922	2,455	502,356	559,425	47,870	11,997	74.5	559,425	220,428	326	127	28.0	48
	1921	2,469	517,318	577,398	48,135	10,888	68.7	578,209	243,861	357	104	22.5	69
N. Y., N. H. & H.	1922	1,959	425,492	463,288	28,212	11,468	73.8	520,341	204,153	279	82	22.6	34
	1921	1,959	430,278	461,892	31,319	9,803	68.1	502,908	212,078	291	79	21.2	36
Great Lakes Region:													
Delaware & Hudson	1922	887	252,889	340,016	31,453	7,258	68.0	411,449	188,102	286	31	9.6	172
	1921	880	347,632	458,688	31,349	8,538	60.8	577,956	285,840	283	33	10.6	121
Del., Lacka. & Western	1922	994	455,411	550,419	99,977	14,346	70.3	707,651	288,313	308	61	16.5	70
	1921	995	490,049	598,516	114,985	14,758	66.9	833,101	383,779	307	53	14.7	48
Erie (incl. Chic. & Erie)	1922	2,309	767,898	844,472	50,541	25,560	64.9	1,435,734	605,157	536	234	30.4	122
	1921	2,259	826,571	924,621	43,358	27,256	67.7	1,624,761	770,095	561	135	19.3	143
Lehigh Valley	1922	1,316	495,536	551,709	79,905	14,821	66.5	819,966	355,565	465	100	17.7	205
	1921	1,316	527,711	586,024	60,545	15,166	63.6	929,394	427,402	430	105	19.6	136
Michigan Central	1922	1,827	500,699	511,509	21,581	16,047	64.0	837,051	308,197	315	89	22.0	89
	1921	1,829	418,226	428,478	17,926	12,874	61.8	708,607	269,455	331	87	20.8	112
New York Central	1922	5,675	1,588,102	1,743,651	95,838	58,638	65.5	3,101,216	1,209,700	1,045	547	34.4	377
	1921	5,655	1,543,562	1,698,829	131,794	54,502	63.1	3,167,232	1,365,010	1,046	604	36.6	358
N. Y., Chic. & St. L.	1922	510	329,906	331,139	1,254	11,066	66.9	551,945	204,576	108	34	24.1	35
	1921	510	308,138	308,373	674	9,260	66.9	475,550	182,327	109	52	32.4	40
Pere Marquette	1922	2,191	323,029	332,753	6,270	8,408	67.5	423,181	191,105	162	48	23.0	14
	1921	2,207	300,957	312,058	6,636	7,501	66.6	438,406	186,035	165	44	21.1	17
Pitts. & Lake Erie	1922	228	84,161	87,785	1,003	2,480	67.2	158,202	87,973	66	19	22.0	22
	1921	225	91,281	96,284	475	2,930	61.4	217,370	124,748	67	13	15.7	20
Wabash	1922	2,418	566,991	598,649	6,258	16,311	71.6	815,725	331,719	271	66	19.5	36
	1921	2,418	514,735	541,719	6,980	15,442	69.1	816,193	345,861	277	67	19.4	54
Ohio-Indiana-Allegheny Region:													
Baltimore & Ohio	1922	5,235	1,667,092	1,903,544	144,940	43,028	65.3	2,564,518	1,232,777	914	447	32.8	190
	1921	5,185	1,630,907	2,034,767	131,241	38,908	59.5	2,576,366	1,267,155	1,025	406	28.4	182
Central R. R. of N. J.	1922	689	216,492	240,155	33,695	4,923	68.0	263,655	120,246	229	31	12.0	66
	1921	679	246,882	273,374	34,719	5,503	58.5	372,563	182,077	194	68	26.0	15
Chicago & Eastern Ill.	1922	945	232,887	238,700	4,491	5,621	70.8	308,429	151,284	123	48	28.3	49
	1921	1,131	212,437	213,257	3,821	4,971	63.0	299,581	147,832	123	45	26.7	48
C., C., C. & St. L.	1922	2,387	666,677	715,369	10,605	20,223	62.3	1,227,808	567,654	307	142	31.5	19
	1921	2,382	629,601	657,389	2,099	16,287	55.6	1,068,423	471,993	318	121	27.5	51
Elgin, Joliet & Eastern	1922	459	97,919	107,626	5,731	3,080	68.3	216,324	117,573	88	21	19.1	22
	1921	456	83,312	90,979	5,304	2,434	66.2	177,999	93,871	98	10	9.3	34
Long Island	1922	394	42,996	47,195	7,387	488	59.8	27,230	9,578	37	10	21.1	1
	1921	395	39,946	44,970	7,450	432	60.8	23,961	9,085	34	8	19.4	3
Pennsylvania System	1922	10,893	3,967,482	4,238,714	276,704	104,673	66.7	6,274,032	2,877,095	2,606	810	23.7	764
	1921	10,893	3,750,533	4,075,091	286,945	95,742	61.7	6,626,413	3,283,222	2,716	799	22.7	958
Phila. & Reading	1922	1,119	436,541	475,015	50,129	10,668	67.4	623,534	299,456	392	81	17.0	245
	1921	1,119	485,206	550,479	70,442	12,024	61.9	822,871	430,683	376	79	17.4	171
Pocahontas Region:													
Chesapeake & Ohio	1922	2,548	799,632	872,238	21,347	25,051	57.6	1,933,468	1,048,787	442	105	19.2	64
	1921	2,545	793,410	852,002	24,863	22,653	57.0	1,808,986	984,641	444	113	20.2	50
Norfolk & Western	1922	2,228	986,522	1,181,755	47,275	28,336	56.5	2,318,107	1,275,639	609	97	13.8	157
	1921	2,210	742,584	900,841	37,106	20,478	56.9	1,646,025	898,209	586	109	15.7	199
Southern Region:													
Atlantic Coast Line	1922	4,922	734,720	744,496	10,935	17,975	62.8	914,375	332,114	305	95	23.7	15
	1921	4,887	630,964	633,362	9,842	14,430	62.0	750,846	275,739	292	120	29.2	15
Central of Georgia	1922	1,915	226,416	231,498	4,193	5,083	75.5	243,914	105,716	112	23	17.3	6
	1921	1,908	239,210	240,030	2,816	4,737	67.2	257,105	113,483	111	23	17.2	...
I. C. (inc. Y. & M. V.)	1922	6,137	1,781,221	1,792,599	46,000	46,937	63.5	2,845,218	1,205,043	760	85	10.1	59
	1921	6,151	1,560,606	1,567,420	68,372	38,912	62.3	2,467,197	1,075,745	747	102	12.0	15
Louisville & Nashville	1922	5,021	1,851,854	2,058,238	72,222	32,588	59.9	2,160,147	1,016,306	599	81	11.9	1
	1921	5,026	1,527,410	1,632,379	59,005	25,588	58.5	1,683,730	783,807	550	101	15.5	36
Seaboard Air Line	1922	3,537	503,259	512,776	7,372	11,365	65.0	589,781	219,226	207	68	24.7	...
	1921	3,537	409,898	415,609	6,141	8,715	67.0	446,821	172,746	167	91	35.3	...
Southern Ry.	1922	6,942	1,301,246	1,324,139	28,376	28,666	67.3	1,475,949	596,670	859	182	17.5	28
	1921	6,942	1,176,851	1,196,243	28,705	23,835	61.3	1,323,636	521,236	891	228	20.4	94
Northwestern Region:													
C. & N. W.	1922	8,393	1,347,017	1,383,074	19,864	29,027	64.7	1,537,503	580,647	783	250	24.2	71
	1921	8,334	1,243,392	1,265,943	13,960	25,476	65.0	1,388,442	587,254	669	282	29.6	50
C., M. & St. P.[1]	1922	11,027	1,460,315	1,501,931	62,873	37,285	66.8	1,987,478	871,476	825	245	22.9	119
	1921	10,618	1,256,454	1,289,481	56,258	30,649	66.0	1,648,206	726,712	798	257	24.3	171
C., St. P., M. & O.	1922	1,726	305,727	330,109	12,190	5,730	68.9	298,118	123,320	156	51	24.5	36
	1921	1,726	261,690	270,958	10,054	4,629	71.8	231,566	92,792	161	52	24.4	50
Great Northern	1922	8,266	793,912	825,452	33,995	23,547	69.0	1,322,272	643,087	586	157	21.1	163
	1921	8,164	670,825	690,823	25,120	18,262	64.9	1,055,823	501,843	593	186	23.9	257
M., St. P. & S. Ste. M.	1922	4,384	475,218	506,081	6,261	10,801	71.2	533,793	244,112	341	63	15.6	27
	1921	4,225	402,748	432,816	6,753	8,488	69.6	428,502	191,795	347	53	13.3	53
Northern Pacific	1922	6,404	731,821	763,987	49,667	22,507	70.1	1,194,472	545,360	536	151	21.9	106
	1921	6,408	657,641	686,389	45,254	19,061	67.3	1,056,546	484,043	555	161	22.5	154
Ore.-Wash. R. R. & Nav.	1922	2,186	191,978	214,309	30,410	4,727	72.2	259,732	119,278	113	37	24.5	1
	1921	2,198	180,957	199,632	23,994	4,504	72.2	256,608	126,330	120	44	26.8	10
Central Western Region:													
Atch., Top. & Santa Fe	1922	9,798	1,431,183	1,497,853	63,917	39,572	68.7	2,139,629	828,351	784	156	16.6	199
	1921	9,771	1,437,486	1,507,576	74,858	37,585	65.1	2,110,658	785,468	800	176	18.0	172
Chicago & Alton	1922	1,010	256,323	258,289	4,606	5,816	67.3	314,602	120,120	111	46	29.2	31
	1921	1,010	324,099	330,798	4,830	6,451	59.0	406,336	171,919	122	41	25.1	16
Chic., Burl. & Quincy	1922	9,326	1,373,195	1,432,204	71,336	36,127	67.2	1,968,629	877,458	717	244	25.4	107
	1921	9,326	1,356,501	1,413,088	61,426	35,059	62.8	2,139,004	1,014,186	678	272	28.6	131
Chic., Rock Isl. & Pacific	1922	7,662	1,248,940	1,262,421	12,387	27,304	65.8	1,475,849	601,674	622	136	17.9	92
	1921	7,662	1,203,767	1,221,208	11,072	25,279	65.6	1,400,663	600,147	575	172	23.0	56
Denv. & Rio Grande West'n	1922	2,593	198,485	243,740	48,557	4,416	71.1	246,243	120,193	229	84	26.9	37
	1921	2,593	178,050	218,770	42,222	3,991	67.7	230,617	111,996	214	99	31.7	63
Oregon Short Line	1922	2,360	275,882	289,124	20,839	6,526	66.9	375,006	167,205	166	61	26.9	53
	1921	2,359	255,903	263,185	17,428	5,665	67.0	343,756	165,277	189	39	17.2	59
Southern Pacific	1922	6,983	1,012,912	1,162,359	220,656	29,253	65.0	1,675,726	679,239	552	194	26.0	41
	1921	6,975	1,050,520	1,214,421	235,384	28,601	65.3	1,651,499	679,926	547	217	28.4	36
Union Pacific	1922	3,707	682,528	691,877	30,395	23,561	77.9	1,133,833	467,294	415	114	21.5	189
	1921	3,615	668,877	678,897	24,598	21,406	76.3	1,109,749	501,047	381	159	29.5	121
Southwestern Region:													
Gulf, Colo. & Santa Fe	1922	1,895	206,586	217,737	4,621	5,151	65.2	288,246	120,871	125	25	16.7	34
	1921	1,895	278,066	292,927	5,533	6,593	63.6	384,793	171,249	91	57	38.5	...
Missouri, Kans. & Tex.	1922	1,658	235,169	235,287	5,580	6,640	62.3	374,621	152,779	135	44	24.5	61
	1921	1,710	233,963	234,001	6,181	6,135	60.2	350,640	141,117	142	39	21.7	59
Mo., Kans. & Tex. of Tex.	1922	1,738	191,040	195,553	5,011	3,684	62.0	211,678	84,108	85	51	37.2	18
	1921	1,740	214,642	219,166	2,511	4,281	59.1	254,523	102,673	101	44	30.6	24
Missouri Pacific	1922	7,305	1,009,613	1,019,823	29,342	25,436	69.8	1,380,057	616,223	409	171	29.5	2
	1921	7,263	1,033,013	1,039,673	26,648	24,382	69.2	1,368,395	627,384	385	178	31.6	35
St. Louis-San Francisco	1922	4,683	867,617	880,014	12,845	16,085	64.1	929,734	398,730	362	89	19.2	22
	1921	4,683	706,468	714,705	11,507	12,251	65.0	697,420	300,110	330	143	30.2	67
Southern Pacific Lines (in Texas and Louisiana)*	1922	3,710	552,402	556,014	3,954	11,381	65.4	659,926	290,002	197	98	33.2	20
	1921	3,647	527,431	529,307	3,020	10,336	62.1	619,450	266,287	171	120	41.2	...
Texas & Pacific	1922	1,953	231,905	232,033	1,246	5,447	64.9	294,284	121,786	135	63	31.9	30
	1921	1,952	262,156	262,156	2,956	5,802	65.6	315,111	125,247	119	71	37.3	23

Compiled by the Bureau of Statistics of the Interstate Commerce Commission. Subject to revision.

Compared with May, 1921, for Roads with Annual Operating Revenues above $25,000,000

Region, road and year	Average number of freight cars on line daily: Home	Foreign	Total	Per cent unserviceable	Gross tons per train, excluding locomotive and tender: Stored	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car-miles per car-day	Pounds of coal per 1,000 gross ton-miles, including locomotive and tender	Net ton-miles per mile of road per day	Passenger service: Train-miles	Passenger-car-miles
New England Region													
Boston & Albany 1922	3,611	4,685	8,296	9.4	697	1,021	368	16.9	320	27.0	6,697	195	307,948	2,008,786
1921	3,347	4,013	7,359	7.8	747	983	388	21.4	419	30.9	7,829	196	313,659	1,997,778
Boston & Maine 1922	16,884	13,582	30,466	18.4	1,603	1,114	439	18.4	233	17.1	2,896	147	817,915	4,531,191
1921	18,074	13,242	31,316	19.0	3,765	1,118	471	22.4	251	16.3	3,187	151	861,064	4,602,054
N. Y., N. H. & H. 1922	24,450	14,738	39,188	25.8	952	1,223	480	17.8	168	12.8	3,361	154	1,023,546	6,488,751
1921	23,872	14,695	38,567	20.4	2,156	1,169	493	21.6	177	12.0	3,492	166	1,033,610	6,777,644
Great Lakes Region:													
Delaware & Hudson 1922	11,391	5,395	16,786	8.7	3,122	1,627	744	25.9	361	20.5	6,841	181	193,798	1,016,353
1921	11,207	5,157	16,364	9.7	1,839	1,663	822	33.5	563	27.7	10,473	186	189,581	1,049,617
Del., Lake. & Western 1922	19,078	6,176	25,254	10.3	770	1,554	653	20.1	368	26.1	9,356	175	503,939	3,656,285
1921	17,938	7,184	25,122	9.4	1,389	1,700	783	26.0	493	28.3	12,447	169	496,329	3,546,485
Erie (incl. Chic & Erie) 1922	39,833	14,995	54,828	18.2	10,385	1,870	788	23.7	356	23.2	8,453	140	680,212	4,818,821
1921	40,767	14,485	55,252	15.5	14,994	1,966	932	28.3	450	23.5	10,998	139	677,615	5,023,574
Lehigh Valley 1922	33,067	7,545	40,612	12.0	16,564	1,655	718	24.0	282	17.7	8,714	158	348,967	2,718,851
1921	31,975	9,487	41,462	17.8	3,756	1,761	810	28.2	333	18.5	10,474	164	360,584	2,778,574
Michigan Central 1922	17,496	10,634	28,130	18.8	333	1,672	616	19.2	354	28.7	5,443	117	551,247	4,896,453
1921	19,539	11,926	31,465	15.7	2,247	1,694	644	20.9	276	21.3	4,751	120	568,434	4,880,567
New York Central 1922	81,658	42,388	124,046	19.1	8,780	1,953	762	20.6	315	23.3	6,876	121	2,369,370	19,368,644
1921	91,024	48,913	139,937	12.3	39,452	2,052	884	25.0	315	19.9	7,786	117	2,330,506	18,526,118
N. Y., Chic. & St. L. 1922	4,562	5,212	9,774	8.5	1,160	1,673	620	18.5	675	54.6	12,934	100	97,890	664,928
1921	6,071	4,717	10,788	15.5	2,080	1,543	592	19.7	545	41.4	11,527	109	85,246	556,816
Pere Marquette 1922	11,206	9,446	20,652	13.0	467	1,310	592	22.7	299	19.4	2,814	124	246,662	1,284,641
1921	11,390	9,073	20,463	17.0	1,000	1,457	618	24.8	293	17.8	2,719	130	296,229	1,425,049
Pitts. & Lake Erie 1922	20,994	9,564	30,558	34.3	6,017	2,880	1,045	35.5	93	3.9	12,451	89	114,933	583,827
1921	16,861	7,012	23,873	19.1	1,587	2,381	1,367	42.6	169	6.4	17,914	90	109,854	581,282
Wabash 1922	12,855	9,021	21,876	12.3	596	1,439	585	20.3	489	33.6	4,426	148	555,285	3,055,385
1921	13,062	9,680	22,742	10.4	877	1,586	672	22.4	491	31.7	4,614	152	525,292	2,775,090
Ohio-Indiana-Allegheny Region:													
Baltimore & Ohio 1922	71,996	32,135	104,131	14.4	13,766	1,538	739	28.7	382	20.4	7,596	171	1,498,162	9,246,788
1921	72,111	28,039	100,150	13.7	7,512	1,580	777	32.6	408	21.1	7,884	178	1,381,229	8,721,469
Central R. R. of N. J. 1922	21,231	7,821	29,052	6.1	11,468	1,218	555	24.4	134	8.0	5,630	207	355,994	1,757,554
1921	21,155	8,094	29,249	25.3	4,730	1,509	738	33.1	201	10.4	8,656	171	341,513	1,666,504
Chicago & Eastern Ill. 1922	17,472	3,874	21,346	15.9	6,000	1,324	650	26.9	229	12.0	5,163	161	216,494	1,413,587
1921	16,847	3,334	20,181	9.4	4,949	1,410	696	29.7	236	12.6	4,216	160	233,993	1,467,428
C., C., C. & St. L. 1922	18,285	18,278	36,563	14.3	7,237	1,842	851	28.1	501	28.6	7,672	122	697,440	4,564,776
1921	17,684	15,379	33,063	11.8	2,617	1,697	750	29.0	461	28.6	6,391	138	760,220	4,620,571
Elgin, Joliet & Eastern 1922	8,992	6,133	15,125	10.9	188	2,209	1,201	38.2	251	9.6	8,257	133	(1)	(1)
1921	10,101	3,299	13,400	5.6	3,759	2,137	1,127	38.6	226	8.8	6,636	138	(1)	(1)
Long Island 1922	2,026	3,347	5,373	4.7	180	633	223	19.6	58	4.9	784	388	202,279	1,199,356
1921	2,335	3,336	5,671	4.3	1,274	600	227	21.0	52	4.0	743	454	199,478	1,136,821
Pennsylaniva System 1922	210,915	77,097	288,012	12.5	59,388	1,581	725	27.5	322	17.6	8,520	145	5,025,063	32,652,513
1921	219,968	67,943	287,910	10.3	47,766	1,767	875	34.3	368	17.4	9,723	136	5,100,080	33,686,967
Phila. & Reading 1922	25,871	10,371	36,242	5.6	8,572	1,428	686	28.1	267	14.1	8,630	179	509,476	2,331,880
1921	27,416	10,732	38,148	10.1	8,007	1,696	888	35.8	364	16.4	12,420	183	529,010	2,414,834
Pocahontas Region:													
Chesapeake & Ohio 1922	36,552	13,991	50,543	14.3	1,131	2,418	1,312	41.9	669	27.8	13,278	120	441,237	2,497,490
1921	40,644	11,357	52,001	9.0	5,615	2,280	1,241	43.5	611	24.7	12,480	123	438,100	2,475,912
Norfolk & Western 1922	29,964	10,266	40,230	5.7	614	2,350	1,293	45.0	1,023	40.2	18,471	154	395,025	2,399,091
1921	36,133	5,654	41,787	9.5	4,118	2,217	1,210	43.9	693	27.8	13,111	153	407,363	2,509,531
Southern Region:													
Atlantic Coast Line 1922	21,301	9,759	31,060	16.3	.....	1,245	452	18.5	345	29.7	2,177	119	717,057	4,594,867
1921	22,777	7,478	30,255	16.8	.....	1,189	437	19.1	294	24.8	1,820	129	742,481	4,781,963
Central of Georgia 1922	4,689	3,307	7,996	19.0	.....	1,077	467	20.8	426	27.1	1,781	145	327,311	1,646,290
1921	5,527	3,508	9,035	22.1	.....	1,075	474	24.0	405	25.2	1,919	151	314,567	1,524,353
I. C. (inc. Y. & M. V.) 1922	44,025	20,339	64,364	11.5	6,092	1,597	677	25.7	604	37.1	6,335	136	1,499,323	9,406,392
1921	48,138	16,640	64,778	10.1	9,132	1,581	689	27.6	536	31.1	5,641	135	1,480,424	9,186,515
Louisville & Nashville 1922	34,496	18,960	53,456	12.0	79	1,166	549	31.2	613	32.8	6,529	160	1,011,452	5,880,313
1921	38,884	14,954	53,838	25.2	118	1,102	513	30.6	470	26.2	5,030	168	970,792	5,599,819
Seaboard Air Line 1922	13,039	10,278	23,317	14.3	.....	1,172	436	19.3	303	24.2	1,999	156	555,712	3,165,724
1921	12,199	7,214	19,413	23.7	.....	1,090	421	19.8	287	21.6	1,575	178	577,383	3,345,214
Southern Ry. 1922	36,977	20,509	57,486	19.6	.....	1,134	459	20.8	335	23.9	2,773	185	1,286,209	7,273,640
1921	40,458	17,554	58,012	11.3	5,383	1,125	443	21.9	290	21.6	2,422	199	1,330,361	7,600,459
Northwestern Region:													
C. & N. W. 1922	46,192	22,526	68,718	8.5	4,200	1,141	431	20.0	273	21.1	2,232	165	1,605,432	9,904,740
1921	48,723	20,885	69,608	8.0	6,500	1,117	472	23.1	272	18.2	2,273	194	1,647,224	10,000,349
C., M. & St. P. 1922	51,401	21,157	72,558	16.0	.....	1,361	597	23.4	387	24.8	2,549	148	1,477,317	8,923,390
1921	44,950	16,442	61,392	15.0	4,337	1,312	576	23.7	382	24.4	2,208	159	1,474,064	9,088,034
C., St. P., M. & O. 1922	5,015	10,526	15,541	11.0	1,840	975	403	21.5	256	17.2	2,304	158	318,261	1,790,829
1921	4,254	11,581	15,835	11.1	3,934	885	355	20.0	189	13.1	1,734	188	321,122	1,804,664
Great Northern 1922	45,205	5,014	50,219	15.6	.....	1,666	810	27.3	413	21.9	2,510	137	996,825	5,862,044
1921	47,201	5,967	53,168	17.7	.....	1,574	748	27.5	304	17.1	1,983	156	989,612	5,808,457
M., St. P. & S. Ste. M. 1922	18,594	5,716	24,310	13.6	2,700	1,125	514	22.6	324	20.1	1,796	130	437,382	2,462,279
1921	18,423	5,202	23,625	11.3	4,732	1,064	476	22.6	262	16.7	1,464	131	430,334	2,320,961
Northern Pacific 1922	35,281	7,459	42,740	10.4	890	1,632	745	24.2	412	24.2	2,747	130	855,877	5,457,524
1921	38,753	6,519	45,272	13.8	11,333	1,607	736	25.5	345	20.1	2,437	131	851,936	5,357,764
Ore.-Wash. R. R. & Nav. 1922	7,221	2,206	9,427	3.1	1,116	1,353	621	25.2	408	22.4	1,760	208	256,291	1,678,401
1921	4,905	3,244	8,149	3.6	2,180	1,418	698	28.0	500	24.7	1,854	208	256,631	1,645,282
Central Western Region:													
Atch., Top. & Santa Fe. 1922	51,022	11,978	63,000	8.1	14,361	1,495	579	20.9	424	29.5	2,727	143	1,666,928	12,556,576
1921	48,884	12,136	61,020	10.8	9,221	1,468	546	20.9	415	30.5	2,593	146	1,650,072	12,205,426
Chicago & Alton 1922	10,105	4,096	14,201	3.5	2,000	1,227	469	20.7	273	19.6	3,836	185	284,157	1,651,793
1921	9,891	4,206	14,097	5.2	2,500	1,254	530	26.7	393	25.0	5,490	180	294,214	1,684,337
Chic., Burl. & Quincy 1922	48,392	18,426	66,818	10.4	9,100	1,434	639	24.3	424	25.9	3,035	148	1,473,833	9,436,069
1921	49,449	15,074	64,523	15.3	1,843	1,577	748	28.9	507	27.9	3,505	156	1,531,270	9,857,146
Chic., Rock Isl. & Pacific. 1922	34,416	11,662	46,078	9.8	6,330	1,182	482	22.0	421	29.1	2,533	159	1,101,788	7,459,009
1921	32,691	15,520	48,211	11.4	9,131	1,164	499	23.7	402	25.8	2,527	164	1,334,291	7,611,285
Den. & Rio Grande West'n. 1922	13,831	2,104	15,935	9.6	2,827	1,241	606	27.2	243	12.6	1,495	199	283,479	1,641,926
1921	13,308	2,036	15,344	9.7	2,864	1,295	629	28.1	235	12.4	1,393	212	229,545	1,622,021
Oregon Short Line 1922	6,476	3,002	9,478	7.2	.....	1,359	606	25.6	569	33.2	2,286	140	285,188	1,959,560
1921	7,931	2,651	10,582	6.6	2,540	1,343	646	29.2	504	25.8	2,260	141	299,089	2,055,561
Southern Pacific 1922	23,419	19,975	43,394	6.1	5,071	1,654	671	23.2	505	33.4	3,138	146	1,351,318	10,682,329
1921	22,937	20,556	43,493	10.3	7,419	1,572	647	23.8	494	32.4	3,144	154	1,407,974	11,012,137
Union Pacific 1922	18,567	6,418	24,985	16.2	4,521	1,661	685	19.8	603	39.1	4,066	144	875,150	7,181,907
1921	21,143	6,033	27,176	24.4	6,949	1,659	749	23.4	595	33.3	4,471	152	868,092	7,245,899
Southwestern Region:													
Gulf, Colo. & Santa Fe. 1922	7,113	3,342	10,455	5.0	527	1,395	585	23.5	373	24.4	2,058	131	197,714	1,153,279
1921	9,413	3,071	12,484	4.9	599	1,384	616	26.0	443	26.8	2,917	136	196,575	1,131,876
Missouri, Kans. & Tex. 1922	9,255	5,166	14,421	7.3	4,134	1,593	650	23.0	342	23.8	2,972	131	266,874	1,858,981
1921	8,822	4,528	13,350	8.1	2,275	1,499	603	23.0	341	24.6	2,661	144	272,192	1,933,692
Mo., Kans. & Tex. of Tex. 1922	341	10,012	10,355	7.1	1,542	1,108	440	22.8	262	18.5	1,561	150	270,628	1,617,502
1921	369	12,171	12,540	4.6	1,153	1,186	478	24.0	264	18.6	1,904	154	277,030	1,721,113
Missouri Pacific 1922	31,617	16,972	48,589	8.7	1,796	1,367	610	24.2	409	24.2	2,721	146	924,981	5,484,575
1921	33,483	16,486	49,969	10.0	7,104	1,325	607	25.7	405	22.8	2,786	148	948,011	5,569,097
St. Louis-San Francisco. 1922	20,771	10,594	31,365	8.0	.....	1,072	460	24.8	410	25.8	2,746	173	761,578	4,380,016
1921	21,474	9,376	30,850	6.3	.....	987	425	24.5	314	19.7	2,067	204	783,047	4,445,069
Southern Pacific Lines (in Tex. and Louisiana)[a]. 1922	8,253	11,555	19,808	10.0	1,447	1,195	525	25.5	472	28.3	2,521	126	541,546	3,419,259
1921	9,263	13,572	22,835	18.1	3,058	1,171	505	25.8	376	23.5	2,355	131	536,491	3,341,407
Texas & Pacific 1922	6,203	4,838	11,041	18.8	.....	1,269	525	22.4	356	24.5	2,012	141	286,579	1,854,571
1921	6,383	5,044	11,427	19.8	.....	1,202	478	21.6	354	25.0	2,069	149	318,278	1,999,327

[1]Includes Chicago, Terre Haute & Southeastern from July 1, 1921, only. [2]No passenger train service.
[a]Includes Galveston, Harrisburg & San Antonio, Houston & Shreveport, Houston & Texas Central, Houston, East & West Texas, Iberia & Vermilion, Lake Charles & Northern, Louisiana Western, Morgan's La & Tex. R. R. & S. S. Co., and Texas & New Orleans.

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CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—Thomas B. Koeneke, 604 Federal Reserve Bank Bldg., St. Louis, Mo. Meetings, first Tuesday in month at the American Hotel Annex, St. Louis.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 2d Thursday in January, March, May, September and November, Hotel Iroquois, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. P. Elliott, Terminal Railroad Association of St. Louis, East St. Louis, Ill. Annual convention, August 22-24, Chicago.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—D. B. Wright, 34th St. and Artesian Ave., Chicago, Ill. Meeting with Chief Interchange Car Inspectors' and Car Foremen's Association.

CINCINNATI RAILROAD CLUB.—W. C. Cooder, Union Central Bldg., Cincinnati, Ohio. Meetings, 2d Tuesday in February, May, September and November.

EASTERN RAILROAD ASSOCIATION.—E. N. Bessling, 614 F St., N. W., Washington, D. C.

FREIGHT CLAIM ASSOCIATION.—(See American Railway Associations., Division VII.)

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—C. H. Treichel, Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Friday in month, Room 1414, Manhattan Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Annual convention, August 15-17, Hotel Sherman, Chicago. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—George P. White, 747 Railway Exchange, Chicago. Meeting with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—I. G. Crawford, 702 E. 51st St., Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn. Next convention, September 5-8, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—C. W. Sullivan, Garlock Packing Co., 326 W. Madison St., Chicago. Meeting with International Railway Fuel Association.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Division V.)

MASTER CAR BUILDERS' ASSOCIATION.—(See A. R. A., Division V.)

NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—Warren C. Nixon, Western Tie & Timber Co., 905 Syndicate Trust Bldg., St. Louis, Mo.

NATIONAL ASSOCIATION OF RAILWAY AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Next convention, September 26, 1922, Detroit, Mich.

NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, People's Gas Bldg., Chicago. Annual exhibition at convention of American Railway Engineering Association.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, excepting June, July, August and September.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3d Friday in month, except June, July and August, at 29 W. 39th St., New York.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 600 Liberty Bldg., Broad and Chestnut Sts., Philadelphia, Pa. Annual dinner, February 1, Waldorf-Astoria, New York.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, General Electrical Co., Chicago. Annual meeting with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—R. J. Himmelright, 17 East 42nd St., New York. Meeting with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, C. & O. Ry., Richmond, Va. Next meeting October 10-13, 1922, Pittsburgh, Pa.

RAILWAY SIGNAL ASSOCIATION.—(See A. R. A., Division IV., Signal Section.)

RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A., Division VI.)

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meeting with A. R. A., Division V.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 19 and 20, Asheville, N. C.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W. Ry., Sterling, Ill. Annual convention, September 19-21, 1922, Hotel Statler, Cleveland, Ohio. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, P. O. Box 1305, Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—I. L. Carrier, Car Serv. Agt., Tenn. Cent. Ry., 319 Seventh Ave., North Nashville, Tenn. Next meeting, October 19, St. Augustine, Fla.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—H. S. White, 9 W. Jefferson St., Chicago.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hilburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Annual convention, September 12-15, Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—Bruce V. Crandall, 14 E. Jackson Boulevard, Chicago. Regular meetings, 3d Monday each month except June, July and August.

Foreign Railway News

Railroad Disasters in France and Russia

Forty persons killed and 50 injured is the heading of a press dispatch from France on August 1, reporting a rear collision of passenger trains near Villecomtal. The trains were filled with pilgrims from Moulins bound for Lourdes.

Two hundred killed, many of them burned to death, is the reported result of the burning of a five-car passenger train on August 2 between Kiev and Schepetowka.

Chile and Argentina Agree on Trans-Andine Roads

The governments of Argentina and Chile believe that the time has come for the establishment of a standard which shall define and govern their future policy in the matter of Trans-Andine railroads, according to Commerce reports.

The Minister of Foreign Affairs in Chile and the Argentine Minister to Chile signed an agreement in Santiago, on April 25, which will put such a plan into effect. By this agreement two railroads will be built to connect, without change of cars: (1) In the north, Salta (Argentina) and the port of Antofagasta (Chile); (2) in the south, an extension of the Southern Railroad from Zapala (Argentina) to Curacutin (Chile), which will connect Bahia Blanca with cities on the Southern Chilean system. Both lines are to be completed and put into service within three years after ratification of the agreement by both governments.

The agreement provides that:

1. The minimum rates on freight and stock shall be based on operating expense only, not including fixed charges. In special cases or for the encouragement of certain industries, an exception to the above basis may go into effect under a temporary agreement.

2. In each case the conditions under which the commodity is produced, cost of production, market price, and the producer's profit are considered in establishing an increase over the minimum or basic tariff, which will allow some profit to the railroads without hindering industry and commerce.

3. The tariffs established on the above basis shall always be of an elastic nature to allow their adaptation to changing conditions.

4. The tariffs, in general, shall be alike for merchandise in transit and for that consigned to intermediate points on the lines. Special rates may be established to encourage local production, and in such cases reciprocal compensation may be arranged, if convenient. In other cases, unless interests conflict, the tariffs will be developed so as to encourage general traffic which will assist the producing zones and the terminals.

5. The rolling stock used in common on the Argentine and Chilean sections shall be of such type that it may be operated with safety and without change over all sections of the same gage on both international lines. A technical agreement shall be made to carry out the above. The rules established by the Berne convention for the railroads of Central Europe will be used to govern the interchange of rolling stock, for which payments will be liquidated on a per-car per-day basis.

6. The Argentine and Chilean governments shall agree opportunely upon the necessary supplementary regulations and upon the detailed application of this agreement. The present agreement shall be ratified and ratifications exchanged in Santiago, Chile, as soon as may be possible.

There is some opposition to the ratification of this agreement, but it is argued that national boundaries can no longer limit trade. Chilean nitrate and coal, it is said, will move to Argentina in exchange for agricultural products. The distance would be shortened from Argentina to the United States via Antofagasta, and Chile would be in closer connection with Europe through Buenos Aires.

Equipment and Supplies

Locomotives

THE DETROIT TERMINAL has ordered 2, 0-8-0 type locomotives from the American Locomotive Company.

THE SOUTHERN PACIFIC has ordered from the American Locomotive Company two snow plows, to have 12 ft. cut, and 18 by 26 in. cylinders.

THE UNION PACIFIC is inquiring for ten 2-8-8-2 Mallet type locomotives. This is in addition to the inquiry for 70 locomotives noted in the *Railway Age* of July 29.

THE BALTIMORE & OHIO, reported in the *Railway Age* of July 22 as inquiring for 15 Pacific type locomotives, has ordered this equipment from the Baldwin Locomotive Works.

THE PARIS-ORLEANS (France) has ordered through the General Electric Company one, 4-6-6-4 type electric locomotive from the American Locomotive Company. This locomotive will have a total weight in working order of 240,000 lb.

THE DAVIS J. JOSEPH COMPANY, Cincinnati, Ohio, has ordered one, 0-4-0 switching locomotive from the American Locomotive Company. This locomotive will have 13 by 20 in. cylinders and a total weight in working order of 65,000 lb.

THE ST. LOUIS COKE & CHEMICAL COMPANY, Granite City, Ill., has ordered one, 0-6-0 type switching locomotive from the American Locomotive Company. This locomotive will have 21 by 26 in. cylinder and a total weight in working order of 147,000 lb.

THE CHESAPEAKE & OHIO will receive bids until 12 o'clock noon August 25 at Richmond, Va., for general repairs to 50 locomotives. This company, as noted in the *Railway Age* of July 29, is also asking for bids until August 11 on the repair of 50 locomotives.

Freight Cars

THE FRUIT GROWERS' EXPRESS is inquiring for 1,000 refrigerator cars.

THE INDIANA GAS & COKE COMPANY is inquiring for repairs to 50 hopper cars.

THE BOSTON & MAINE is having 1,000 box cars repaired at the shops of the Laconia Car Company.

THE CHICAGO, BURLINGTON & QUINCY has ordered repairs to 500 gondolas from the Keith Railway Equipment Co.

THE BURMA RAILWAY COMPANY, LTD., is inquiring through the car builders for 446 covered goods wagons, 60 bogie quarduple bolster wagons and 10 goods brake van underframes.

THE NORTHERN PACIFIC, reported in the *Railway Age* of July 22 as inquiring for 1,000 steel center constructions, has ordered this equipment from the Western Steel Car & Foundry Co.

THE CHICAGO & NORTH WESTERN, reported in the *Railway Age* of July 15, as about to issue inquiries for repairs to a number of freight cars, has ordered repairs to 500 box cars from the American Car & Foundry Company.

THE MISSOURI PACIFIC has placed orders for repairs to 2,500 freight cars as follows: American Car & Foundry Company, 1,250; Sheffield Car & Equipment Company, 1,000; and the Mount Vernon Car Manufacturing Company, 250.

THE CHICAGO, ROCK ISLAND & PACIFIC, reported in the *Railway Age* of July 15 as inquiring for repairs to 1,500 box cars, 500 to 1,500 gondola cars, 500 refrigerator cars and 500 automobile and furniture cars, has placed orders so far with the Western Steel Car & Foundry Co. for repairs to 400 wooden box cars, 300 automobile and furniture cars and 400 steel underframe box cars.

THE NEW YORK CENTRAL is having 500 coke cars converted to gondola cars at the shops of the Ryan Car Company, Hagewisch, Ill; 500 coke cars converted into gondola cars at the shops of the Buffalo Steel Car Company, Buffalo, N. Y., and 973 coke cars converted into 500 flat, 300 double deck stock, and 173 single deck stock cars at the shops of the American Car & Foundry Company, Detroit, Mich.; for the Pittsburgh & Lake Erie 1,200 coke cars are being converted into box cars at the shops of the Standard Steel Car Company, Newcastle, Pa.; 300 coke cars converted into box cars at the shops of the American Car & Foundry Company, Detroit, Mich.

Passenger Cars

THE CHICAGO ELEVATED RAILWAY has ordered 100 elevated cars from the Cincinnati Car Company.

THE A. B. C TRANSIT REFRIGERATOR COMPANY, Chicago, has renewed its inquiry for 150, 40-ton express refrigerator cars.

THE NATIONAL RAILWAYS of Mexico have ordered 5 first-class and 10 second-class, narrow gage passenger coaches, from the Pullman Company.

THE BOSTON ELEVATED, reported in the *Railway Age* of July 1 as inquiring for 40 tunnel cars, has ordered this equipment from the Pullman Company.

THE PITTSBURGH & WEST VIRGINIA, reported in the *Railway Age* of July 29 as inquiring for four cars for passenger service, has ordered nine coaches, one passenger and baggage, two passenger, baggage and mail and two baggage cars from the American Car & Foundry Company.

Iron and Steel

THE NORFOLK & WESTERN is receiving bids for fabricated steel to be used in repairing and enlarging its coal piers and for track work at Lamberts Point, Va.

THE CHICAGO & NORTH WESTERN has placed an order with the American Bridge Company for three steel-deck girder spans (215 tons) to be used over the Milwaukee River near Lindwerm, Wis.

THE MISSOURI, KANSAS & TEXAS has placed an order with the Mississippi Valley Structural Steel Company for 350 tons of steel to be used in the construction of its new shops at Denison, Tex.

Machinery and Tools

THE CHICAGO, MILWAUKEE & ST. PAUL is inquiring for a 20-ton crane, a 1,100-lb. steam hammer, two lathes, a shaper and a drill press.

THE ATCHISON, TOPEKA & SANTA FE has placed an order with the Milwaukee Electric Crane & Manufacturing Company, Milwaukee, Wis., for a 15-ton crane.

One of the Wheeling & Lake Erie's Mallets

Supply Trade News

T. H. Lange has been appointed traffic manager of the Pawling & Harnischfeger Company, Milwaukee, Wis.

C. H. G. Larrimore has been appointed general manager of the Railway Audit & Inspection Company, Philadelphia, Pa., in charge of all operations, succeeding T. C. Cary deceased.

L. H. Matthews, for 19 years connected with the railroad department of the Fairbanks, Morse & Co., resigned on August 1, to become Pacific coast manager of the Chicago Metallic Packing Company, with headquarters at Los Angeles.

The Rome Wire Company, Rome, N. Y., has acquired an interest in the Atlantic Insulated Wire & Cable Company, Stamford, Conn. The latter company will continue to manufacture its brands of high-grade rubber covered wires and cables.

A. L. Roberts, formerly master mechanic of the Lehigh Valley Railroad, and recently chief engineer of the Arlas Crucible Steel Company, has been appointed sales engineer, railroad department, of the United Alloy Steel Corporation, Canton, Ohio.

The Roberts-Pettijohn-Wood Corporation has moved its offices in Chicago to 646 North Michigan avenue. Fred Pettijohn, vice-president of the company, has taken charge of its Eastern office in the Mills building, Washington, D. C. W. A. Van Hook has been appointed chief engineer of the valuation department with headquarters at Chicago. James C. Kelsey has joined the staff of the company as consulting engineer and Joseph M. McShane as chief accountant of the company's public utilities department, both with headquarters at Chicago.

The Tuttle Railway Supply Company, Inc., has opened offices in the Woolworth Building, New York City, for the handling of railway supplies and specialties. This company has just been appointed the eastern representative of the Edward S. Woods Company of Chicago. S. W. Tuttle, president of the Tuttle Railway Supply Company, Inc., was, some years ago, connected with the National Dump-Rodger Ballast Car Company, Chicago, in their shops, and for the past fourteen years has been connected with the American Car & Foundry Company, in the manufacturing, executive and selling departments.

The Air Reduction Sales Company, N. Y., has under way a program of plant expansion. Sites have been bought for an Airco acetylene plant at Birmingham, Ala.; an oxygen plant at Milwaukee, Wis.; and an acetylene plant and a calorene plant at Pittsburgh, Pa.; at the latter place the company recently completed an oxygen plant. Construction of the plant at Birmingham already has begun, and plans are well under way for putting up the plants at Milwaukee and Pittsburgh. In addition to these new plant installations, the company's facilities for producing oxygen from the air will be enlarged in Buffalo and Minneapolis. The estimated cost of the proposed improvements is over $500,000.

Obituary

William Andrew Thompson, Jr., one of the vice-presidents of the Texas Company, New York City, died at his home in Brooklyn on July 24.

L. O. Henggi, inventor of the Henggi rail-anchor and for a number of years connected with the P & M Co., Chicago, died at his home in Oakmont, Pa., on July 22.

T. C. Cary, vice-president and general manager of the Railway Audit & Inspection Company, Philadelphia, Pa., died recently. Mr. Cary was born on December 25, 1878, at Sheboygan Falls, Wis.

Railway Construction

Atchison, Topeka & Santa Fe.—This company will receive bids until August 17 for the construction of a new boiler and tank shop at Albuquerque, N. M., 140 ft. by 405 ft., to cost approximately $400,000. Authorization of this work was reported in the *Railway Age* of June 3, page 1312.

Chicago, Burlington & Quincy.—This company is calling for bids for the construction of a combination passenger and freight station at Elsberry, Mo. Bids for this work are to be closed August 14.

Illinois Central.—This company has awarded a contract to the Fred R. Jones Construction Company, Chicago, for the laying of a second track between Paducah, Ky., and Clarks, a distance of 3½ miles at an estimated cost of $125,000.

Illinois Central.—This company is calling for bids for the construction of nine water treating plants to be located at Council Bluffs, Iowa, Logan, Dunlap, Denison, Rockwell City, Wall Lake and Fort Dodge on the Iowa division; and at Amboy, Ill., and LaSalle on the Wisconsin division, four of these to be of 10,000, three of 20,000 and two of 30,000-gal. per hour capacity. Bids are also asked for the rebuilding of exisiting water treating plants at Manchester, Iowa, Galena, Ill., and Scale's Mound on the Minnesota division, to increase their capacity from 10,000 gal. to 20,000 gal. per hour and to install filters.

Illinois Central.—This company is calling for bids for the construction of a water station, including a 100,000-gal. storage tank, at Matteson, Ill., in connection with grade separation work at that place.

Union Pacific.—This company, which was reported in the *Railway Age* of June 22, page 134, as calling for bids for the construction of a brick freight house at Denver, Colo., has awarded a contract for this work to P. J. Sullivan, Denver, Colo., at an estimated cost of $240,000.

Union Pacific.—This company is calling for bids for the construction of two standard brick oil houses 28 ft. by 115 ft. at Grand Island, Neb., and Green River, Wyo.

Photo from Keystone View Co., Inc.

N. Y. C. Train 59 Near Syracuse, June 11

Railway Financial News

BALTIMORE & OHIO.—*Asks Authority for Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to issue $6,750,000 of 5 per cent, 15-year equipment trust certificates to be used in connection with the purchase of equipment to the amount of $9,069,680. The certificates have been purchased by Kuhn, Loeb & Co., and Speyer & Co., at 96.40.

BOSTON & MAINE.—*Stockholders Meeting Held.*—The meeting of the stockholders, adjourned several times by court action of E. D. Codman, was held July 27. The former board of directors was re-elected and William D. Woolson, of Springfield, Mass., was elected a director to succeed the late Charles P. Hall.

CHICAGO & ALTON.—*Ownership of Stock by Rock Island.*—See Chicago, Rock Island & Pacific.

CHICAGO, ROCK ISLAND & PACIFIC.—*Approval of Holding of Alton Stock Unnecessary.*—The Interstate Commerce Commission has dismissed this company's application for an order approving the ownership and holding by it of common and preferred stock of the Chicago & Alton on the ground that it does not come within the jurisdiction conferred by paragraph 2 section 5 of the commerce act.

DEATH VALLEY.—*Application to Issue Stock Denied.*—The Interstate Commerce Commission has denied this company's application for authority to issue either such amount of its capital stock from time to time as may be necessary when the proceeds thereof are used in conjunction with its sinking fund to retire its outstanding first mortgage 5 per cent sinking fund bonds as they become due, or such amount as may be required in conjunction with the sinking fund to retire 100 bonds which matured on March 1. The commission says the company has failed to show any satisfactory reason why the outstanding bonds cannot be retired otherwise than through the issue of capital stock from cash on hand.

GRAND RAPIDS & INDIANA.—*Lease by Pennsylvania.*—See Pennsylvania.

GREAT NORTHERN.—*Rehearing Denied.*—The Interstate Commerce Commission has denied an application for a rehearing of the decision in which the commission denied authority to abandon 3.69 miles of its Portland branch in Traill County, N. D.

ILLINOIS CENTRAL.—*Six Months' Guaranty Certified.*—The Interstate Commerce Commission has issued a certificate certifying the amount of this company's guaranty for the six months' period of federal control, including the Chicago, Memphis & Gulf and the Yazoo & Mississippi Valley, as $13,689,078, of which $1,313,078 was still to be paid.

INTERNATIONAL & GREAT NORTHERN.—*Properties Sold.*—In accordance with the reorganization plan recently announced the properties of the International & Great Northern were sold at public auction at Houston on July 28. The purchasers were representatives of the Central Trust Company of New York, representative, in turn, of the second mortgage bondholders. The purchase price was $5,000,000.

LEETONIA.—*Asks Authority to Abandon Line.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Tiadaghton, Pa., to Leetonia, 8.7 miles.

NEW YORK, CHICAGO & ST. LOUIS.—*Asks Authority to Issue and Sell Bonds.*—This company has applied to the Interstate Commerce Commission for authority to sell $5,071,000 of second and improvement mortgage 6 per cent bonds, Series A and Series B, the issue of which had been previously authorized, and also to issue and sell $3,592,000 of Series B and Series C bonds. Some of the bonds previously issued have been pledged a security for a note for $1,000,000 to the director general of railroads which it is now proposed to retire and the balance of the proceeds is to be used to reimburse the treasury for expenditures not yet capitalized.

NORFOLK SOUTHERN.—*Equipment Notes Authorized.*—The Interstate Commerce Commission has authorized an issue of $375,000 of first lien equipment notes to be pledged with the Secretary of the Treasury as collateral for a loan from the government.

PENNSYLVANIA.—*Authorized to Acquire Control.*—The Interstate Commerce Commission has authorized the acquisition of control of the Grand Rapids & Indiana by lease for 999 years on the condition that the Pennsylvania shall not dispose of its stock of the G. R. & I., without the consent of the commission.

PERE MARQUETTE.—*Permission to Abandon Line Denied.*—The Interstate Commerce Commission has denied applications of this company for certificates authorizing the abandonment of its Freeport branch in Michigan, 6.23 miles long, and also that part of its line extending from a point near White Cloud to Big Rapids, Mich., 19.67 miles. Objections to the proposed abandonment were filed by interested shippers, organizations of business men and certain public utilities, and the commission holds that it is unable to find that present and future public convenience and necessity permit the proposed abandonment.

PITTSBURGH & WEST VIRGINIA.—*Vote Stock Increase.*—Stockholders of the Pittsburgh & West Virginia at a special meeting in Pittsburgh, July 27, voted unanimously in favor of increasing the capital stock from $47,000,000 to $51,900,000.

SAN FRANCISCO SACRAMENTO.—*Asks Authority to Issue Bonds.*—This company has applied to the California Railroad Commission for permission to issue $200,000 of its first mortgage gold bonds to be known as the series of 1923. These bonds are to bear interest at the rate of 6½ per cent and to mature on Jan. 1, 1940. They will be redeemable on any interest date at par and accrued interest plus a premium of 10 per cent. The proceeds are to be used to pay for extensions and additions.

ST. LOUIS SOUTHWESTERN.—*Annual Report.*—The annual report issued Wednesday shows for the year ended December 31, 1921, a net income of $2,493,481 as compared with 2,959,386 in 1920. The report shows the following details:

	1921	1920
Operating revenues	$25,140,164	$31,020,958
Expenses	19,089,559	25,886,056
Taxes, etc.	1,122,764	1,249,454
Operating income	$4,927,841	$3,885,448
Non-operating income	962,610	1,836,952
Gross income	$5,890,451	$5,722,400
Interest, rentals, etc.	3,396,970	3,298,656
Net income	$2,493,481	$2,423,744
Federal deficit	.....	536,093
Corporate net income	$2,493,481	$2,959,837
Investment in physical property	2,493,481	2,959,837

WABASH.—*Equipment Trust Certificates Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $4,245,000 of equipment trust certificates to be sold at 95¾.

WESTERN PACIFIC.—*Rehearing Granted.*—The Interstate Commerce Commission has announced a rehearing before Examiner Clarke at Washington on August 24 on this company's application for authority to acquire control of the Sacramento Northern, which was denied.

YAZOO & MISSISSIPPI VALLEY.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $5,034,000 5 per cent gold improvement bonds to be delivered at par to the Illinois Central in reimbursement of advances.

Regulations for Applications for Issue of Securities

The Interstate Commerce Commission has issued a revised order prescribing regulations for the filing of applications for authority to issue securities or to assume obligation or liability under Section 20-a of the interstate commerce act, which it says, shall be filed sufficiently in advance of the date of the proposed issue or assumption to give the commission reasonable time,

not less than 30 days, for the notices and investigation required by law. The order also includes the following definitions:

(a) Capital stock is considered to be *nominally issued* when certificates are signed and sealed and placed with the proper officer of the carrier for sale and delivery.
(b) Funded debt securities are considered to be *nominally issued* when certified by trustees and placed with the proper officer of the carrier for sale and delivery.
(c) "Securities," as that term is defined in said section 20a, are considered to be—
(1) *Conditionally issued*, when pledged or otherwise placed in some special fund of the obligor or issuing carrier.
(2) *Actually issued*, when they have been sold to a bona fide purchaser for a valuable consideration, and such purchaser holds them free from all control by the obligor or issuing carrier.
(3) *Actually outstanding*, when actually issued and not reacquired and held by or for the obligor or issuing carrier.
(4) *Nominally outstanding*, when reacquired by or for the obligor or issuing carrier under such circumstances as require them to be considered as held alive.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out to the several roads the following amounts:

Maine Central	$850,000
Portland Terminal	850
Southern Pacific Terminal	412,000
San Francisco & Portland Steamship Co	54,000
Troy Union	42,000
Baltimore & Ohio, as result of final settlement, gave director general its obligation, on account of additions and betterments for.	9,000,000
SHORT LINES	
Leetonia	$4,600
Okmulgee Northern	1.00

The payment of these claims on final settlement is largely made up of balance of compensation due, but includes all other disputed items as between the railroad companies and the administration during the 26 months of federal control.

The Railroad Administration has also issued a quarterly summary of its settlements which shows that up to June 30 final settlements had been made with 252 railroads, which received a total of $152,259,146.73. Ten companies had paid the director general a total of $11,181,142.

Dividends Declared

Illinois Central.—Preferred, $1.10, payable September 1 to holders of record August 4, common, 1¾ per cent, payable September 1 to holders of record August 4.

Delaware & Hudson.—$2.25, quarterly, payable September 20 to holders of record August 28; common 2¼ per cent, payable September 20 to holders of record August 28.

Trend of Railway Stock and Bonds Prices

	August 1	Last Week	Last Year
Average price of 20 representative railway stocks	$68.98	$67.23	$58.69
Average price of 20 representative railway bonds	88.36	87.82	76.24

P. & A. Photo.

Coal Mines to Be Opened Under Guard—Troops Leaving Harrisburg, Pa., for Coal Fields

Railway Officers

Operating

R. B. Hoffman has been appointed superintendent of transportation of the Pacific Fruit Express with headquarters at Chicago with jurisdiction over car service matters in the territory east of Omaha, Neb., and El Paso, Tex.

F. H. Knickerbocker, general superintendent of the Oregon Short Line, with headquarters at Pocatello, Idaho, who has been appointed general manager of the Alaska Steamship Company and the Copper River & Northwestern, was born on December 10, 1875, at Chicago and entered railway service on March 16, 1897, as stenographer to the general freight agent of the Oregon Short Line with headquarters at Salt Lake City, Utah. He was successively promoted to secretary to the general superintendent on January 1, 1900; secretary to the vice-president and general manager, May 16, 1902, and to assistant to the general manager, January 1, 1909, his headquarters in each case being at Salt Lake City. He served in the latter capacity until August 15, 1916, when he was promoted to general superintendent with headquarters at Pocatello, Idaho, which position he held until the date of his recent appointment as general manager of the Alaska Steamship Company.

F. H. Knickerbocker

R. A. Pierce, superintendent of the Utah division of the Oregon Short Line with headquarters at Pocatello, Idaho, has been promoted to general superintendent with the same headquarters to succeed F. H. Knickerbocker, resigned. Mr. Pierce was born at Elmwood, Ill., on August 3, 1875, and entered railway service on November 4, 1890, as a yard clerk on the Rio Grande Western at Ogden, Utah. He served in this capacity until February 1, 1894, when he was promoted to general yardmaster at the same place, resigning this position on November 26, 1902, to become yardmaster of the Union Pacific at Ogden. He held this position until April 1, 1903, when he entered the services of the Southern Pacific as trainmaster at Ogden, which position he held until November 1, 1906, when he returned to the Union Pacific as general yardmaster at Ogden. He was appointed superintendent of the Ogden Union Railway & Depot Company on April 1, 1913, and was employed in this capacity until May 1, 1916, when he was appointed superintendent of the Utah division of the Oregon Short Line, which position he held until his recent promotion.

R. A. Pierce

EDITORIAL

Railway Age

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Service Continues Good

The shopmen's strike has now been under way for six weeks. It has had some adverse effects. These have been in evidence on some of the leading carriers serving non-union coal fields but latest reports are that congestion even on these roads is now being rapidly cleared up assisted in some cases by embargoes on traffic other than coal. On roads other than these, fast freight service—which is perhaps the best indicator of any—is not moving with quite its old time punctuality or regularity. It can hardly be said, however, that the delays are serious and certainly there is no approach whatever to anything like a crisis as to the transportation of perishable food supply. It seems rather safe to presume that most railroad managements a month ago would have considered themselves unduly optimistic if they had hoped that the operating situation would have been as good as the situation now happens to be at the end of that month. The newest development in the strikers' activity is their contention that there has been a rapid deterioration of equipment due to a failure to give it proper repairs. There may have been some deterioration but if in six weeks the strikers have failed to hinder passenger service or to slow down fast freight service any more than they have it looks as if the situation could not be much worse at the end of three times six weeks than it is now.

Theory and Practice in Concrete

The use of concrete has become so universal on the railroads and in fact so much a commonplace in the day's work that cognizance is seldom taken nowadays of the fact that its manufacture is really an art, based on sound principles of science derived from voluminous experimental data, and representing an infinite amount of careful study by no means ended. There are many evidences of this. One that merits special attention, is the method by which a number of roads have been observed to proportion aggregates on construction. However strange it may seem to close students of modern concrete construction, it is nevertheless true while some railroads are giving close attention to the design of the structure in the office, even to specifying definitely the proportions of cement, sand and gravel they give a conspicuous lack of attention to the quality and proportions of the aggregate that actually are used. As an illustration of this, it is frequently observed that where definite proportions of cement, sand and gravel are called for in the specifications governing the work of contractors, concrete is actually made by mixing the cement with run of bank gravel which often contains strippings and without giving more than the crudest consideration to wide variations in the uniformity of the material not to mention a neglect of screening to insure correct proportioning. In fact on some jobs it has appeared that more thought was given to the salvaging of the cement sacks than to the proper use of their contents. Whatever might be said about the good results which have occasionally been obtained from this method of undertaking concrete construction, this practice may nevertheless be said to represent an attitude toward concrete construction (for which surprisingly large sums are spent annually) that will sooner or later work to the injury of any road countenancing it. It may indeed be theory to include in specifications requirements as to the proportioning of the aggregate and as distinguished from this it may be good practice to use bank run. But if the results which have been obtained in the past justify the specifying of proportions, as they have, it is obvious that good reasons still exist for the railroads to conform rigidly to a practice more nearly in conformity with the art than some of them now employ.

Rail Strike and Financial Centers

One of the curious reactions to the railway shopmen's strike is the manner in which the strike has been regarded in financial circles. The facts of leading interest are that last week something like 20 leading railroad stocks advanced to new highs for the year. Among these stocks were the Chesapeake & Ohio, the Norfolk & Western and the Louisville & Nashville, all three of which have been rather badly hit by the shopmen's walkout. The reason for the favor which has been shown for the railroad issues is presumably in the main the favorable June earnings statements of a large share of the carriers. Insofar as concerns the C. & O., the N. & W. and the L. & N., the June statements were, of course, especially favorable because they reflected the heavy non-union coal traffic in June. Wall street, if one may revert to that expression, has come in recent weeks to look upon railroad stocks with a much more favorable attitude than formerly. Railroad issues have not had that same increase in price that industrial issues have had. Financial circles are, however, now turning their attention to the railroad stocks and to what the railroads are doing generally. The fact that they pay little or no attention to any possible adverse effects of the strike apparently indicates that they agree that the shopmen's strike has failed to hinder the railroads greatly in their start on a march to increasing prosperity.

Avoiding Mechanical Ruts

There is no doubt that the stockholders of railroads as well as other corporations sustain large annual losses because mechanical methods are often over standardized, new labor-saving methods and machinery being introduced only with great difficulty. The older mechanical department officers and shop foremen, in particular, are liable to get in a rut, rely too much on precedent, and believe that certain operations must be correct because they have always been done that way. Realizing that hundreds of more or less impractical machines and methods are proposed each year, it is easy to understand the caution with which railroad men adopt anything new. There is no justification, however, for the point blank refusal to try a promising new machine or method simply because it is new. Neither should it be rejected because shop men think they know more about their business than any one else and have nothing to learn. If an open-minded attitude is maintained, valuable lessons can be learned from the specialists in similar kinds of shop work. In this connection it is safe to say that some railroads maintain too stringent a policy in keeping salesmen out of the shops, as these men often convey suggestions of immense practical

value regarding carrying out the work. One of the important functions of the modern mechanical department is to avoid ruts, developing a policy of thorough investigation of the merits of new machinery and methods applicable to shop work. It is also the function of the department to show higher railroad officers the relation between modern labor-saving shop machinery and railroad net earnings.

The Proof of the Pudding

The many experiences which railways have had in adopting new ways of doing things or authorizing large expenditures for equipment on the strength of the glowing representations made by their advocates, only to find later that the results expected were not forthcoming, has quite naturally and rightly operated to put the roads constantly on their guard against newcomers. The necessity for the roads maintaining this attitude to avoid becoming the dumping ground for immature ideas does not, however, mean that they should close their minds to the ever-present possibilities of effecting economies or otherwise improving conditions to their own benefit, nor that they should not be always ready to consider the introduction of such methods or equipment as really offer some promise of substantial benefit. In view of this it is of interest to comment on the recent authorization by a large western railroad of the construction of nine new water treating plants and the remodeling of three others at an expenditure in excess of $200,000. This action has a two-fold significance, arising on the one hand, from the fact that a railroad has deliberately undertaken the construction of as many as nine new plants after having had several years' experience in water treating by various means, and arising on the other hand, from the fact of its remodeling a number of existing plants. Its action in building new plants is conclusive evidence of the continued belief of this road, at least in the efficacy of the process, and its action in remodeling existing plants affords evidence that treating plants, like other equipment established to do a certain work, are susceptible of improvement to keep pace with the development of the art. When it is considered that water treatment on railroads is still comparatively in its infancy and that some roads have not yet seen fit to interest themselves aggressively in it, these two points command attention. As ever, the proof of the pudding is in the eating, and when one road is found building treating plants upon the strength of the service obtained from others, it is reasonable to conclude that similar results may be obtained elsewhere.

Line Wire Crossings

Because of the rapidly increasing number of cross country transmission lines, in addition to the growing net work of public telephone systems, the railroads should be seriously interested in the character of the construction of these lines at the crossings with their communication and signal pole lines. Interference between power lines and railroad telegraph or signal control wires results in serious delays to traffic, to say nothing of the danger to employees. If a road operates a high tension a.c. signal line on the right of way that could become crossed with public telephone lines, the railroad may also be liable for damages resulting therefrom. These problems have received serious consideration from various state bodies, the American Railway Association and the Bureau of Standards. The A. R. A. specifications call for heavier construction for telegraph lines at power line crossings than is deemed necessary in the National Electrical Safety Code issued in 1920. The specifications of the Telegraph and Telephone Section of the A. R. A., adopted in 1922, are at variance with the code in respect to the number of wires which may be carried by an unguyed pole and also with reference to the limits on wire sag. The introduction of legislation recently in several different states relative to wire crossings has called for an unusual amount of time and information from railroad telegraph and signal officers and representatives of the communication and public utilities organizations. In order that the National Electrical Safety Code may serve as the basis for legislation in these states with minimum changes and conferences, the American Engineering Standards Committee is now forming a representative committee to consider the revision of the code dealing with wire crossings. There are several important matters for the railroad representatives to keep in mind in this revision, among which would be the elimination of the differentiation between the construction of power lines over main lines, branches and sidings. The railroad communication lines should be equally as well protected from public utilities power lines regardless of the number of trains or the size of the telegraph leads. The code, no doubt, will be adopted in whole or part as the law in numerous states, and the several sections of the A. R. A. and the railroad officers concerned might well follow the action of this proposed committee in order that the interests of the railroads may be guarded in the changes made in the code at this time.

Railroad Shop Transportation Facilities

It is a common saying that a carpenter is too busy to attend to small repairs about his own house or even to fix his roof until it leaks so badly as to be decidedly uncomfortable. In the same way it often looks as though a railroad was so busy furnishing or preparing to furnish transportation facilities to the public that no time was found to attend to the strictly local transportation problems around its own shops and terminals. Such a group of buildings, many of them often of considerable size, is frequently spread out over a large area. When the plant is laid out provision is made for standard gage tracks at the sides of the buildings and leading into them so that a car of coal can be delivered to the power house or alongside the blacksmith shop, or a car of couplers to the freight car shop. But what are the provisions for moving the coal from the bin to the various furnaces or for delivering the couplers at the car to which they are to be applied? Shops must have an adequate supply of standard gage tracks. At certain shops these have been supplemented by a well planned system of narrow gage industrial tracks which has aided greatly the distribution of materials. In the majority of cases, however, the only rolling stock provided is composed entirely of hand-pushed cars. Where tracks are well laid out a small storage battery locomotive or a platform car, self-propelled and with sufficient surplus power to haul several other small cars, would aid considerably in expediting deliveries and in reducing the costs of moving materials. In storage battery or gasoline engine industrial trucks and tractors a most convenient means of transportation is now available. Because of their flexibility and speed they can be used to great advantage even in shops which already have a system of industrial tracks. In order that they may be used to the best advantage it is important that the aisle space be of good width, well defined and kept free from obstructions. Suitable concrete walks or passage-ways also should be laid out to connect the various buildings. The whole problem of shop transportation is a large one and needs careful study, preferably by an expert. How many shops are there which have what may properly be called a real transportation system? The system and its equipment having been provided, the results obtained will then depend upon its operation. The selection of routes, the frequency with which they are covered and other problems of a similar character should be easily solved provided a suitable man is selected who is given full charge of the traffic.

President Harding's Second Strike Plan

PRESIDENT HARDING'S first plan for settling the shop employees' strike was "accepted" by the labor leaders with reservations that amounted to a rejection of it. Their answer to his proposal that railway managers and workmen should agree to recognize the validity of decisions of the Railroad Labor Board and faithfully carry them out clearly reserved to the employees the right to strike rather than carry out the Board's decisions. The railways accepted all parts of the President's plan except that which provided for taking back the strikers with their full seniority rights.

The definite rejection by the railway executives of the President's proposal regarding seniority rights has resulted in his submitting to the labor leaders and the railway executives a second plan. That is, that the strikers shall return to work, the railways shall give them employment, and the question of seniority rights shall be submitted upon its merits to and be decided by the Railroad Labor Board. Of course the President's second plan, like his first, involves, although he does not say so, rehearing by the Labor Board of the wage case and regarding the rules adopted by it to which the labor leaders object. The President's second plan was promptly rejected by the labor leaders. The meeting of the railway executives called to consider it was held too late for its outcome to be reported in this week's issue of the *Railway Age*.

It is the opinion of the *Railway Age* that the President's second plan is the only one he could have suggested which would have been consistent with the views he expressed in his letter to Chairman Cuyler of the Association of Railway Executives. The fundamental issue presented by the shop employees' strike is whether controversies between the railways and their employees are to be settled by arbitration by the Railroad Labor Board, or by strikes. The plain purpose of the labor provisions of the Transportation Act was to prevent strikes by causing every controversy which might result in a strike to be settled by decision of the Labor Board. If employees are to strike rather than accept any and every decision of the Board they do not like, then the labor provisions will fail to accomplish their purpose, and had better be repealed and the Labor Board abolished. In this instance, the labor provisions did fail of their purpose, and the supposed preventive of strikes has proven worse than the disease. It has delayed changes in working rules and reductions of wages which should have been made months before, it has not prevented a strike, and it has not made the strike any easier to settle.

The raising of the seniority issue and its becoming the principal obstacle to the settlement of the strike were inevitable results of the strike. Most of the railways could not hope to maintain normal operation without keeping many of their old shop employees and getting many new men. They could not do this without promising these men regular employment, and they could not assure them regular employment without promising them seniority rights. Once the question of seniority rights had been raised, it was a foregone conclusion that it could be settled only either first, by a complete victory for one of the combatants, or secondly, by some kind of arbitration, the performance of which function should naturally be delegated to the Railroad Labor Board. To settle the question arbitrarily in favor of either side would be to disregard the Railroad Labor Board, minimize its functions, reduce its authority and impair its prestige. On the other hand, to submit to it every issue involved, whether an issue which helped cause the strike, or one which is a direct outgrowth of it, will tend to do the very thing the President said he desires to do; viz., "establish the unchallenged authority of the Railroad Labor Board" and thereby help to make it a useful agency in "maintaining industrial peace in railroad service."

Neither the railroads, nor the employees now at work, nor those who have struck, can reasonably refuse to submit the seniority issue to the Railroad Labor Board, because this involves submitting to an impartial body on which all parties in interest are represented the determination of the question of what actually are the rights of each party. Anybody who says that this cannot be done with fairness to all says, in effect, that there is no fair way except by the use of force to settle such controversies, which is equivalent to saying that civilized society has discovered a kind of controversy that certain of its members cannot fairly settle in any way except by the uncivilized method of submitting it to the arbitration of force and violence. Any group of men who take the position that they have rights which are so clear and so paramount to those of all other members of society that the determination of whether they actually possess those rights cannot more fairly and safely be left to some form of judicial arbitrament than to the arbitrament of force take a position which no civilized society can tolerate with justice to other parties in interest, or with safety to itself.

It cannot reasonably be assumed that the Railroad Labor Board or any other governmental body performing judicial or semi-judicial functions always has or always will perform them with perfect fairness. But the Railroad Labor Board, or any other governmental body performing judicial or semi-judicial functions is much more likely, in the long run, to do approximate justice as between the parties to a controversy than either party is to do justice to the other. Both parties to the strike have agreed to submit to rehearing by the Board of the controversies which caused the strike, and the Board is just as competent to settle fairly questions which have arisen as a result of the strike as those which caused it.

The coal strike and the railroad shopmen's strike afford the most powerful arguments ever afforded in this country in favor of the public, in the interest of justice and for its own protection, adopting and rigorously enforcing measures which will require all labor controversies in essential industries to be submitted to arbitration and which will compel the parties to such controversies to accept and faithfully carry out the arbitration awards.

The "Crimes" of the Railways

SO MUCH PROPAGANDA has been disseminated from labor union sources alleging wholesale violations by the railways of the labor provisions of the Transportation Act and the decisions of the Railroad Labor Board, that it is time the public was given a plain statement of the actual facts.

The facts given in this editorial will relate only to cases affecting the shop crafts, since they are the employees who have gone on strike and offered offences committed by the railways as a reason for doing so. The facts which will be presented are taken from records compiled by and for the Railroad Labor Board, and public members of the Board are the *Railway Age's* authority for stating that the cases we shall mention are the only cases involving alleged violations by railways of the law or directions of the board, which have been brought to the attention of the board.

There are over 200 Class I railways. How many of these are involved in these alleged violations? Exactly 24. How many violations of the law or decisions of the board have been charged against these 24 carriers? The number of the alleged violations is 34. What is the nature of the alleged violations? Twenty-two out of 34 cases involve the contracting of work by 17 different railways. These railways had 12 per cent of the total mileage of all the Class I railways. Therefore no contracting of work has been complained of upon railways having 88 per cent of the total mileage. All these railways engaged in contracting work before there had ever been a decision by the Labor Board regarding whether it was legal or even desirable. Since the board rendered its decision all the railways but two have

indicated to it that they will quit contracting out work. These two railways have a mileage of 2,691 miles, which is 1.2 per cent of the total mileage of the Class I carriers.

There are seven railways which have been charged with making reductions in wages not authorized by the Labor Board. The total mileage of these railways is 4,460 miles, or about five per cent of the total mileage of the Class I railways. There have been four cases involving alleged violations of rules and working conditions fixed by the Labor Board, but they are all cases of minor importance and in not one of them has a decision been rendered by the Labor Board. The foregoing is the sum total, as shown by the records of the Labor Board, of all the outrageous violations of the law and of decisions of the board which the leaders of the shop crafts unions could truthfully charge against the Class I railways as justification for ordering the present strike.

The propaganda the labor leaders have disseminated regarding alleged violations of the law and the decisions of the Labor Board committed by the railways, is precisely similar in character to all the other propaganda that they carry on for the purpose of misleading the public.

Labor Leaders Did Not Accept President Harding's First Plan

One of the most astounding illusions that ever prevailed in the United States is the illusion that the railway shop crafts unions accepted President Harding's first plan for settling the shop employees' strike. They did not accept it any more than the railways did.

President Harding made three proposals as a basis for settling the strike. The railways rejected the third of these proposals—that relating to seniority rights. The labor unions rejected the first, which related to the attitude to be assumed in future by railways and employees toward decisions of the Railroad Labor Board. President Harding in his letters transmitting his second plan to the railways and the labor leaders expressed gratification that both of them had agreed to accept and carry out decisions of the board in future. But the labor leaders in their reply to the President's first proposal expressly reserved the right to order strikes in future against every decision of the Labor Board which may be "non-acceptable" to them.

The first of the terms of agreement presented by the President was stated in his own language as follows:

"First, railway managers and workmen are to agree to recognize the validity of all decisions of the Railroad Labor Board and to faithfully carry out such decisions as contemplated by law."

President Harding must have meant when he wrote these words that the former employees belonging to the shop crafts unions, as one of the conditions of settlement of the strike, should agree not to strike rather than accept decisions of the board in future. Otherwise his presentation of this proposal to the employees would have been meaningless, for it is only by striking that they can refuse to accept and carry out its decisions. The following is the language in which the labor leaders "accepted" this proposal, the italics used being ours:

"The employees have always taken the position that *so long as they continued to render service* they should abide by the rules and working conditions and accept the wages agreed upon by proper negotiation or determined by the Labor Board after hearing of a dispute upon any of these matters. They respectfully point out again that violations of law and refusals to comply with decisions of the Labor Board have been exhibited only by the railway managements, and that it *has been universally admitted that the employees in exercising their right to suspend work upon non-acceptable conditions, were neither violating the law nor the decisions of the Board.*"

Now, everybody who ever read the labor provisions of the Transportation Act knows that if it is a violation of law for a railroad to refuse to comply with any decision of the board, then it is equally a violation of law for any group of railway employees to refuse to abide by any decision of the board. When Mr. Jewell and his associates said it had been "universally admitted that the employees, in exercising their right to suspend work upon non-acceptable conditions, were neither violating the law nor the decisions of the board," he stated that something had been "universally admitted" which never has been admitted by anybody outside of the labor unions.

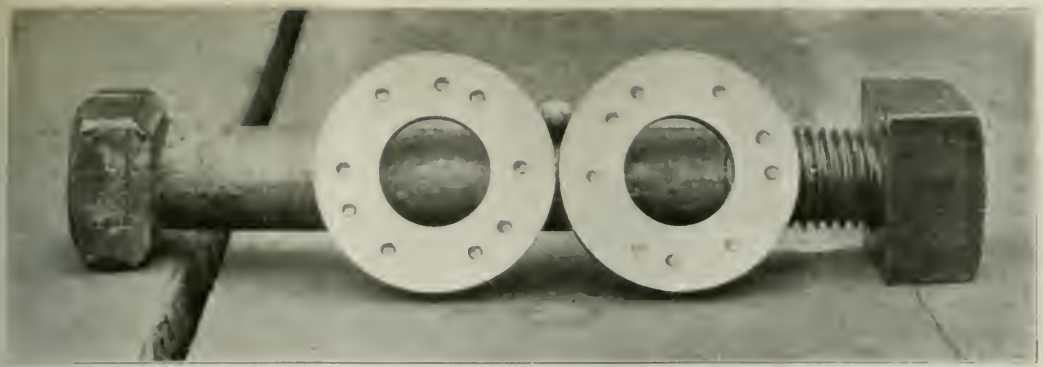
But what do these phrases, "as long as they continued to render service" and "exercising their right to suspend work upon non-acceptable conditions," mean? They mean simply that the labor unions demand that the railways shall accept and carry out every decision of the Railroad Labor Board, while the labor unions themselves reserve for themselves the "right" to strike at any time against any and every decision of the board which imposes "non-acceptable conditions" and that they even claim when they do this they are not violating the very decision of the board against which they strike! The railway executives accepted this proposal of the President, but with the understanding that it was not intended to preclude any party to a controversy from taking a decision or order of the board into court to determine whether it actually is valid.

President Harding said in his letter of July 31 to Thomas DeWitt Cuyler, chairman of the Association of Railway Executives: "It is wholly unthinkable that the Railroad Labor Board can be made a useful agency of the government in maintaining industrial peace in railway service unless employers and workers are both prompt and unquestioning in their acceptance of its decisions. I feel it is more desirable than I know how to express to have established the unchallenged authority of the Railway Labor Board because we must do those things which are necessary to bring about recognition of suitable authority to decide and end such disputes as menace the continuity of transportation." If any interpretation of the President's first proposal were needed, the language here used by him would afford it. He is seeking to make the Railroad Labor Board a useful agency in "maintaining industrial peace in the railroad service" and as a means to this end he asks employers and workers both to be "prompt and unquestioning in their acceptance of its decisions." But can it be said that a group of railway employees which expressly reserves the right to "suspend work upon non-acceptable conditions" established by the Labor Board is showing any disposition whatever to be "prompt and unquestioning in its acceptance" of the decisions of the board?

It is only too plain that the labor leaders, in pretending to "accept" the President's plan, accepted only two parts of it. The first part they accepted was that which provided that the railways should withdraw all lawsuits against the labor unions or their members growing out of the strike. The second of the terms they accepted was the President's suggestion that the striking employees should be allowed to return to work with their seniority rights unimpaired. In other words, they agreed to those parts of his plan which provided that the railways should make concessions, but rejected the most important part of it, namely, that which was designed to promote industrial peace in future.

There was much astonishment felt by railway officers that the President ever could have believed the railways would accept the first plan which he proposed for settling the strike.

There is even more reason for astonishment, however, that he or anybody else could have believed, after reading the labor leaders' letter to him, that they had accepted this plan.

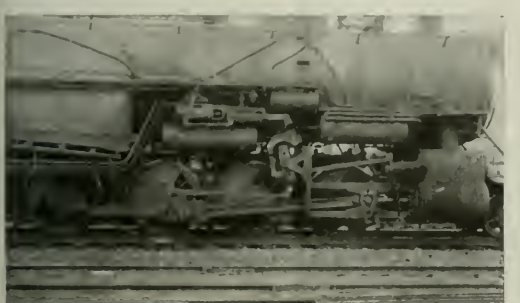


Two of the Washers Showing the Impressions Made by the Brinell Balls

Determining the Impact Loads on Track Bolts

Interesting Tests Performed on Philadelphia & Reading to Evaluate and Compare Induced Stresses

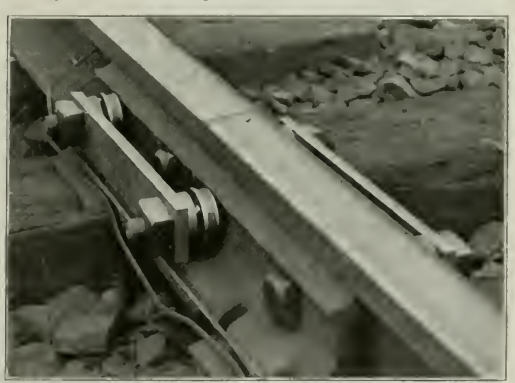
SOME INTERESTING TESTS were carried out recently to determine the stresses in track bolts induced by the impact of trains and locomotives and the pull of a trackman on a wrench. A separate test was also made to secure the breaking strength of a track bolt installed under the same conditions. These tests were conducted on the Philadelphia & Reading by the National Lock Washer Company, Newark, N. J., working with the officers of the railroad. The load caused by the impact was measured by an adaptation of the Brinell system of testing hardness, the impact or pull of the wrench forming depressions in hardened steel washers from which the stresses were determined. The average minimum and maximum loads were 25,980 lb. and 29,298 lb., giving stresses on the one-inch bolts used of 47,236 lb. per sq. in. and 53,270 lb. per sq. in. respectively.



The Locomotive Stopped Over the Joint to Show Position of Counterweight

The underlying principle of the method consisted of the forming of impressions upon hardened steel washers, through the medium of standard Brinell balls, by the loads which it was desired to determine. The equipment, which was developed, is shown clearly in the illustration and was for use with a four-hole joint. It consisted of four standard untreated one-inch bolts such as are used in insulated track joints (the standard track bolt being too short); four coned filler blocks with an angle of 41 deg. from the largest diameter face; eight hardened steel washers, $2^1/_4$ in. in diameter and $^3/_8$ in. thick, four 3-ball retaining washers, two steel bars used to prevent the washers from turning and the necessary nuts and Brinell balls. Washers were made from crucible steel, about 0.90 carbon, heat treated by quenching in oil at 1550 deg. Fahr. and drawing at 600 deg.

The field tests were made on the southbound, high-speed main track of the Philadelphia & Reading at a point opposite tower "PW," slightly over $2^1/_2$ miles north of Norristown Junction, Pa. The track at this point was laid with the Pennsylvania Steel Company's Section 105, open hearth, 100-lb. rail on tie-plated, creosoted pine ties, on stone ballast with good line and surface and four hole, reinforced angle bars.



The Test Apparatus Installed in Track

The old bolts were removed from one of the angle bars by a section man, after which the test arrangement was put in place, the new bolts being numbered 1, 2, 3 and 4 in the direction of travel. The nuts were then pulled up by the section man, using a 36-in. track wrench and applying, as nearly as possible, a normal amount of force. This was done in preparation for train No. 92, a high-speed passenger train which passed over the joint a short time after, at 58 miles an hour. The equipment consisted of a fairly heavy Atlantic

A TABLE SHOWING THE RESULTS OF THE IMPACT TESTS

Washer position, No.	Washer No. 1 – Diameter of impression 1	2	3	Average M M	Average Ins	10,000 lb. test impression diam M M	Ins	Pressure per sq. in. $H = \frac{P}{2\pi r\left(r-\sqrt{r^2-\frac{D^2}{4}}\right)}$	Load on each washer impression made in joint	Washer No. 2 – Diameter of impression 1	2	3	Average M M.	Average Ins.	10,000 lb. test impression diam. M M	Ins.	Pressure per sq. in. $H = \frac{P}{2\pi r\left(r-\sqrt{r^2-\frac{D^2}{4}}\right)}$	Load on each washer impression made in joint	Sum of impression loads determined for Washers No. 1 and No. 2	Average of impression loads determined for Washers No. 1 and No. 2	Determined load placed on each bolt for each washer position	Remarks
				BOLT No. 1									BOLT No. 1									
1	3.4	[illegible]	[illegible]4	3.43	1350				8084	3.0	3.0	2.8	2.93	1153				8906	16990	8495	25485	Passenger train
2	3.7	[illegible]	3.6	[illegible]60	1417	[illegible]8	1496	547,395 lb.	8930	3.0	3.0	2.9	2.96	.1165	3.1	1220	834,376 lb.	9102	18032	9016	27048	Freight engine
3	3.9	[illegible]	3.0	3.40	1338				7935	3.0	3.1	2.9	3.00	1181				9350	17285	8643	25929	Wrench pull
4	4.0	3.4	[illegible]7	3.70	1457				9458	3.2	3.2	3.1	3.16	.1224				10073	19531	9766	29298	Breaking bolt
				BOLT No. 2									BOLT No. 2									
1	2.0	2.9	[illegible]8	2.86	1126				8483	3.0	2.8	2.9	2.90	1141				8720	17203	8602	25806	Passenger train
2	2.9	2.7	2.8	[illegible]80	1102	[illegible]1	.1 20	8[illegible]4,376 lb.	81[illegible]	[illegible]9	[illegible]9	2.7	2.83	.1114	3.1	.1220	834,376 lb.	8297	16419	8210	24630	Freight engine
3	2.9	2.7	2.8	2.80	1102				8122	2.9	2.8	2.7	2.80	.1102				8122	16244	8122	24366	Wrench pull
				BOLT No. 3									BOLT No. 3									
1	3.2	3.8	3.5	3.5	1378				10000	2.9	3.0	3.0	2.96	.1165				9102	19102	9551	28653	Passenger train
2	3.3	3.1	3.2	3.2	1260	[illegible]3	1378	649,392 lb.	8313	3.0	3.0	2.8	2.93	.1153	3.1	.1220	834,376 lb.	8906	17219	8610	25830	Freight engine
3	3.5	3.1	3.7	3.43	1350				9590	3.0	3.0	2.9	2.96	.1165				9102	18692	9346	28038	Wrench pull
				BOLT No. 4									BOLT No. 4									
1	3.0	2.[illegible]	3.0	2.96	1165				8522	3.0	2.9	2.9	2.93	.1153				8906	17428	8214	24642	Passenger train
2	3.0	3.4	3.0	3.13	1232	[illegible]	.1260	781,189 lb.	9556	3.2	2.9	2.8	2.96	.1165	3.1	.1220	834,376 lb.	9102	18658	9329	27987	Freight engine
3	3.0	[illegible]	3.0	2.93	1153				8338	3.0	2.9	2.8	2.90	.1141				8720	17058	8529	25587	Wrench pull

	Average		Average
Passenger train	26145 lb.	Wrench pull	25980 lb.
Freight engine	26374 lb.	Breaking pull	29298 lb.

type engine with a weight on drivers of 129,210 lb.; a combination car, three day coaches and two Pullmans.

After the passage of this train, the nuts were loosened, the impressions marked for future identification and the washers turned through a small angle to secure a new bearing surface for the balls. The nuts were then turned up and a heavy Consolidation engine running light at 45 miles an hour, was run over the joint. The weight on the drivers of this locomotive was 251,920 lb., the weight on the third pair of drivers being 64,690 lb. The drivers were 53½ in. in diameter. The locomotive was stopped gradually, backed up to the joint and stopped with the third pair of drivers exactly over the joint to locate the position of the counterweight. The joint was neither subjected to a maximum nor a minimum stress but one more nearly approaching an average.

Following this test, a new surface was again brought into position and the nuts tightened by the same section man to secure the load produced by the pull of the wrench. Another surface was brought into position after this had been done and a nut on one of the bolts tightened until it broke. The hardened washers, carefully marked for identification, were taken later to a testing laboratory where each washer was subjected to a test load of 10,000 lb., using a Brinell ball of the same diameter employed in the field test. This was done to determine the unit resistance to pressure of washer from which the actual field loads could be calculated.

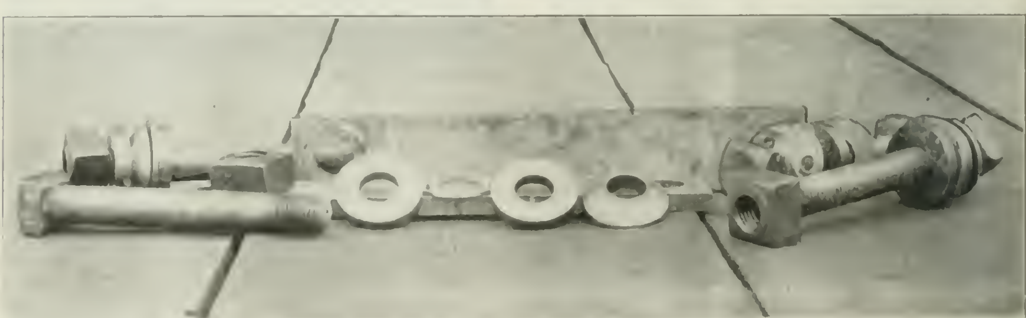
The load, as indicated by the units of three impressions on each washer, was calculated separately after which the results for the two washers on the individual bolts were averaged to secure the load. The final loads were determined from an average of the loads on each bolt. The results give a stress of 26,145 lb. on a one-inch bolt resulting from the passage of the passenger train, 26,374 lb. for the free-running freight locomotive, 25,980 lb. for the wrench pull and 29,298 lb. for the breaking pull. This gives stresses per sq in. of approximately 47,536 lb., 47,952 lb., 47,236 lb., and 53,270 lb. respectively, using 0.550 sq. in. as the area at the root of the thread. The formulas follow:

$$H = \frac{P}{2\pi r\left(r-\sqrt{r^2-\frac{D^2}{4}}\right)}$$

$$P_1 = 2\pi r H\left(r-\sqrt{r^2-\frac{D_1^2}{4}}\right)$$

H = Unit pressure on surface of ball impression made by test load or unit pressure resistance of material in washer.
P = Pressure on ball making test impression = 10,000 lb. P_1 = Pressure on ball to make track impression.
r = Radius of ball—5 m.m. in each case.
D = diameter of impression made by test load of 10,000 lb. in each class. D_1 = Diameter of impression made when washers were on track bolts.

The test described here was conducted under the direction of J. Howard Horn, National Lock Washer Company, Newark, N. J., and R. B. Abbott, assistant general superintendent, and J. S. Goodman, division engineer of the Philadelphia & Reading.



The Complete Equipment Used in the Track Test

President Proposes New Plan to Settle Strike

Asks Unions to Call Off Strike and Roads to Take Men Back, Leaving Seniority Question to Labor Board

WASHINGTON, D. C.

AFTER HAVING maneuvered both the railway executives and the federated shop craft unions into an agreement to recognize the validity of decisions of the Railroad Labor Board, President Harding on Monday proposed a new plan for a settlement of the railroad strike by a submission of the respective seniority rights of the strikers, the loyal employees who remained at work and the new employees to the Labor Board for a decision.

This proposal, which contemplates that the strikers return to work and that the railroads take them back, was embodied in nearly identical communications sent by wire to Thomas DeWitt Cuyler, chairman of the Association of Railway Executives, in New York, and by messenger to B. M. Jewell, president of the Railway Employees' Department of the American Federation of Labor, who was in Washington, about noon on Monday. The President then called the newspaper correspondents to the White House, where they were given copies of the messages with a brief explanatory statement that after great reflection and thorough investigation of all avenues of adjustment the plan of referring to the Labor Board the only remaining dispute in the way of a settlement "seems the only practical course for the government to take" and that "this is done as rather a final call, mindful of all existing conditions" including the threatened paralysis of transportation affecting many varieties of seasonal traffic and "the very great inconvenience and menace which threatens general industry through the fuel situation," and as representing "the best judgment of the government, stand-

Text of the President's Second Proposal

B. M. JEWELL:

I had your communication in which you and your associates, speaking for the striking railway shopmen pledged your agreement to the proposals which I submitted to the railway executives and your organizations for the settlement of the pending railroad strike. Inasmuch as I was acting as a voluntary mediator, seeking the earliest possible settlement, I confess to you the same disappointment which I have conveyed to the executives that the terms were not unanimously accepted. As you are already aware the executives of the carriers declared their inability to restore seniority rights unimpaired.

It is exceedingly gratifying, however, that in responding to the terms which were proposed that both the spokesmen for the carriers and the spokesmen for the employees have pledged that they "will recognize the validity of all decisions by the Railroad Labor Board and to faithfully carry out such decisions as contemplated by the law." Moreover, spokesmen for carriers and employees have approved the second paragraph of the proposal and in their approval have agreed that "Railroad Labor Board decisions which have been involved in the strike may be taken, in the exercise of recognized rights, by either party, to the Railroad Labor Board for rehearing."

Inasmuch as the employees have agreed to all the terms proposed and the executives have agreed to two of the bases of settlement and rejected the third, there remains only the question of seniority covered in paragraph three in dispute, to bar a settlement. Mindful of the pledge of both the executives and the striking workmen to recognize the validity of all decisions by the Railroad Labor Board I am hereby calling on the striking workmen to return to work, calling upon the carriers to assign them to work, calling upon both workmen and carriers, under the law, to take the question in dispute to the Railroad Labor Board for hearing and decision and a compliance by both with the decision rendered.

WARREN G. HARDING.

T. DEWITT CUYLER:

I had your communication in which you conveyed to me the resolutions of your association agreeing to two paragraphs in the proposal which I submitted for the settlement of the pending strike of railroad shop employees, and declining to accept the third, which provided for restored seniority rights of the workmen on strike. Inasmuch as I was acting as a voluntary mediator, seeking the earliest possible restoration of railway transportation to full efficiency, I confess a disappointment that the terms were not accepted.

The resolutions which you transmit on behalf of the executives do pledge that the carriers "will recognize the validity of all decisions of the Railroad Labor Board, and to faithfully carry out such decisions as contemplated by the law." You convey the further agreement, as expressed in the second paragraph of the proposal, that "Railroad Labor Board decisions which have been involved in the strike, may be taken in the exercise of recognized rights, by either party, to the Railroad Labor Board for rehearing."

The striking employees agreed to all the terms proposed, therefore only the question of seniority, covered in paragraph three, which the executives rejected, remains in dispute and bars a settlement. Mindful of the pledge of both the executives and the striking workmen to recognize the validity of all decisions by the Railroad Labor Board, I am hereby calling on the striking workmen to return to work, and calling upon the carriers to assign them to work, and calling upon both workmen and carriers under the law, to take the question in dispute to the Railroad Labor Board for hearing and decision, and a compliance by both with the decision rendered.

WARREN G. HARDING.

ing between the two contending forces and seeking an adjustment in the public interest."

The President had conferred for an hour or so on Saturday with Mr. Jewell, W. H. Johnston, president of the International Association of Machinists, and J. P. Noonan, president of the Brotherhood of Electrical Workers, and they had remained in the city and called on the President again on Monday prior to the announcement, but it was stated at the White House that he was not in a position to say what would be the attitude of labor toward the new proposal and that he had had no formal conference with any one representing the executives. It was said that "this is the government's own motion, it is not a partisan appeal, and the President hopes it will meet with public approval."

The plan is in accordance with the President's purpose as expressed on several occasions to uphold the authority of the Labor Board as the final arbiter of all disputes between the railroads and their employees. Although the President had expressed great disappointment that his original plan had been rejected by the railroads he was represented as attaching far greater importance to the acceptance of the principle of recognizing the authority of the Board.

Association of Railway Executives Meets Friday

Mr. Cuyler, who was at Bar Harbor, promptly called a meeting of the member roads of the Association of Railway Executives for New York on Friday. A meeting of the strike leaders was also called to be held at Washington on Wednesday. It was stated, however, that any decision reached at this meeting would probably be withheld until after a conference of the executives of all the railroad labor organizations on Friday.

Unions Oppose New Plan

While it was at first assumed that, as before, the President had reason to believe that his new plan would be acceptable to the shopcraft leaders, it soon became evident that they were as much opposed to the idea of calling off the strike without being assured of seniority for the strikers as the executives had been to the idea of completely surrendering the rights of their present employees. What they now want is that the President should get the Labor Board to assume jurisdiction over the seniority question before the strike is called off, and without waiting for it to be submitted as a joint dispute. The first move of the strike leaders after receiving the President's message was to call upon the train service and other railroad labor organizations for help and at the same time they apparently began a campaign of trying to alarm the public by declaring that railroad equipment is in an unsafe condition.

General Conference of Railroad Labor Leaders Called

Messrs. Jewell, Johnston and Noonan issued a statement Monday evening announcing that they had requested a conference of all executives of railroad labor organizations to be held in Washington on Friday and in their telegram to the labor executives said, "it is now apparent that no constructive program is being proposed."

Before asking for the general meeting of labor leaders they had conferred with the legislative agents of the engineers, firemen and trainmen. The statement said:

"We have requested this conference because we recognized that railroad employees not now on strike will, in defense of the traveling public and themselves, necessarily have to decline to operate the defective locomotives and cars now in service.

"It is clear to any unbiased person that railroad equipment is growing more unsafe each day, and the relief must be had through an honorable settlement. Employees now on strike are firm in their position and will continue as long as the Association of Railway Executives declines to accept reasonable terms of agreement."

The message to Warren S. Stone, as chairman of the Labor leaders, was as follows:

"Shop crafts did everything conceivable to avoid the necessity for a strike and since the strike have at all times been willing to confer with any party authorized to submit a proposal as a basis for honorable settlement. We accepted the President's terms of agreement submitted to employees and managers July 31. The Association of Railway Executives in rejecting the President's terms of agreement, obviously acting under the direction of those who exercise financial control and dictate the labor policies of the railroads, repudiated the promise given by their chairman to the President and defied the spokesman of the American people. To date, only the employees have made concessions. Obviously the strike must be settled if the country is to avoid the impending calamity of a collapse of transportation. The government has the authority to promptly settle the strike on the just, fair and reasonable basis proposed by the President July 31.

"However, it is now apparent that no constructive program is being proposed, and that unless the railroad employees can offer additional counsel and advice, the lives and safety of employees and traveling public, already endangered by the continued use of defective railroad equipment, will be imperiled to a greater extent.

"Believing that the chief executive of each of the standard railroad labor organizations, as a result of their years of experience, broad public viewpoint and sincere desire for industrial peace, can, by conference with the officers of shop crafts formulate a program having for its purpose protection of the public, preservation of the railroad industry and an honorable basis of settlement for the managers and the employees, we urgently recommend that you, as chairman of the railroad organizations, wire each chief executive requesting him to attend a conference in Washington on Friday, August 11."

Mr. Stone replied on Tuesday that the heads of all the organizations except the train service brotherhoods were in Washington or on their way and that they would be present on Friday.

Mr. Jewell has inaugurated a series of twice a day conferences with newspaper men and on Tuesday he exhibited a large number of telegrams from local organizations insisting that they would not "stand for" leaving the seniority question to the Board and that they would accept only the President's proposal of July 31. Mr. Jewell said that his message to Mr. Stone carried no suggestion of a general strike, but that the meeting was for the purpose of obtaining advice and counsel. Regarding the seniority question, he said that in the past whenever a strike had been settled it had been taken for granted that the men were to retain their seniority. When he was reminded that the present strike is the first nation-wide strike and that the situation differs from that involved in previous settlements because while some roads could take back the strikers without difficulty, many others consider that they have already defeated the strikers, he declined to admit that any road has beaten the strike and took the position that the new men employed by the roads are "no good."

One of the obstacles to the acceptance of the plan by the unions is the Labor Board resolution of July 3 which recognized the present employees rather than the strikers as the real employees of the railroads, and which the Board attempted to tone down by its action on August 7. The fact that the resolution had been adopted increases the unwillingness of the strikers to take their chances by trusting their seniority rights to the decision of the Board and they resent bitterly the idea which they consider represents the attitude of the government that they cannot be strikers and employees at the same time.

House to Be in Session

The strike situation was discussed by the Cabinet in a general way on Tuesday but no results were announced and the President declined to give any indication as to what course he would pursue if the latest plan is rejected. It was stated, however, that the House of Representatives would be kept in session after the members return on August 15. There had been some discussion of a series of short recesses

that would permit many of the members to stay away but it was stated that it was considered wise to have Congress on the job because "there is no disguising the seriousness of the coal situation and perhaps the seriousness of the railroad situation." This was taken by the newspapers to mean that the President had a legislative plan to propose. There has been some consideration of amendments to the Transportation Act to strengthen the authority of the Labor Board for the future but no definite plan for meeting the present railroad situation by legislation has been suggested.

White House Says Cuyler Saw Plan in Writing

That there was no modification of the terms of the President's proposal for a settlement of the shop strike between the time of his personal talk with Mr. Cuyler on July 27 and the formal statement of the plan in his letters to Mr. Cuyler and Mr. Jewell, except the change in the second part of the plan, relating to a rehearing before the Labor Board to which he called attention in the letter to Mr. Jewell, was stated officially at the White House on Friday. This was in response to suggestions that appeared in the press to the effect that the President's proposal on the seniority question came as a bombshell to the railway executives at their meeting in New York on August 1, for the reason that some change had been made in the plan. There was a very marked difference in the plan as formally announced and the unofficial forecasts of it that had appeared in the newspapers and attributed to official sources, but the President authorized the newspaper men to quote him as saying that "in a matter of such importance or in any of his official transactions he never permits a misunderstanding or makes a misrepresentation." It was stated that there was a change in part 2 of the plan, wholly voluntary on the President's part, because it was contrary to the original proposal, and that the President had pointed this out in formally communicating the plan to Mr. Jewell, but that Mr. Cuyler saw the proposal in writing at the time of his personal conference with the President and that there was no change thereafter in the part relating to seniority. Newspaper men had been told at the White House on July 28, at the time it was announced that the President had a plan to propose, that it had not been completely formulated, and Mr. Cuyler had been quoted in New York as saying that when he left Washington it had not been drafted. No information was given out at the White House regarding the terms of the plan until one o'clock Tuesday afternoon, after it had been submitted to the railway executives in New York, but the stories printed to the effect that the employees remaining at work would be given seniority above the strikers certainly received some encouragement, if not inspiration, in official circles and the statement indicating that Mr. Cuyler and Mr. Atterbury had promised that they would back the plan or at least not oppose it was attributed to a Senator who has been acting as one of the go-betweens for the President.

It was also stated at the White House that the government is always anxious to bring about a settlement in matters of this kind which vitally affect the public welfare and that there was very great disappointment that the proposal submitted was not accepted all around. However the President was represented as feeling that a great advantage had been gained in that both the railroad executives and the union leaders have accepted what he terms the two basic points in the settlement proposal, namely, that both managers and workmen agreed to recognize the validity of all decisions of the Labor Board, that the carriers would withdraw lawsuits and that Labor Board decisions which have been involved in the strike may be taken to the Labor Board for rehearing. This recognition of the authority of the Labor Board is regarded by the President as the most important point and he feels that so long as both parties accept the jurisdiction of the Labor Board a marked degree of progress has been made. As to the third point of the proposal, relating to seniority rights, it was stated on behalf of the President that the government only undertook voluntary mediation because that sort of mediation between carriers and employees is contemplated in the Transportation Act.

Brotherhoods Urge Acceptance of President's Original Proposal

The legislative agents of the engineers', firemen's and trainmen's brotherhoods called on President Harding on Saturday, August 5, to present the views of their executives in connection with the shop strike situation and their complaints that their members had been urged to take out equipment in unsafe condition. A telegram to the legislative agents sent by W. S. Stone, grand chief of the Brotherhood of Locomotive Engineers; W. G. Lee, president of the Brotherhood of Railroad Trainmen, and D. B. Robertson, president of the Brotherhood of Locomotive Firemen and Enginemen, had asked them to present the following to the President:

"Complaints in increasing numbers are pouring into our respective offices against demands that our men take out locomotives and equipment which are in dangerous and unsafe condition, in violation of safety statutes and rules which have been enacted for the protection of the lives and property of the public, and of assaults on and insults to our members by armed guards that are placed on the various railroad properties.

"Up to this time, by constant urging of a neutral attitude, fidelity to their contracts and in the interest of public peace and safety, we have prevailed on our members to continue at their posts. Constant aggravation of the above conditions and the refusal of the railroad executives to accept the proposals of the President for a compromise settlement of pending questions are making the situation infinitely more difficult to handle. The plain intention of the railroad executives to smash the shop craft unions is resulting in more and more of the locomotives and equipment getting into disrepair, and the dangers of a most hazardous occupation are being daily increased.

"We fear that a continuation of these conditions will inevitably result in our members, as a matter of self-protection, being drawn into the controversy, and we greatly deplore such a contingency.

"We feel that the American public is fully in sympathy with the President's efforts to settle this strike, and, in the light of the above facts and in the interest of public welfare, peace and safety, we suggest you call upon the President and urge him to again bring this matter to the attention of the railroad executives, with the hope that he may yet succeed in convincing them of the necessity for their prompt acceptance of the President's proposals, which have been accepted by the shop crafts.

"Continued refusal to accept the President's proposals for a compromise settlement of pending questions will place upon the railroad executives full responsibility for the increasing seriousness of the situation.

"We suggest you file this message with the President, as a basis for discussion with him of the questions at issue and to show you have full authority of the undersigned chief executives to meet him. We are wiring the President you will call upon him with full authority to discuss this subject."

The brotherhood representatives told the newspaper men that they had no thought of a sympathetic strike but that they were trying to emphasize the seriousness of the situation.

I. C. C. to Report on Locomotive Inspection

The Senate on August 7 adopted without debate the resolution proposed by Senator King of Utah directing the Interstate Commerce Commission to report whether the locomotive inspection act is being violated and, if so, the extent of such violation, and whether inspection of locomotive boilers is presently being made in all federal locomotive boiler inspection districts and on all roads, as required by the act. The commission is preparing to reply to the resolution as quickly as possible. It will probably reply that its force of inspectors is totally inadequate to report on the condition at any given time of 70,000 locomotives scattered over 270,000 miles of track and 4,000 terminals, but it is doubtless in a position to give the results of the reports that have been made by its inspectors.

According to reports reaching the commission, there have

been comparatively few cases of enginemen refusing to take out locomotives because of their condition and they have received instructions from their officers to ignore minor defects but to take it up with the management if they feel that the engine is actually unsafe. Labor leaders said on Tuesday, however, that new instructions had been issued.

Mr. Gompers on Record

As a part of the campaign to alarm the public, Samuel Gompers, president of the American Federation of Labor, on August 8, issued the following statement:

"Reports of railroad wrecks have been frequent of late and in at least one such accident, on the Missouri Pacific, 35 persons were killed and more than 100 injured.

"There has been no statement as to the cause of these frequent wrecks other than the statements issued by railroad managers which have uniformly ascribed the wrecks to causes other than faulty railroad equipment. In the most serious of these recent wrecks the railroad officials stated that the engineer had run past stop signals.

"In view of the large number of apparently authentic statements charging a deplorable condition of railroad equipment, the public should be furnished with a more authoritative and unbiased statement than any which are furnished by railroad officials where train accidents occur.

"If it is true that a high percentage of locomotives is unfit for operation may it not be the case that the increasing frequency of railroad wrecks is due to the use of such defective locomotives?

"It seems to me entirely proper that in every case of a railroad accident there should be an immediate inquiry by public officials who are not under the influence of railroad authorities and that the public should be immediately informed of the results of such inquiry in order that it may be known whether use of unfit locomotives, in defiance of rules of safety and in defiance of law, is taking a toll of human life.

"Constant reiteration, by persons evidently in possession of accurate information, of charges that totally unfit locomotives are being used both in the freight and passenger service of the various railroads justifies the demand for some other explanation for the increasing number of wrecks than those offered by railroad officials."

The Bad Order Locomotive Situation

The Association of Railway Executives on August 4 authorized the following:

"Representatives of the striking railroad employees are attempting to arouse public concern over the alleged enormous impairment in the condition of the motive power and cars of the railroads.

"No industry in the world is conducted with anything like the publicity which surrounds all the important aspects of American railroad operation. Among other things the railroads report and publish regularly statistics covering their car loadings, their idle cars and their bad order equipment.

"The stories to the effect that a thousand locomotives are falling out of use every day are ridiculous. On July 15 of this year two weeks after the strike began there were fewer locomotives in bad order than February 1, March 1, April 1, May 1 or June 1. Below are the figures showing the number of bad order locomotives from July 1, 1921 to July 15, 1922, inclusive

	Locomotives
July 1, 1921	15,437
August 1, 1921	15,643
September 1, 1921	15,569
October 1, 1921	15,471
November 1, 1921	15,491
December 1, 1921	15,790
January 1, 1922	18,881
February 1, 1922	15,865
March 1, 1922	16,497
April 1, 1922	16,165
May 1, 1922	16,237
June 1, 1922	15,765
July 1, 1922	11,134
July 15, 1922	15,764

The number of bad order cars has been excessive ever since the period of federal control. The inability of the railroads to earn even operating expenses during a part of 1921, coupled with the resistance of the men now on strike to any reasonable reduction in wages, made the adequate maintenance of the cars of the country financially impossible over a long period. Bad order cars on July 1 numbered 324,583, and on July 15, 342,078, an increase of 17,495. This is not an abnormal increase, in view of the traffic indicated by the heavy car loadings of the months of June and July."

Of the 15,764 locomotives in bad order on July 15, 12,254 needed repairs requiring over 24 hours and 3,510 required less than 24 hours.

In a conference with newspaper men on Tuesday Mr. Jewell and Mr. Johnston said they had been trying to get information regarding the condition of equipment but had not yet analyzed their reports. However, they said, experience indicated that the railroads ought to repair 70,000 cars a day, including 6,000 for heavy repairs and 64,000 for light repairs, and about 1,000 locomotives a day, and with the men on strike these repairs are not being made while accurate reports are not being made because only a few inspectors are left in service. Mr. Johnston said that even if the strike were settled at once it would take a year to get the equipment back into proper condition.

Mr. Johnston also volunteered the information that they had received reports from pickets that railroads had imported strikebreakers from Europe, in ignorance of the character of the work, and that they had taken the matter up with the Department of Labor. He said he had not the faintest idea as to how many had been so imported and he mentioned the Chesapeake & Ohio as the source of his "first report" on the subject.

Asked whether the men would go back to work in the event the government should take over certain roads on the basis of the President's proposal Mr. Johnston said: "If the government took over all the roads," and Mr. Jewell assented, "is this government going to constitute itself a strikebreaking agency by taking over the roads on which we make the strike most effective?" he asked. There will be no separate settlements, they added. The labor leaders also asserted that Mr. Cuyler had not only seen a written copy of the President's original plan but that he had promised to accept it and that the President was "put out" because the labor leaders insisted that they were without authority to accept a plan.

Predictions That President May Take Over Coal Roads

Press predictions that the President is thinking of taking over the railroads or those on which coal movement has been retarded since the beginning of the strike of shop employees are apparently based on rather vague statements of one or two cabinet officers that the government has the power, if it were deemed necessary, to have receiverships declared for roads which are unable to give proper service, but there have been no indications in official circles that such a plan has been very seriously considered. It has been definitely stated at the White House that the President believes he has power in case of a sufficient emergency to take over either the railroads or the coal mines without legal legislation, but it was added that it was not likely that the railroad situation would take that tack. There has been a suggestion, however, that the President would propose legislation for the creation of a coal commission and there are some more or less definite plans for amendments to the labor provisions of the transportation act.

Southern Railway's Proposals Rejected

The committee representing the shop crafts on the Southern Railway on Tuesday definitely rejected the proposals of the company for an individual settlement on the basis of the President's original proposal, on the ground that a national issue is involved and that any settlement must be made on a national basis.

Declaring that the Southern Railway had "more than fulfilled" its duty to striking shop employees in endeavoring to get them to return to work under the terms of President Harding's strike settlement offers, Fairfax Harrison, president of the road, sent telegraphic appeals throughout the service for assistance in the endeavor to maintain "unimpaired transportation service" notwithstanding the strike.

"Our duty is to our employees, the public and the company," the message said. "The duty to our striking employees we have more than fulfilled, and I now call upon you, whatever is your occupation, to assist the management in performing its duty also to the public and the company. This obligation calls for unimpaired transportation service and this we will perform."

Strikers' Meeting Postponed

The meeting of the officers of the shop crafts intended to be held on Wednesday to consider the President's proposal was postponed until Thursday, but it was stated that no definite answer to the President would be formulated at least until after the general conference of the 17 railroad labor organization executives on Friday.

T. H. Davis, chairman of a general shop crafts committee of the Pennsylvania System, headed a delegation of Pennsylvania employees who called on President Harding on Wednesday and urged the President not to countenance any strike settlement which would impair the seniority status of men who remained in railroad service in spite of the strike. About 65 per cent of the Pennsylvania shop employees, Mr. Davis said, remained at work and others who went out have returned, so that at present about 75 per cent of the old men are on the job.

Mr. Jewell issued a statement on Wednesday based on the figures in the American Railway Association's semi-monthly report of locomotive equipment filed for July 15, which, he said, showed that the railroads had fallen behind in required locomotive repairs during the first 15 days of the strike by 6,587 locomotives. He also called attention to the fact that the report itself shows that the figures of previous reports were used "account labor trouble" for 18 roads. The statement also said that the federal locomotive inspection and safety appliance laws are not being complied with during the strike; that no proper inspections are being made and no reports being released giving the true condition. Mr. Jewell said there are only 50 government inspectors and asked why additional government officials are not assigned to require compliance with the law and protect the traveling public and railroad employees when taxpayers are called upon to pay for "thousands of additional guards, police and sheriffs, to say nothing about state militiamen and federal soldiers."

Secretary Hoover on August 7 issued the following statement in reply to reports that at a conference with a number of New York bankers on August 1, preceding his address to the railway executives, he had tried to persuade the bankers to use their influence toward a settlement of the strike: "The statement as it appears in the press is entirely incorrect. The meeting took place between myself and a small group of bankers and others at the request of some of their members, in which the general economic situation that was resulting from the coal and railway strikes was discussed by me, and I counseled that all responsible men should show moderation.

"There was no suggestion that banking pressure should be brought on any particular group, but that men of influence should exert themselves toward securing compromise and early settlement."

Strike Developments in Chicago and the West

In the West during the past week the strike of shopmen has been a story of continued success on the part of the railroads in rebuilding their shop forces, accompanied by intermittent outbreaks of rioting and violence which has resulted in the death of strikers, loyal employees and police officers who have attempted to restore order. To a large extent the past week's developments are a repetition of those described for the previous week in the *Railway Age* of August 5, page 249. The resumption of violence on the part of the striking shopmen was not wholly unexpected inasmuch as the railroads emphatic stand on the seniority issue, their announced intention of protecting to the fullest extent their loyal employees and those who have been hired to take the place of strikers, and the success of the carriers in recruiting new and experienced men, have all tended to make the strikers restless and apprehensive as to the success of the strike and their future. On the other hand, the constantly recurring rumors of a settlement by the government, always with the intimation that the strikers will be restored with their seniority and other rights practically unimpaired has tended to retard the return of shopmen to work.

The success western roads are meeting in rebuilding their shop forces is clearly indicated by the fact that whereas on July 25, 44,501 shopmen were at work, on August 1, the forces had been increased to 58,075, on August 3 to 63,329 and on August 5 to 65,552.

Practically all of the larger roads in the west are reporting daily increases in their shop forces of from 150 to 300 men, all experienced and capable workers who have been selected with the view of their becoming permanent and useful employees. Some of the large roads in Chicago have been so successful in the recruiting of employees that their shop forces are rapidly approaching normal and this has resulted in several cases in an actual improvement in the bad order car situation as compared with the situation prevailing before the strike began.

The propaganda to the effect that the strike is seriously interfering with freight and passenger traffic in western territory has led to the issuance of several statements by the western executives giving the results of daily reports, particularly by those roads whose headquarters are in Chicago. On August 4 it was said:

"The reports of the roads (with headquarters in Chicago) show that the strike is having practically no effect upon the ability of the carriers to render adequate freight and passenger service, all of the roads reporting that they are handling freight traffic currently and that the operation of passenger trains continues normal."

On August 8, it was announced that:

"The western roads report that they are handling the freight traffic offered in a normal way. Several of the larger roads report that they are handling an exceptionally heavy freight traffic, almost equal, in several cases, to the heaviest movement on record. As to the passenger traffic, reports of the curtailment of service, when correct, apply practically without exception to unprofitable and unnecessary trains which have been taken off solely to conserve coal supplies."

Rioting and Intimidation Continues at Various Points

The violence which has accompanied the success of the carriers in building up their shop forces and followed their decided stand on the seniority issue has been most marked at Joliet, Ill., where on August 7 a serious riot necessitated the calling of state militia to restore order. A special agent of the Elgin, Joliet & Eastern and a striker were killed and Sheriff James A. Newkirk was seriously wounded in the fighting. According to the latest reports the state troops have restored order.

At Joliet, as has been the case at many other points during the past two weeks, violence has been due not to attempts on the part of strikers to interfere with railroad operations but to their attempt to intimidate loyal employees in and around their homes. In the majority of cases strikers have gathered, marched to the homes of loyal employees with the intention of damaging their houses and property as much as possible and bloodshed has resulted when police officers have attempted to disperse the rioters.

The tense situation prevailing after the rioting at Joliet

and the arrival of state troops resulted on August 9 in the refusal to work by the train service employees on the Joliet division of the Elgin, Joliet & Eastern. The walkout was called in protest against the presence of the troops in the terminal yards at Joliet and was decided upon at a meeting of the brotherhood men involved on August 8. The train service men felt that the troops were not needed in Joliet, according to the chairman of the local organization. The engineers, firemen, conductors and brakemen reported for work as usual on August 9 but refused to take out their trains and engines until the troops had been removed.

Among the other acts of violence which have been reported during the past week are the following:

One man said to be a striker was killed and another wounded during an exchange of shots on August 3 at Van Buren, Ark., between guards in the Missouri Pacific shop and men who are believed to be strikers or strike sympathizers. At Jackson, Mich., several police officers and striking shopmen were injured, when more than a thousand strikers and sympathizers, including many women and children, attacked non-union workers as they were leaving the shops of the Michigan Central at that place. Eighty strike sympathizers attacked more than sixty workers in the Chicago Great Western shops at Des Moines, Iowa, resulting in the severe injury of one participant and the kidnapping of several of the loyal employees. All of the men kidnapped were later accounted for, having been carried some distance and mistreated before being released. On the same day two demonstrations before the homes of loyal employees were made in Lincoln, Neb., by strikers and sympathizers. Four non-union employees of the Missouri, Kansas & Texas were severely treated and put off a train at Upton, Texas, by strike sympathizers.

On August 4 two deaths resulting from rioting were reported, one in Edgemond, S. D., where a switchman of the Chicago, Burlington & Quincy was shot and the other in Chicago where a carpenter employed in the Illinois Central shops was beaten to death. A repairman in the Illinois Central shops at Chicago was also severely beaten because he refused to join the strikers. A Union Pacific trainmaster was seized by a mob at Las Vegas, Nev., taken several miles into the desert and given a coat of tar and excelsior by a crowd of strike sympathizers. Previous to this four women had attacked the wife of a Union Pacific roundhouse foreman as she was carrying dinner to her husband and severely beat her. At Birmingham, Ala., two men and two women were severely injured in a clash between non-union workers and striking shopmen of the St. Louis-San Francisco.

On August 5 the reports from various parts of western territory included the following:

At Newark, Ohio, a negro claiming to be a federal marshal shot and killed a striking shopman and wounded another. At Albert Lea, Minn., several men were seriously injured and a large number suffered minor injuries in an attack on the Minneapolis & St. Louis roundhouse by strikers and strike sympathizers. According to the report approximately eighty men stormed the roundhouse, driving the employees therein away but again losing control of the property when the employees launched a counter attack and retook the building. At Joliet, Ill., a striking shopman formerly employed by the Elgin, Joliet & Eastern was shot while doing picket duty near the property of that carrier. Striking shopmen blamed the armed guards in the employ of the railroad for the shooting and it resulted in tense ill feeling which later culminated in the disturbance described above. On August 6, a car foreman employed by the Illinois Central at Birmingham, Ala., was kidnapped and severely beaten by armed men supposed to be striking shopmen.

More Carriers Obtain More Injunctions

More injunctions restraining strikers or strike sympathizers from interfering with the work of loyal employees and new men hired to take the place of those on strike were issued during the past week to various western carriers. Among the injunctions of this character reported during the past week are included those involving the Chicago, Milwaukee & St. Paul at Madison, Wis., Helena, Mont., and Seattle, Wash., the Texas & New Orleans and the Gulf, Colorado & Santa Fe at Texarkana, Texas, the Nashville, Chattanooga & St. Louis at Chattanooga, Tenn., the Chicago & North Western at Superior, Wis., and the Los Angeles & Salt Lake at Salt Lake City, Utah. At several points strikers or their sympathizers have been arrested under the provisions of similar injunctions, for instance, 17 men being arrested at Beardstown, Ill., and Roadhouse, charged with violating injunctions previously issued to the Chicago, Burlington & Quincy and the Chicago & Alton. The men were released on bond and will be tried in the Federal Court at Springfield, Ill.

Rumors of the Spread of the Strike Again Circulated

Reports of a spread of the shopmen's strike are still being circulated, many of the leaders of other organizations announcing, as strategic moves, that their membership continue to urge the calling of a strike in sympathy with the shopmen or on new "grievances."

E. F. Grable, president of the United Brotherhood of the Maintenance of Way employees, on August 6 received a telegram from William D. Roberts of Wilkes-Barre, Pa., vice-president of the maintenance of way organization on 28 eastern railroads, asking for a sympathetic strike in behalf of the shopmen. Mr. Grable is quoted as having notified Mr. Roberts that "there would be no change in our program for the present." Somewhat similar situations have been reported from time to time by the leaders of the other organizations which had previously decided to abide by the Board's decisions and allow the shopmen to carry on their fight alone. Reports of difficulties of a similar character on individual roads in western territory have also been made during the past week, among them the threat of the strike of clerks on the Great Northern, strike balloting on seven other northwestern roads by the same class of employees, the threat of the strike of maintenance of way employees on the Chicago Milwaukee & St. Paul and a similar move by the telegraphers on the Big Four.

That the strike situation now centers in Washington is indicated by the fact that not only has B. M. Jewell, president of the Railway Employees Department of the American Federation of Labor and head of the striking shopmen, and his executive counsel directed their activities from there during the past week, but that Mr. Grable, J. G. Larson, head of the train dispatchers' organization, E. H. Fitzgerald, president of the clerks' union and several other leaders have either joined the Washington gathering or announced their intention to do so in the future.

Santa Fe Shopmen Petition President Harding and Labor Board for Protection

The loyal and new shop employees of the Atchison, Topeka & Santa Fe on August 2 urged both President Harding and Ben W. Hooper, chairman of the Labor Board, to guarantee them their positions and seniority when the shopmen's strike ends. The telegram, in the form of a resolution, outlines the events which led up to the strike, adding:

"Whereas, the members and officers of the several crafts have openly threatened to run out of the various shops all men now employed therein including foremen, when they (the crafts) return to work, and,

"Whereas, these threats linked with the press reports of peace being near have been the means of keeping the minds of the men in fear and uncertainty, thus keeping many men from returning to work and,

"Whereas, we have reasons to believe that this is the only motive that actuates the strike leaders in putting out this 'peace defensive' as they call it,

"Resolved, by the men employed in the shops of the Santa Fe railway that having confidence in the promise of the Labor Board, backed by the President of the United States and believing them incapable of permitting any organized board to deprive men who have been loyal to the government in this great crisis, of the right of employment retained or accepted under certain solemn promises as were made to the men now working on American railroads.

"Therefore be it further resolved, that a failure on the part of our government to redeem the promises made would be a betrayal of the men who remained loyal because of the belief so frequently expressed by government representatives that the crafts were striking against a decision of a government board and would destroy all faith in government."

Labor Board Agrees to Take Up Seniority Issue

The Railroad Labor Board, acting upon the President's new plan for settlement of the strike, adopted a resolution on August 7 agreeing to take up the seniority issue and render a decision on it. The Board's resolution said:

Whereas, the President of the United States recently made certain suggestions to the railway executives and the representatives of the railway employees now on strike, looking toward the settlement of the strike, which suggestions were in part agreed to by both parties, and

Whereas, the one question upon which there was such a wide divergence of opinion that the carriers declined to accept the President's suggestion was that of the reinstatement of the men on strike with seniority and other rights unimpaired, and

Whereas, the President has since suggested that the question of seniority be submitted to the Railroad Labor Board for hearing and decision, and

Whereas, the Railroad Labor Board on July 3, 1922, passed a resolution which, while it makes no express reference to seniority has been generally construed to have inferential bearing on same, and

Whereas, it has been thought that this resolution, although it does not possess the force and effect of a decision, might stand in the way of the submission of this question to the Railroad Labor Board in accordance with the suggestion of the President, now, therefore,

Be it Resolved, that the Board signify its willingness to extend to the carriers and any employees concerned ample opportunity to present in accordance with the Transportation Act and the established procedure of the Board any dispute involving the seniority question or to seek an interpretation of the rules covering said question, and to submit, on both sides, such testimony and argument, as may be deemed advisable; to the end that the Board may, after a full and fair hearing of every phase of the question involved, render a formal decision adjudicating the matters in controversy. It is the purpose of the Board to indicate by this resolution that it will as promptly and readily consider and determine the questions of seniority growing out of the present strike as it will rehear the wage and rule questions which were originally involved in the strike. The only difference in the attitude of the Board toward the wage and rule questions on the one hand and the seniority question on the other, is that as to the former, the Board would be called upon to rehear matters already formally decided and, as to the latter, to consider a question which has not been formally heard and decided, but which has been inferentially touched upon in the resolution of July 3, 1922.

An amendment to this resolution was offered by A. O. Wharton, the only member of the labor group on the Board present, to the effect that the "Board rescind the resolution of July 3, insofar as that resolution has been interpreted to affect the question of seniority." This amendment, however, was defeated and Chairman Hooper subsequently made the following explanation of his vote which also explains the position of the majority on this question:

"I voted NO on the proposed amendment because it in effect requires the Board to take action now on the question of seniority, which is the very thing that this resolution proposes that the Board shall do later, after a full hearing has been had. A resolution without this amendment means that the Board is in a position to give the question of seniority full and fair consideration regardless of the resolution of July 3."

W. L. McMenimen and Albert Phillips, the other labor members on the Board, and R. M. Barton, a member of the public group, were not present. The resolution was passed by the votes of Chairman Hooper and G. W. W. Hanger, both of the public group, and the three members of the railroad group, Mr. Wharton voting against.

Labor Board Chairman Approves President's Peace Plan

Commenting on President Harding's new peace proposals, Chairman Hooper on August 8 said:

"The President's proposition is fair and practical. It would conserve the law, would sacrifice the rights of neither party and would save the country from the further ill-effects of the strike.

"It was to be anticipated that there would be some objection to it on both sides, but such objections are not insuperable. The concurrent condemnation of opposite extremes raises a suspicion that the President must have found the safe and sane position of fairness and conservatism. The opinion already expressed by one executive that the President's recommendation seems to 'demand a complete surrender' on the part of the railways and the characterization of the proposal by a leader of the employees as 'an uncalled for attempt to help the railroads break the strike' will be hard to reconcile in the public mind.

"On many of the railroads, the President's plan can be carried out without any inconvenience whatever, on others with but slight inconvenience, and, on a small number, it would unquestionably involve some difficulty.

"It must not be overlooked, however, that there are several conditions that would contribute to the working out of such a solution. Many of the new men employed by the carriers in the haste and urgency of a strike are not competent mechanics, and will ultimately be dropped for cause. On a large number of the roads, there was not a full shop force before the strike began, many men having been laid off for months. It is estimated that 75,000 men had thus been furloughed. The rising tide of business prosperity and the consequent increase of railway traffic, coupled with the accumulated shop work resulting from the strike, will necessitate the employment of a greatly enlarged number of mechanics. The other ordinary processes of readjustment that always follow a strike would likewise operate effectively. On a very large number of the roads, in my judgment, the question of seniority would never even arise."

The Situation in the East

STRIKE CONDITIONS on the Eastern roads have, generally speaking, undergone but slight change during the past week. No serious disturbances have been reported. Traffic moves normally. The roads by continued recruiting are bringing their shop forces to higher and higher percentages of normal. Indeed so favorable have conditions become on some of the roads that they are assisting roads in other sections of the country by sending men to them. The roads which have been aided in this manner are the Chesapeake & Ohio, the Norfolk & Western, the Louisville & Nashville and the Virginian—all of which serve non-union bituminous coal regions and on which the unions have concentrated their efforts to bring about a stoppage of traffic. The New York, New Haven & Hartford has been acting as an employing agent for the Norfolk & Western and Chesapeake & Ohio and has placed advertisements in papers in its territory stating that New Haven officers will accept applications for positions on these roads.

Official figures of shop forces in Eastern territory, as of August 4, given out by L. F. Loree, president of the Delaware & Hudson, were 103,528 or 64.7 per cent of normal, as against 97,724 or 62.7 per cent on July 28. The Pennsylvania has been particularly fortunate in increasing its shop forces. On August 4 its forces totaled 46,603, or 77.5 per cent of normal. A progress report on recruiting given out by this company is given in the accompanying table.

There have been some few instances of narrowly averted accidents suggestive of attempted sabotage, the most outstanding of which occurred last Sunday on the Long Island, when a number of current-carrying third rails were taken from

tracks in the electrified zone, apparently in a malicious attempt to wreck trains and bring a stoppage of heavy Sunday traffic to the beaches. The railroad has offered a reward of $1,000 for the arrest and conviction of persons found guilty of the deed, and it is reported that strikers in the metropolitan area have offered a similar reward.

A COMPARATIVE STATEMENT OF MEN WORKING—PENNSYLVANIA SYSTEM SHOP FORCES

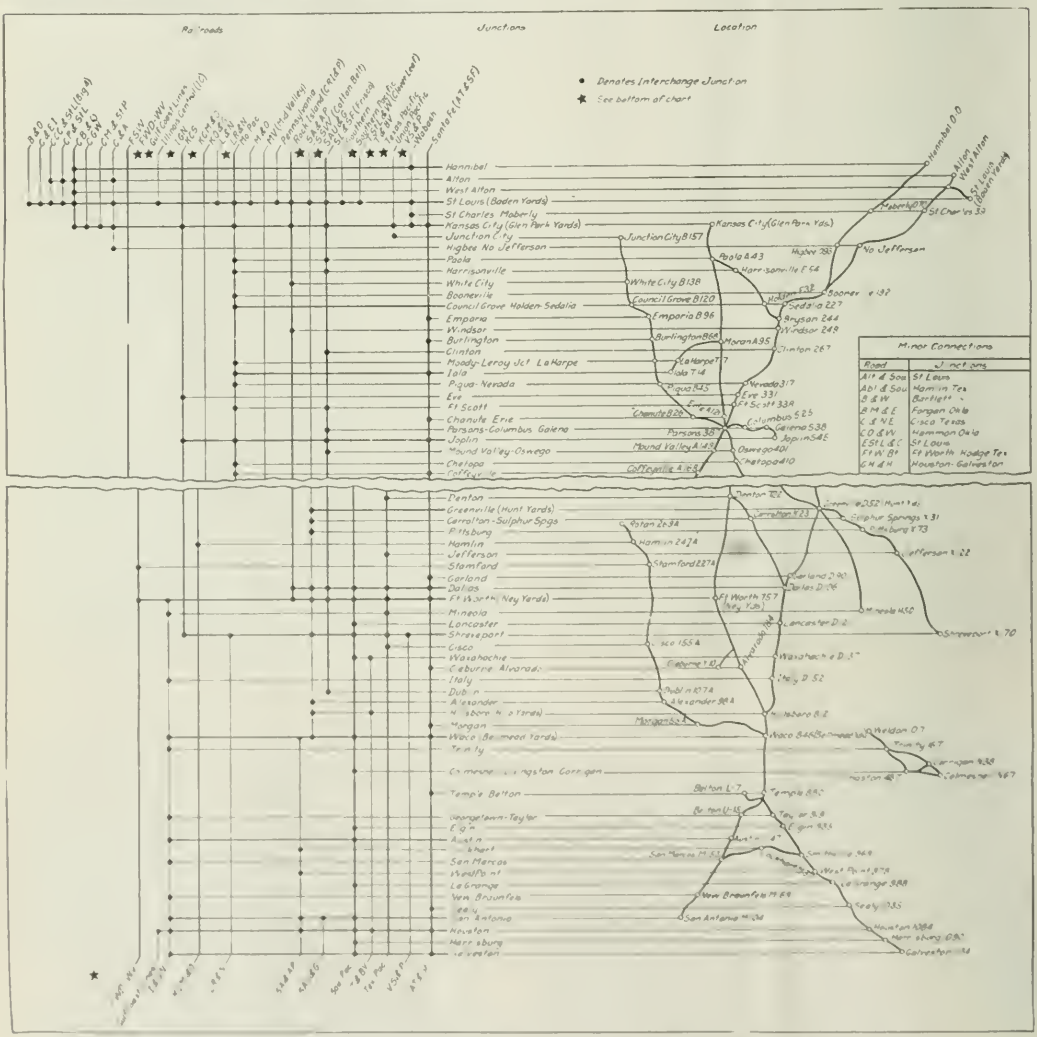
Date	Normal	No. working	Per cent working	Increase over same day of previous week	Increase over July 5th
July 8th	60,157	40,875	67.9	2,590	2,590
July 15th	60,157	41,885	69.6	1,010	3,600
July 22nd	60,157	42,368	70.4	483	4,083
July 29th	60,157	44,448	73.9	2,080	6,163
Aug. 4th	60,157	46,603	77.5	2,155	8,318

A strike of clerks on the New York, New Haven & Hartford which was threatened last week has been averted by an agreement between the management and these employees which is said to restore temporarily the working conditions which prevailed prior to July 1, but under the new rates of pay as established by the Labor Board.

Employees of the Cooke plant of the American Locomotive Company at Paterson, N. J., to the number of approximately 250, walked out on Tuesday rather than permit repairs to be made to Erie locomotives. It was said that these strikers have appealed to employees of other plants of the American Locomotive Company likewise to refuse to repair locomotives of railroads whose shop employees were on strike.

The Erie has announced the cancellation of 20 trains in the Hornell region on account of the shortage of fuel.

The Pennsylvania announced on Wednesday of this week that striking employees returning to the service would not lose their accumulated pension privileges. Seniority, the statement said, depends upon the continuity of employment, while pensions are based upon the total years of service, regardless of whether they are continuous or not.



A Conveniently Arranged Chart of Interchange Connections—Missouri, Kansas & Texas Lines

A Convenient Chart of Interchange Connection

A CHART showing all interchange connections of the Missouri, Kansas & Texas system, arranged alphabetically by the names of the roads and by locations on the home line, has been developed by R. W. Edwards, superintendent car service of the M. K. & T. lines. The chart, the form of which is shown in the illustration, is contained in the latest circular of information and instructions governing employees in the disposition of empty railroad owned freight equipment, and has been so proportioned that it occupies the two middle pages of the 8-in. by 11-in. circular.

By referring to the illustration on the opposite page it will be seen that the names of the connecting lines are listed across the top. With one exception this list has been arranged alphabetically so that any road may be quickly located. In the case of the Santa Fe, however, the fact that numerous interchanges with this road are located along the entire line led to its location at the right of the list of connections, adjoining the table of junction points, merely as a matter of convenience in the organization of the chart.

The table of junctions is arranged vertically in station order from north to south, the map of the line being distorted sufficiently to permit joining each name in the table with the corresponding location on the road by a horizontal line. These horizontal lines are continued to the left, intersecting the vertical lines extending downward from the names of the connecting roads, the names of the connections at each junction point being indicated by black circles where the horizontal and vertical lines intersect. In addition to the table of junction points the names of the junctions are shown on the map together with their station numbers, which indicate the mileage from the northern terminals in the case of main line points and the mileage from the junctions in the case of branch line points. To simplify the appearance of the chart those roads with connections nearer the southern end of the system have been star marked in the list of connections at the top of the chart and repeated at the bottom with the vertical reference lines extending up from the bottom.

The purpose of this chart is to facilitate the reduction of empty mileage in the disposition of empty foreign freight cars. It is intended for use in station and yard offices, where the nearest interchange point with any connection may quickly be located, the mileage being readily computed on the basis of station numbers. The circular containing the chart will also be distributed to carload shippers along the line of Missouri, Kansas & Texas, to whom it will prove useful in routing interline shipments.

Missouri Pacific Accident at Sulphur Springs, Mo.

Rear-End Collision on Evening of August 5, Results in Death of 37 and Injury to Over 100 People.

ONE OF THE WORST accidents in the history of the Missouri Pacific occurred at Sulphur Springs, Mo., on the evening of August 5, when passenger train No. 4, northbound from Texas, crashed into the rear of local passenger train No. 32, killing 37 and injuring over 100

Home Signal Location 232-233—Signal 232 Was Knocked Down

people. Train No. 32 had stopped for water when train No. 4, having passed a distant and a home automatic block signal set against it, crashed into it. The engineman of No. 4 jumped off and was killed; and the fireman was severely injured.

The collision occurred on the Missouri division of the Iron Mountain, 25 miles south of St. Louis. This line is double track from St. Louis to Cliff Cave, a distance of 13 miles and is single track from that point south. Trains are operated by train orders and an automatic block signal system which extends from St. Louis to Poplar Bluff, Mo., a distance of 165 miles. The track follows the west bank of the Mississippi River from Cliff Cave through Sulphur Springs to Riverside, 3.5 miles south of Sulphur Springs and is a succession of curves with only short stretches of tangent.

Approaching the point of accident from the south, northbound distant signal No. D232 is located 1,275 ft. north of mile post 24. The track is tangent to a point 396 ft. north of the signal where it curves to the left with a 2 deg. curve 1,320 ft. long. There is then 198 ft. of tangent when a 2 deg. 48 min. curve starts to the right. The accident occurred at a point 1,360 ft. from the beginning of this curve. The water tank is located on the curve 615 ft. north of the point of the accident and the Sulphur Springs station is 422 ft. north of the tank. A bridge about 85 ft. long and about 56 ft. above water spans Glaize creek. The south end of the bridge is 495 ft. south of the tank.

The single track territory where this accident occurred is

Looking South from Point of Collision

protected by automatic block signals. Three position upper quadrant home signals are used and two position upper quadrant distant signals, the latter operating from the 45 deg. position to the 90 deg. position. Home automatic block signals Nos. 232 and 233 are located 55 ft. south of the south end of the bridge. The northbound distant signal 232, mentioned above, is 3,289 ft. south of its home signal. The

control circuits of both the home signal and its distant signal overlap the next home signal in advance, the control of northbound home signal 262 at Riverside, extending beyond the next northbound home signal 232, at which point the accident occurred.

The first point at which the engineman on train No. 4 could see the water tank is 3,337 ft. south of it. The tank and standing train should also have been visible 3,112 ft. south; and the home signal, tank and all of train 32 should have been visible to the engineman on train No. 4 at a point 2,254 ft. south. A full view of the rear of the standing train could be obtained at a point 709 ft. south of the home signal location. There is 1,089 ft. of tangent track approaching distant signal D232. When train 32 stopped with the engine opposite the water tank, the end of the rear car stood approximately 80 ft. south of the home signals south of the bridge.

Train No. 32 had 10 cars, including two baggage cars, one combination baggage and mail car, one mail car, three chair cars and three coaches. Train No. 4 had a mountain type passenger locomotive and consisted of 12 steel cars including 6 baggage cars, two combination coach and chair cars, one Pullman, two dead-head coaches and a dining car.

On the evening of the accident, No. 32 arrived at Riverside at 6:48 and departed at 7:07, while No. 4 passed at 7:13. No trouble had been experienced by either train in making running time although No. 32 was 2 hrs and 11 min. late out of Riverside and No. 4 was 20 minutes late. No. 32 was delayed at Riverside longer than usual as it had an order to meet No. 41. No. 4 had been running about 45 miles an hour and slowed down to about 25 miles an hour at Riverside to pick up a 19 order which read:

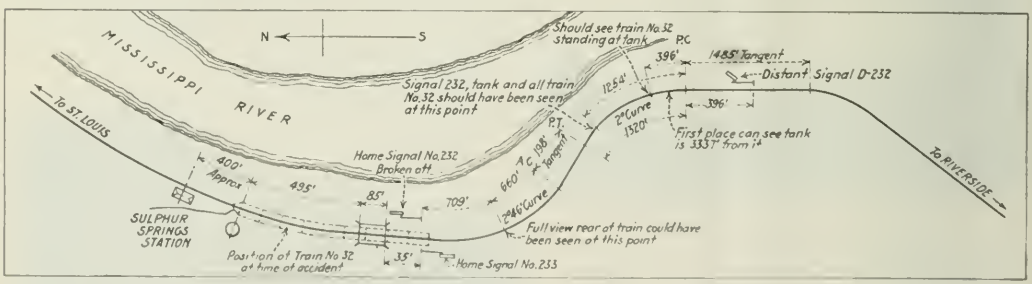
"No. 1 engine 5,306 wait at White House until 7:37 p. m. Wicks 7:40 p. m. for No. 4 engine 5,312."

No. 4 then began to pick up speed and apparently passed home automatic block signal No. 262, located about 1,380 ft around the curve north of Riverside station. This signal was in the stop position. No. 4 evidently failed to reduce speed at distant signal D232 governing the approach to home signal 232, the point of the accident. The speed of the train was estimated to be about 40 miles an hour when it struck No. 32, although just before the crash brakes were applied in emergency. No. 32 had stopped at the water tank about 30 seconds before the crash came, the fireman not having started to take water. The flagman was on the fourth car from the rear and north of the bridge.

Members of the train crews stated that the automatic signals gave the proper indication after they had passed them. They were found to be indicating properly by signalmen after the accident and all lights were burning. The mast of signal 232 was knocked down but the mechanism was found in the stop position.

The coroner's jury at the inquest held at De Soto on August 7 returned a verdict that the collision was due to the negligence of the engineman of train No. 4 in failing to observe signals. In the investigation by the Bureau of Safety representatives which began immediately after the close of the coroner's inquest members of the train crew on No. 4 stated that at the ten or twelve stops made before the accident they observed nothing unusual and that the engineman had no trouble in making the customary station stops. The fireman was too badly injured to obtain a statement at that time. The engineman had been in the service of the company for 37 years and had a perfect record. The investigation showed that the crew of train No. 32 had been lax in flagging at Riverside and Sulphur Springs. Both trains involved were of the same class and had equal rights. When No. 32 was at Riverside the conductor inquired of the operator if he should let No. 4 pass between there and St. Louis. The dispatcher, when told that No. 32 expected to let No. 1 pass at Wicks, 4.2 miles north of Sulphur Springs, said he could let No. 4 pass there. The employees involved were not on duty in violation of the hours of service law.

A Close-Up of the Wreckage



Layout of Track and Signals at Scene of Accident

The Commission has granted the motion of the Corporation Commission of Oklahoma to dismiss the proceeding involving Oklahoma intrastate rates because of the removal of the unlawful discrimination against interstate commerce which had resulted from previous action of the Oklahoma commission.

The Application of Engineering in Transportation*

Modern Operation Requires Analytical Study of Data and Formulation of Practices Therefrom

By G. D. Brooke,
Superintendent of Transportation, Western Lines, Baltimore & Ohio

WHAT IS THE TEST or criterion of an engineer? Is it the degree conferred by an institution of learning? Without any thought of disparaging the value of such a degree and with full recognition and belief in the advantages of the training of technical men in our colleges and universities, the answer is, "No!" What, then, is the measure of an engineer? The national engineering societies require as qualifications of membership from six to ten years' actual practice and some four or more years in responsible charge of work—graduation from a school of engineering of recognized standing being equal to two years of actual practice—and moreover, the ability to design engineering works. Experience then is the requisite of the engineer; and knowledge and ability gained through this experience, as evidenced by having been in actual charge of work, of having directed such work and of being competent in engineering design, are the things which measure the engineer.

The officers of our railroads, the trainmasters, superintendents, general superintendents, superintendents of transportation, general managers, and others, whatever their titles may be, who have direct charge of transportation, through their years of service or practice in transportation, through their knowledge and ability gained in the school of experience, as evidenced by the organizations, the operations, the work under their direction, have qualified as transportation engineers just as truly as have our engineers of construction, our mechanical engineers and our maintenance engineers qualified in their respective branches of engineering. And our usefulness as transportation engineers is measured by the skill with which we carry through our undertakings, by our ability to do well with one dollar that which can easily be done with two after a fashion, by our capability to comprehend and bring about the proper balance between locomotive maintenance, locomotive operation, and other transportation expenses.

Moreover, the methods of engineering are generally applicable in dealing with transportation problems. They consist briefly of surveys, observations or other means of collecting data, the marshalling of this data by means of drawings, tabulations or other convenient form, the study and analysis of the information thus prepared, the designing of structures or works or the planning of methods of procedure, and the actual construction in accordance with the designs or the execution of the work according to the plans. In some of the problems of engineering the conditions are to a large degree fixed or constant and can be met with designs or plans of work which are to a certain degree permanent. In others the conditions are gradually changing and have to be met by changes in design. In no branch of engineering is there such continual changing of the conditions as in railroad transportation. Not only is it subjected to varying physical conditions, as by the seasonal changes of temperature and other weather conditions—by which also the maintenance of roadbed and tracks are affected—but the flow of traffic is subjected to the same seasonal changes and in addition many other influences are constantly being brought to play upon it. This inherent characteristic of transportation, variability, places upon the transportation engineer the task not only of thorough study and analysis of the problems arising from the more constant conditions but also of meeting continually in an effectual and economical way new situations which, although they present themselves almost daily and without warning, are persistently different from their predecessors.

Careful Analysis Will Bear Fruit

In some classes of service the requirements of the traffic fix to a large degree the general features of the schedules, the size of the trains and the character of the equipment. This is particularly the case in passenger service and the opportunities for economies are not so great as in other branches. But even here continued and careful analysis will bear fruit. On a division where there are a number of local passenger runs it may be found feasible, by changing the lay-up points of engines and cars or by coupling up runs to reduce the number of locomotives and cars required, and even to reduce the crew expense. And as passenger travel varies with the seasons and from other causes, it will frequently be found that cars can be taken off during light periods and so save locomotive fuel and repairs to equipment and insure greater reliability in the observance of the schedules. Where a passenger train has a fast schedule, particu-

*Abstracted from a paper presented before the Western Society of Engineers, Chicago, May 18.

larly if there are a number of stops, the elimination of one car from the train will make a considerable saving in the amount of fuel consumed in making the runs. The cutting off from a six-car train of one heavy car will easily save a ton of fuel on a 100-mile run over the average profile.

An important feature of transportation is the adaptation of train operation to the requirements of the traffic. The problems to be met vary from the simple one of a slow moving traffic, as of coal or ore on some engine district reaching into the mine fields, where the business can best be handled in slow freight trains, with perhaps one or two local passenger trains per day, to the busy multiple track trunk line with a heavy and diversified traffic, requiring two or three classes of passenger trains with varying schedules, express and mail trains, two or more fast freight trains, a large volume of slow freight to be moved in tonnage trains, and the local and pickup trains which handle the way freight, do the station switching and move cars to and from local points.

Each case between and including these extremes offers a different problem. A simple one is that of an engine district having a mixed freight traffic requiring some two to three through freight trains, a local freight train, and two local passenger trains per day in each direction. It will probably be found that the best freight service can be given by running at least two freight trains daily on definite schedules, suitably spaced throughout the 24 hours, and handling any additional business in extras, run daily or every other day as required. The freight trains may be heavily loaded and the schedules slow but if they are maintained with regularity the service will be reliable and satisfactory from a traffic standpoint as well as economical and efficient in the use of locomotives and cars. Branch line trains of this kind should be scheduled to arrive at the junctions so that cars of important freight can be switched out and forwarded without excessive delay in fast freights on the main line, thus affording continuous movement to destination. With a more complex traffic situation a more elaborate arrangement of train service must be provided. The important thing is to plan the train service so as to be attractive to travelers and shippers and thereby enable the traffic department to sell transportation, to fill the empty seats and to give the freight locomotive a full load.

Large Train Loads

In recent years the value of a high train load has become to a great extent a matter of course, and many railroads have systematic methods of following this important feature of transportation. It is not possible to emphasize too strongly the important relation of the train load to the cost of moving freight. Fortunately methods of determining the proper tonnage ratings for locomotives have been established scientifically and are available in the proceedings of the American Railway Engineering Association and in other engineering and railroad literature, so that it is a comparatively simple matter to compute the train load for various speeds on the ruling grades and the adjustment factors to compensate for the frictional resistance of additional cars under varying temperatures. There remains, though, the ever-present problem of determining, under varying traffic conditions, the running time over the engine district with given speeds on the ruling grades and of ascertaining thereby the engine rating which will produce ton-miles at the minimum cost.

On a district having a small percentage of the mileage of the ruling grade, particularly if broken up into short sections, the locomotives can be rated for quite slow speeds on the ruling grade—say from seven to ten miles per hour—without seriously lengthening the time over the district. On the other hand, where much of the mileage is of the maximum grade the rating must be made for higher speeds on this grade in order that the time over the district will not be excessive. Of course the amount of interference by opposing trains and by higher speed trains in the same direction on single track lines, and by important high speed trains on multiple track lines, is a limiting factor in determining the average speed over the district, and must be weighed carefully in fixing the locomotive rating. It should be realized that the economical rating of a few months ago when traffic was very thin may not be the economical rating today with the more frequent business, nor that of today the proper rating for next fall when the volume of traffic will be heavy.

On a mountain division which moves a heavy traffic, some two-thirds of which is coal, it has been found economical to reduce the tonnage of the eastbound trains by one-third during periods of light business and to use one pusher on the helper grades instead of the two required for the heavier train load. This makes practicable the closing of two helper stations and speeds up the road movement so that overtime is virtually eliminated, resulting in a lower cost of handling the freight. When business is heavy, though, it has been found that with a given number of locomotives available a greater volume of tonnage can be moved with the heavier trains, requiring two helpers on the hills, and it has been found expedient to revert to this scheme of operation even though the cost is somewhat higher.

Through Routing of Trains

Another feature of great importance in transportation is a definite scheme of systematic switching or classification and through routing of trains. Although offering possibilities of great economies, it has not received anything like the attention during the last decade that has been accorded the development of the train load, due doubtless to the results being of a less definite nature and more difficult to reduce to figures, and to the failure of transportation men to realize fully the advantages which follow the establishment of such a scheme. Then, too, a great deal of careful and painstaking work is required and when the plan or scheme has been developed there is need of a firm hand to supervise it and to see that there are no departures from its provisions.

Detailed information as to the routing of business over and the delivery and assembling of loads and empties on each road and terminal district, the amount and character of classification already in effect at each yard, the capacity of each yard both for holding cars and for switching, the character of the traffic and the train schedules, must be gathered and prepared in tabulations, diagrams or other convenient form for analysis. And since the officer who is to work out or design the scheme should have a working knowledge of each yard and each engine district, it seems essential that he supervise and personally engage in the assembling of this information. Then, with suitable plans of the yards and terminals and track charts of all engine districts, he is in position to analyze the problem thoroughly and to draw up a tentative scheme of classification to meet both the divisional and the system requirements. After this it is advisable to call together in conference the yardmasters and the superintendents and other transportation officers in suitable groups to consider the tentative scheme and make such revisions as may be found advisable.

The completed scheme should then be published in suitable form for distribution to the officers and employees whose duty it is to carry out its provisions. The cardinal principle of systematic classification and through routing of trains is that the first classification yard that switches a car after the bill is made and it starts on its journey, places it in the classification that will take it through to the point of delivery, or to the last yard short of its destination, without another switch. Station order switching of cars for the engine districts leading out of each yard, the classification of empty cars according to their class and suitability for loading with the different kinds of freight are among its provisions.

To obtain the full benefit of the through routing of trains

it is advisable also to establish a scheme of car inspection and repairs by which the equipment will be in condition when loaded or when received in interchange to go through in the proper classification without being cut out for repairs. Then, with a sufficient volume of business, trains can be built up to move through terminal after terminal as "main trackers," requiring only the changing of locomotives and crews and such inspection as is necessary to detect unsafe defects which may have developed on line of road since leaving the last terminal.

Intensive Utilization of Cars

The economic or intensive utilization of freight cars embraces the principal factors of high average car mileage and high average car loading, which are to a considerable degree inter-dependent. There must be not only a high mileage per car per day but the unproductive mileage must also be reduced to the minimum. By unproductive mileage is meant the useless haul of cars, whether loaded or empty. When two or four or ten cars are used to move a shipment of freight where one or three or nine would have sufficed, unproductive mileage is made just as truly as where there is a cross-haul of empty cars suitable for the same class of loading. It is here that the feature of proper car loading comes in. By far the greatest percentage of empty mileage is not unproductive mileage, for the reason that in the nature of the traffic there is no possibility of securing a return load and the movement of the empty is an integral step in transporting the shipment. With the proper realization of this condition an analysis will show that the opportunities of reducing unproductive mileage are far less than seem to be generally assumed.

It would seem then that about the only way to make unproductive empty mileage is to haul empty stock cars, refrigerators or box cars east or north or to move empty coal cars away from the mining districts. And such really is the case. It is true that during the war, and the years of heavy business succeeding it, the movement of traffic was more nearly balanced and stock cars, gondolas and even flats were loaded with cement, stock cars with brick and tile, rough loading box with tinplate and other finished steel products, to quite a large extent. In fact a load could be secured for almost any car capable of being made approximately suitable even at a heavy expense. This condition reached the maximum in March, 1920, when the railroads of the country were able to reduce the empty mileage to 27.7 per cent of the total—the lowest of which there is record. But these were not normal times nor does there seem to be much likelihood of a recurrence of the balance of traffic movement which then obtained.

There are a few instances of cross-haul of box cars, rough loaders being used in one direction and good tight cars in the other, causing duplicate empty mileage, but these are exceptions. During the periods when business is falling off rapidly, considerable empty mileage is made in hauling cars to suitable points for storage. Empty mileage is also made in the movement of bad order cars to convenient shops for repairs. None of this empty mileage, moreover, is unproductive mileage, for it is made in meeting situations which arise in the most practicable way.

How, then, is unproductive mileage made? Largely through the inexperience or carelessness of agents, yard clerks and other employees who route the cars improperly. During the extensive relocation of equipment which took place in the autumn of 1920 and the following winter, there was doubtless considerable of this misrouting, for the car service rules had been inoperative for several years, during which many new employees had entered railroad service and the personnel of the yard and station forces was untrained or rusty in the handling of cars under the rules. A year later when another relocation of the same kind but of a less extent took place and these forces were well trained there was comparatively little of this misrouting of empty cars. There is even greater improvement in this respect at the present time and although if all of the unproductive movements on a large railroad system could be stated in car mileage, the figures probably would be rather startling, if reduced to a percentage of the total car mileage, the result would seem insignificant and the efficiency of car handling would be found quite high.

The attainment of a high average car mileage requires sufficient business to utilize all suitable cars, freedom from congestion in road movement, prompt handling in yards and at stations and quick loading and unloading by the shippers or the railroad's own forces. The attainment of a high average carload requires the securing of as many loads as possible in the direction of the preponderating empty movement, the distribution of the cars so as to adapt the size and capacity of the car to the character of the load, co-operation of shippers in loading the cars to either the cubic or the carrying capacity and the obtaining of such maximum loading at freight stations, warehouses and other loading points operated by the railroad.

Lengthening Locomotive Runs

If the accounts of a railroad are examined it will be found that the expenses directly affected by locomotive utilization and train operation will run around 35 per cent of all expenses and 50 per cent of the cost of maintenance of equipment and conducting transportation. From this it is apparent that a broad field is offered here for effecting real economies. A great many factors are involved, some of which are the adaptation of types of locomotives to the requirements of the service, the length of locomotive runs, the pooling of locomotives or their operation with regular or assigned crews, the manipulation of power by the chief dispatcher, and the scheduling of slow freight trains out of terminals and over the road.

Here, as in other branches of transportation work, there are many situations to be met and each requires thorough analysis to determine what is the best solution. On one division pooling will give the best results; on another the regular crewing of locomotives will be found best. The tendency of the immediate present seems to be towards longer locomotive runs in both freight and passenger service. Long runs keep the locomotives on the road and so increase the percentage of working time to the total, and reduce the number of dispatchments and hence the engine house expenses. The mileage per locomotive is increased so that the same work is done by a smaller number of locomotives and in this way the cost of locomotive maintenance is decreased. In passenger service coal burning locomotives have for years been making runs of 200 to 300 miles and locomotives in slow freight service 150 to 170 miles regularly and even as high as 187 miles on a very heavy traffic division. So there is nothing new or experimental in long runs. But a very large percentage of the freight runs have been around 100 miles, ranging perhaps from 80 to 120 miles. Now modern locomotives are capable of long periods of sustained performance and the number of comparatively short runs seems to offer excellent opportunities of coupling up runs and effecting economies thereby. A number of passenger locomotive runs have recently been lengthened on the Baltimore & Ohio, the longest resulting run being from Louisville to Toledo, a distance of 330 miles, and on one division the freight locomotives are now running 258 miles where the runs were formerly one-half that distance.

In adapting locomotives to the service on various districts the problem is usually that of using those on hand to the best advantage. The elimination of light types from heavy service and of retiring them permanently or at least so long as heavier locomotives are available is of prime importance;

almost equally so is the disposition of the occasional type which is unusually vulnerable and is constantly giving trouble on the road or spends too much of its time undergoing repairs. Then, too, it may be found that a certain type of locomotive will perform more efficiently and reliably in continuous service, or its weight and axle loads will meet possible restrictions, and hence is peculiarly fitted for use in connection with the lengthening of runs.

On every engine district having a heavy mixed traffic slow freight trains called during certain periods of the day will make better runs than those called at other hours. The chief dispatcher will be found taking cognizance of this and arranging the calls of slow freights accordingly. The full development of this idea will prove of much value where a large volume of slow freight is to be moved in extra trains and can be carried a step further by making standard schedules for the movement of the trains over the district. They can be prepared in simple form, for example, giving the running time between points where operating stops are made, as at water stations, coal docks, and helper stations, and can be printed on cards of convenient size to be carried in the pocket or in the back of the time table. These schedules set the pace for the engine and train crews and give them something definite to work to in their trips over the district.

Substantial results have recently been obtained by the establishment of schedules for the operation of freight trains with assigned locomotives and crews on the Chicago division of the Baltimore & Ohio. An analysis of the traffic on the division showed an unbalanced movement, the eastbound power requirements being the greater on account of the volume of livestock and quick dispatch freight moving in light high speed trains. The westbound slow freight was being handled in trains of full tonnage and the surplus power run light. The division consists of two districts of approximately 130 miles each and the men in engine and train service live principally at the intermediate terminal, Garrett, Ind. It was determined to give trains to all westbound locomotives and runs were scheduled so as to get the power to Chicago in time to return with the eastbound movement of livestock and quick dispatch freight trains departing between 6 p. m. and midnight.

A brief description of one schedule will make clear the method of operation: a train departs from Willard at 3 p. m. and arrives at Garrett at 11 p. m., where it changes engine and train crews; it then departs at 11:30 p. m. with the same locomotive and train and arrives at South Chicago at 7:30 a. m. On the return trip the train departs from South Chicago at 7 p. m. and arrives at Garrett at 11:30 p. m., where it changes engine and train crews, the men relieved having 24 hours ahead of them off duty; the train departs at 12:01 a. m. and arrives at Willard at 6 a. m. The engine and train crews leave Willard on the schedule at 3 p. m. and arrive at Garrett at 11 p. m., where the men are relieved and are off duty for 24 hours. The schedule requires two locomotives, four engine crews and four train crews. The men are on duty about 16 hours on the round trip and have an eight hour rest at South Chicago or Willard and 24 hours off duty at Garrett, out of each 48 hours.

The advantages are improved working conditions for the crews; running locomotives through and thereby increasing the mileage and eliminating the roundhouse work at Garrett, elimination of all overtime, the better movement of westbound loads and empties, the saving of approximately 150 car days per day, and the general toning up of the entire organization and performance of the division. Although this method of operation was not started until March 10, the mileage made by ten locomotives used in the service averaged 5,763 miles for the month, the highest made by any one locomotive being 7,032 miles. This average is about 2,000 miles greater than a similar average for the month of February. The results are considered thoroughly satisfactory.

The Toledo division of the same road has recently furnished a good example of the unusual demands frequently met in transportation. The coal production in eastern and southeastern Kentucky has been very heavy since the middle of April and a large part of the business has been routed through Cincinnati. The Baltimore & Ohio, having docks at Toledo, has received the routing of all the coal for transshipment via the lakes and also a heavy all-rail traffic. The division consists of a double track line from Cincinnati to Dayton—60 miles—and a single track line from Dayton to Toledo—140 miles—there being only two short stretches of double track north of Dayton. The heaviest previous business was handled in July, 1918, when 736 loads and 29 empties per day were moved north from Cincinnati. During the first 15 days of May an average of 931 loads and 44 empties has been moved, an increase over the previous record business of 27 per cent. The southbound daily movement into Cincinnati during the same period was 233 loads and 705 empties, a total of 938 cars.

The movement of this heavy traffic in a very satisfactory manner has been due to the ability to dispose of the all-rail business to connections freely; the control of the lake coal by temporary restrictions when the dumping at the lake port was retarded on account of weather conditions or shortage of boats, a sufficient but not an over-supply of suitable power and the systematic classification and through routing of trains on this and connecting divisions. There are three through and one local passenger trains per day in each direction over the single track north of Dayton and two scheduled fast freights and one local freight. From 17 to 21 trains per day have been required to move the freight tonnage north from Cincinnati.

The Illinois Central, in its latest newspaper advertisement to promote better relations with the public, tabulates the history of its "1921 Dollar" as follows:

Where the 1921 Dollar Came From

	Cents
Transportation of freight (44,637,466 tons; average distance per ton 270.46 miles; average revenue per ton per mile 1.015 cents)	71.71
Transportation of passengers (37,027,889 passengers; average distance per passenger, 25.25 miles; average revenue per passenger per mile 3.104 cents	16.98
Transportation of mail	1.69
Transportation of express	1.53
Sources related to freight service, such as demurrage and storage, and special service	0.49
Switching service	0.85
Sources related to passenger service, such as operation of parlor cars, excess baggage, etc.	0.56
Hotel, restaurant, dining and buffet service	0.58
Station and train privileges, and miscellaneous	0.32
Rents of equipment, road, buildings and other property, joint facilities, and miscellaneous income	2.79
Income from corporate investments	2.50
	100.00

Where the 1921 Dollar Went

	Wages Cents	Material Cents	Total Cents
Maintenance of tracks, roadbed, buildings, bridges and other structures (wages, 54.7 per cent; material, 45.3 per cent)	8.56	7.09	15.65
Maintenance of locomotives, freight and passenger cars and other equipment (wages, 62.67 per cent; material, 37.33 per cent)	11.87	7.07	18.94
Train, station and switching operations, and other transportation service (wages, 92.96 per cent; material, 7.04 per cent)	24.81	1.88	26.69
Traffic agencies, compilation and issuance of tariffs, miscellaneous traffic expenses (wages, 73.44 per cent; material, 26.56 per cent)	0.94	0.34	1.28
Hotel, restaurant, dining and buffet service (wages, 48.39 per cent; material, 51.61 per cent)	0.30	0.32	0.62
Fuel	...	...	7.50
Salaries of clerks and other general office employees	...	...	1.48
Legal expenses	...	...	0.18
Pension department expenses	...	...	0.16
Salaries of general officers	...	...	0.19
Valuation expenses	...	...	0.15
Miscellaneous general expenses	...	...	0.37
Depreciation and retirement of equipment	...	...	3.90
Loss, damage and casualties	...	...	1.97
Rent of equipment, leased lines, joint facilities and miscellaneous rents	...	...	2.45
Interest on bonds and other interest charges	...	...	6.85
Dividends on capital stock	...	...	4.48
Taxes	...	...	5.54
Balance available for enlarging and improving the property	...	...	1.60
			100.00

James M. Herbert

JAMES M. HERBERT, president of the St. Louis Southwestern and its subsidiary, the St. Louis Southwestern of Texas, died suddenly in St. Louis on August 5 from an attack of apoplexy. He was stricken while in his automobile returning from a baseball game and died before he could be removed from the car.

Mr. Herbert was a man of great energy, both physically and mentally. He was essentially a man of action, aggressive in disposition, with the ability to make decisions quickly. When he came to the Cotton Belt as vice-president on August 1, 1916, the situation required a strong hand. The property was under-maintained and the equipment was in particularly bad condition. Mr. Herbert attacked this problem with a directness that brought a marked change within a short time.

Being promoted to president on August 1, 1917, he was in charge of the property during the turbulent days of federal control which began five months later and during the equally trying period of reconstruction which has followed. These days were particularly turbulent among the roads of the Southwest where the existing order was changed more radically than elsewhere.

J. M. Herbert

Mr. Herbert was known among those with whom he came in contact as a man who possessed the courage of his convictions. An interesting illustration of this characteristic of his was afforded by his decision to reject the government guarantee of earnings during the six months' period following the termination of federal control. Standing on his belief that the property had suffered under federal administration, he chose to undertake its rehabilitation without that support and the restrictions which would have followed. That this decision required courage is indicated by the fact that during the calendar year 1919 the road had failed to earn its standard return by $2,348,755. That Mr. Herbert's confidence in the ability of the management to regain its ground was well founded is indicated by the fact that the net income of the road for this guarantee period exceeded the standard return which the road would have received by $306,754, after spending $1,593,285 more for the maintenance of the property than it was estimated that the road would have been permitted to have spent under the terms of the guaranty.

Mr. Herbert was a man who was willing to assume responsibility and who, as president, directed the management of the property in detail. Having started at the bottom in the operating department he had a thorough grasp of the problems which enabled him to establish a close contact with employees. The Cotton Belt, in common with other roads, suffered from the demoralization of its forces during federal control but with the return of the property to its owners on March 1, 1920, Mr. Herbert was successful to an unusual degree in enlisting their co-operation. As a result, during the switchmen's strike in the spring of 1920, the Cotton Belt was able to keep its freight house in St. Louis open continuously and had the situation so well in hand that it offered to send to connecting roads for freight if these roads were themselves unable to make delivery. This aggressive policy has also done much to win the support of the shippers for the road.

Mr. Herbert was born at Belmont, Pa., on January 15, 1863. He entered railroad service in 1880 as a night telegraph operator on the Wabash, St. Louis & Pacific, now a part of the Wabash System, after which he was employed consecutively on this road as station agent, yard clerk, train dispatcher, chief train dispatcher and train master to June, 1897, with the exception of a few months when he was with the Cleveland, Cincinnati, Chicago & St. Louis. From June, 1897, to June, 1898, he was train master on the Eastern division of the Grand Trunk with headquarters at Island Pond, Vt. He was then train master at Belleville, Ont., for two months and in July, 1898, he was promoted to superintendent of the Eastern division, which position he held until October 1, 1900, when he was appointed superintendent of the Colorado and Pacific divisions of the Missouri Pacific with headquarters at Osawatomie, Kans. On April 1, 1901, he was promoted to general superintendent of the St. Louis, Iron Mountain & Southern and in July of the same year he was appointed manager of the Pacific System of the Southern Pacific. From November 1, 1901, to January 1, 1903, he was general manager of the Denver & Rio Grande and the Rio Grande Western. From the latter date to December 7, 1905, he was vice-president and general manager of the Colorado & Southern and from that time to March 1, 1906, was first vice president of the same road. From March 1, 1906 to July 1, 1914, Mr. Herbert was out of railway service. On July 1, 1914, he was elected president of the Colorado, Wyoming & Eastern. On August 1, 1916, he became connected with the Cotton Belt as first vice-president, and, as stated above, was elected president one year later.

HALF A MILLION DOLLARS A DAY is the loss, as estimated by an officer of the Forest Products Laboratory, which American shippers of freight sustain by reason of the use of improper or inadequate containers for their goods, and by poor packing. Col. B. W. Dunn, chief inspector of the Bureau of Explosives, quoting this statement, says that he is extending his activities into the field of non-explosive shipments; and he would like to have shippers keep adequate records of all goods sent out, by means of which, after experience, and advice from consignees, they would discover the defects in their containers, if there be any; and the collating of such shippers' records from many places will make possible an intelligent study which would lead to the making of any improvements found desirable in the design of containers of all sorts.

Atlantic Coast Line Reports Favorable Earnings

Net Railway Operating Income for Year 1921 Was $6,860,107. For the First Half of 1922 It Is $8,845,354

The Atlantic Coast Line reports for the first six months of 1922 a net railway operating income of $8,845,354. This is more than twice the 1921 first six-months' figure which was $3,170,358. The property's standard return for operation during federal control was $10,180,915. The question now is as to whether the peak figure which was reached in 1917, namely $13,239,902, will be equaled this year.

Atlantic Coast Line traffic is fairly even throughout the year although as a rule its traffic is somewhat heavier in the spring months. The comparative evenness of traffic results from the road's serving a territory extending north and south and from the large volume of perishable freight. The road is, in fact, said to be the largest originator of perishable freight in the country. Traffic in this territory is ready for market in relation to the season. The cycle begins in November and from that month until about May the citrous fruits and fresh vegetables move from Florida. As the season advances growing areas further north begin to supply traffic.

Increased Business in 1922

In the first six months of 1922, the gross was $37,095,580 as compared with $36,732,035 in the first six months of 1921. This increase was due to increased traffic. Our latest figures are those for the five months ending May 31. In the first five months of 1922 the Atlantic Coast Line reported net ton-miles (including revenue and non-revenue) totaling 1,493,188,000 as compared with 1,443,661,000 in the first five months of 1921. Car loadings figures are available up to the third week of July. They show that traffic in July is not running quite as heavy as it did in preceding months. It continues, however, to be well ahead of last year at the same time.

It was noted above that the Atlantic Coast Line's standard return was set at $10,180,915. In 1918 it earned $11,155,520 or 5.44 per cent on its property investment. The net in 1919 was $6,539,900 or 3.07 per cent. In 1920 net after rentals was $1,380,569 or but 0.62 per cent. In 1921, exclusive of guaranty period lap-overs, the figure reported was $6,860,107 which is 2.90 per cent on the investment. These figures are interesting as a basis of comparison for 1922's figure of $8,845,354 for the six-months' period.

23.92 Per Cent Less Tons in 1921 Than in 1920

In 1921, as compared with 1920, the Atlantic Coast Line moved 23.92 per cent less tons and 24.65 per cent less ton-miles. The revenue tons carried totaled 13,180,144 as compared with 17,324,916 in 1920. The principal reductions were in products of mines, products of forests and manufactures. Products of agriculture, making up 17.11 per cent of the total tonnage, supplied 2,255,275 tons as against 2,339,316 tons in 1920. Because of the importance of products of agriculture in Atlantic Coast Line tonnage it is worth noting that tobacco made up 1.05 per cent of the total 1921 tonnage, cotton, 1.50 per cent, and fruit and vegetables, 7.17 per cent. Products of forests supplied 3,764,980 tons or 28.57 per cent of the total, this figure comparing with 4,507,861 in 1920. lumber at present is moving much better than it was moving at this time a year ago. The road originates no coal; in 1921 it carried 931,575 tons or 7.07 per cent of its total tonnage.

One of the factors in Atlantic Coast Line traffic in 1921 was the low prices, this being a factor on this road as on most Southern roads in that the amount of tonnage southbound depends so greatly upon the buying power which the products of the territory yield. Concerning this matter the Atlantic Coast Line 1921 annual report said: "The low prices received for all agricultural products have had a depressing influence upon the industry as a whole. The boll weevil depredation in South Carolina, Georgia and in some countries of North Carolina, in its effect upon the cotton crop, has been one of the chief factors in this depression." The Atlantic Coast Line in 1921 carried 54,804 tons of live stock. The encroachment of the boll weevil has led the road to give some attention to the possibilities of live stock traffic. It is rather interesting, therefore, to read in the annual report: "On account of the recent advance in the price of live stock, especially of hogs, we may reasonably expect an increase in the number of hogs raised for market. As a hog producing state, Georgia is exceeded only by Iowa."

Reduction of 15.93 Per Cent in Operating Expenses

Freight revenues in 1921 totaled $44,550,741 as compared with $48,193,387 in 1920, a reduction of $3,636,645 or 7.55 per cent. Total revenues were $66,730,768. This compared with $74,121,956 in 1920, the reduction being $7,391,188 or 9.97 per cent. The operating expenses were decreased $10,988,029 or 15.93 per cent. The 1921 figure was $58,005,833; that for 1920, $68,993,862. The operating ratio in 1921 was 91.53, which, while high, was considerably below the 1920 figure of 97.43. At present the road is operating at less than 70. The net operating revenues in 1921 totaled $5,649,935, a sizable improvement indeed when compared with the 1920 net of $1,903,094. All of the foregoing figures are exclusive of federal control period lap-overs.

With further reference to the 15.93 per cent reduction in operating expenses, the reduction in maintenance of way expenses was 19.88 per cent; in maintenance of equipment, 10.52 per cent, and in transportation, 18.32 per cent. The reduction in maintenance of way expenses is of special interest because this reduction in dollars was accompanied by a greatly increased amount of work as designated in material units. For instance, there was laid in existing tracks 208 miles of new 85-lb. rail, whereas in 1920 the figure was only 122 miles. Including relay rail, in 1921, 273 miles, or about 5.9 per cent of the total main line and branch mileage, was given new steel. The number of ties placed in existing tracks in 1921 was 1,679,820 as compared with 1,634,425 in 1920. These figures include practically no treated ties. Ballasting in 1921 totaled 449,991 cu. yd., nearly all gravel, this figure comparing with 269,977 cu. yd. in 1920. Tie plates were used to the number of 1,686,427 in 1921; in 1920, the figure was 1,306,112.

The annual report showed also considerable improvement in other directions, notably with reference to shops and shop equipment. The report gives rather an imposing detailed list of the improvements of this kind. The net charges to additions and betterments of all kinds in 1921 were $7,763,607 which compared with only $2,098,722 in 1920. Additions and betterments to equipment in 1921 totaled $6,545,325.

Corporate Net in 1921 Totaled $1,790,569

The Atlantic Coast Line in 1921 had a net corporate income after fixed charges of $1,790,569. This compared with $7,684,156 in 1920 when the road had the advantage of

standard return for two months and guaranty for six. In 1919 when its earnings from railroad operations were represented in the standard return the corporate net was $7,187,557. The company derives "other income" running from $4,000,000 to $5,000,000 annually. In 1921, the other income was $4,423,110; in 1920, it was $5,905,804. This other income is mostly dividend income—which in 1921 was $2,890,584—but there is also a large return in the form of income from funded and unfunded securities, etc. A large share of the dividend income is represented in the 367,200 shares of Louisville & Nashville of which the Atlantic Coast Line owns a majority interest. The L. & N. is now proposing a 75 per cent stock dividend, the majority portion of which will accrue to the Atlantic Coast Line. This is, naturally, one of the leading factors of interest insofar as concerns future earnings of the latter property, particularly as it is expected that the L. & N. will be able to maintain a good dividend rate even with the increased stock.

The Atlantic Coast Line fixed charges in 1921 totaled $8,212,826. The dividends are at the rate of 5 per cent on the $196,700 preferred and 7 per cent on the $68,580,200 common and total $4,810,869 annually. These are paid from profit and loss account. The company's profit and loss credit balance on December 31, 1921 was $48,704,648. The general impression one gets of Atlantic Coast Line affairs is that at present the property is in rather a favorable position, the two chief elements of which are its favorable net earnings from railroad operations in recent months and the benefit which is expected to accrue from the L. & N.'s proposed stock dividend.

Virginian Realizes on Non-Union Coal Traffic

Has Net After Rentals of $3,833,222 for 1922 First Six-Months as Compared with $4,726,886 for Whole Year 1921

COAL LOADINGS in the Pocohontas district for the week ended July 29 totaled 16,721 cars, the lowest reported for that district so far this year. This information is rather disconcerting because the Pocohontas district, the three roads in which serve largely non-union mines, has been getting out about one-third of our coal supply since the beginning of the strike. The reason for the present decline is primarily the shopmen's strike combined with which the Chesapeake & Ohio and the Norfolk & Western have had a clerk's strike of no mean proportions. Loadings in the Pocohontas region in June ran about 31,000 weekly. They reached a peak of 31,460 for the week ended June 24. The following week they were 31,331 and then they fell to 22,945 for the week ended July 8 to 19,037 for the week ended July 22 and now to 16,721 for the week ended July 29.

These figures may be regarded from two angles. The first is the fact that the country is having difficulty in keeping up its half-normal coal supply. The second point is the effect on the net earnings of the three roads in the Pocohontas district—namely the Chesapeake & Ohio, the Norfolk & Western and the Virginian. The first point is beyond question important enough. It is the second question, however, that will receive our attention in the present article, and particularly with reference to the third of these three carriers—the Virginian. The effect on net earnings will, of course, be adverse. But there happens to be a silver lining in the cloud, namely that as low as the July loadings have been they are still ahead of the loadings a year ago. There is the additional important detail that the Pocahontas district lines have been able to realize handsomely on the heavy loadings of the months preceding July. The June loadings which averaged some 30,000 cars weekly compared with loadings in the same weeks of last year of but about 24,000. Loadings in the first half of 1921—up to May at least—were not very good. For several weeks they ran only about 15,000 to 17,000. This indicates that the July condition, as severe as it may finally prove to be, can be regarded as only a temporary setback which is balanced by a long period of very excellent business.

July Loadings Off But Still Ahead of 1921

So much for the situation in its larger aspect; now as to the status of the individual road to which it is proposed to direct our interest—the Virginian. This road reported for the first six months of 1922 a gross income of $10,485,199 which compared with a gross in the first six months of 1921 of $9,596,049. For the first half of 1922 it had an operating ratio of 57.93 as contrasted with a figure for the first six months of last year of 65.03. To June 30, 1922, the net railway operating income was $3,833,222 which is a rather sizeable improvement over the figure for January to June last year of $2,917,300. In July the Virginian had a falling off in traffic similar to that of its two neighbor roads. Its coal loadings in July were 9,184 cars as compared with 12,752 cars in June. But the July loadings—strike or no strike—were still good; they compared with 9,110 in July last year. The seriousness of the situation is still further minimized by the fact that in July, 1921, there was a falling off also; June, 1921, loadings were 12,544 cars. Much seems to have been made by the strikers' publicity men as to the difficulties at the Hampton Roads coal piers. The Virginian apparently has been affected to a minimum degree. Its coal dumpings at its Sewells Point pier for July, 1922, totaled 8,366 cars or 468,159 tons. In July, 1921, dumpings were 5,802 cars or 334,828 tons.

Virginian operations are characterized by the high proportion of coal tonnage—over 90 per cent of the total tonnage is coal; and by the manner in which this coal moves in heavy trainloads to tide-water. This combination and an unusually high traffic density enable the road to realize on a plant characterized by its high engineering standards. Further than that the road has been improving its position year by year and is becoming an increasingly important factor in the Hampton Roads situation.

The improvement in the road's position is indicated in that the property had a standard return of $3,247,603. This it did not earn for the government in 1918 or 1919, in which years the net railway operating income was $1,952,872 and $2,555,230 respectively. In 1920, however, the road earned a net railway operating income of $4,776,886 and in 1921 with a sharp reduction in tonnage the figure was held to $4,726,940. We have spoken of the 1922 results to date; that they bid fair to exceed 1921 seems fairly certain.

Average Train Load 1812 Tons

In 1921 the road carried 6,376,648 revenue tons of freight of which 5,691,790 tons was coal. In 1920 the revenue tonnage was 7,784,517. The 1921 revenue ton-miles totaled 2,308,049,877 and the revenue ton-miles per mile of road were 4,387,177. In 1920 the traffic density figure was 1,440,384 which is high enough for the main line of many a busy road of two or more tracks. Of course, in the Virginian's

case it is due to coal moving in heavy trains and heavily loaded cars. The average train load in 1921 was 1,812 which was increased from 1,718 tons in 1920 even with the reduced traffic. Virginian cars include many of 120-tons capacity. The average carload in 1921 was 55.55 tons, comparing with 51.10 in 1920. The road secures an average haul on its freight of 362 miles and in 1921 its revenue per ton per mile was 0.679 cents.

The road's gross revenues in 1921 totaled $18,024,357 of which $13,743,395 was for coal and coke. In 1920 the road had a gross of $18,158,853. This shows for 1921 a decrease of but $134,496 which is explained, in view of the falling off in tonnage, by 1920 receipts per ton per mile of 0.553 cents as compared with the 1921 figure given above of 0.679 cents. The operating expenses in 1921 totaled $12,405,728 as compared with expenses in 1920 of $12,908,982, a reduction of only $368,758. The reason for such a small reduction in expenses was increases in expenses of maintenance of way and equipment which nearly balanced a decrease of approximately $1,000,000 in transportation expenses. The road operated in 1921 with a ratio of 68.83; in 1920 it operated at 71.09. The ratio of transportation expenses to gross revenues was in 1921, 30.74 as compared with 35.87 in 1920. The Virginian in the first six months of 1922 operated at 57.93 per cent as above noted.

Physical Improvement in 1921

With its increasing net income the Virginian has been improving its property to take care of increasing business. There is much said about the building of an additional pier at Sewells Point although the management does not seem ready to commit itself as to that as yet. The outstanding developments in 1921 were the completion of double-tracking on the 2.07 per cent grade approaching Clarks Gap from the west; new construction of the so-called Virginian & Western, 14.45 miles; an extension of the Winding Gulf branch, 2.05 miles; new facilities at Elmore, W. Va.; additional shop machinery at Roanoke, Princeton, etc. The road now serves 107 coal mines, 56 of which are served jointly with the C. & O. It has 234 miles laid with 85-lb. rail and 5 miles with rail of Pennsylvania 130-lb. section.

The Virginian in 1921 had a corporate net after fixed charges of $2,937,732. Including a credit of $2,308,095 for additional compensation for operation during federal control the net income carried to profit and loss was $5,245,827. In 1920 the corporate net was $3,287,462, inclusive of a credit of $513,365 for standard return for two months. The 1920 accounts did not include any credit on account of the guaranty. The balance sheet shows as of December 31, 1921, a profit and loss credit balance of $17,416,721 "after payment of $13.00 per share on account of dividends accrued on 279,550 shares preferred stock from May 1, 1912." The company's preferred stock is 5 per cent cumulative. In 1920, 7 per cent was paid on this issue; in 1921, two payments each of 3 per cent were made. The greater part of the preferred stock is closely held. No dividends have ever been paid on the 31,271,500 common shares.

Freight Car Loading

WASHINGTON, D. C.

LOADING OF revenue freight on American railroads totaled 859,733 cars during the week ended on July 29, compared with 861,124 cars during the previous week, or a reduction of 1,391 cars. This was an increase of 64,301 cars over the corresponding week last year, but a decrease of 76,633 cars below the corresponding week in 1920. As compared with the heaviest week before the shop strike the reduction was 18,123 cars.

Coal loading totaled 76,374 cars, an increase over the previous week of 314 cars, but a decrease of 73,065 compared with the corresponding week last year, and a decrease of 109,418 cars compared with the corresponding week two years ago. Coke loading totaled 9,112 cars, a decrease of 837 cars compared with the week before. While this was an increase of 4,934 cars over the same week in 1921, it was a decrease of 4,224 cars below the same week in 1920. Ore loading totaled 64,147 cars, 270 cars below the preceding week, but 34,023 cars above the corresponding week last year. Compared with the same week two years ago, a reduction of 12,212 cars was reported.

Grain and grain products totaled 59,170 cars, an increase over the week before of 1,604, but 4,360 under the corresponding week last year. This was an increase of 19,318 cars above the corresponding week in 1920. Live stock loading amounted to 27,104 cars, 351 cars below the preceding week. This was, however, an increase of 2,294 cars above the corresponding week in 1921, and 1,039 in excess of two years ago.

Merchandise and miscellaneous freight for the week ended on July 29 totaled 565,629 cars, a reduction of 1,536 cars

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, JULY 29, 1922

District	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year, 1922	Corresponding year, 1921	Corresponding year, 1920
Eastern	1922	11,710	2,520	8,852	1,782	5,222	7,139	66,837	94,812	198,974	.....	.....
	1921	10,961	2,642	41,583	826	4,539	2,273	56,177	73,255	.....	192,256	233,622
Alleghany	1922	4,107	2,315	19,584	4,106	3,135	13,665	50,327	79,811	177,050	.....	.....
	1921	4,120	2,490	42,891	2,062	2,526	6,675	43,591	51,395	.....	155,730	188,326
Pocahontas	1922	268	151	16,721	288	1,123	30	3,466	3,525	25,572	.....	.....
	1921	273	171	17,475	81	1,247	.....	5,051	4,041	.....	28,339	36,526
Southern	1922	4,503	2,237	14,969	774	18,029	1,062	35,370	37,941	114,885	.....	.....
	1921	4,359	1,792	19,337	313	13,963	193	35,143	35,145	.....	110,245	127,605
Northwestern	1922	11,706	7,769	7,882	1,531	15,365	39,696	30,835	40,496	155,280	.....	.....
	1921	12,813	6,476	6,807	446	10,616	19,391	27,689	33,027	.....	117,265	160,968
Central Western	1922	19,450	9,494	5,140	434	7,534	2,108	32,931	47,992	125,103	.....	.....
	1921	4,004	8,743	16,972	199	5,550	772	30,524	39,942	.....	126,715	123,989
Southwestern	1922	7,426	2,618	3,226	197	7,689	427	14,801	26,485	62,869	.....	.....
	1921	7,000	2,507	4,374	251	7,311	870	16,356	26,253	.....	64,873	65,330
Total Western Dists.	1922	38,582	19,881	16,248	2,162	30,588	42,251	78,567	114,973	343,252	.....	.....
	1921	43,817	17,726	28,153	896	23,487	20,983	74,569	99,222	.....	308,853	350,287
Total all roads	1922	59,170	27,104	76,374	9,112	58,197	64,147	234,567	331,062	859,733	.....	.....
	1921	63,530	24,810	149,439	4,178	45,762	30,124	214,531	263,058	.....	795,432	.....
	1920	39,852	26,065	185,492	13,336	63,202	76,359	183,795	342,765	.....	.....	936,366
Increase compared	1921	4,360	2,294	.....	4,934	12,435	34,023	20,036	68,004	64,301	.....	.....
Decrease compared	1921	.....	.....	73,065	.....	.....	45,772	.....	.....	.....	.....	.....
Increase compared	1920	19,318	1,039	.....	.....	.....	.....	.....	.....	.....	.....	.....
Decrease compared	1920	.....	.....	109,418	4,224	5,005	12,212	.....	11,903	76,633	.....	.....
July 29	1922	59,170	27,104	76,374	9,112	58,197	64,147	234,567	331,062	859,733	795,432	936,366
July 22	1922	57,566	27,455	76,060	9,949	58,512	64,417	239,510	327,655	861,124	788,034	928,418
July 15	1922	48,911	30,216	77,334	9,698	58,121	69,162	241,180	326,285	860,907	774,884	942,851
July 8	1922	35,267	21,847	68,996	9,665	44,736	55,739	210,140	271,939	718,319	640,535	796,191
July 1	1922	41,897	28,846	94,748	10,361	61,422	64,776	247,111	328,035	876,886	776,079	891,621

American Railway Association—Car Service Division.

below the preceding week. Despite this decrease, however, the loading of merchandise and miscellaneous freight exceeded the corresponding week last year by 88,040 cars and even surpassed the corresponding week in 1920 by 33,869 cars.

Forest products totaled 58,197 cars, a decrease of 315 cars under the week before, but an increase of 12,435 cars over the corresponding week last year. Compared with the corresponding week in 1920, a reduction of 5,005 was shown.

Compared by districts, increases in the loading of all commodities over the preceding week were reported in the Allegheny, Central Western and South Western districts, with decreases in the Eastern, Pocahontas, Southern and North Western districts. All except the Pocahontas, Central Western and South Western districts, however, reported increases over the corresponding week last year.

Perfecting Plans for the Distribution of Coal

Various Agencies Involved Are Co-operating in Effort to Make Best Use of Limited Supply

WASHINGTON, D. C.

THE CENTRAL COAL Committee was able to turn more of its attention this week from the work of organization to its problem of trying to supply the many demands made upon it for coal. The district committees are now on duty and various orders for coal from railroads, public utilities and states have been forwarded to them from the Washington office.

On Monday preliminary plans were arranged for the movement of about 30,000 tons a week through the Cleveland Coal and Ore Exchange for trans-shipment across the lakes for the northwest and to increase the allocation as rapidly as possible until about 1,000,000 tons a week are moved to the lakes. In addition to C. E. Tuttle, in charge of distribution for the lake movement, C. P. White was appointed as a representative of the committee to have headquarters at St. Paul or Minneapolis.

It was believed that the action of the eastern railroads in sending shop employees to assist roads serving the coal-producing districts where shipments have recently been reduced because of congestion will result in an increased output. Consideration has been given to sending locomotives from other roads, but it was pointed out that men to keep the roads' own engines in condition would be of more service.

The problem of railway fuel supplies largely occupied the attention of the federal fuel distribution committee on Tuesday. The needs of some lines operating in the Middle States and in the Mid-West were said to be somewhat pressing, while railroads in the southeastern region were said to be in slightly better shape. The problem has been complicated by the fact that some railroads have sent buyers to the producing coal fields, and their competitive efforts to obtain fuel are having the tendency to raise prices.

The state of Massachusetts, through the state fuel administrator, has applied to Federal Fuel Distributor Spencer for emergency coal needs under Priority No. 2 classification. This coal is desired for the operation of various public utilities in that state and is in addition to coal supplies already provided for by contracts.

An appeal came from Iowa for coal for the operation of public utilities, some of which are said to face the possibility of an early closing-down if their fuel requirements are not met. A special appeal has been made for the vegetable-canning industry of the state. Farmers are also asking for coal to keep the wheat-threshers going. Maine canners have addressed an appeal to the committee. As the total tonnage required by the canning industry of the country is not especially large, it is not anticipated that there will be difficulty in meeting the needs of these establishments.

A quantity of coal in the possession of the War Department at Camp Grant, Ill., for which that department had no urgent need, was ordered turned over to railroads centering in Chicago.

The problem of the proper distribution of coal as between the seaboard states and the West was given consideration. The matter of striking a proper balance between eastbound shipments intended for New England and westbound shipments routed to points in the Middle West will require much study.

The fact that mechanics from northern states are now reporting for service in considerable numbers at the railroad repair shops of the Virginia and West Virginia coal-carrying lines is expected to relieve to some extent the car congestion which has been hampering coal production in that territory.

Numerous applications for coal have been made to Federal Fuel Distributor Spencer from industrial concerns in various states. These concerns are informed generally that their particular problems should be presented to their respective state fuel administrators.

Consideration was given to the re-establishment of restrictions on sky-rocketing prices of coal in Pennsylvania at a conference between the Pennsylvania State Coal Committee and administration officials on Wednesday.

The Interstate Commerce Commission on August 4 issued Amendment 1 to Service Order No. 23, effective on and after August 5, 1922. This amendment changes paragraph No. 7 in the following respects:

(1) Class 2 in the priority order, which follows the class of special orders, is enlarged by the addition of Clause (d), reading:

> (d) Bituminous coal which has passed over screens of four inches or larger opening, coke, and anthracite coal, to be shipped to retail dealers for household use.

(2) Class 4 is eliminated and a new Class 4 is substituted therefor, reading:

> Class 4: (As to all such common carriers by railroad) Coal for the production and manufacture of foodstuffs and medicines and for the manufacture of containers therefor, for daily use but not for storage, exchange, or sale.

The amended order also states that it is not intended to give any priority as between clauses a, b, c and d of Class 4, which relate to fuel for railroads, public utilities, government institutions and retail dealers, so that these classes are to be considered on a parity.

(3) Agents of the commission are designated and appointed with authority to give directions as to car service and to the matters referred to in paragraphs (15) and (16) of section 1 of the interstate commerce act, and referred to in paragraph No. 7. The agents, in addition to John C. Roth, director, E. H. De Groot, assistant director, and Frank C. Smith, chief inspector of the Bureau of Service, were to be stationed at the following points, beginning Monday, August 7: S. J. Mayhood, Thurmond, W. Va.; B. S. Robertson, Bluefield, W. Va.; C. C. Semple, Huntington, W. Va.; W. L. Barry, Norton, Va.; O. S. Reynolds, Knoxville, Tenn.; H. M. Priest, Louisville, Ky.; J. B. Ford, Birmingham, Ala.

The Car Service Division of the American Railway Association has issued a circular giving instructions to govern the

distribution of coal cars under the priority provisions of the commission's order, in part as follows:

(1) Requisitions for cars must show the number of cars required by each mine for each of the five classes enumerated in Service Order 23, Paragraph 7.

(2) Orders for cars in excess of a mine's demonstrated ability to load daily will not be accepted.

(3) Cars will be supplied for loading coal to be consigned in compliance with the above classes in the order named. No cars will be supplied on orders given under Class 2 until all requirements under Class 1 have been fully met. No cars will be supplied under Class 3 until Classes 1 and 2 have been fully met and etcetera. Available cars will be distributed equitably between mines ordering cars of the same class of priority shipments.

(4) a.—The mine tage or billing instructions must show the class of priority under which the shipment is made.

b.—Revenue billing will carry the endorsement showing the class under which coal is moving.

c.—Coal will not be forwarded from mines unless mine tage or billing instructions carry this information.

(5) Railroads will maintain daily records of:

a.—All requisitions for coal cars by classes of priority.

b.—Number of cars placed for loading at each mine

c.—Number of cars loaded and shipped by classes of priority.

Open Top Cars and Building Materials

That the greater part of the construction projects now under way will be forced to shut down for lack of construction materials unless the present coal priority order is modified was asserted by the Associated General Contractors of America in a petition of protest to the Interstate Commerce Commission. It is the opinion of the contractors that the action of the commission is so drastic as to defeat its own purpose.

The contractors are in favor of priority for coal for the first four classes established by the commission, including special purposes, government uses, public utilities, medical supplies, and domestic consumption; but contend that building materials are just as important to construction as coal is to other manufacturers, and should have equal place with it after the first four classes are served.

The petition calls attention to the fact that with the reopening of the mines the demand for cars for coal will be not less than 320,444 cars per week, of the maximum 324,000 serviceable cars, and that of these 291,000 will be suitable for the loading and transportation of coal, leaving only 33,000 open-top cars weekly for all other purposes. Going on the assumption that the coal and railway strikes will be settled, and that the present priority order stands, the contractors estimate the probable demand and supply of open-top cars, weekly during August, September, and October, will be as follows:

Commodity	Demand	Supply	Per cent supplied
Coal	320,000	291,000	91
Sand, stone and gravel	50,000	10,645	21
Ore	40,000	8,516	21
Iron and steel	25,000	5,322	22
Miscellaneous	20,000	4,258	21
Limestone	10,000	2,129	21
Coke	10,000	2,129	21

Instructions to State Fuel Committees

A letter containing detailed advice regarding the method of distribution of coal by the state fuel committees was forwarded on August 5 by Federal Fuel Distributor Spencer to the governors of the states. It stated that the federal fuel distributor will not (except for the common carriers and the departments of the United States government) act upon applications made by consumers or dealers directly to him, but will refer the applicant to his state fuel committee to the end that if his need is essential and the applicant must have emergency coal which he cannot obtain from sources within his state, the committee may then make application to the federal fuel distributor.

Governor's committees were requested to apply for coal produced in other states only through the federal fuel distributor at Washington and not to order any coal from federal fuel district committees nor producers outside of their own state.

There is no anthracite coal available for distribution by the federal fuel distributor.

Application for emergency coal to the federal fuel distributor should be made only for current use and not for storage.

Application for emergency coal should be made only for the most essential purposes following the priority classes established by the Interstate Commerce Commission in Service Order No. 23.

Emergency coal supplied on these applications made to the federal fuel distributor will be placed f. o. b. railway cars at the mines at the fair prices approved for the producing district by Secretary Hoover.

It will be the endeavor of the federal fuel distributor to place orders for emergency coal in those districts from which the supply is most available to the applicants.

John E. Benton, general solicitor of the National Association of Railway and Utilities Commissioners, has addressed a circular letter to the state commissions advising that the question had arisen whether the service orders of the Interstate Commerce Commission, made to meet the existing emergency, apply to intrastate shipments. It has been considered by the President's committee, and it is thought to be important that there shall be no doubt as to the application of the rules prescribed by those orders as to all shipments. It is thought that the question ought to be settled, so far as within the power of the regulatory authorities, state and federal, without necessity for determining the legal questions involved. It is believed that there will be no disposition anywhere at this time to do otherwise than to co-operate whole-heartedly without bringing to the front jurisdictional or other contentious questions, he said.

Commissioner Aitchison was quoted as saying, not speaking for the Interstate Commerce Commission, but for the President's Fuel Committee, that the committee desired to advise the state commissions that action on their part, so far as they have or claim car service jurisdiction, in the line of the promulgation intrastate of car service orders identical in their provisions with the car service orders already promulgated by the Interstate Commerce Commission will be appreciated, and will be helpful in the present emergency. Mr. Benton assured Commissioner Aitchison that he believed the state commissions generally, having jurisdiction, would be glad to co-operate in the establishment of common regulations, thus entirely avoiding any occasion for the question of jurisdiction arising.

It is understood that some state commissions have no jurisdiction over car service, and accordingly cannot comply with this request. At least one commission—that of Alabama—before this question arose had already adopted I. C. C. Car Service Order No. 23 in precise terms for application intrastate.

Weekly reports compiled by the Car Service Division of the American Railway Association of coal mine operations and car requirements and the open-top car situation show clearly that the worst of the effects of the shop employees' strike is concentrated on the comparatively few roads that for several months have handled practically all of the coal being produced and on which congestion and resulting car shortage had begun to appear even before the shop strike began on July 1. These are the roads regarding which there has been more or less loose talk of their being taken over by the government and the roads to which Mr. Jewell doubtless referred when he asked if the government "would constitute itself a strike-breaking agency by taking over the roads on which we have made the strike most effective."

The railroads during the week of July 22, the third week of the shopmen's strike, according to these reports placed 71 per cent of the cars required for bituminous coal loading.

or 94,627 against requirements amounting to 1v2,665. The low percentage is due to the conditions in the Pocahontas and Southern districts, which furnished only 45 and 49 per cent, respectively, of the cars required. In the Pocahontas district 20,412 cars were placed as against orders for 47,025 and in the Southern district 20,153 cars were placed against orders for 41,071. In the Southern district the percentage of cars placed to cars required was 99, in the Allegheny 129; in the Northwestern 102; in the Central Western 117, and in the Southwestern 101. Of 146 roads reporting, only 19 furnished less than 100 per cent. Of these the principal ones were the Wheeling & Lake Erie, 90; Baltimore & Ohio, 89; Chesapeake & Ohio, 58; Long Fork, 27; Norfolk & Western, 52; Virginian, 45; Carolina, Clinchfield & Ohio, 66; Interstate, 56; Kentucky & Tennessee, 25; Louisville, Henderson & St. Louis, 99; Louisville & Nashville, 85; Mobile & Ohio, 81; Southern, 52; and St. Louis-San Francisco, 99.

In the week of July 15 the percentage of cars placed to cars required was 84. The percentage for the Pocahontas district being 65, Southern, 56 and Southwestern, 79. For the week of July 8 the percentage for all roads was 107, only the Southern region being below 100, with a percentage of 70. During the week of July 22 the roads furnished 89 per cent of the number of open top cars required, 282,079 against 319,186. In the week of July 15 they furnished 96 per cent. In the week of July 25, 1921, the roads furnished 100 per cent and in the week of July 24, 1920, only 67 per cent. In the week of July 22 97 per cent of the requirements for limestone were furnished, 100 per cent for ore, 98 per cent for iron and steel, 97 per cent for sandstone and gravel, and 98 per cent for miscellaneous freight.

An increase in the number of cars loaded daily is shown by reports received from the carriers. On Monday, August 7, these reports showed a total of 16,021 cars loaded with coal. This total has only been exceeded on seven days since the miners' strike started on April 1, and then only by an average of a few hundred cars. The number of cars loaded daily with coal since August 1 follows:

August 1	11,783 cars
August 2	13,218 cars
August 3	13,177 cars
August 4	12,567 cars
August 5	12,317 cars
August 7	16,021 cars

In August, 1921, the average number of cars loaded daily with coal was 25,688 cars.

Reports show that on the Chesapeake & Ohio, Norfolk & Western and the Louisville & Nashville, the three largest coal carrying roads in the West Virginia and Kentucky non-union coal fields, 7,554 cars were loaded on Monday. These three roads averaged in June 7,373 cars daily, which was the heaviest month's coal loading in their history.

Standard Designs for Indian Locomotives

A Discussion of Requirements, Both Military and Fuel, and Comparisons with the U. S. R. A. Standards

By H. L. Cole
Secretary of the Railway Board of India

LOCOMOTIVE DEVELOPMENT in India, which so far has merely followed normal British practice, appears likely in the near future to enter upon a new phase. Considerable changes are occurring in several of the most important conditions by which locomotive design has hitherto been governed in India, and these will no doubt affect future locomotive proportions in that county to no small degree. It is nearly 20 years since the existing standard locomotive designs were initiated; and with the exception of the subsequent introduction of superheaters they present no features, barring their gage, to differentiate them from the ordinary British practice of their period.

The recent revision of the fixed structure gage, however, opens up possibilities which could not previously be considered; and these possibilities are likely to become of even greater importance in view of the projected adoption either of the central automatic coupler, or at least of draft gear much stronger than that now in use. The eventual value of these two developments cannot be overlooked as aids to the solution of the now pressing problem of traffic congestion.

Changing Fuel Conditions

There is in progress, moreover, a marked change in respect to fuel supplies. Barely a quarter of a century ago the coal requirements of Indian railways were still largely met from the United Kingdom. When the present standard engines were introduced the importation of British coal was diminishing rapidly with the development of the Bengal coal fields, and the products of the latter, although decidedly in-

Superheater Express Locomotive, Bengal-Nagpur Railway. Built by Robert Stephenser & Co.

ferior to the British coal, were good enough even with the small grates of the locomotives of that period for the moderate speeds and loads then called for. But demands on locomotive power were already becoming more exacting; and with the complete change over from British to Indian coal the necessity arose for relatively larger grate areas.

This necessity was to a certain extent recognized and provided for in the standard 4-4-0 and 0-6-0 designs of 1903; and more so in the subsequent 4-6-0, 2-8-0 and 4-4-2 engines. The development is interesting; the older 4-4-0 passenger engines on the State Railways with 17 in. by 24 in. cylinders and 17 sq. ft. of grate area, or a ratio of grate area to cylinder volume of 2.68. The 2-4-0 passenger locomotives with 18 in. by 24 in. cylinders and 20.5 sq. ft. of grate area had a ratio of 2.9. The 4-4-0 standard light passenger locomotive of 1903 with 18½ in. by 26 in. cylinders and 25.3 sq. ft. of grate area has a ratio of 3.1 and the later 4-6-0 passenger locomotives with 20 in. by 26 in. cylinders and a grate area of 32 sq. ft. has a ratio of 3.33. All these engines were designed prior to the adoption of superheaters. This increase in grate proportions was a natural expansion from these which had been based originally on experience with British coals.

At that period—only 15 or 20 years ago—there was scarcely any industrial consumption of coal in India, and rapidly as the railway demand for Bengal in place of imported coal increased, it was thought that locomotive requirements could be and would be filled by the best of Bengal coals, and for some years it was possible to a great extent to ensure this. Since then, however, a radical change has come over the whole fuel position. The available proportion of first-class Indian coal is limited. On the other hand, demands for shipping and for industries, and especially for metallurgical purposes for which it is essential to secure coals of a particular quality and with definite characteristics, have rapidly increased. It is no longer possible to pick the best local coals for railway purposes as the quantity actually available is but a comparatively small proportion of the total demand.

APPROXIMATE COMPOSITION OF SOME TYPICAL COALS

	Moisture	Volatile Matter	Fixed Carbon	Ash	Sulphur
Indian—Raniganj	5.0	30.5	54.5	10.5	0.7
Indian—Barakar	1.0	21.0	66.0	13.0	0.7
Great Britain—Yorkshire	2.0	33.0	62.5	2.7	0.8
Great Britain—South Wales	1.5	16.0	70.0	11.0	1.0
American—Pennsylvania	1.3	34.5	57.5	7.0	1.7
American—Illinois	9.5	33.0	48.0	8.5	1.0
American—Pocahontas	Dry	19.0	75.0	5.5	0.7

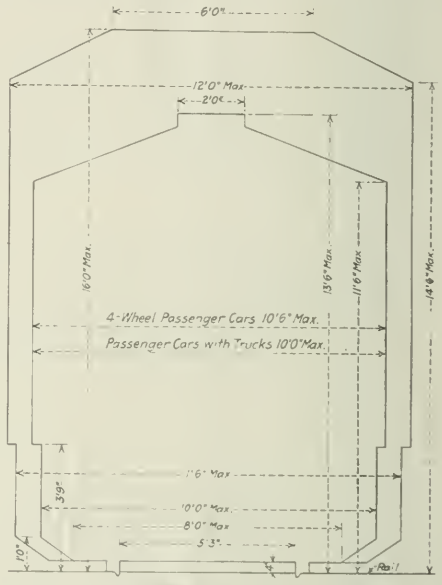
In short, railways have been forced in recent years and will certainly be forced in the future to use the poorer qualities of Indian coal in steadily increasing proportions. If efficiency is to be maintained—and we should look forward to its being steadily improved—locomotive boiler design must be adapted to the fuel conditions. In fact a stage in railway development in India has now been reached when it would appear to be a matter of imperative necessity to take account of the new conditions, and discard unsuitable or non-essential traditions.

The question of future policy in respect of standard locomotives is a live issue. "Standardization," however, like "self-determination," is a catchword, the length, breadth and depth of which are seldom clearly defined or appreciated. There can be no question as to the value of standardization as a principle, for economical production and for economical maintenance. As a practice, however, it is at least liable to result in stagnation, and to the perpetuation of obsolete designs.

The extent, therefore, to which the principle of standardization can be carried without detriment to progress or to the steady improvement of efficiency, is a matter which has important bearing on any policy that may be adopted with reference to the future development of locomotive construction and practice. There exist many important factors affecting the issue of this question, but they are substantially different in India from those that obtain either in England or in the United States.

Indian Railways in Relation to Standardization

The position of India in relation to any railway standardization program is somewhat exceptional, and this holds good in spite of the fact that there are two distinct main line gages. The meter-gage system of India, apart from its considerable mileage, is generally of a fairly high standard; neither the Burma nor the old Rajputana-Malwa meter-gage railways, for example, can be classed as light railways. Each gage, the 5 ft. 6 in. and the meter, is constructed practically to a standard that is common to all railways of that



Inner Lines Show Maximum Moving Dimensions of 1921; Outer Lines Possible Future Moving Dimensions

gage. Bridge rules also are uniform, and while occasionally variations have been permitted for particular reasons, speaking broadly it may be said, in respect to loading gages and running dimensions there has been maintained from the earliest days a consistent, well-considered, and well co-ordinated policy.

This may have been of greater or less benefit to individual railways at different times; but the result at the present day, when it is necessary to explore every possible means of reducing both the initial cost of new locomotives and rolling stock, and of increasing the possibilities of interchange, whether for frontier war concentrations or for peace-time traffic emergencies, is of first-class importance, in that it removes one of the first great obstacles in the way of a practical standardization program.

With rare exceptions, such as the Bombay and Baluchistan mountain sections, operating conditions throughout India are not marked by extreme variations. A general similarity of practice, at least in broad essentials, is no doubt partly an outcome of uniform loading gages, but it is also a natural result of a certain degree of technical co-ordination which always has been maintained between the various

railway administrations and the Government of India. The standard engines of 1903 merely replaced an older series, examples of which could be found running on lines as far apart as Madras and Peshawar. Recommended locomotive and rolling-stock designs exhibited in the old Locomotive and Carriage and Wagon Superintendents' Committee's proceedings of 1890 and onwards drafted in effect a standardization policy which appears to have been accepted as a practical working proposition.

Another not unimportant factor consists in a broad uniformity of fuel supplies in India, in the sense that the main standby is bituminous coal—variable in quality, certainly; but neither so good as British steam coal on the one hand, nor on the other hand so diversified in quality and nature as the various anthracite, bituminous, and sub-bituminous or lignitic coals in use on different American railways. The variation between the best first class and the worst second class Bengal coals is not so serious a matter as to form any real obstacle to standardization if that be desirable on other grounds. The fuel position, difficult is it may be, is not so grave as to require that the mail-train locomotives be provided with boilers suited to burn the poorer qualities of second class coal; nor will many railways contemplate obtaining under present or prospective conditions supplies of first class coal for ordinary slow-speed services. The known supply of first class Indian coal is limited; whereas the supply of second class is abundant, and only awaits development.

Military Considerations

One important factor in the consideration of a standardization policy has been touched upon already but needs emphasis. India possesses dangerous land frontiers. It is a necessary insurance, therefore, that provision should exist for the possible necessity of having to effect a great military concentration at any time and at short notice; locomotives of 5 ft. 6 in. gage cannot readily be borrowed from abroad and there would be no time to build them. But India cannot afford to maintain an idle reserve of locomotives awaiting such an emergency. The demand, should it arise, must consequently be met from existing resources; in other words, from various railways all over India. No argument is needed to elaborate the value and economy of having standard power under such conditions, or the vast amount of trouble in the thick of heavy troop-traffic, due to having a variety of power and an infinity of different detailed parts to maintain.

Standardization in Principle and Practice

If we turn to America for indications of the trend of modern practice or for specific data upon which to work out new designs, it is because American railways have been up against high labor costs and indifferent fuel longer than India has, and because India possesses neither the accumulated test results nor the resources for obtaining such results locally. The railways of the United Kingdom, on the other hand, have never suffered from poor quality fuel; the service rendered by British labor prior to the war was efficient in relation to its cost, and the results of experiments, where made, are for the most part buried in the records of the particular railways to which they pertain. Moreover, Indian operating conditions in respect of the average length of runs, high car axle-loads, and consequently the value of full train-loads and maximum engine-rating as against a rapid turn-around of very low capacity stock, are in general more similar to conditions in the United States than to those that obtain in the United Kingdom.

Outside the Indian standard locomotive scheme, it would probably have been difficult until recently to find anywhere in the world a series of engines serving so great an area and designed under circumstances so favorable to consistent practice in respect to weight, boiler and tractive effort ratios.

During the war, however, a series of standard locomotives was designed under the authority of the United States Railroad Administration; and some hundreds—nearly 2000—of those standard engines were constructed. Now the United States, in common with Great Britain, has a considerable variety of loading gages; they have also a wide variety of operating conditions, and a far greater range of fuels in actual use on railways than is the case in India. And there are roughly 70,000 locomotives in service on American railroads. Locomotive standardization, therefore, as a policy in common between American railways generally was then and is at the present time not really a practical issue.

This may serve as an illustration of the deliberate adoption of a standardization program devised specifically and solely with the object of rapid and economical manufacture, practically irrespective of the operating or maintenance con-

DIMENSIONS AND PROPORTIONS OF STANDARD INDIAN LOCOMOTIVES

Type	4-4-0	4-4-2	4-6-0	4-4-0	4-6-0	0-6-0	2-8-0	0-6-0	2-8-0
Service	Pass.	Pass.	Pass.	Pass.	Pass.	Freight	Freight	Freight	Freight
Saturated or superheated	Sat.	Sat.	Sat.	Sup.	Sup.	Sat.	Sat.	Sup.	Sup.
Cylinders, diameter and stroke, in	18½ by 26	19 by 26	20 by 26	20 by 26	20½ by 26	18½ by 26	20 by 26	20 by 26	22 by 26
Weights in working order:									
On drivers, lb	70,560	78,400	107,520	75,040	113,570	107,520	141,120	111,100	143,360
On trucks, lb	41,440	71,680	35,840	43,460	43,900	.....	17,920	.....	20,160
Total engine, lb	112,000	150,080	143,360	118,500	157,470	107,520	159,040	111,100	163,520
Tender, lb	87,360	105,280	91,840	90,500	106,850	87,360	105,280	90,500	105,280
Driving wheels, diameter, in	74	78	73	74	73	61	56	61	56
Boiler pressure, lb	180	180	180	160	160	180	180	160	160
Grate area, sq. ft	25.3	32	32	25.3	32	25.3	32	25.3	32
Heating surfaces:									
Firebox, sq. ft	128	157	157	127	152	128	173	127	172
Tubes, sq. ft	1,230	1,833	1,674	951	1,419	1,230	1,914	951	1,598
Total evaporative, sq. ft	1,358	1,990	1,831	1,078	1,571	1,358	2,087	1,078	1,770
Superheating, sq. ft	.....	.....	.....	240	407	.....	.....	223	389
Combined evap. and sup., sq. ft	.....	.....	.....	1,318	1,978	.....	.....	1,301	2,159
General data, estimated:									
Rated tractive force, 85 per cent, lb	18,360	18,360	21,879	19,040	20,400	22,338	28,458	23,120	30,600
Cylinder horsepower	1,026	1,082	1,199	1,153	1,212	1,026	1,199	1,153	1,394
Weight proportions:									
Weight on drivers ÷ tractive force, lb.	3.84	4.27	4.92	3.94	5.57	4.81	4.96	4.81	4.73
Weight on drivers ÷ total weight, engine per cent	63.0	52.3	75.0	63.3	72.1	100	88.7	100	87.7
Total weight, engine ÷ cylinder horsepower lb.	109	139	119	103	130	105	133	96	117
Boiler proportions:									
Comb. heating surface ÷ cylinder horsepower	1.32	1.84	1.53	1.14	1.63	1.32	1.74	1.13	1.55
Tractive force ÷ comb. heating surface	13.52	9.23	11.95	14.44	10.32	16.44	13.64	17.77	14.17
Tractive force × dia. drivers ÷ comb. heating surface	1,000	719	872	1,067	754	1,003	764	1,083	794
Cylinder horsepower ÷ grate area	40.5	33.8	37.5	45.4	37.9	40.5	37.5	45.4	43.6
Firebox heating surface ÷ grate area	5.05	4.90	4.90	5.04	4.75	5.05	5.72	5.06	5.63
Firebox heating surface ÷ evap. heating surface — per cent	9.42	7.89	8.58	11.78	9.67	9.42	8.29	11.78	9.72
Superheating surface ÷ evap. heating surface per cent	.....	.....	.....	22.2	25.9	.....	...	20.7	22.0

ditions of individual railways. From the point of view of individual railways, therefore, this standardization scheme had little to recommend it. It involved proportions unsuited to various local conditions, power below the capacity of particular lines, and details which did not duplicate those of existing engines even of corresponding dimensions. But these standardized designs did enable manufacturers to carry out a heavy production program; and that was the need of the moment—essentially a war measure.

No standardization policy, however, can be considered as really practical or satisfactory as a normal peacetime measure, if it fails to make provision for progressive improvements in designs, on a basis of added knowledge, or of modification in practice to meet changes in conditions. A certain degree of elasticity is necessary for progress; standards cannot be fixed for all time. Standardization is an expedient for the cheap production of approved designs, and for the easy and economical renewal of worn parts. It should never and need never be a device for the perpetuation of obsolete designs. It is a false conception of the practical value of standardization to refer to the policy as if it involved finality.

To the extent that a standard locomotive policy has already long been recognized in principle on Indian railways, there is indeed no need for stagnation, but there is a certain basis for a consistent forward policy. More exacting demands, denser traffic, point already to the need for heavier trainloads without sacrifice of speed. Alterations in the loading gage and the contemplated improvement in the coupler indicate substantial possibilities in that direction. The spacing of double tracks and renewal of bridges, regrettably in arrears on certain highly congested trunk lines, must certainly precede the use of the heavier trains that would help so powerfully to ease the traffic situation.

Of even more pressing importance than these, probably, is the necessity of providing for the widely extended use of fuel which has hitherto been regarded as of too low a grade for railway requirements. This will perhaps be the most potent factor in the immediate future in deflecting Indian locomotive practice from ratios and wheel arrangements which have hitherto been accepted as normal.

An examination of the table showing the general dimensions and proportions of the standard Indian locomotive indicates apparent inconsistencies. It must, however, be remarked that these designs were not brought out simultaneously, that they are all somewhat old, and that the superheater-fitted engines were not originally designed as such, but are old saturated steam locomotives altered to take superheaters.

At the same time this examination suggests the possibility of the present position leading to the adoption of modifications in view of the experience gained with the standards initiated in 1903, as well as in the light of developments elsewhere. Attention is especially drawn in this connection to the U. S. R. A. standard light Pacific and light Mikado locomotives.

In respect of adhesion, speaking broadly, Indian climatic conditions should certainly permit of an adhesion ratio not exceeding four to one in the case of normal designs, and probably 4.5 to 1 in the case of compound articulated engines. On the U. S. R. A. passenger and freight engines the ratio was approximately 4 to 1.

The U. S. R. A. light Pacific locomotive had 1.84 sq. ft. and the light Mikado 1.91 sq. ft. of heating surface per cylinder horsepower, the ratio of tractive force to combined heating surface was 9.85 for the Pacific and 11.75 for the Mikado; the tractive force multiplied by the diameter of the drivers and divided by the combined heating surface was 719 for the Pacific and 740 for the Mikado; the Pacific had 3.8 and the Mikado 50.5 cylinder horsepower per square foot of grate area; the firebox heating surface was about 8 per cent of the evaporative heating surface on the Pacific and 7.4 per cent on the Mikado. On both locomotives there was a little over 4 sq. ft. of firebox per square foot of grate and the superheater surface was between 23 and 24 per cent. of the evaporative heating surface.

The ratio of total weight to tractive effort ratio of the I. S. R. Atlantic engine is notably bad. This may lead to the rejection of the type, and the adoption of six-wheels coupled as regular passenger locomotive practice. With fares so low as those in force in India—not two cents per mile, but two to two and one-half miles for one cent for third-class passengers—loads must be good to be remunerative. Nevertheless, there appears to be as yet no necessity nor any inclination to proceed to the eight-coupled passenger engine on Indian railways. If this seems inconsistent, it should be noted that Indian 5 ft. 6 in. gage passenger cars with four wheel trucks, weigh barely 30 tons, as a rule, a fact which also supplies a reason for the relatively light engines in use as compared with modern American passenger engines.

As to future wheel arrangements, apart from the number of wheels coupled, it seems fairly certain that it will be necessary to adopt trailing radial axles in order to accommodate the larger grates that will have to be employed to utilize in the future inferior grades of coal. We may expect, therefore, to see on Indian broad gage railways in the near future, 4-6-2 and 2-8-2 types in supersession of the present standard passenger and freight engines respectively.

There appears to be no early prospect of any advance beyond the 2-8-2 freight engine, except on ghât or mountain sections, at any rate as a standard; partly because present operating conditions do not favor trains exceeding about 2,000 ft. in length, and partly because in any case very heavy preliminary expenditures on siding extensions, loops and other works will be necessary, and this can only be spread over a number of years. The coupler question is also involved, but this is already under consideration and may be settled on lines that will remove it from the list of obstacles to heavy freight movements.

WHISTLE LEVERS are being installed on the fireman's side of 175 locomotives on the Missouri, Kansas & Texas.

Photo by Keystone

Strikers Watching Entrance to D. L. & W. Shops, Hoboken, N. J.

General News Department

L. A. Downs, vice-president and general manager of the Central of Georgia, has been elected an honorary corresponding member of the National College of Italian Railway Engineers. Mr. Downs was president of the American Railway Engineering Association last year and was a delegate from the United States to the International Railway Congress at Rome last May at which time this honor was conferred upon him.

To Operate Part of Kansas City Northwestern

Business men living in towns along the defunct Kansas City Northwestern held a meeting at Seneca, Kan., last week to consider the possibility of operating electric cars over the line, which suspended operations except at terminals in March, 1921. The north terminal of the road is at Virginia, Neb., and it is proposed to operate cars from that point to Beatrice over the tracks of the Chicago, Rock Island & Pacific. Plans for a general renewal of operations are, however, still tentative.

Southern Pacific Asks New Hearing in Dissolution Case

The Southern Pacific on July 31 filed in the Supreme Court of the United States an application for a rehearing of the case in which the court recently ordered the separation of the Southern Pacific and the Central Pacific. The court had given permission to file the petition, but no action can be taken on it until the court meets for its next term in October.

The company grouped the grounds advanced for the re-hearing under five heads and among other things urged an application of the Sherman act "in the light of the rule of reason," insisting that under the laws of California there was authority for the lease made by the Central Pacific in 1885, which, if valid, constituted the Southern Pacific proprietor of the Central Pacific for 99 years.

The petition asserted that it was not the intention of the Sherman act to "subvert titles vested before its passage" and that Congress in considering the refunding of the Central Pacific debt always looked "for a guaranty of its payment by the Southern Pacific."

The petition further stated that the Sherman law "should not be interpreted as requiring the disintegration of railroad lines which in the 50 years of their history have had a community of operation through a single management of unbroken continuity." All consolidations, leases and conveyances of California companies holding federal franchises to construct and operate railroads were made upon the basis which prevailed in the Central Pacific lease, and "have stood unchallenged from earliest times."

The Federal Refunding Committee "was clearly coupled with authority," the petition continued, "to make a settlement calling for a guaranty by the Southern Pacific predicated upon its position as lessee, inasmuch as such a settlement was in line with what had always been regarded in Congress as practically indispensable to refunding."

The opinion of the court, the petition said, "fails to do justice to the moral or legal aspects of our case under the settlement," in that it leaves out of consideration governmental action from 1885 to 1898 "indispensable to a sound interpretation of the powers conferred upon the (refunding) commission and the settlement made by it."

The opinion also "ignores the lease as the predicate upon which the guaranty was requested and given . . . claiming that it "assumes that the commission did not request but merely, unresistingly, appointed the guaranty."

The decision of the court is further criticized on the ground that "it ignores the fact that without the guarantee the government could not have obtained payment of the debt"; also that "it takes no account of the fact that without the concurrence of the Southern Pacific the Central Pacific could not have complied with the terms of the agreement of settlement which required the lease of the Southern Pacific to be subordinated to the bonds issued by the reorganized company," and that "it ignores the fact that it was the first duty of the commission to familiarize itself with the plan of reorganization and to satisfy itself that it was adequate to insure the payment of the government debt within 10 years.

The company asked an opportunity for counsel to present an argument on that part of the opinion relating to the apportionment or use of certain properties "constructed or acquired during the unified control of the two systems," contending that "propositions upon which they may be thought to rest were never presented by any pleading, never mentioned in the taking of evidence, at no time argued . . . and are not to be supported by any rule heretofore announced or applied" by the Supreme Court.

Prosperity in Steel and Lumber

The Bureau of Economics of the National Lumber Manufacturers Association reports in its monthly "Graphic Summary of Business Statistics" that the two broad bases of prosperous manufacturing in the United States—steel and lumber—are now virtually normal or better. The latest available monthly figures put pig iron production at 93, raw steel at 98 and lumber at 117 per cent of the normal, which is assumed to be the average for the last 10 years.

In a large measure 17 other significant statistics support the lumber and steel indication of returned "normalcy." Time money rates are 82 per cent of normal; call money 98 per cent; industrial dividends (volume) 100 per cent; New York bank clearings, 100; average price of twenty industrial stocks, 110; twenty railroad stocks, 93; New York stock exchange business, 157; bank clearings outside of New York, 119; business failures, 151 per cent; unfilled steel tonnage, 79; merchandise imports, 102; merchandise exports, 77; authorized capital of new corporations—for June—60 per cent; lumber shipments, 130; lumber orders, 146; Bradstreet's commodities price index, 90 per cent; bituminous coal production (despite the strike), 59 per cent; estimated cost of new buildings in 20 cities for June, 236 per cent.

Convention and Vacation Traffic Heavy

To accommodate the many conventions and the heavy vacation travel of the past spring and early summer the railroads and the Pullman Company provided 1,905 special sleeping cars for convention traffic, in addition to 1,719 extra pullmans during the few days following June 28, to handle the holiday traffic. In June, the Chicago, Rock Island & Pacific alone handled almost 50 special passenger trains which carried about 10,000 paying passengers, and comprised approximately 400 sleeping cars, coaches, etc. A better idea of the recent demand for extra equipment made by conventions, sporting events, and early summer travel may be gained from the following figures: For the Knights Templar Conclave held in New Orleans, La., 284 extra sleeping cars were used; the Investment Bankers' Association, 22 cars; the Rotary clubs' convention, 107 cars; advertising clubs, 38 cars; Shriners' convention, 688 cars; United Confederate Veterans' reunion, 117 cars; Kiwanis clubs, 23 cars; Derby Day, Louisville, Ky., 218 cars, Indianapolis, Ind., auto races, 95 cars. The reduced railroad rates from Los Angeles, Cal., to the East required the use of 253 additional cars. Figures available regarding the number of extra sleeping cars in use from the principal Eastern points during the last of June and the first part of July are distributed as follows: Northwestern territory (N. Y. C., N. Y., N. H. & H., P. L. & W., Erie) 896 cars; southeastern territory (Penna., B. & O., C. & O., L. V.) 472 cars; southern points 107 cars; Chicago, except P. R. R., B. & O., N. Y. C., Big Four, 244 cars.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1922

Name of road.		Average mileage operated during period.	Operating revenues			Maintenance of		Operating expenses				Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
			Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Akron, Canton & Youngstown	June	170	$188,785	$1,110	$198,848	$22,776	$20,332	$6,501	$55,067	$9,159	$113,849	57.30	$84,999	$73,999	$41,292	$22,24.
	6 mos.	170	1,018,330	8,222	1,071,614	107,800	111,224	34,054	284,267	52,551	589,483	55.00	482,131	424,044	270,567	—1,128
Alabama & Vicksburg	June	141	203,732	60,460	281,735	49,546	57,163	10,227	97,340	11,808	228,171	81.00	53,564	34,065	38,361	—25,046
	6 mos.	141	1,140,928	329,054	1,575,090	277,024	312,391	53,701	568,711	71,105	1,293,924	82.20	281,166	156,504	175,895	—117,622
Vicksburg, Shreveport & Pac	June	171	230,453	97,496	350,342	52,234	60,717	10,767	124,791	12,575	264,563	75.50	85,779	62,841	54,735	40,696
	6 mos.	171	1,214,483	539,369	1,881,316	352,689	300,457	62,611	721,198	80,306	1,530,415	81.30	350,901	231,612	181,381	55,242
Ann Arbor	June	293	371,055	43,954	445,353	62,559	74,459	9,112	175,667	20,109	341,906	78.50	93,447	70,647	51,306	24,823
	6 mos.	293	2,072,774	248,176	2,413,075	287,294	408,785	56,405	1,063,712	84,973	1,901,237	78.80	511,838	385,713	255,382	12,831
Atchison, Topeka & Santa Fe	June	8,855	10,083,872	4,120,633	15,524,584	3,263,155	3,420,274	265,158	4,631,389	325,416	11,880,517	76.50	3,644,067	2,595,290	2,725,943	5,238,927
	6 mos.	8,857	55,478,980	20,691,728	83,402,328	14,874,821	20,735,931	1,572,781	27,301,281	2,006,079	66,439,994	79.70	16,962,334	10,756,490	11,522,790	15,041,276
Gulf, Colorado & Santa Fe	June	1,907	1,390,722	364,915	1,892,718	383,354	407,669	43,018	581,018	63,995	1,477,475	78.10	415,243	340,364	275,954	897,879
	6 mos.	1,907	7,412,637	1,839,118	9,994,276	2,395,968	2,694,152	252,082	3,489,260	409,304	9,236,384	92.40	757,892	360,810	—26,132	1,781,907
Panhandle & Santa Fe	June	857	407,476	132,502	574,661	218,904	134,534	7,734	171,646	17,943	549,212	95.50	25,449	2,541	—26,605	244,008
	6 mos.	857	2,500,598	644,010	3,471,006	928,573	1,144,103	41,292	1,191,136	113,336	3,411,992	98.30	59,014	—78,414	—266,165	195,116
Atlanta & West Point	June	93	98,994	75,866	207,363	27,162	39,203	7,352	74,865	10,601	165,667	79.90	41,696	29,320	23,334	—15,311
	6 mos.	93	575,746	409,150	1,147,232	141,085	248,891	45,805	452,615	61,768	973,793	84.90	173,439	112,149	68,529	21,027
Western of Alabama	June	133	121,203	66,169	213,381	25,555	42,139	8,030	65,446	11,108	158,265	74.20	55,116	44,590	46,706	12,476
	6 mos.	133	683,472	371,223	1,194,732	148,785	278,855	50,297	398,732	65,215	961,955	80.50	232,777	178,547	180,334	55,343
Atlanta, Birmingham & Atlantic	June	639	248,610	36,031	312,517	59,737	90,394	20,776	166,719	15,706	353,398	113.10	—40,881	—55,460	—67,687	—187,542
	6 mos.	639	1,497,313	191,772	1,842,846	351,003	531,771	127,095	948,942	95,045	2,054,405	111.46	—211,559	—300,703	—374,906	—1,020,818
Atlantic Coast Line	June	4,922	4,007,037	1,093,025	5,571,036	668,310	1,281,314	93,198	2,063,486	132,491	4,266,630	76.60	1,304,406	1,027,798	956,249	—24,840
	6 mos.	4,923	25,705,491	8,547,819	37,095,580	4,097,740	7,051,317	642,509	13,087,950	826,003	25,917,517	69.90	11,178,063	9,564,834	8,845,354	3,170,358
Charleston & Western Carolina	June	342	218,351	37,057	271,725	46,018	34,311	6,674	106,037	6,137	199,177	73.30	72,548	61,540	54,198	—73,755
	6 mos.	342	1,420,580	216,552	1,724,476	273,600	223,820	40,126	691,022	34,280	1,267,348	73.50	457,128	390,505	335,250	—202,150
Baltimore & Ohio	June	5,235	13,870,834	2,444,226	17,580,515	1,900,941	4,340,037	307,910	6,566,222	474,521	13,776,907	78.40	3,803,608	3,069,386	2,666,332	321,133
	6 mos.	5,235	79,325,814	12,910,208	98,679,159	11,704,269	22,377,895	1,785,190	38,060,865	2,867,708	77,698,974	78.70	20,980,215	16,697,276	14,580,295	7,630,464
Baltimore & Ohio Chic. Term	June	91	.....	.....	290,213	54,302	30,059	1,675	138,368	11,281	240,050	82.70	50,163	—1,234	98,120	25,376
	6 mos.	91	.....	.....	1,477,424	221,143	187,704	11,462	814,158	61,418	1,319,911	89.30	157,513	—125,093	567,531	161,548
Staten Isl. Rapid Transit	June	23	63,767	113,914	202,266	65,626	26,231	1,893	123,338	13,494	230,582	114.00	—28,316	—46,335	—59,114	—12,810
	6 mos.	23	476,300	562,493	1,151,808	300,869	184,012	11,715	682,622	82,268	1,261,486	109.40	—109,678	—212,224	—294,225	—200,343
Bangor & Aroostook	June	625	471,032	67,261	562,672	144,362	146,387	3,830	159,640	26,072	482,727	85.80	79,945	44,415	56,685	35,755
	6 mos.	625	3,901,688	449,239	4,488,387	708,137	764,524	24,695	1,193,866	119,170	2,813,712	62.70	1,672,675	1,336,242	1,353,125	355,504
Belt Ry. Co. of Chicago	June	32	.....	.....	501,780	77,412	51,848	2,597	201,699	19,965	343,521	68.50	158,259	—124,886	131,957	132,443
	6 mos.	32	.....	.....	2,890,726	277,521	315,643	12,209	1,262,027	59,466	1,926,866	66.70	963,860	—751,577	828,984	803,709
Bessemer & Lake Erie	June	225	1,337,524	26,210	1,389,042	133,206	365,442	17,122	382,262	27,321	929,794	66.90	459,248	426,539	461,629	587,968
	6 mos.	225	4,368,930	176,583	4,664,649	636,629	1,766,735	93,944	1,612,869	153,363	4,293,098	92.06	371,551	175,111	365,618	—82,556
Bingham & Garfield	June	34	22,913	.....	23,625	14,789	3,439	1,565	6,265	3,716	29,935	126.70	—6,310	—10,554	2,911	—31,111
	6 mos.	34	81,458	.....	82,380	101,310	21,106	7,958	28,518	25,127	184,315	223.70	—101,935	—133,002	—77,086	—115,397
Boston & Maine	June	2,287	3,944,466	1,778,322	6,523,383	1,110,193	1,211,164	54,324	2,680,479	212,256	5,289,782	81.10	1,233,601	1,005,832	758,833	—159,368
	6 mos.	2,287	23,591,119	10,298,737	37,848,763	5,813,127	7,220,571	334,974	17,559,103	1,329,796	32,402,799	85.60	5,445,964	4,282,699	2,767,091	—4,485,385
Brooklyn Eastern Dist. Term	June	9	118,546	.....	127,723	8,501	12,735	487	49,303	4,579	75,605	59.20	52,118	45,531	45,531	19,055
	6 mos.	9	750,639	.....	797,420	33,200	112,329	1,294	299,248	29,046	475,117	59.60	322,303	283,732	283,732	146,437
Buffalo & Susquehanna	June	253	61,114	4,186	68,622	32,474	30,215	2,424	28,421	9,966	103,500	150.80	—34,878	—38,128	—32,983	—35,763
	6 mos.	253	670,413	36,528	731,747	184,750	235,124	13,171	266,012	55,055	754,112	103.10	—22,365	—41,902	58,639	—50,849
Buffalo, Rochester & Pittsburgh	June	589	743,249	125,059	945,708	293,326	390,196	19,657	394,673	40,296	1,139,845	120.50	—194,137	—229,187	—186,917	31,093
	6 mos.	589	5,840,182	785,434	6,942,958	912,234	2,518,790	104,468	2,715,009	228,009	6,491,504	93.50	451,454	237,152	406,499	333,104
Canadian Pacific (Lines in Me.)	June	233	154,581	32,654	201,647	40,221	27,913	4,587	78,657	3,717	155,095	76.90	46,552	30,552	12,591	—49,681
	6 mos.	233	1,210,023	201,734	1,508,504	215,812	272,596	25,818	711,440	22,200	1,247,866	82.70	260,638	164,638	83,381	—4,096
Carolina, Clinchfield & Ohio	June	295	645,436	39,490	699,220	67,537	155,385	24,432	150,932	25,295	423,578	60.60	275,642	235,622	321,916	186,580
	6 mos.	295	3,574,170	220,049	3,863,255	446,831	899,757	142,042	951,739	113,427	2,551,561	66.10	1,311,694	1,071,206	1,506,416	962,718
Central of Georgia	June	1,920	1,344,076	441,344	1,993,095	263,520	353,785	58,086	727,100	75,757	1,486,174	74.60	506,921	395,207	403,140	152,922
	6 mos.	1,917	7,307,486	2,394,378	10,747,997	1,422,225	2,075,574	396,359	4,180,010	446,939	8,559,701	79.60	2,188,296	1,651,310	1,747,837	97,209
Central of New Jersey	June	688	2,360,388	808,455	3,443,405	524,649	1,026,419	27,722	1,558,789	102,366	3,258,324	94.60	185,081	—75,761	—112,518	688,283
	6 mos.	688	17,489,173	4,160,582	23,199,980	2,538,130	6,586,164	202,126	9,686,569	626,355	19,737,835	85.10	3,462,145	1,901,239	1,681,722	3,073,510
Central Vermont	June	407	394,191	87,475	542,133	97,725	115,258	11,550	259,413	18,251	503,676	92.90	38,457	21,398	—1,475	—117,817
	6 mos.	407	2,430,873	522,858	3,168,328	433,493	597,225	67,882	1,647,689	136,177	2,891,270	91.30	277,058	174,445	21,977	—850,415
Chesapeake & Ohio	June	2,547	7,491,175	982,567	8,870,114	1,145,380	2,119,118	81,119	2,663,858	157,583	6,191,743	69.80	2,678,371	2,410,053	2,452,539	1,944,753
	6 mos.	2,547	37,273,439	4,912,408	44,172,859	5,103,559	11,251,434	456,542	15,379,255	966,056	33,273,392	75.30	10,899,467	9,288,282	9,644,657	5,041,318
Chicago & Alton	June	1,050	1,535,880	565,122	2,306,082	402,450	615,723	59,904	869,831	58,466	2,014,208	87.30	291,874	216,576	88,339	11,735
	6 mos.	1,050	10,054,897	2,981,031	14,132,672	1,615,077	3,878,200	337,704	5,440,108	346,998	11,643,937	82.70	2,448,735	1,996,603	1,154,084	—44,825
Chicago & Eastern Illinois	June	945	1,445,153	408,592	2,010,422	289,420	586,787	44,180	811,166	66,580	1,808,860	90.00	201,562	115,756	60,797	93,777
	6 mos.	945	8,829,315	2,201,924	11,993,154	1,366,621	3,137,054	253,246	4,876,613	397,430	10,098,954	84.80	1,804,200	1,290,880	1,119,477	—380,322
Chicago & North Western	June	8,402	9,392,153	2,762,911	13,665,322	2,144,311	2,628,629	168,699	5,172,081	303,960	10,506,547	76.90	3,158,775	2,426,609	2,389,331	894,039
	6 mos.	8,402	46,063,556	14,257,018	67,660,620	8,777,326	14,537,903	890,891	30,217,918	1,866,708	56,707,469	83.80	10,953,160	6,556,439	6,331,403	—3,567,055
Chicago, Burlington & Quincy	June	9,393	9,067,361	2,576,326	13,384,755	2,155,061	2,781,705	201,682	4,606,853	383,965	10,205,871	78.00	2,878,884	1,961,361	1,776,039	2,340,197
	6 mos.	9,393	54,692,883	12,967,703	74,635,952	9,505,390	15,976,044	1,104,294	27,513,009	2,075,912	56,723,894	76.00	17,912,058	12,386,073	11,659,072	16,672,390
Chicago Great Western	June	1,496	1,506,729	370,486	2,038,290	430,259	456,281	73,470	802,506	54,593	1,830,324	89.80	207,966	129,275	—13,927	170,518
	6 mos.	1,496	8,214,538	2,059,937	11,323,144	1,652,686	2,790,078	390,228	4,952,230	340,614	10,205,337	90.10	1,117,807	628,067	—148,449	284,147

REVENUES AND EXPENSES OF RAILWAYS

Month of June and Six Months of Calendar Year 19[illegible]—Continued

Name of road.	Period	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General	Total	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Chicago, Ind. & Louisville	June	654	$959,246	$265,599	$1,358,651	$152,314	$292,584	$35,010	$517,100	$36,485	$1,047,247	77.10	$311,404	$244,725	$142,220	$57,747
	6 mos.	654	5,537,481	1,530,349	7,757,916	819,412	1,720,485	194,838	2,873,178	213,114	5,898,269	76.00	1,859,647	1,479,989	868,136	—778
Chicago, Milwaukee & St. Paul	June	11,030	9,720,557	2,239,056	13,513,554	2,122,045	3,464,172	204,505	4,959,964	341,446	11,175,668	82.70	2,337,886	1,533,726	1,215,105	817,090
	6 mos.	11,030	52,115,128	11,405,494	71,156,775	9,236,371	19,421,487	1,113,818	30,427,142	1,976,711	62,544,874	87.90	8,611,901	3,790,425	1,617,155	—2,815,724
Chicago, Peoria & St. Louis	June	246	144,429	13,799	168,092	31,533	43,122	5,483	108,442	10,662	199,212	118.50	—31,150	—40,674	—66,492	—37,231
	6 mos.	246	947,236	115,775	1,133,185	183,710	251,423	6,652	664,335	63,855	1,189,975	105.00	—56,790	—113,887	—148,100	[illegible]
Chicago River & Indiana	June	38	.....	.....	594,994	64,110	59,491	510	230,924	5,156	360,191	60.50	234,803	190,359	167,017	....
	6 mos.	38	....	....	792,263	87,995	82,070	733	315,919	8,183	494,900	62.50	297,363	238,496	345,479	......
Chicago, R. I. & Pacific	June	7,661	7,465,396	2,505,328	10,733,758	1,379,939	2,296,528	195,041	4,001,966	225,139	8,163,984	76.10	2,569,774	2,024,764	1,783,169	1,080,714
	6 mos.	7,661	39,202,214	12,640,192	56,053,682	7,240,761	12,661,951	1,062,084	23,848,496	1,397,909	46,414,592	82.90	9,609,090	6,416,478	4,971,126	4,513,424
Chicago, R. I. & Gulf	June	461	388,155	80,731	516,269	92,210	57,957	14,638	208,494	14,174	386,830	74.90	129,439	118,279	99,024	105,525
	6 mos.	461	2,003,480	452,689	2,716,060	386,675	486,675	82,566	1,255,387	84,013	2,299,533	84.70	416,527	346,465	[illegible]	375,594
Chic., St. Paul, Minn. & Omaha	June	1,749	1,691,398	568,943	2,466,833	306,742	473,554	35,308	1,003,274	72,985	1,902,868	77.10	563,965	430,644	400,904	152,336
	6 mos.	1,749	9,097,581	3,001,908	13,056,451	1,626,297	2,561,322	198,432	6,161,951	434,583	11,029,360	84.60	2,017,091	[illegible]	[illegible]	—769,013
Cincin., Indianapolis & Western	June	347	304,131	52,312	376,757	46,381	79,735	13,636	150,300	19,640	312,461	82.90	64,296	[illegible]	[illegible]	[illegible]
	6 mos.	347	1,637,358	294,355	2,043,584	256,002	457,408	68,196	913,508	119,237	1,829,086	89.50	214,498	128,758	[illegible]	[illegible]
Colorado & Southern	June	1,099	903,754	173,726	1,156,706	219,708	246,092	12,936	389,936	44,788	923,342	79.80	233,364	165,303	[illegible]	[illegible]
	6 mos.	1,099	4,737,312	873,994	6,059,966	781,325	1,379,419	77,666	2,270,902	268,508	4,820,475	79.50	1,239,491	[illegible]	[illegible]	[illegible]
Ft. Worth & Denver City	June	456	523,855	194,406	784,649	58,217	135,163	13,499	219,280	35,319	467,927	59.60	316,722	275,406	[illegible]	[illegible]
	6 mos.	456	3,081,848	1,001,902	4,362,143	386,674	824,445	70,261	1,428,467	218,770	2,951,609	67.60	1,410,534	1,173,344	1,189,590	1,397,445
Wichita Valley	June	256	57,866	23,742	89,779	20,418	5,617	25	38,867	1,412	66,296	73.80	23,483	17,963	[illegible]	[illegible]
	6 mos.	256	401,828	126,499	571,445	127,816	47,238	279	248,471	9,053	429,823	75.20	[illegible]	107,055	[illegible]	[illegible]
Columbus & Greenville	June	167	94,551	25,953	126,183	26,496	17,547	3,327	46,568	8,676	102,614	81.30	23,569	[illegible]	7,432	[illegible]
	6 mos.	215	513,066	162,564	714,658	162,698	81,690	20,179	282,653	50,892	598,067	83.70	116,591	[illegible]	17,057	[illegible]
Delaware & Hudson	June	887	1,733,777	277,411	2,296,018	520,587	640,566	45,664	1,069,692	149,383	2,477,438	107.90	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	887	15,440,422	1,612,712	18,866,430	2,883,721	4,912,292	262,296	7,628,989	887,572	16,896,701	89.60	1,969,729	1,439,913	1,464,153	[illegible]
Dela., Lackawanna & Western	June	994	3,534,763	1,197,918	5,501,267	900,196	1,094,256	119,772	2,503,623	160,974	4,833,534	87.90	667,733	[illegible]	411,745	[illegible]
	6 mos.	994	25,074,206	6,434,184	35,882,808	3,933,888	7,630,283	668,991	15,543,052	959,395	28,945,547	80.70	6,937,261	4,374,760	4,726,070	[illegible]
Denver & Rio Grande Western	June	2,593	1,248,638	555,995	2,737,227	431,234	634,793	54,706	840,751	84,986	2,117,624	77.40	619,603	455,853	[illegible]	[illegible]
	6 mos.	2,593	10,923,931	2,410,561	14,456,211	2,061,533	3,104,899	276,875	4,890,777	500,735	11,089,374	76.70	3,366,837	[illegible]	2,653,151	[illegible]
Denver & Salt Lake	June	255	22,731	13,597	41,963	52,509	14,292	1,019	15,079	5,663	88,562	211.00	—46,599	—55,599	—52,824	[illegible]
	6 mos.	255	428,068	84,569	555,823	213,056	152,778	5,719	212,657	36,483	620,693	111.70	—64,870	—118,880	[illegible]	[illegible]
Detroit & Mackinac	June	385	141,738	29,033	185,535	29,460	56,104	3,205	57,879	5,359	151,794	81.80	33,741	23,506	22,243	10,073
	6 mos.	385	585,425	165,493	815,311	154,518	306,706	13,775	344,606	33,070	852,159	104.50	—36,848	[illegible]	[illegible]	[illegible]
Detroit & Toledo Shore Line	June	61	306,217	....	310,025	33,852	20,848	1,658	66,876	6,100	129,334	41.70	180,691	166,672	[illegible]	30,540
	6 mos.	61	1,793,092	....	1,809,131	174,577	124,925	12,491	485,704	43,066	840,763	46.50	968,368	884,308	[illegible]	87,958
Detroit, Toledo & Ironton	June	454	882,956	9,568	904,632	153,081	208,819	4,756	262,478	20,002	648,737	71.70	255,895	253,539	[illegible]	125,977
	6 mos.	454	4,358,160	57,102	4,477,923	607,996	934,606	34,027	1,466,430	109,878	3,152,538	70.40	1,325,405	1,249,921	[illegible]	190,082
Duluth & Iron Range	June	281	1,220,081	14,080	1,317,150	148,123	116,771	1,170	233,739	19,288	519,672	39.50	797,478	709,706	712,391	[illegible]
	6 mos.	281	1,894,026	92,992	2,176,549	471,247	552,260	6,808	796,334	100,920	1,922,177	88.30	254,372	92,592	103,988	—507,624
Duluth, Missabe & Northern	June	307	2,463,601	36,568	2,679,074	251,490	144,561	2,892	404,119	20,551	825,370	30.80	1,853,704	1,652,902	1,644,808	969,899
	6 mos.	306	3,326,817	252,536	3,844,734	886,505	804,423	18,443	1,204,653	118,932	3,043,263	79.20	801,471	201,446	185,778	—71,915
Duluth, South Shore & Atlantic	June	591	300,163	92,370	441,665	87,163	69,073	7,005	185,444	11,374	366,650	83.00	75,105	42,105	[illegible]	—103,808
	6 mos.	591	1,298,384	479,638	1,964,781	368,906	405,439	39,614	1,103,475	69,307	[illegible]	102.70	—53,132	—239,402	—258,772	—504,891
Duluth, Winnipeg & Pacific	June	178	170,447	19,047	194,909	32,551	38,648	4,896	65,980	5,432	147,507	75.76	47,402	37,464	[illegible]	—36,887
	6 mos.	178	823,794	115,045	972,664	158,790	237,290	28,120	433,854	33,326	891,356	91.60	81,308	27,067	13,327	27,150
Elgin, Joliet & Eastern	June	459	1,501,342	8	1,731,845	168,857	415,241	11,310	539,075	37,030	1,171,303	67.60	560,542	468,155	339,745	193,884
	6 mos.	459	9,448,136	22	10,507,235	845,709	2,152,523	72,248	3,101,133	206,088	6,376,896	60.70	4,130,339	3,607,179	2,877,166	1,324,816
El Paso & Southwestern	June	1,139	825,042	181,796	1,066,040	184,848	170,083	30,476	285,761	45,410	724,642	68.00	341,398	245,410	176,336	281,181
	6 mos.	1,139	3,884,899	973,043	5,209,396	935,736	878,114	167,657	1,427,791	247,281	3,702,312	71.10	1,507,084	930,581	740,193	[illegible]
Erie	June	2,039	5,154,572	1,128,391	6,911,866	935,419	2,281,746	128,322	3,204,101	276,820	6,871,558	99.40	40,308	—253,428	—114,050	534,481
	6 mos.	2,039	34,678,302	6,249,744	44,435,306	4,593,439	12,705,939	807,043	19,570,046	1,703,291	39,629,390	89.20	4,805,916	3,193,540	3,999,908	2,488,876
Chicago & Erie	June	269	773,146	66,355	903,506	102,552	157,449	17,703	381,213	33,089	692,507	71.60	210,993	155,986	—121,815	—443,022
	6 mos.	269	4,816,539	312,048	5,492,774	571,435	814,932	117,375	2,405,117	205,545	4,114,795	74.90	1,377,979	1,059,689	—593,097	—2,185,598
New Jersey & New York	June	45	16,837	102,326	123,401	16,293	19,010	1,474	71,549	2,917	111,242	90.10	12,159	9,159	—17,176	—1,256
	6 mos.	45	119,673	581,060	728,748	85,336	107,708	7,969	405,714	20,145	626,871	86.00	101,877	83,655	—67,180	—101,348
N. Y., Susquehanna & Western	June	135	224,705	61,580	324,241	57,076	61,856	3,315	193,403	8,073	323,868	99.90	373	—25,098	—41,797	143,938
	6 mos.	135	1,354,459	356,246	1,975,049	262,039	341,869	21,527	1,119,320	57,143	1,802,026	91.20	173,023	21,651	—57,227	—45,866
Florida East Coast	June	764	493,930	199,575	813,138	149,168	193,895	11,983	298,864	25,280	683,525	84.10	129,613	66,866	3,838	—104,859
	6 mos.	764	4,726,520	2,407,921	8,065,238	1,023,904	1,182,210	87,896	2,308,381	158,950	4,838,631	60.00	3,226,607	2,860,698	2,613,188	1,600,182
Ft. Smith & Western	June	249	109,749	22,748	142,073	25,438	21,685	4,733	43,813	6,805	103,404	72.80	38,669	32,820	21,149	—30,780
	6 mos.	249	548,978	125,831	730,608	148,097	146,447	29,075	272,625	41,330	642,955	88.00	87,653	52,604	883	—101,871
Galveston Wharf	June	13	......	......	98,602	54,068	3,854	989	22,497	3,167	98,675	100.10	—73	—17,119	—17,230	63,491
	6 mos.	13	......	......	706,854	345,458	25,589	1,906	170,928	21,868	671,383	95.00	35,471	—68,611	—68,576	453,801
Georgia	June	328	280,800	106,058	421,356	42,671	72,627	18,754	195,920	19,564	349,787	83.00	71,569	64,467	70,585	15,061
	6 mos.	328	1,630,132	555,444	2,367,734	236,910	420,630	116,251	1,150,242	113,848	2,039,158	86.10	328,576	285,400	302,112	—66,509
Georgia & Florida	June	405	118,310	12,028	138,050	18,470	14,373	8,289	52,928	6,403	100,676	72.50	37,374	31,073	21,369	—26,717
	6 mos.	405	549,657	69,637	665,104	102,657	106,108	50,024	265,327	38,439	563,839	84.80	101,267	63,407	19,656	149,325

REVENUES AND EXPENSES OF RAILWAYS

Month of June and Six Months of Calendar Year 1922—Continued

Name of road.		Average mileage operated during period	Operating revenues: Freight.	Operating revenues: Passenger.	Operating revenues: Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Operating expenses: Maintenance of Equipment.	Operating expenses: Traffic.	Operating expenses: Transportation.	Operating expenses: General.	Operating expenses: Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Grand Trunk Western	June	347	$1,498,719	$170,128	$1,683,523	$173,315	$307,148	$22,956	$580,194	$47,671	$1,137,284	67.60	$546,239	$473,058	$234,858	$32,732
	6 mos.	347	6,030,945	862,381	7,343,633	647,132	1,643,033	161,575	3,280,074	300,836	6,070,072	82.70	1,273,561	885,957	269,484	—863,320
[illegible]	June	106	107,414	31,214	164,862	48,849	25,118	5,258	96,494	9,655	185,885	112.80	—21,023	—37,923	—72,413	—153,508
	6 mos.	106	1,067,904	196,055	1,364,899	238,366	219,822	27,192	782,521	72,285	1,350,683	99.00	14,216	—87,228	—495,087	—603,992
Chi., Det. & Canada G. T. Jct.	June	59	1[illegible],086	10,282	155,448	17,720	16,078	2,622	68,246	3,786	108,441	69.80	47,007	33,684	10,949	11,975
	6 mos.	59	[illegible]5,338	54,342	1,124,376	82,420	76,724	20,376	396,267	22,258	597,955	53.20	526,421	476,875	366,849	179,751
Det., Gr. Haven & Milw.	June	189	473,218	43,030	553,815	54,404	54,336	6,802	233,777	16,756	366,492	66.20	187,323	183,618	104,603	—54,489
	6 mos.	189	2,121,739	237,879	2,536,005	245,040	279,691	50,263	1,258,820	101,819	1,937,876	76.40	598,129	559,004	171,941	—567,816
Great Northern	June	8,263	6,921,563	1,390,155	9,242,241	1,590,594	1,694,061	182,964	3,092,327	216,498	6,807,580	73.70	2,434,661	1,731,326	1,830,787	1,187,985
	6 mos.	8,263	31,449,656	6,755,161	42,739,195	6,159,727	9,153,101	833,220	18,021,718	1,284,422	35,780,679	83.70	6,949,516	3,279,703	4,039,579	—1,611,160
Green Bay & Western	June	262	100,566	15,400	125,040	24,431	19,423	2,619	40,021	2,328	88,819	71.00	36,221	28,221	24,929	7,150
	6 mos.	262	5[illegible],230	104,386	686,695	125,694	112,185	14,424	253,712	16,239	522,231	76.00	164,464	116,464	90,423	71,795
Gulf Coast Lines	June	..	470,333	153,595	678,499	146,847	129,556	24,406	190,267	32,741	522,193	77.00	156,306	116,806	118,249	84,740
	6 mos.		3,864,926	899,151	5,102,678	815,900	833,285	159,459	1,412,210	212,933	3,527,300	69.60	1,575,378	1,349,478	1,243,209	766,718
Gulf & Ship Island	June	307	204,126	38,453	259,108	42,379	37,251	6,162	75,202	11,867	173,171	66.80	85,937	68,246	60,777	2,283
	6 mos.	307	1,176,256	220,203	1,437,784	263,246	223,735	45,106	432,667	69,536	1,036,396	72.10	401,388	294,174	259,843	56,172
Gulf, Mobile & Northern	June	436	366,118	34,012	417,466	60,411	65,745	11,942	142,984	15,360	292,421	70.00	125,045	107,747	86,357	—32,242
	6 mos.	436	1,960,855	207,805	2,259,011	334,412	374,304	81,646	760,034	94,568	1,636,573	72.40	622,438	518,991	432,815	70,968
Hocking Valley	June	348	936,174	84,533	1,178,018	113,272	230,100	11,184	364,981	32,670	748,211	63.50	429,807	337,629	348,816	137,645
	6 mos.	348	5,339,390	491,145	6,350,410	609,031	1,326,547	71,151	2,113,306	187,365	4,297,045	67.70	2,053,365	1,507,772	1,538,478	480,365
Illinois Central	June	4,784	9,496,756	1,995,288	12,355,745	1,652,018	3,007,704	185,829	4,283,764	305,712	9,491,232	76.80	2,864,513	1,839,762	1,877,234	1,348,000
	6 mos.	4,784	53,283,351	11,310,309	69,773,121	8,525,161	15,549,688	211,696	4,881,534	352,590	10,828,029	78.60	2,952,692	1,808,905	1,850,271	1,258,739
Illinois Central (inc. Yazoo & Miss. Val.)	June	6,166	10,532,016	2,290,656	13,780,721	2,026,172	3,298,458	1,271,881	29,172,983	2,165,404	60,706,199	77.30	17,795,541	11,164,993	11,499,994	9,228,233
	6 mos.	6,166	59,667,012	13,097,946	78,501,740	10,558,819	17,259,311	1,116,873	25,497,377	1,866,993	52,842,748	75.70	16,930,373	11,011,775	11,357,080	9,078,964
Yazoo & Miss. Valley	June	1,381	1,035,260	295,368	1,424,976	374,154	290,754	25,867	597,770	46,878	1,336,797	93.80	88,179	30,854	26,963	—89,261
	6 mos.	1,381	6,383,661	1,787,637	8,728,619	2,033,658	1,709,623	155,008	3,675,606	298,411	7,863,451	90.10	865,168	153,218	142,914	149,273
International & Gr. Northern	June	1,159	735,364	230,032	1,090,186	148,150	214,516	26,622	451,817	45,918	895,734	82.20	194,452	160,472	127,489	—53,795
	6 mos.	1,159	4,791,933	1,181,254	6,741,669	936,893	1,310,921	158,954	2,933,993	288,117	5,664,698	84.00	1,076,971	873,585	540,442	—423,960
Kans. City, Mexico & Orient	June	272	100,547	12,058	123,182	26,122	29,127	4,900	56,999	5,761	122,909	99.80	273	—8,047	—7,891	—64,551
	6 mos.	272	553,433	62,180	665,313	150,076	174,427	28,064	364,920	39,699	757,186	113.80	—91,873	—141,819	—139,152	—264,610
Kan. City, Mex. & Orient of Tex.	June	463	112,290	14,338	135,325	21,298	37,365	1,991	64,688	6,704	135,047	99.80	278	—5,722	—18,757	—97,992
	6 mos.	463	627,864	65,616	740,236	161,224	236,264	28,177	463,573	39,512	928,750	125.50	—188,514	224,825	—308,663	—473,210
Kansas City Southern	June	767	1,197,590	181,303	1,518,100	195,884	339,648	36,471	523,653	72,841	1,168,660	77.00	349,440	253,979	214,682	319,859
	6 mos.	767	6,907,531	963,117	8,732,517	1,106,445	1,719,549	220,547	3,175,649	414,151	6,630,710	75.90	2,101,807	1,515,777	1,474,942	2,070,968
Texarkana & Ft. Smith	June	81	151,506	15,522	183,464	14,332	9,528	4,701	18,933	8,469	85,963	46.90	97,501	86,547	71,504	—9,170
	6 mos.	81	806,954	86,303	977,860	112,568	143,329	29,747	295,274	51,296	631,259	64.60	346,601	285,003	189,691	143,549
Kansas City Terminal	June	27	......	......	......	......	......	......	......	......	......	......	......	27,710	198,597	185,976
	6 mos.	27	......	......	......	......	......	......	......	......	—17	......	17	—167,451	1,188,682	1,114,068
Kansas, Oklahoma & Gulf	June	314	228,850	11,783	250,799	46,204	31,826	6,715	87,573	10,780	183,215	73.10	67,584	56,869	45,528	—20,525
	6 mos.	314	1,217,984	72,817	1,341,614	260,050	150,139	33,063	485,436	59,261	989,155	73.70	352,459	292,578	227,417	119,421
Lake Superior & Ishpeming	June	33	148,766	29	177,980	21,790	11,545	217	25,484	2,368	61,404	34.50	116,576	110,869	112,309	—22,514
	6 mos.	33	208,433	472	47,681	117,896	58,297	1,257	75,738	15,629	268,817	108.50	—21,136	—54,273	52,894	—263,579
Lake Terminal	June	13	....	.....	84,266	11,440	12,514	......	41,566	1,754	67,274	79.80	16,992	10,656	17,013	18,173
	6 mos.	13	.	...	551,559	58,262	57,712	......	245,117	9,604	370,695	67.20	180,864	142,845	202,041	13,100
Lehigh & Hudson River	June	96	146,482	3,162	160,126	33,063	26,176	1,403	78,863	7,876	147,336	92.00	12,790	—3,488	—18,444	48,612
	6 mos.	96	1,117,217	22,025	1,200,236	168,662	222,559	8,927	494,793	45,103	939,999	78.30	260,237	180,869	72,058	185,897
Lehigh & New England	June	236	231,326	1,760	240,118	64,743	86,592	5,645	99,197	15,042	271,018	112.90	30,900	—37,545	—27,228	82,037
	6 mos.	236	1,922,410	11,891	1,987,365	258,770	742,416	47,588	714,984	99,777	1,863,308	93.80	124,057	61,186	135,264	416,680
Lehigh Valley	June	1,334	3,699,145	616,618	4,682,192	578,173	1,440,698	100,680	2,183,693	163,172	4,499,642	96.10	182,550	—8,700	—60,897	694,747
	6 mos.	1,334	25,560,675	3,165,731	30,941,221	3,288,626	8,985,322	624,645	13,945,256	826,466	27,814,520	89.90	3,126,701	1,883,020	1,636,840	676,347
Los Angeles & Salt Lake	June	1,137	1,094,036	598,745	1,844,979	372,496	341,798	52,023	511,728	44,372	1,374,981	74.50	469,998	359,070	325,189	276,693
	6 mos.	1,141	6,094,500	2,513,354	9,450,004	2,048,635	2,099,440	278,278	3,146,221	255,106	8,089,228	85.60	1,360,776	699,292	450,497	722,795
Louisiana & Arkansas	June	302	279,417	33,154	320,341	57,138	44,405	7,184	86,228	8,183	196,765	61.40	123,576	104,185	100,948	18,090
	6 mos.	302	1,396,061	195,830	1,633,284	308,304	279,153	44,897	513,267	49,739	1,192,224	73.00	441,060	324,762	312,076	108,686
Louisiana Ry. & Nav. Co.	June	343	233,333	30,876	281,851	61,243	67,331	11,700	102,594	11,241	254,024	90.10	27,827	11,477	16,756	14,4[illegible]2
	6 mos.	343	1,350,034	175,156	1,607,991	381,883	285,861	62,172	664,582	70,497	1,464,244	91.00	143,747	45,494	—99,777	12,799
Louisville & Nashville	June	5,038	9,274,203	1,951,824	11,882,969	1,533,906	2,558,342	202,351	4,037,176	233,533	8,606,893	72.40	3,276,076	2,681,539	2,619,409	474,769
	6 mos.	5,038	47,748,016	10,569,915	62,050,125	8,811,744	14,812,641	1,255,637	23,325,034	1,102,265	49,855,468	80.30	12,194,657	9,811,924	9,839,446	2,589,212
Louisville, Henderson & St. L.	June	199	21[illegible],025	60,333	297,736	78,161	31,306	6,587	105,485	8,168	229,708	77.20	68,028	59,266	44,405	9,592
	6 mos.	199	1,096,006	340,434	1,531,388	309,974	241,088	37,317	520,859	50,376	1,159,614	75.70	371,774	319,231	239,628	71,181
Maine Central	June	1,194	1,135,037	416,433	1,699,621	315,197	288,970	15,821	692,057	45,627	1,358,829	79.90	340,792	241,343	253,680	15,795
	6 mos.	1,194	7,324,475	2,064,465	10,126,725	1,607,671	2,119,203	77,044	4,429,719	281,898	8,521,548	84.10	1,605,177	1,009,307	973,879	—781,671
Midland Valley	June	381	341,962	74,040	434,597	66,815	34,002	5,125	110,337	14,960	231,239	53.20	203,358	186,154	167,184	37,561
	6 mos.	383	1,78[illegible],292	408,909	2,[illegible]81,899	314,770	268,871	28,369	670,932	87,976	1,352,893	59.70	919,006	837,348	784,270	257,936
Minneapolis & St. Louis	June	1,649	1,006,777	150,672	1,[illegible],471	185,634	245,348	24,373	552,495	41,266	1,049,231	85.10	183,240	114,814	64,367	—23,755
	6 mos.	1,649	6,149,222	925,232	7,469,918	1,069,759	1,524,464	146,371	3,512,487	243,467	6,495,005	86.90	974,913	591,595	252,584	—683,653
Minn., St. Paul & S. S. Marie	June	4,383	3,118,196	664,044	4,204,331	672,340	719,491	65,467	1,472,322	112,314	3,053,445	72.60	1,150,886	891,135	844,525	—178,934
	6 mos.	4,383	14,139,398	3,232,370	19,274,928	3,079,531	3,918,646	354,552	9,027,602	626,442	17,036,602	88.50	2,218,326	691,952	510,322	—2,886,602
Mississippi Central	June	258	108,332	14,967	129,211	19,960	38,465	5,294	39,832	6,669	110,221	85.30	18,990	12,687	12,440	—6,728
	6 mos.	260	619,027	93,864	739,711	106,479	212,065	33,397	245,562	41,695	639,199	86.40	100,542	62,870	54,743	61,416

REVENUES AND EXPENSES OF RAILWAYS

Month of June and Six Months of Calendar Year 1922—Continued

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Operating revenues: Passenger.	Operating revenues: Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Operating expenses: Maintenance of Equipment.	Operating expenses: Traffic.	Operating expenses: Transportation.	Operating expenses: General.	Operating expenses: Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Missouri & North Arkansas	June	354	$59,519	$13,153	$76,963	$6,154	$10,989	$1,301	$38,207	$5,067	$61,718	[illegible]	[illegible]	$11,045	[illegible]	[illegible]
	6 mos.	[illegible]	88,435	18,219	[illegible]	7,824	23,004	1,875	60,157	8,732	[illegible]	[illegible]	13,670	[illegible]	[illegible]	[illegible]
Missouri, Kansas & Texas	June	1,670	2,016,343	513,643	2,747,099	313,525	680,775	47,304	711,208	83,534	1,741,045	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	1,670	[illegible]	[illegible]	14,698,965	1,501,801	2,921,853	81,734	[illegible]	660,753	[illegible]	65.00	[illegible]	[illegible]	[illegible]	[illegible]
Mo., Kans. & Texas of Texas	June	1,737	1,167,851	488,640	1,816,892	338,304	304,474	42,271	644,427	[illegible]	1,399,489	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	1,737	6,561,085	[illegible]	10,008,850	1,508,121	1,393,193	250,803	3,972,012	479,496	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wichita Falls & Northwestern	June	229	71,063	[illegible]	105,402	44,086	34,414	705	54,308	[illegible]	[illegible]	[illegible]	[illegible]	−7,119	[illegible]	[illegible]
	6 mos.	329	498,694	130,774	[illegible]	159,313	119,630	5,651	313,639	55,670	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Missouri Pacific	June	7,342	6,356,595	1,419,861	8,663,036	1,659,935	[illegible]	153,278	3,063,361	[illegible]	7,117,297	[illegible]	1,545,739	[illegible]	[illegible]	[illegible]
	6 mos.	7,330	36,203,136	[illegible]	[illegible]	8,349,543	10,673,582	913,485	19,448,148	1,592,632	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mobile & Ohio	June	1,165	1,262,379	144,952	[illegible]	187,621	320,827	46,908	530,082	[illegible]	1,134,580	[illegible]	345,642	[illegible]	[illegible]	[illegible]
	6 mos.	1,165	7,275,381	817,649	8,522,874	1,050,650	1,701,977	[illegible]	3,267,980	291,165	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Monongahela	June	106	102,397	23,934	129,932	35,253	32,400	1,968	48,798	7,572	125,989	97.00	3,943	[illegible]	[illegible]	[illegible]
	6 mos.	106	1,530,402	174,310	1,730,964	234,903	262,095	8,178	451,301	[illegible]	1,013,308	58.60	717,156	[illegible]	[illegible]	[illegible]
Monongahela Connecting	June	7	....	....	155,429	22,649	22,195	540	66,799	[illegible]	121,978	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	7	....	....	832,985	89,817	132,697	3,214	345,233	46,633	617,594	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Montour	June	56	[illegible]	742	21,802	12,190	17,207	1,156	10,232	[illegible]	46,772	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	56	337,714	4,003	348,006	92,675	159,034	5,956	112,836	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nashville, Chatt. & St. Louis	June	1,258	1,218,714	896,601	1,751,912	316,091	443,878	67,432	657,489	51,748	1,540,332	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	1,258	[illegible]	2,196,889	10,143,436	1,640,003	2,754,469	121,229	3,954,063	345,670	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nevada Northern	June	165	35,814	6,255	46,078	7,981	[illegible]	548	9,048	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	165	137,408	[illegible]	186,150	52,804	18,362	2,649	44,647	15,751	135,213	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Newburgh & South Shore	June	7	....	[illegible]	178,888	16,419	38,955	....	69,678	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	7	....	[illegible]	997,496	57,600	205,650	....	376,571	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New Orleans Great Northern	June	274	[illegible]	[illegible]	213,954	[illegible]	8,768	4,579	74,565	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	274	[illegible]	[illegible]	[illegible]	[illegible]	210,539	29,934	402,702	61,238	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New York Central	June	[illegible]	17,380,272	8,498,917	[illegible]	3,786,209	7,155,153	[illegible]	9,482,895	766,858	21,852,140	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	[illegible]	97,650,550	[illegible]	158,557,783	18,333,847	39,967,696	1,871,058	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cincinnati Northern	June	[illegible]	295,187	[illegible]	317,754	[illegible]	61,323	6,509	100,128	7,035	[illegible]	75.20	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	[illegible]	1,619,745	88,145	1,750,311	337,981	312,306	30,152	568,928	49,453	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cleve., Cin., Chic. & St. Louis	June	2,411	5,464,956	1,575,377	7,613,870	1,124,721	1,144,514	136,077	2,523,132	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	2,411	[illegible]	7,698,384	40,829,638	4,500,398	7,636,665	658,559	14,928,577	1,018,176	[illegible]	71.10	[illegible]	[illegible]	[illegible]	[illegible]
Indiana Harbor Belt	June	119	....	....	822,389	131,730	92,788	4,660	[illegible]	[illegible]	527,002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	119	....	....	4,638,822	[illegible]	419,336	[illegible]	1,857,036	116,609	[illegible]	64.10	[illegible]	[illegible]	[illegible]	[illegible]
Kanawha & Michigan	June	176	144,594	42,869	203,839	67,208	149,314	4,306	99,601	10,784	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	176	1,214,314	264,473	[illegible]	363,700	619,445	25,763	628,394	[illegible]	[illegible]	109.10	[illegible]	[illegible]	[illegible]	[illegible]
Lake Erie & Western	June	718	786,763	34,147	856,905	183,032	317,361	18,378	307,406	[illegible]	[illegible]	[illegible]	1,787	[illegible]	[illegible]	[illegible]
	6 mos.	718	4,199,443	[illegible]	4,588,921	807,395	1,167,475	108,851	1,789,227	[illegible]	4,055,940	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Michigan Central	June	1,862	4,646,650	1,851,164	[illegible]	780,223	1,113,522	76,424	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	1,862	25,294,403	8,428,167	37,437,749	3,998,602	8,037,630	535,346	13,169,920	804,146	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pittsburgh & Lake Erie	June	227	[illegible]	[illegible]	2,061,173	306,589	720,717	16,764	695,689	63,910	1,805,494	87.60	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	[illegible]	[illegible]	1,250,099	11,800,206	1,465,861	5,839,798	115,505	4,039,522	380,695	[illegible]	100.40	[illegible]	[illegible]	[illegible]	[illegible]
Toledo & Ohio Central	June	563	505,576	63,222	401,560	121,372	176,256	10,475	214,892	24,957	550,438	137.10	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	503	3,155,343	365,545	3,684,921	745,612	1,182,307	65,063	1,655,772	149,235	3,814,844	103.50	[illegible]	[illegible]	[illegible]	[illegible]
New York, Chic. & St. Louis	June	[illegible]	2,408,000	[illegible]	2,606,879	272,742	501,064	64,777	842,693	80,263	1,768,778	67.90	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	523	13,326,884	555,310	14,222,570	1,363,934	2,579,822	348,792	5,108,922	483,687	9,916,567	69.70	4,306,003	[illegible]	[illegible]	[illegible]
N. Y., New Haven & Hartford	June	1,986	4,921,915	4,088,591	10,249,837	1,766,691	2,186,526	59,997	4,154,204	269,398	8,576,409	83.70	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	1,986	28,411,466	22,913,558	57,847,727	7,763,103	11,481,835	327,599	23,891,454	1,730,761	46,071,316	79.60	11,776,411	[illegible]	[illegible]	[illegible]
Central New England	June	295	413,898	16,819	458,678	128,425	93,282	4,572	195,559	10,375	431,462	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	295	[illegible]	116,031	3,511,250	651,675	522,639	25,467	1,210,519	69,754	2,479,130	70.60	[illegible]	896,171	613,984	[illegible]
New York, Ontario & Western	June	569	[illegible]	305,266	888,365	187,023	162,270	15,278	417,749	29,840	[illegible]	91.40	76,205	[illegible]	[illegible]	[illegible]
	6 mos.	569	3,588,683	1,035,962	5,597,268	761,086	1,082,156	88,878	2,742,166	179,546	4,853,832	86.80	737,436	[illegible]	[illegible]	[illegible]
Norfolk & Western	June	2,237	8,398,611	790,814	9,473,091	1,061,738	1,940,910	87,425	[illegible]	157,038	[illegible]	[illegible]	3,869,137	[illegible]	[illegible]	[illegible]
	6 mos.	2,237	10,307,257	4,120,620	46,011,351	5,623,664	10,452,605	[illegible]	[illegible]	902,583	30,885,297	67.10	[illegible]	[illegible]	[illegible]	[illegible]
Norfolk Southern	June	930	583,780	131,358	752,968	105,231	118,114	22,519	291,464	[illegible]	566,823	75.30	186,145	[illegible]	[illegible]	[illegible]
	6 mos.	930	3,300,453	673,927	4,200,225	611,810	686,152	132,044	1,766,197	182,317	3,380,876	80.50	819,349	[illegible]	[illegible]	[illegible]
Northern Pacific	June	[illegible]	5,872,074	1,647,617	8,300,557	1,535,565	[illegible]	137,554	2,731,257	213,401	[illegible]	[illegible]	1,643,318	[illegible]	[illegible]	[illegible]
	6 mos.	6,650	30,614,820	7,396,909	41,922,104	6,201,903	11,045,150	828,728	16,802,336	1,318,766	36,708,898	87.60	[illegible]	[illegible]	[illegible]	[illegible]
Northwestern Pacific	June	496	369,195	268,296	719,158	127,157	59,498	6,945	255,965	14,361	465,635	64.70	[illegible]	[illegible]	197,530	[illegible]
	6 mos.	504	1,869,776	1,215,793	3,557,385	683,262	427,298	41,726	1,463,331	87,290	2,711,684	76.20	[illegible]	[illegible]	[illegible]	[illegible]
Pennsylvania	June	7,314	26,834,476	10,003,406	40,260,248	5,866,017	10,049,663	460,508	14,425,347	1,087,424	[illegible]	80.90	[illegible]	[illegible]	[illegible]	[illegible]
	6 mos.	7,314	163,181,214	57,320,544	240,161,064	28,453,756	61,510,775	2,637,076	87,751,681	6,602,250	[illegible]	79.50	[illegible]	[illegible]	36,959,992	[illegible]
Balti., Chesa. & Atlantic	June	87	99,837	40,411	148,510	16,102	21,519	2,887	[illegible]	4,369	[illegible]	82.90	25,327	20,657	[illegible]	1,459
	6 mos.	87	472,474	167,337	667,302	77,994	233,371	10,256	406,547	22,353	750,526	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cumberland Valley & Mont	June	33	50,620	5,656	60,211	12,003	16,866	1,095	30,919	2,955	63,838	106.00	−3,627	−11,166	−15,883	[illegible]
	6 mos.	33	397,214	35,087	453,318	54,305	107,154	5,382	183,015	15,562	365,418	80.60	87,900	54,987	[illegible]	210,884
Cin., Lebanon & Northern	June	76	85,163	9,343	100,082	21,390	17,293	1,944	52,753	2,709	96,089	96.00	3,993	−4,417	363	−13,951
	6 mos.	76	420,763	46,847	519,111	87,331	96,492	10,510	329,537	13,825	537,695	103.60	−18,584	−59,577	−49,509	[illegible]
Grand Rapids & Ind.	June	575	484,074	164,669	712,602	135,780	194,045	14,659	370,232	23,989	740,080	103.90	[illegible]	[illegible]	−79,560	−91,583
	6 mos.	575	2,898,331	893,881	4,125,809	617,306	1,159,522	83,141	2,179,536	145,287	4,187,930	101.50	−62,121	216,529	−321,538	[illegible]

REVENUES AND EXPENSES OF RAILWAYS

Month of June and Six Months of Calendar Year 1922—Continued

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Operating revenues: Passenger.	Operating revenues: Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Operating expenses: Maintenance of: Equipment.	Operating expenses: Traffic.	Operating expenses: Transportation.	Operating expenses: General.	Operating expenses: Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Long Island	June	398	$713,380	$1,947,357	$2,917,091	$275,707	$421,405	$28,330	$1,113,889	$54,952	$1,912,348	65.60	$1,004,743	$799,298	$745,797	$430,485
	6 mos.	398	4,325,362	8,372,332	13,964,429	1,613,558	2,500,540	98,179	6,312,067	345,683	10,977,315	78.60	2,987,114	2,384,520	1,981,023	—70,479
Md., Dela. & Virginia	June	82	74,388	29,510	107,654	8,492	34,653	1,960	68,696	2,866	116,667	108.30	—9,013	—11,049	—13,762	—24,809
	6 mos.	82	353,297	111,386	483,500	52,046	171,737	6,950	339,471	14,607	584,811	121.00	—101,311	—106,365	—113,972	—74,272
N. Y., Phila. & Norfolk	June	122	516,503	83,558	659,842	63,215	172,290	7,225	342,418	13,732	608,002	92.10	51,840	25,295	—11,503	—56,172
	6 mos.	122	2,757,725	439,084	3,483,385	340,737	936,939	45,401	1,773,802	82,901	3,231,458	92.80	251,927	160,005	53,430	—509,026
Pitts., Cin., Chicago & St. L.	June	2,435	6,362,693	1,737,420	8,910,749	1,067,732	2,375,313	117,182	3,250,329	199,661	7,085,123	79.50	1,825,626	1,438,533	1,014,883	167,063
	6 mos.	2,435	33,299,585	9,377,421	47,521,417	4,684,385	12,861,905	672,469	18,993,390	1,223,228	38,831,885	81.70	8,689,532	6,748,664	5,368,072	—2,349,421
West Jersey & Seashore	June	359	391,881	607,568	1,090,194	169,968	217,586	17,089	506,082	26,155	949,677	87.10	140,517	48,427	30,304	24,729
	6 mos.	359	2,227,255	3,016,014	5,725,940	926,962	1,203,685	89,549	2,778,525	156,250	5,223,128	91.20	502,812	311,479	214,179	465,990
Peoria & Pekin Union	June	19	6,477	1,396	129,845	41,154	11,379	506	55,356	9,110	117,505	90.50	12,340	—2,660	20,150	20,337
	6 mos.	19	71,591	22,818	891,054	165,606	102,248	1,085	367,017	54,827	690,783	77.50	200,271	113,771	251,718	34,084
Pere Marquette	June	2,212	2,472,121	484,077	3,304,993	450,200	619,311	50,710	1,121,172	99,789	2,345,541	71.00	959,452	805,719	709,448	497,520
	6 mos.	2,220	14,261,309	2,328,230	18,207,976	2,058,058	3,738,674	312,499	7,127,136	631,219	13,915,012	76.40	4,292,964	3,411,258	2,626,684	1,564,466
Philadelphia & Reading	June	1,127	4,506,342	793,732	5,673,491	767,101	1,774,394	69,331	2,299,160	152,069	5,074,392	89.40	599,099	382,957	123,507	829,217
	6 mos.	1,127	31,557,059	4,746,895	38,260,119	4,511,473	10,354,382	366,048	13,914,136	890,097	30,062,134	78.60	8,197,985	6,970,448	5,582,788	2,698,260
Atlantic City	June	176	134,036	323,357	467,594	81,101	42,650	10,798	228,332	9,125	372,012	79.60	95,582	76,333	28,663	42,600
	6 mos.	176	717,160	1,107,834	1,874,969	351,910	175,137	30,360	1,131,087	29,780	1,717,150	91.60	157,819	36,649	—132,483	—323,215
Perkiomen	June	41	110,331	7,813	122,108	7,846	4,432	112	47,450	902	60,781	49.80	61,327	56,455	50,858	35,552
	6 mos.	41	519,727	44,342	585,458	42,313	25,329	649	264,826	5,352	338,701	57.90	246,757	214,377	180,373	282,244
Port Reading	June	21	56,448	......	92,507	24,588	21,084	229	38,228	1,496	85,625	92.60	6,882	7,871	—41,010	—14,308
	6 mos.	21	682,531	......	998,840	118,814	47,678	1,374	333,280	10,440	511,584	51.20	487,256	397,956	67,251	122,381
Pittsburg & Shawmut	June	102	50,394	3,451	55,345	23,122	65,406	1,751	22,030	6,456	118,765	214.60	—63,420	—63,546	—54,397	—12,731
	6 mos.	102	467,709	33,689	510,067	156,592	227,929	9,070	173,116	42,145	608,852	110.40	98,785	99,532	—36,865	67,535
Pittsburg & West Virginia	June	85	192,852	7,639	228,343	35,001	43,579	3,927	50,141	13,944	154,917	67.80	73,426	44,770	66,153	119,724
	6 mos.	85	1,153,191	54,137	1,391,143	163,933	401,940	21,094	330,113	94,630	1,063,120	76.40	328,023	172,112	378,770	64,106
Pittsburg, Shawmut & Northern	June	210	63,223	4,905	72,413	26,184	33,209	2,338	30,753	5,636	98,129	135.50	—25,716	27,916	—31,194	—28,324
	6 mos.	210	464,630	40,649	523,890	106,723	255,143	10,168	233,501	42,245	647,809	121.70	—123,919	—137,253	—139,605	—125,434
Quincy, Omaha & Kans. City	June	252	64,443	24,258	98,873	34,448	15,716	713	35,865	2,511	89,128	90.10	9,745	5,787	833	—13,473
	6 mos.	252	337,720	142,094	530,687	181,537	97,767	4,776	250,911	14,350	548,212	103.30	—17,525	—41,131	68,657	—96,612
Richmond, Fred. & Potomac	June	117	539,580	253,553	960,332	152,126	125,021	7,587	300,170	25,406	636,086	66.20	324,246	270,899	231,426	40,820
	6 mos.	117	2,729,932	1,787,891	5,407,635	610,474	748,055	48,031	1,894,045	157,556	3,585,231	66.30	1,822,404	1,527,521	1,210,844	485,307
Rutland	June	415	245,259	113,249	469,047	106,028	94,302	8,431	260,256	14,454	425,151	90.60	43,896	20,248	19,707	22,948
	6 mos.	415	1,528,612	676,318	2,740,961	543,722	554,206	49,683	1,273,890	79,476	2,509,559	91.60	231,402	105,562	129,340	—271
St. Louis-San Francisco	June	4,760	5,338,466	1,706,758	7,566,589	1,256,886	1,327,867	92,578	2,451,792	178,165	5,267,290	69.60	2,299,299	1,924,644	1,861,468	1,355,560
	6 mos.	4,760	27,794,110	8,766,117	39,420,419	5,791,594	7,502,577	504,597	14,200,124	1,127,316	28,982,863	73.50	10,437,556	8,413,501	8,468,956	7,870,357
Ft. Worth & Rio Grande	June	235	61,623	31,737	104,424	55,772	21,221	2,960	48,009	6,247	134,200	128.50	—29,776	—33,382	38,757	—55,725
	6 mos.	235	364,869	167,916	595,052	274,495	132,099	16,568	301,342	34,565	756,850	127.20	161,798	184,825	215,450	—229,401
St. Louis, San Fran. & Tex.	June	134	119,697	15,535	141,489	30,473	21,055	4,097	72,586	7,097	135,315	95.60	6,174	4,057	—16,270	—9,061
	6 mos.	134	653,215	88,609	780,826	186,549	144,244	22,238	350,848	41,088	744,122	95.30	36,704	24,722	—99,525	—360,532
St. Louis Southwestern	June	968	1,248,388	135,724	1,449,634	182,054	208,596	40,840	378,557	56,352	873,177	60.20	576,457	492,692	472,754	432,600
	6 mos.	968	7,234,037	765,413	8,351,238	1,230,614	1,302,782	258,394	2,193,726	322,876	5,340,433	63.90	3,010,805	2,635,403	2,429,093	2,238,651
St. Louis Southw. of Tex.	June	807	500,684	91,197	634,760	188,733	140,758	21,055	305,389	31,373	685,968	108.10	—51,208	—75,495	65,973	—114,555
	6 mos.	807	2,707,199	510,938	3,438,201	1,143,223	964,745	119,228	1,806,656	184,092	4,212,417	122.50	—774,246	—918,714	—879,085	—769,808
San Antonio & Aransas Pass	June	739	309,210	72,866	416,187	97,056	105,311	9,548	186,403	33,690	431,393	103.60	—15,206	29,423	—38,484	36,571
	6 mos.	739	1,937,008	373,090	2,483,789	564,483	689,682	56,985	1,207,037	161,134	2,675,581	107.70	—191,792	—276,383	—352,391	—361,473
San Antonio, Uvalde & Gulf	June	317	42,814	17,918	69,044	13,665	13,195	2,800	31,072	5,865	66,574	96.40	2,470	—8,523	10,030	18,553
	6 mos.	317	354,371	99,883	514,482	84,734	73,267	17,007	205,522	38,192	417,483	81.10	96,999	79,074	15,364	36,543
Seaboard Air Line	June	3,563	2,619,774	627,017	3,600,199	405,422	592,187	112,410	1,486,841	150,273	2,770,470	77.00	829,729	654,088	449,610	209,543
	6 mos.	3,563	15,681,298	4,527,066	22,426,507	2,451,079	3,833,941	735,244	9,593,219	915,114	17,728,824	79.00	4,697,683	3,665,033	2,031,037	642,783
Southern	June	6,971	7,868,620	2,699,663	11,385,785	1,563,436	1,869,575	228,173	4,048,345	321,086	8,111,808	71.20	3,273,977	2,777,481	2,420,736	1,098,958
	6 mos.	6,971	43,333,820	14,117,154	61,995,456	8,821,556	11,362,074	1,266,410	24,416,749	1,946,216	48,279,092	77.90	13,716,364	10,912,759	8,877,426	2,143,948
Alabama Grt. Southern	June	318	634,936	189,739	861,027	104,095	164,835	18,022	303,491	25,321	621,870	72.20	239,157	185,619	187,440	114,354
	6 mos.	318	3,624,600	861,886	4,711,467	512,942	901,373	107,408	1,771,012	149,718	3,475,511	73.80	1,235,956	977,227	990,614	244,666
Cin., N. O. & Tex. Pacific	June	338	1,451,109	296,039	1,821,510	173,907	470,527	30,487	619,019	44,248	1,345,663	73.90	475,847	396,394	294,908	266,656
	6 mos.	338	7,145,427	1,589,967	9,119,251	959,435	2,384,577	166,134	3,143,304	255,820	6,968,598	76.40	2,150,653	1,720,292	1,586,004	776,913
Georgia Southern & Fla.	June	402	288,489	91,201	406,801	65,772	58,663	8,873	164,298	11,887	312,243	76.80	94,558	74,481	49,604	—90,390
	6 mos.	402	1,599,685	599,543	2,371,004	382,061	409,163	53,116	1,016,798	74,127	1,952,706	82.40	418,298	314,876	187,240	—506,216
New Orleans & Northeastern	June	207	419,797	89,718	558,572	72,781	117,702	10,810	229,298	19,336	452,522	81.00	106,050	69,344	71,290	—26,519
	6 mos.	207	2,354,232	465,199	3,120,824	419,597	639,213	65,960	1,370,874	105,510	2,622,348	84.00	498,476	265,060	233,959	—164,634
Northern Alabama	June	110	109,279	10,024	122,001	20,222	7,924	1,434	49,151	2,810	81,541	66.80	40,460	36,392	6,106	—1,207
	6 mos.	110	548,184	66,044	628,932	101,908	34,062	8,026	240,912	18,370	403,273	64.10	225,659	201,297	70,098	—54,518

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.	Period	Average mileage operated during period.	Operating revenues: Freight.	Operating revenues: Passenger.	Operating revenues: Total (inc. misc.)	Maintenance of: Way and structures.	Maintenance of: Equipment.	Operating expenses: Traffic.	Operating expenses: Transportation.	Operating expenses: General.	Operating expenses: Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Southern Pacific	June	7,118	$10,701,013	$4,433,888	$16,740,374	$1,939,803	$2,568,509	$220,096	$5,319,763	$441,661	$10,826,192	64.70	$5,914,182	$4,555,017	$4,305,135	$3,127,715
	6 mos.	7,117	53,662,358	21,431,641	83,205,310	11,616,942	15,062,984	1,367,868	29,010,805	2,556,918	61,230,534	73.60	21,974,776	13,848,888	13,472,784	13,347,209
Arizona Eastern	June	382	254,921	32,399	281,019	33,013	26,125	3,446	75,127	15,984	154,583	55.00	126,436	102,923	84,803	—36,948
	6 mos.	382	1,271,483	173,335	1,494,068	173,219	165,759	18,223	425,267	112,642	899,232	60.20	594,836	451,911	369,103	17,937
Atlantic S. S. Lines	June	...	801,617	41,681	883,427	11,121	190,898	18,971	498,480	27,064	746,534	84.50	136,893	124,472	125,5[illegible]2	21,748
	6 mos.	.	5,052,452	302,797	5,635,528	72,249	982,877	113,959	3,211,126	156,887	4,536,198	80.50	1,099,330	1,024,077	1,026,132	209,618
Galv., Harris. & S. Antonio	June	1,379	1,294,096	434,235	1,860,437	334,547	361,586	37,803	669,858	70,767	1,494,008	80.30	365,8[illegible]9	314,255	[illegible]8,936	177,724
	6 mos.	1,379	7,653,698	2,233,735	10,506,166	1,961,514	2,128,759	224,382	4,167,763	434,618	8,965,821	85.30	1,540,345	1,231,349	95[illegible]10	830,195
Houston & Texas Central	June	923	710,991	294,075	1,094,774	233,739	225,495	25,039	387,250	42,376	909,343	83.10	185,431	141,332	127,585	69,789
	6 mos.	923	4,711,594	1,734,384	6,904,226	1,277,109	1,362,064	142,265	2,556,060	250,650	5,575,209	80.80	1,329,017	1,065,820	863,886	—36,074
Houston, East & West Texas	June	191	226,160	45,004	281,942	52,444	53,996	3,677	105,108	7,918	221,471	78.55	60,471	56,093	38,015	40,164
	6 mos.	191	1,109,336	235,744	1,413,013	295,921	296,085	20,248	592,007	49,080	1,246,306	88.20	166,707	130,386	52,153	—24,860
Louisiana Western	June	207	188,539	96,711	310,701	70,158	57,546	8,767	90,686	16,422	247,985	79.80	62,716	65,373	69,229	7,093
	6 mos.	207	1,445,374	517,544	2,108,193	397,322	401,141	53,498	622,437	107,482	1,606,068	76.20	502,125	367,813	364,370	213,588
Morgan's L. & T. R. R. & S. S. Co.	June	400	409,219	168,234	627,443	140,597	131,526	15,249	254,836	31,950	579,730	92.40	47,713	1,198	—14,945	—[illegible]9,699
	6 mos.	400	2,637,059	896,552	3,850,216	844,064	857,307	98,508	1,589,788	202,829	3,620,924	94.00	229,29[illegible]	—51,[illegible]7	144,048	[illegible]
Tex. & New Orleans	June	507	474,309	105,106	686,184	153,059	178,897	10,607	321,469	24,238	693,787	101.10	—7,603	—29,876	—54,235	17,918
	6 mos.	507	3,161,431	922,970	4,346,660	856,209	1,083,411	65,734	1,659,771	156,280	3,853,002	88.60	493,658	355,116	173,365	—546,7[illegible]
Spokane International	June	165	79,312	12,465	96,547	14,866	7,218	3,106	32,103	6,724	63,815	66.10	32,732	7,255	1[illegible],301	5,[illegible]
	6 mos.	165	450,530	65,409	541,334	85,217	46,584	17,698	207,471	36,334	397,998	73.50	143,336	110,363	68,793	95,399
Spokane, Portland & Seattle	June	549	420,339	171,326	646,532	21,587	93,132	12,598	217,368	20,172	377,216	58.40	269,296	185,124	198,212	12[illegible],447
	6 mos.	549	2,308,665	787,601	3,390,108	312,009	519,822	58,887	1,163,710	119,550	2,221,967	65.50	1,168,141	662,835	616,869	42[illegible],814
Tennessee Central	June	292	163,367	43,364	219,064	44,533	32,344	6,622	89,643	16,585	189,707	86.60	29,357	25,175	4,784	—10,816
	5 mos.	292	867,936	240,844	1,193,731	205,758	201,213	31,932	622,720	71,287	1,132,851	94.90	60,880	35,173	—73,938	—249,432
Term. R. R. Assn. of St. Louis	June	37	....	....	353,404	88,466	37,281	1,040	116,035	6,441	252,636	65.90	130,758	70,537	191,540	123,734
	6 mos.	37	....	....	2,283,855	449,154	219,395	6,644	739,547	40,527	1,476,202	64.60	807,653	485,148	1,181,716	9[illegible]
East St. L. Connecting	June	1	....	....	173,377	13,794	7,840	294	55,901	2,370	80,199	46.30	93,178	85,123	76,322	15,971
	6 mos.	1	....	....	1,011,166	78,171	43,470	1,940	341,545	16,595	481,721	47.60	529,445	4[illegible]6,875	406,703	132,[illegible]3
St. L. Merchants' Bridge Term.	June	9	....	....	278,309	43,241	31,841	918	132,886	4,056	212,942	71.50	65,367	47,737	67,347	40,830
	6 mos.	9	....	....	1,781,546	240,149	154,478	5,917	850,985	27,907	1,279,436	71.80	502,110	385,9[illegible]	511,[illegible]5	[illegible]
St. Louis Transfer	June	6	....	....	62,455	10,954	4,954	170	33,188	1,537	50,803	81.30	11,652	10,771	1,79[illegible]	30,783
	6 mos.	6	....	....	370,574	59,308	25,740	1,123	197,676	10,326	294,173	79.40	76,401	73,834	24,[illegible]67	2[illegible]
Texas & Pacific	June	1,952	1,689,712	664,301	2,566,841	464,154	446,156	48,168	871,493	136,650	1,989,9[illegible]8	77.50	576,913	476,566	401,847	276,78[illegible]
	6 mos.	1,952	9,798,865	3,442,151	14,370,805	2,682,369	2,885,252	281,217	5,553,714	581,369	12,089,684	84.10	2,281,121	1,604,230	1,180,306	819,27[illegible]
Toledo, Peoria & Western	June	247	94,266	38,769	145,712	26,342	38,695	2,975	69,510	7,726	145,248	99.70	464	—10,536	—15,012	—[illegible]0,583
	6 mos.	247	457,883	272,048	791,224	138,867	212,642	17,237	405,309	45,773	820,756	101.70	—29,532	—95,91[illegible]	—1[illegible],078	—2[illegible]8,301
Toledo, St. Louis & Western	June	454	843,574	29,198	917,607	112,857	144,831	20,983	282,324	26,343	587,338	64.00	330,269	[illegible]	230,141	15[illegible],572
	6 mos.	454	4,521,342	154,325	4,906,257	603,538	821,802	129,433	1,583,344	156,078	3,294,195	67.10	1,612,062	1,328,991	1,185,551	381,106
Trinity & Brazos Valley	June	368	113,756	19,427	139,785	30,533	30,334	3,254	63,002	11,110	137,507	98.40	2,278	—4,733	—5,[illegible]	13,557
	6 mos.	368	1,396,752	124,356	1,580,058	381,700	337,619	19,539	587,480	71,236	1,393,564	88.20	186,494	144,359	—147,473	—8,611
Ulster & Delaware	June	128	67,868	46,526	154,490	27,549	22,990	3,903	74,353	7,952	137,270	88.90	17,220	11,[illegible]17	6,445	—1[illegible],181
	6 mos.	128	357,511	157,882	713,527	115,991	128,488	14,787	364,589	46,795	674,150	94.50	39,377	3,111	—19,903	—133,591
Union of Penn.	June	45	....	....	1,192,118	114,428	189,590	464	408,423	7,290	720,195	60.40	471,923	458,093	503,097	13[illegible],624
	6 mos.	45	....	....	5,071,267	418,139	1,093,062	1,495	2,090,906	42,127	3,645,725	71.90	1,452,542	1,345,052	1,679,158	847,4[illegible]
Union Pacific	June	3,707	5,713,399	1,776,495	8,401,925	1,167,960	1,829,234	171,684	2,184,872	312,090	5,894,884	70.20	2,507,041	1,915,307	1,934,588	2,308,510
	6 mos.	3,679	32,875,155	8,168,505	45,402,183	4,943,214	10,187,973	827,322	13,499,284	1,872,231	32,265,252	71.10	13,136,931	9,706,066	9,552,999	1[illegible],153,685
Oregon Short Line	June	2,359	2,011,856	545,448	2,804,310	615,890	575,357	53,512	826,750	119,408	2,267,178	80.80	537,132	258,044	251,106	2[illegible]3,477
	6 mos.	2,359	12,568,091	2,567,924	16,380,589	2,507,623	3,394,394	276,717	5,215,988	719,766	12,452,890	76.00	3,927,699	2,272,919	2,157,448	980,808
Oreg. Wash. R. R. & Nav.	June	2,237	1,533,289	583,560	2,343,050	671,413	447,264	65,671	987,900	125,176	2,329,955	99.40	13,095	—168,170	—245,210	109,[illegible]4
	6 mos.	2,224	8,893,255	2,649,831	12,698,727	2,783,021	2,503,904	357,222	5,755,334	749,594	12,315,223	97.00	383,504	—704,064	—1,162,794	—74[illegible],507
St. Joseph & Gr. Island	June	258	190,069	25,594	234,919	66,623	54,303	2,322	108,429	11,770	243,447	103.60	—8,528	—[illegible]8,146	—19,708	—41,004
	6 mos.	258	1,262,341	152,526	1,505,620	258,330	294,100	15,143	665,195	72,170	1,304,938	86.70	200,68[illegible]	92,[illegible]47	39,115	—71,258
Utah	June	102	157,653	456	159,033	33,206	34,528	3,[illegible]0	29,743	5,965	103,792	65.26	55,241	50,0[illegible]	14,489	—43,2[illegible]
	6 mos.	102	745,909	4,607	760,531	108,142	215,855	2,161	171,653	28,989	526,800	69.27	233,731	194,876	123,989	—30,34[illegible]
Virginian	June	526	1,877,724	68,815	2,069,254	207,745	423,428	10,756	397,614	34,012	1,072,504	51.80	996,750	873,466	884,715	79[illegible],51[illegible]
	6 mos.	526	9,451,181	377,140	10,485,198	1,112,829	2,503,565	69,441	2,203,008	187,044	6,074,409	57.90	4,410,789	3,758,883	3,833,2[illegible]	2,917,3[illegible]
Wabash	June	2,472	3,925,185	917,661	5,362,371	748,049	1,016,121	116,671	2,048,146	151,93[illegible]	4,111,876	76.70	1,250,495	1,056,565	800,946	3,98[illegible]
	6 mos.	2,472	22,214,756	4,427,892	28,630,584	3,937,895	5,801,615	696,159	11,970,260	917,187	23,469,108	82.00	5,161,476	4,016,546	[illegible],430,437	59[illegible],1[illegible]7
Western Maryland	June	804	1,097,996	78,375	1,271,571	159,907	259,817	41,011	445,686	46,488	972,895	76.50	298,676	258,676	257,567	[illegible]49,904
	6 mos.	804	7,200,274	436,736	8,244,039	1,053,640	1,664,843	195,328	2,906,174	272,353	6,216,989	75.40	2,027,050	1,757,050	1,562,474	1,464,493
Western Pacific	June	1,045	643,956	339,793	1,064,742	202,613	165,099	33,206	347,297	36,623	812,956	76.40	251,786	165,186	179,477	33,937
	6 mos.	1,043	3,670,565	1,048,436	5,090,241	895,361	976,018	191,990	2,047,301	230,035	4,455,291	87.50	634,950	116,223	284,711	348,601
Wheeling & Lake Erie	June	511	1,151,385	71,727	1,346,652	210,387	264,123	15,271	411,208	32,782	937,308	69.60	409,344	271,303	267,284	359,301
	6 mos.	511	5,933,876	417,598	6,822,930	997,953	1,397,562	103,665	2,373,877	204,949	5,098,936	74.70	1,723,994	1,036,89[illegible]	932,141	450,[illegible]3

Railroads Handle Traffic Efficiently During Chicago Car Strike

During the Chicago street car and elevated railroad strike which began on August 1, and lasted until August 6, the railroads handled a greatly increased traffic in their suburban zones with little delay or congestion. In most cases the extra train service was provided by the abandonment of the regular suburban schedules and the substitution of shuttle service under which trains were run as fast as the traffic warranted. Some idea of the pressure placed on the larger suburban carriers may be gained from the following figures: The Chicago & North Western carries approximately 60,000 suburban passengers on a normal business day and the number of trains necessary to handle this business is 166. On August 1, the first day of the strike, the number of passengers carried by this road was 109,810, and the trains operated, 225. On August 2, the above number was increased to 134,704 passengers and 245 trains were run. A still greater number was handled on August 3, when 135,619 passengers were carried, although the number of trains operated was decreased to 243, while on August 4, the number of patrons carried was 134,822, and 242 trains were run. The Illinois Central averaged 73,500 suburban passengers daily before the strike with 378 trains. On August 1, this number was increased to 132,576 passengers and 592 trains, while on August 2, there were 146,124 passengers and 594 trains; August 3, 151,787 passengers and 610 trains; August 4, 157,022 passengers and 616 trains; and on August 5, there were 157,517 passengers and 612 trains. The Chicago, Rock Island & Pacific, which normally carries 30,000 suburban passengers, increased this number by 50 per cent after the first day of the strike. The Chicago, Milwaukee & St. Paul added 17 trains while the Chicago & Western Indiana increased its number by 15. The strike ended Sunday noon and on Monday the suburban service was approximately normal, although a great number of the strike patrons were still making use of their commutation tickets.

Collision on the Cincinnati, Lebanon & Northern

In a collision of passenger trains on the Cincinnati, Lebanon & Northern, at Pleasant Ridge, Ohio, seven miles north of Cincinnati, on August 1, three passengers and two employees were killed and three or more passengers and two employees were injured. The trains were northbound regular passenger No. 11 and a southbound excursion train. It is said that the excursion train disregarded the rule requiring it to keep clear of the regular train.

Photo by International

Shortly After the Accident on the C., L. & H.

A press dispatch from Moscow says that the offices of the Canadian Pacific Railway and the White Star Steamship line in that city have been reopened. These offices were closed by the Soviet Government and their restoration is said to have been due to representations made by the British Mission.

Traffic News

P. R. Thompson has resigned as traffic manager of the Pacific Coast Steel Company to become chairman of the transportation committee of the Peninsular Bureau of Chambers of Commerce and Civic Associations, with headquarters at Redwood City, Cal.

The Canadian roads—the Grand Trunk and the Canadian Pacific—have voluntarily accepted the terms of the order of the Interstate Commerce Commission under which, on western freight billed through to and from New England, the proportions allowed to the New England roads are to be 15 per cent more than heretofore. The Canadian roads were not parties to the case before the commission.

Potato Business on the Pennsylvania

The Pennsylvania Railroad reports that the white potato crop of the Maryland-Delaware-Virginia Peninsula, from Cape Charles, Va., to Wilmington, Del., has this year broken all previous records for both production and shipments, the total movement amounting to 16,019 carloads, an increase of 10 per cent over the previous high record. Most of the crop goes to Philadelphia, New York City and New England and to the Central Western region between Pittsburgh, Chicago and St. Louis. This year about 60 per cent of the crop went east and 40 per cent west. Nearly 20 per cent of the entire crop went into New England, an unusually large proportion.

On the heaviest single day, July 12, 661 carloads were forwarded. The car supply this year was entirely adequate. The shopmen's strike was on during the greater part of the shipping period, but neither the car supply nor the handling of the loaded cars was interfered with in the slightest degree. About 8,000 box cars were required to handle the crop, each car averaging two round trips between shipping point and market.

Coal Production

A slight increase in output marked the eighteenth week of the coal strike (July 31-August 5). Preliminary returns compiled by the Geological Survey indicate a production of 4,250,000 tons of soft coal against 3,933,000 tons in the week before. The increase is said to be due to improved car supply in the Middle Appalachian fields rather than to reopening of mines hitherto closed by the strike.

In spite of the increase in bituminous output, the eighteenth week finds production still about 1,100,000 tons short of the level reached before the shopmen's strike, for in the week ending June 24, 5,337,000 tons were raised.

Production of anthracite in the eighteenth week will be barely 30,000 tons.

The trend of production is shown in the cars loaded daily by the railroads. Loadings on Monday, July 31, were 14,768 cars, an increase over the preceding Monday of 11 per cent. The following day the total dropped to 11,783 cars, partly because of pay day. A partial recovery carried loadings on Wednesday up to 12,218 cars, and on Thursday 12,177 cars were loaded.

Detailed records of shipments from each district indicate that up to the present, mines responding to the invitation to resume operations have added little to the coal supply of the country. There has been practically no increase in output in any of the strongly organized districts, and the increase in shipments from Pennsylvania, and from the Fairmont and Kanawha districts has not been large.

The mine reports for the week ended July 22 picture conditions at the mines when the railway shopmen's strike was at its height. Congestion at important rail gateways grew worse and practically every field east of the Mississippi now producing reported increased losses through transportation. In Hazard, Western Kentucky and Southern West Virginia working time steadily decreased as rail difficulties increased.

The loss ascribed to transportation in Colorado was confined to mines in Routt County which reports unavoidable suspension of service on one railroad.

Commission and Court News

Interstate Commerce Commission

The commission has issued a decision amending after further hearings its findings in the western hay and grain rate case so as to eliminate from the findings of the original report interstate carload rates on grain, grain products and hay between points within that portion of Illinois territory included in the western group.

The Interstate Commerce Commission has issued its decision holding that the surcharge for passengers in sleeping and parlor cars which was applied to interstate traffic by its order in Ex Parte 74 should be applied intrastate in Georgia. The surcharge was put into effect on September 1, 1920, in Georgia, with the approval of the Georgia commission, but after a hearing it ordered the cancellation of the surcharge effective on December 20, 1921, and since that time it has not been applied to intrastate business.

Court News

Carrier Operating Two Lines Not Necessarily Bound to Ship by the Cheaper

Following Northern Pacific v. Solearn, 247 U. S. 477, the Springfield Court of Appeals holds that where a carrier is operating two lines between the same points, and the rate over one is less than the rate over the other, it is ordinarily the duty of the carrier to ship by the cheaper route. This duty is not absolute, however. The carrier is not bound to consider only the shipper's interest, but should consider the interest of the public and its own; and if, all things considered, it would be unreasonable to ship by the cheaper route, the carrier is not required to do so.—Stroud v. M. P. (Mo. App.), 236 S. W. 891.

Shifting Cars After End of Journey Not Interstate Commerce

Three cars with coal from Pennsylvania to Canandaigua, N. Y., were placed on the consignee's siding and two were unloaded. The middle car was in such a position that it could not conveniently be unloaded. The yard crew proceeded to readjust the position of this car and to take away the empty cars. While coupling the engine to the cars the conductor was injured because, it was claimed, of defective automatic couplers. The New York Appellate Division holds that this was not a movement of cars in interstate commerce; and there could be no recovery, under the federal act, for his death. Camp v. Pennsylvania, 193 N. Y. Supp. 31.

Coal Refused May Not Be Kept on Cars Long

The initial carrier of a shipment of coal quoted the rate charged by other carriers, but on arrival at destination it was found its tariff rate was higher. The consignee refused to accept the coal, which the railroad kept in the cars for six months and then sold for about half the freight and demurrage charges. The railroad sued for these charges; the consignee claimed that the sale of the coal was conversion entitling it to damages. The Wisconsin Supreme Court held that it is the duty of a carrier, when freight has not been disposed of within a reasonable time, to unload and store it for account of the owner; that the railroad, under this rule, was not entitled to demurrage beyond a reasonable time, that ten days was a reasonable time, and that in view of the railroad's long delay in acting after knowledge of the consignee's refusal to accept the coal, judgment for damages for conversion was warranted. The court said that, while it might have been better business management for the consignee to accept the coal, pay the illegal rate, and afterwards seek his remedy, he was under no obligation to do so. In determining the damages, the unpaid freight charges must be deducted from the market value of the coal at destination.—Waters v. Becker (Wis.), 186 N. W. 167.

Labor Board Decisions

Employees of Freight House Contractor Under Jurisdiction of Labor Board

On February 26, 1922, the Cleveland, Cincinnati, Chicago & St Louis turned the operation of its freight house at Indianapolis over to the A. S. Hecker Company, who immediately reduced the rates of pay of employees engaged in freight handling below those established by the Railroad Labor Board. The arguments advanced by the railroad and by the employees in this case were similar to those put forth in earlier cases governing contracting of shop and track operations. The Board decided that this contract is in violation of the Transportation Act, and that the freight house employees of the contractor are under the jurisdiction of the Labor Board and subject to the application of the Transportation Act; and the carrier was directed to take up with any employee the matter of his reinstatement upon application.—(*Decision No.* 1119.)

Green Bay & Western a Class I Carrier

Sixteen employees' organizations petitioned the Railroad Labor Board for the application of Decision No. 2 to the employees of the Green Bay & Western, after this road had participated in the hearing on an increase in wages for employees of the short line railroads. The employees contended that this road was not a short line railroad but a class I carrier as its operating revenues exceed $1,000,000 a year. The employees claimed that there are 53 class I roads with less mileage than the Green Bay & Western, that 26 have less capital stock, that 32 have fewer freight cars, that 33 have fewer locomotives, and that 29 carry less freight. The railway management maintained that the petition should be dismissed because the road had been a party to the short line hearing which resulted in the issuance of Decision No. 108 and that the employees' requests are exactly the same as those that were dismissed in that decision. The Labor Board decided that the Green Bay & Western is a Class I road, and that its characteristics are of a nature which exclude it from the class of short line roads. It therefore decided that the rates of pay of the employees shall be adjusted on the basis of the increase awarded in Decision No. 2, and the decrease specified in Decision No. 147, and that this decision shall be effective as of May 1, 1922.—(*Decision No.* 1123.)

One Organization to Represent Employees

For several years rules governing the rates of compensation and service of engine house employees and fuel handlers on the terminal division of the Boston & Maine have been made by agreement between the managemnt and a committee affiliated with the Knights of Labor. Since September 1, 1917, the rules covering store department employees in oil rooms and enginehouse storerooms on the Boston Terminal have been negotiated between the management and a similar committee. Under Decision No. 119, and especially principle 15 in Exhibit "B" of that decision, the railway management has considered as one class all laborers in and around shops, enginehouses and storehouses; and has found by vote of the employees that a majority of this class, taking the railroad as a whole, desired to have the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers represent them. The management accordingly proceeded to negotiate an agreement with a committee from that organization. The employees on the Terminal division contended that the separate agreement with the Knights of Labor should continue. The Labor Board decided that the management acted properly in negotiating an agreement with the maintenance of way organization. This decision, however, does not prevent employees from designating representatives of their choice to handle with the management matters affecting their wages and working conditions, provided such procedure is in conformity with the rules incorporated in the agreement entered into with the maintenance of way organization and the provisions of the Transportation Act.—(*Decision No.* 1121.)

Foreign Railway News

Electric Trains in Euston Station

The London & North Western is now running electric suburban trains into Euston station, its London terminus. This event marks the completion of an intensive development of an important suburban area in the neighborhood of London. The electrification involved a considerable amount of construction, including two tunnels, several new stations, the separation of grades at a junction where there were 17 running tracks and some heavy track construction.

British Interests Push Plan for Construction of Short Line from Tampico to Mexico City

Engineers are making final surveys for the railroad which the British interests which own the Mexican (Vera Cruz) Railway are to build from a connection with the former Hidalo & Northeastern near Cachuca to Tampico. The concession for constructing this line was granted by the Mexican government a few months ago. It is stated that all necessary financial arrangements for the rapid building of the road have been made. It will form a direct short line between Tampico and Mexico City and will follow practically the same route that was selected by engineers for the road which had been started by the National Railways of Mexico at the time the revolutionary period began nearly twelve years ago.

Westinghouse Ships Second Consignment for Chile's Electrification

A second train of electrical equipment for Chile, a part of the Westinghouse Electric & Manufacturing Company's $7,000,000 contract, left the company's East Pittsburgh plant last week. The first trainload of electrical equipment for Chile was illustrated in the *Railway Age* of July 22, page 177.

This second train was dubbed the "International Trade Special" and is shown in an accompanying illustration with a Chilean locomotive on standard gage trucks at the head. No locomotives have been shipped on this order as yet, however, but this movement will begin shortly. The contract calls for the delivery of 39 locomotives.

The equipment shipped in this consignment included 2,000 k.w. motor generator sets for installation in three sub-stations under construction at Vina del Mar, San Pedro and Llai Llai; transformers, switching equipment for three sub stations, 15 lightning arresters, three switchboards of 20 panels each and 44 circuit breakers.

New Locomotives for Swiss Federal Railways

London

The Swiss Federal Railways have recently ordered from Swiss factories 20 electric express locomotives with a maximum speed of approximately 56 miles per hour. The locomotives will take about two years to build. During the next four to five years a total of about 100 new electric locomotives are to be built for the Federal Railways.

Safety First Movement in China

The accompanying illustration is the exact reproduction of "safety-first" posters which have been placed at all the important railroad grade crossings in China. The originals are mounted on

sheet metal so that they may withstand varying weather conditions. The picture, itself, which is vivid in its description as may be noticed, was so drawn that it might appeal to and be understood by the average Chinaman of ordinary intelligence who does not possess marked alertness or wit, or is yet trained to think for himself

A Fifty-Mile Private Railroad in Mexico

One of the longest private mining railroads in Mexico is the Chihuahua & Oriente which was finished and placed in operation a few days ago. It was built by the Erupcion Mining Company and the Ahumada Lead Company and is 50 miles long. It connects the mines of these companies in the State of Chihuahua with the National Railways of Mexico and affords a direct shipping outlet for their ores. Before the construction of the line the ore output had to be hauled to the railroad shipping point by wagon. Mining operations of the two companies are being enlarged and two hundred tons of ore are being shipped daily to the smelter of the American Smelting & Refining Company at El Paso.

Train of Supplies for Chile With Chilean Locomotive at Head

Equipment and Supplies

Locomotives

THE INDIANAPOLIS UNION has ordered five 0-8-0 type switching locomotives from the Lima Locomotive Works.

THE POLISH STATE RAILWAYS have ordered 25 Consolidation type locomotives from the Baldwin Locomotive Works.

THE CANADIAN PACIFIC is constructing in its own shops three single track snow ploughs and one steel underframe flanger.

THE CHICAGO & NORTHWESTERN will receive bids until August 23 for 40 mikado type superheater locomotives and 10 Pacific type superheater locomotives.

THE NEW YORK, CHICAGO & ST. LOUIS, reported in the *Railway Age* of July 1 as having ordered 14 locomotives from the Lima Locomotive Works, has ordered five additional locomotives from the same builder.

THE E. S. TUBARAO A. ARARANGUA (BRAZIL) has ordered one mikado type of locomotive from the American Locomotive Company. This locomotive will have 16 by 22 in. cylinders and a total weight in working order of 115,000 lb.

THE PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS has ordered one 0-4-0 type switching locomotive from the American Locomotive Company. This locomotive will have 16 by 24 in. cylinders and a total weight in working order of 99,000 lb.

THE WHEELING STEEL AND IRON COMPANY, Wheeling W. Va., has ordered one 0-6-0 type switching locomotive from the American Locomotive Company. This locomotive will have 20 by 26 in. cylinders and a total weight in working order of 158,000 lb.

Freight Cars

THE UNITED SUGAR COMPANY is inquiring for 40 cane cars.

THE PACIFIC ELECTRIC is inquiring for 200 dump cars of 50 tons' capacity.

THE CANADIAN PACIFIC has ordered 250 refrigerator cars from the National Steel Car Corporation.

THE SEABOARD AIR LINE is having 900 box cars repaired at the shops of the Magor Car Corporation.

THE WILCOX COMPANY, Chicago, has ordered 50 hopper cars from the Western Steel Car & Foundry Co.

THE WHARTON & NORTHERN has ordered from the Clark Car Company 10, 30-yd. extension side dump cars.

THE WEST VIRGINIA PULP & PAPER COMPANY, New York City, is inquiring for 10 steel underframe box cars.

THE TENNESSEE, ALABAMA & GEORGIA is inquiring for 20, 50-ton box and 20, 50-ton composite gondola cars.

THE TEXAS COMPANY has ordered five tank cars of 5,000 gal. capacity from the Pennsylvania Tank Car Company.

THE MANATI SUGAR COMPANY 112 Wall Street, New York City, has ordered 50 cane cars from the Magor Car Corporation.

THE SOUTH INDIAN RAILWAY is inquiring through the car builders for 60 ballast cars, broad gage, and 210 ballast cars of meter gage.

THE CHICAGO MILWAUKEE & ST. PAUL, reported in *Railway Age* July 15 as inquiring for repairs to a number of freight cars, is expected to place orders shortly.

THE CHICAGO & NORTH WESTERN is about to place an order for repairs to 500 box cars which is in addition to the order reported in the *Railway Age* of August 5.

THE WARNER SUGAR REFINING COMPANY, New York, has ordered for the Miranda Sugar Company 150 cane cars of 30 tons' capacity from the Magor Car Corporation.

THE JACOB DOLD PACKING COMPANY, Buffalo, N. Y., reported in the *Railway Age* of July 8 as inquiring for from 50 to 100 refrigerator cars of 30 tons' capacity, will build 35 refrigerator cars in its own shops.

THE CHESAPEAKE & OHIO reported in the *Railway Age* of July 22 is inquiring for 50 refrigerator cars of 40 tons' capacity, has ordered this equipment from the American Car & Foundry Company and it will be built at the company's Berwick, Pa., plant.

THE GRAND TRUNK is having 100 refrigerator cars repaired at the shops of the National Steel Car Corporation. This road is also having repairs made to 500 coal cars and 500 box cars; the order being divided between the Canadian Car & Foundry Company and the Eastern Car Company.

THE CHICAGO, ROCK ISLAND & PACIFIC, reported in the *Railway Age* of July 15 as inquiring for repairs to a number of freight cars and the *Railway Age* of August 5 as having placed orders in part, has now ordered repairs to 1,500 composite National dump cars from the Western Steel Car & Foundry Company.

THE CHESAPEAKE & OHIO recently placed orders for repairing steel coal cars as follows: Illinois Car & Manufacturing Company, Hammond, Ind., 1,000 cars; Keith Railway Equipment Company, Hammond, Ind., 500 cars; American Car & Foundry Company, Huntington, West Va., 1,500 cars; and Richmond Car Works, Richmond, Va., 1,000 cars.

Passenger Cars

THE DIRECTOR GENERAL OF MAIL, MEXICAN GOVERNMENT, is inquiring for 15 mail cars.

THE CANADIAN PACIFIC has ordered 15 baggage cars from the National Steel Car Corporation.

THE ATCHISON, TOPEKA & SANTA FE has not yet placed an order for the 8 buffet library cars referred to in the *Railway Age* of July 1.

Track Specialties

THE MISSOURI PACIFIC is inquiring for 3,000 kegs of track spikes.

Machinery and Tools

THE LONG ISLAND has ordered from the Niles-Bement-Pond Company one 10-ton, 3-motor electric traveling crane.

Miscellaneous

THE CHICAGO UNION STATION is inquiring for 8 tractors and 200 trailers for use in the mail building.

Signaling

THE ILLINOIS CENTRAL has ordered from the Hall Switch & Signal Company 54 unit type three-color light signals.

THE EASTERN BENGAL RAILWAY, India, has ordered 406 relays from the Hall Switch & Signal Company, Garwood, N. J.

THE ATCHISON, TOPEKA & SANTA FE has ordered from the Union Switch & Signal Company the material for 121 miles of automatic block signaling; 75 miles on the Coast Lines, color-light signals, style L, 3-color, and 46 miles on the Eastern Lines; semaphores, style T-2, top-post. These semaphores, 146 of them, will be installed between Dumas, Mo., and Medill, 11 miles; Melvern, Kan., and Ridgeton, 8 miles; Neosho Rapids, Kan., and Emporia Junction, 10 miles; Wagner, Kan., and Braddock, 10 miles, and between Walton, Kan., and Newton, 7 miles. The light signals are to be installed on the double-track line between Yampai, Ariz., and Griffith.

Supply Trade News

G. S. Bigelow, Chicago representative of the Mountain Varnish & Color Works, Toledo, Ohio, has resigned.

H. F. Barrus, sales manager of the Union Twist Drill Company Athol, Mass., has resigned to enter business in the firm of **Barrus & Cullen, Ltd.**, London, England.

W. E. Farnan has been appointed director of the special committee on railroad lumber requirements of the Southern Pine Association, with headquarters at New Orleans, La.

Monroe L. Patzig, 206 Eleventh street, Des Moines, Iowa, has been appointed representative of the **Conveyors Corporation of America**, Chicago. Mr. Patzig's territory is in Central Iowa.

The Klein-Logan Company, Pittsburgh, Pa., has recently opened an eastern sales office in the Woolworth building, New York City to handle railway track tools manufactured by this company.

The Franklin Moore Company, Winsted, Conn., manufacturers of material handling machinery for industrial plants has appointed the **Scheid Engineering Corporation**, 90 West street, New York City, as its metropolitan and export representatives.

The New York City office of the **Chicago Flexible Shaft Company**, Chicago, manufacturers of Stewart industrial furnaces, which has been located at 350 Broadway since it was established early in 1920, has been removed to 16 Reade street. The office, as before, is in charge of J. W. Lazear.

The King Pneumatic Tool Company has moved into a new factory at 1735 Armitage avenue, Chicago, with more than double the capacity of the former plant. The company manufactures molybdenum steel riveting hammers, chipping hammers, rivet cutters, electric drills, and a complete line of pneumatic tools and accessories.

J. J. Hennessy and Hugh Bonham have been appointed assistant superintendents of the lubrication division, railway traffic and sales department of the **Texas Company**, New York. Mr. Hennessy's appointment is for the eastern territory with headquarters at New York City and Mr. Bonham's for the western territory with headquarters at Chicago.

Trade Publications

ELIMINATING WASTE IN BLASTING.—A 48-page, illustrated, booklet has been issued recently by the Hercules Powder Company, Wilmington, Del., devoted to the question of eliminating waste in various forms of blasting. The text takes up in detail the important factors to be considered and in conjunction with numerous illustrations, describes how the work may be handled with economy. Among the chapters are several devoted to planning, drilling, choosing explosives, firing schedules and systems, etc.

ELECTRIC FANS FOR RAILWAY SERVICE.—"The Safety Fan" is the title of a 57-page catalogue recently issued by the Safety Car Heating & Lighting Company, 2 Rector street, New York. The catalogue describes and illustrates the fans for railway cars which are made by the Safety Company and also describes the manner in which the fans can be used to best advantage. A cross indexed table shows at a glance which of the parts of the several fans and speed controls are interchangeable.

WROUGHT IRON.—An interesting and well illustrated description of the manufacture of ordinary wrought iron and staybolt iron is contained in a booklet recently issued by the Penn Iron and Steel Company, Creighton, Pa. The book tells briefly the story of the first rolling of iron bars in America, which is followed by an account of the successive stages in the manufacture of the modern product. In addition to the illustrations of rolling mills and test pieces the book contains a table of the weights of round and square bars.

Railway Construction

BALTIMORE & OHIO.—This company has awarded a contract to the Seabord Construction Company, Philadelphia, for the elimination of a grade crossing with the Lincoln highway at Lumbrook, Del. The company's tracks are to be carried over the highway on a double-track, through plate girder span. The steel for the work was fabricated by the Fort Pitt Bridge Works.

CHICAGO, BURLINGTON & QUINCY.—This company has requested a permit in the city of Council Bluffs, Iowa, to construct a brick roundhouse in that city, of which five stalls will be constructed in the near future.

CHICAGO, ROCK ISLAND & PACIFIC.—This company is now preparing plans for the construction of a passenger station at Moline, Ill., which will have terra cotta walls, brick veneer base and tile roof, and will cost approximately $100,000.

CHICAGO UNION STATION.—This company will soon call for bids for the construction of a concrete trucking subway extending north of Harrison street, Chicago. The work will include three elevator pits and syphon basins and an extension to the Washington street tunnel of the Commonwealth Edison Company.

DAYTON, TOLEDO & CHICAGO.—This company, operating a railroad extending from Dayton, Ohio, north to Delphos, a distance of 95 miles, ceased operations on August 1. In a report to the post office department, W. H. Ogborn, receiver, stated that operations were discontinued "on account of defective bridges and tracks and the financial condition due to the strikes."

ILLINOIS CENTRAL.—This company, which was reported in the *Railway Age* of August 5 as calling for bids for the construction of water station, including a 100,000 gal. storage tank at Matteson, Ill., in connection with grade separation work at that point, has awarded a contract for this work to Joseph E. Nelson & Sons, Chicago. The company has awarded a contract to the Ellington-Miller Company, Chicago, for the masonry work for the Island Creek bridge included in the double tracking between Paducah, Ky., and Clark, which work will involve an expenditure of approximately $25,000; and is also inquiring for bids for alterations to its freight house at Indianapolis, including the construction of a new transfer platform and concrete pavement, this work having been noted in the *Railway Age* of July 15 as being contemplated.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—This company is calling for bids for an 18-stall brick roundhouse at Gladstone, Mich., to replace a structure recently destroyed by fire.

MISSOURI, KANSAS & TEXAS.—This company has awarded a contract to H. D. McCoy, Cleburne, Tex., for the construction of a freight house at Wichita Falls, Tex.

UNION PACIFIC.—This company will close bids August 23 for the remodeling of its passenger station and for the construction of a freight house at Sterling, Colo.

VENTILATION OF PASSENGER CARS might well engage the attention of the railway managers when they have a little leisure.

This is the season of that very serious affection, the "Summer cold," and particularly exposed to the malady are those daily travelers, the members of the commuting tribe. They arrive at the station in Summer more or less hot and moist. . . . No matter how much care they exercise, they are the helpless victims of the window next ahead of the one by which they place themselves, for it is a peculiarity of railway cars that the passenger gets the draft, not from his own window, but from that of his neighbor in front of him. Nobody, or almost nobody, gives a thought to what is suffered by the other person upon whom the gales blow. European cars, with windows that open from the top, instead of from the bottom, are better; they do not go down very far, and ventilation is effected without drafts being felt by anybody.—*New York Times.*

Railway Financial News

ALABAMA & MISSISSIPPI.—*Sold.*—The Alabama & Mississippi railroad, operating between Vinegar Bend, Ala., and Pensacola, Miss., a distance of 76 miles, was sold at auction on August 1 by order of the United States District Court. The purchase price was $142,365, and J. W. Backstrom, of Leakesville, Miss., and H. C. Turner, of Mobile, Ala., who have extensive mill interests in Greene county, Miss., through which that line passes, were the buyers. The railroad owns five locomotives, 24 freight cars and three passenger cars, and runs one train a day each way. It has been in receivership since March, 1921.

CHICAGO UNION STATION CO.—*Guaranty Not Applicable.*—The Interstate Commerce Commission has rendered a decision that the provisions of Section 209 of the transportation act providing for the guaranty for the six months' period of 1920 are not applicable to this company on the ground that its revenues were covered by those of the tenant lines. The property was operated during the guaranty period by the Pennsylvania Railroad as agent for the tenant companies.

COLORADO & SOUTHERN.—*Authority to Abandon Branch Denied.*—The Interstate Commerce Commission has denied the application of this company to abandon its Buena Vista-Romley branch, including certain mine trackage, making a total distance of 29.42 miles, on the ground that the abandonment would deprive a large section of the benefits of rail transportation and would probably result in the abandonment of the mining district and the loss of large investments heretofore made. While the operation of the line for the past four or five years has resulted in substantial losses, the commission says the record affords some assurance that the conditions which produced that result are changing and that future operations may show a more favorable return. If the improvement should not materialize within a reasonable time, the applicant may renew this application. The commission also says the offer of the company to lease the line to the shippers and others that protested against its abandonment at a rental of $5 a year should be given serious consideration.

NEW ORLEANS, TEXAS & MEXICO.—*Application for Authority to Acquire Control Denied.*—The Interstate Commerce Commission has denied this company's application for authority for the proposed acquisition of control of the Dayton-Goose Creek by purchase of its capital stock, as not being in the public interest.

NEW YORK, LACKAWANNA & WESTERN.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized this company to issue $13,639,000 of first and refunding mortgage bonds to be delivered to the Delaware, Lackawanna & Western in reimbursement of advances and in payment of a note. The company was also authorized to issue $10,000,000 of first and refunding mortgage bonds or not exceeding $5,000,000 of stock and such amount of bonds as, together with the stock, will aggregate $10,000,000, to be sold or exchanged for the purpose of paying or refunding certain construction mortgage bonds and terminal and improved mortgage bonds. The Delaware, Lackawanna & Western was authorized to guarantee the bonds and stock.

PENNSYLVANIA RAILROAD.—*Assumes Operation of G. R. & I.*—Announcement is made that the Pennsylvania has taken over and assumed the actual operation of the Grand Rapids & Indiana Ry., in accordance with its lease of that property.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $2,499,000 of general mortgage 4 per cent bonds to reimburse the treasury for expenditures. The bonds are not to be sold at present but are to be placed in the treasury.

VIRGINIAN & WESTERN.—*Authorized to Issue Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $1,500,000 of first mortgage 5 per cent gold bonds to be sold at not less than 95, the proceeds to be applied in part payment for advances by the Virginian.

Treasury Payments to Railroads

Since last announcement, dated July 1, 1922, payments under Sections 204, 209, 210 and 212 of the Transportation Act, 1920, as amended, have been made by the Treasury as follows:

Section 204	
Butler County Railroad Co.	$18,778.17
Fernwood, Columbia & Gulf Railroad Co.	46,478.66
Knoxville, Sevierville & Gulf Railroad Co.	5,099.25
Lumpkin, Hemphill & Gulf Railway Co.	6,517.07
Mansfield Railway & Transportation Co.	14,962.09
Macon, Dublin & Southeastern Railroad Co.	18,458.53
St. John & Ophir Railroad Co.	17,977.78
Section 209:	
Alabama Central Railway Company	2,246.48
Lyon, Berry & Sullivan R. R. Co.	2,961.63
Brownwood North & South Railway Co.	1,051.27
Bernettsville & Cheraw Railroad Co.	6,319.94
Fernwood, Columbia & Gulf Railroad Co.	12,480.05
Fort Worth & Rio Grande Railway Co.	41,885.67
Illinois Central Railroad Co.	1,313,078.57
Kansas City, Clinton & Springfield Ry. Co.	31,228.29
Kansas City, Mexico & Orient Ry. Co. of Texas	84,715.19
Kansas City, Mexico & Orient R. R. Co., receiver	32,904.17
Middle Tennessee Railroad Co.	20,864.90
Port St. Joe Dock & Terminal Railway Co.	1,410.22
Quanah, Acme & Pacific Railway Co.	17,226.86
St. Louis, San Francisco & Texas Railway Co.	114,967.63
St. Louis-San Francisco Railway Co.	855,449.76
Section 210:	
Cisco & Northeastern Railway Co.	27,863.00
Tennessee Central Railway Co.	563,000.00
Section 212:	
Port Bolivar Iron Ore Railway Co.	4,000.00
Total	$3,261,014.36

The total payments to July 31, 1922, have been:

(a)	Under Section 204, as amended by Section 212 for reimbursement of deficits during Federal control:		
	(1) Final payments, including partial payments previously made	$2,789,007.82	
	(2) Partial payments to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	1,201,603.54	
	Total payments a/c reimbursement of deficits		$3,990,611.36
(b)	Under Section 209, as amended by Section 212 for guaranty in respect to railway operating income for first six months after Federal control:		
	(1) Final payments, including advances and partial payments previously made	$91,201,862.25	
	(2) Advances to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	222,102,672.00	
	(3) Partial payments to carriers as to which a certificate for final payment has not been received, as stated above	132,281,922.09	
	Total payments account of said guaranty		445,586,456.34
(c)	Under Section 210 for loans from the revolving fund of $300,000,000 therein provided		314,693,943.00
	Total		$764,271,010.70

Repayments of loans have been made by 31 roads to the amount of $81,363,500.

Trend of Railway Stock and Bonds Prices

	Aug. 8	Last Week	Last Year
Average price of 20 representative railway stocks	70.72	68.98	56.04
Average price of 20 representative railway bonds	88.71	88.36	76.15

SEVERAL HUNDRED EMPLOYEES of the Pullman Company recently entered a competition for the best definition of the word "courtesy." The three prize winning definitions are as follows: First prize, $50—Courtesy consists of giving those we meet such considerate attention that their every want will be satisfied, and that they will realize the attention is due to real interest in their comfort; second, $35—Courtesy is the spirit and essence of service, kindness and good will. The cheery word, the friendly smile, the helping hand—these are handmaidens. It is born of a gentle mind and fostered by tact; third, $15—Do all the good you can, to all the people you can, whenever you can and as promptly and politely as you can.

Railway Officers

Financial, Legal and Accounting

Z. G. Hopkins, assistant to the chief officer of the Missouri, Kansas & Texas, has been appointed manager of the newly created department of public relations, with headquarters at St. Louis, Mo., effective Aug. 1.

Traffic

J. J. Finney has been appointed chief of the tariff bureau of the El Paso & Southwestern, effective August 1.

F. S. Brooks, assistant general livestock agent of the Chicago, Rock Island and Pacific with headquarters at Kansas City, has been promoted to general livestock agent of that road with headquarters at Chicago. He will be succeeded by **A. Peterson,** division freight and passenger agent, with headquarters at Amarillo, Texas.

R. H. Miller, traveling passenger agent of the Chicago & North Western with headquarters at Buffalo, N. Y., has been promoted to general agent with the same headquarters, effective August 1, with charge over the newly established offices of the company in that city. Effective the same date, **W. W. Pontius,** city agent at Cleveland, and **J. P. Fox** have been appointed traveling passenger agents.

Engineering, Maintenance of Way and Signaling

W. P. Wiltsee, assistant engineer of the Norfolk & Western, with headquarters at Roanoke, Va., who has been promoted to principal assistant engineer with the same headquarters, was born on May 30, 1878, at Cincinnati and entered railway service in 1895 as rodman with N. D. Burke, consulting engineer at Cincinnati. He was engaged in municipal and railroad work until 1899, when he entered the employ of the government as a draftsman and instrumentman on river and harbor work. In 1900 he re-entered railway service as assistant engineer of construction and maintenance of the Cincinnati, Portsmouth & Virginia (Norfolk & Western) and in 1901 joined the Norfolk & Western as a draftsman in the office of the engineer maintenance of way and served successively as chief draftsman in the office of the engineer of construction from 1902 to 1903 and as assistant engineer on branch line developments from 1903 to 1912. On the later date he was placed in charge of extensive tidewater improvements at Norfolk and related work. He was employed in this capacity until 1916 when he was appointed assistant engineer in the office of the chief engineer in charge of engineering matters connected with maintenance of way, water supply, fuel stations, etc., which position he held until the time of his recent promotion.

W. P. Wiltsee

General

W. E. Williams has been appointed manager of the newly created department of personnel of the Missouri, Kansas & Texas, with headquarters at St. Louis, Mo.

Obituary

Burton Hanson, for the past 12 years general counsel of the Chicago, Milwaukee & St. Paul, died on August 5 at the Presbyterian hospital, Chicago, from the effects of a minor operation performed July 24, from which he was making good recovery until August 4. Mr. Hanson was born on August 27, 1851, at Rushford, Winnebago county, Wis., and was educated at the Wisconsin State Normal School at Whitewater, Wis. Following the completion of his studies, he began the reading of law in the firm of Carey & Cotterill at Milwaukee. At that time the senior partner of this firm represented the Milwaukee & Northern (now the Superior division of the Chicago, Milwaukee & St. Paul) as solicitor, and in 1879 Mr. Hanson, then also a partner in the firm, was appointed assistant solicitor. He held this position until September 1, 1883, when he relinquished his connection with the Milwaukee & Northern to become assistant general solicitor on the Chicago, Milwaukee & St. Paul, in the service of which he was promoted to general solicitor on September 15, 1895. Mr. Hanson then continued as general solicitor until January 1, 1911, when he was elected general counsel, and was actively engaged in this capacity up to his recent illness.

Burton Hanson

C. W. Jones, manager of the first district of the Chicago, Rock Island & Pacific, with headquarters at Des Moines, Iowa, died in that city on July 22 after a long illness. Mr. Jones was born on November 6, 1860, at Milton, Ind., and entered railway service in 1875 as an agent's helper on the Chicago, Rock Island & Pacific. He was employed successively as telegraph operator from 1877 to 1881; agent and operator from 1881 to 1884, and train dispatcher from 1884 to 1890. In 1890 he was promoted to chief train dispatcher and in 1892, to trainmaster. He was employed in the latter capacity until February, 1895, when he was promoted to assistant superintendent which position he held until August, 1895, when he was promoted to division superintendent, with headquarters at Herington, Kan. He was superintendent of the Eastern division, with headquarters at Horton, Kan., from October, 1897, to May, 1902, and superintendent of the Kansas division with headquarters at Topeka, Kan., from May, 1902, to August, 1905. On the latter date he was transferred to the Iowa division with headquarters at Des Moines, Iowa, which position he held until January 1, 1909, when he was promoted as general superintendent with headquarters at Topeka, Kan. On December 15, of the latter year, he was promoted to general superintendent, with headquarters at Davenport, Iowa, and on February 1, 1912, he was promoted to general manager of the third district of the Chicago, Rock Island & Pacific, and vice-president and general manager of the Chicago, Rock Island & Gulf, with headquarters at Fort Worth, Texas, which position he held until January 1, 1914, when he was transferred to Des Moines.

C. W. Jones

EDITORIAL

Railway Age

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A recent study of the causes of deterioration of freight cars showed that 30 per cent of the expense for repairs was chargeable to time and the elements. As the total cost of freight car repairs in 1920 was $593,000,000, this means that rust and decay in freight cars alone cost the railroads nearly $180,000,000 during that year. This is conclusive evidence of the importance to the railroads of any measures that will prolong the life of wood and steel and indicates the savings that might be effected by the development of non-corrosive materials or of efficient protective coatings. Because of their direct interest, the railroads should take a leading part in research work bearing on these problems and should test thoroughly every promising new material or method. Preservative treatment for lumber where tried has been quite successful. Rust-resisting sheets for cars are now available and a new process of coating underframes with zinc is being used abroad. On certain classes of equipment probably each of these means of prolonging the life of material would save far more than it costs. Possibly it is too early to apply them on a large scale but every railroad should be sufficiently interested to start tests that will demonstrate just what can be expected from each. The cost of such trials would be negligible and they would pay a big return if they led to even a relatively small reduction in the cost of car repairs.

Prolonging the Life of Equipment

Behind the current strike movement is a deep-seated plan to discredit private management of the railroads. No stone is left unturned in efforts to trump up charges of inefficiency of management and to draw unfavorable comparisons with visionary results under governmental operation. This propaganda is so persistent that it can be defeated only by the operation of the railroads with consistent prudence and honesty. It is necessary to guard against anything that has even the appearance of slovenly or indifferent management. The average railroad patron gains his most vivid impression of a railroad while traveling. Of next importance is the opinion gained at the passenger station while awaiting the arrival or departure of trains, and the resultant opinion is the composite impression made on him by the demeanor of the employees, the appearance and cleanliness of the station building and grounds, and the apparent condition of the track. Notwithstanding this, it is a notorious fact that main line passenger tracks are almost invariably in a less favorable condition in the immediate vicinity of passenger stations than at other points on the line. Casual observation made recently at a summer resort station on an important double-track trunk line in the middle west indicated an exceedingly unsatisfactory condition of the track. The receiving end of almost every rail was badly battered, in one case evidencing a split head. Not more than one joint bolt in ten was tight and not a few track spikes were missing. In fact, conditions were far from normal for high speed passenger service. Subsequent observation on the train disclosed riding qualities of the line which indicated that the condition observed at the station was by no means typical of the track along the entire line. It must be said in justice to the maintenance of way officers that the demands made on the track at passenger stations are perhaps less severe than elsewhere because of the lower speeds of the trains, but the fact remains that it is at the stations that people will pass judgment on the standards of maintenance in effect on the property.

Track Maintenance Near Stations

One of the surprising developments of the shopmen's strike is the relatively small increase in the number of locomotives in need of repairs during the first two weeks after the walkout, when the roads had the smallest forces in the shops. Since more mechanics are being recruited daily, the condition of the power will probably improve. Nevertheless, if the miners go back to work, some of the coal-carrying roads may get more traffic than they could handle even if they were not handicapped by the strike. Under present conditions it would be hard to build up the shop forces to meet such an emergency. Probably the most effective method of overcoming a possible shortage of power would be to run the locomotives over two divisions. Several roads have tried this with notable success. One mechanical department officer stated that by thus increasing the mileage of the large power the road had reduced the number of engines required, cut down the cost of maintenance and decreased fuel consumption by 15 per cent. If these results can be obtained in regular operation, surely it would be worth while to try longer runs during the strike in case there is any local shortage of power.

No Prospect of Shortage of Power

To almost succeed is to fail. This truth we learn in childhood and it is illustrated every day in all sorts of contests in work and sport; yet in important matters of everyday duty we forget it, with sad results. The collision near Leeds, Mo., about ten miles from Kansas City, reported on another page, in which three passengers and an employee were killed, when an engineman ran his train past a meeting point, is a remarkable case. It could undoubtedly have been prevented if the conductor, the rear brakeman and the fireman had been absolutely sure that they knew where they were to meet the opposing train. They knew, but they did not know with that certainty which would cause them to act instantly when they saw that action was necessary. The conductor was, very naturally, reluctant to believe that the engineman was forgetting his meet order and so took time to consult another man before pulling the conductor's valve. The brakeman, equally incredulous, took time to look a second time at his copy of the order. Judging by the statements in the report, both of these men will now, undoubtedly, admit that they ought to have set the brakes at once; they could have settled their doubts afterward. As to the responsibility of the fireman, the situation appears to have been about what it always is in reports of this character; a fireman takes no special thought about meeting points until something happens

Difficulty of Checking a Forgetful Engineman

to force him to do so. The failures here noted are recalled, not for the purpose of apportioning blame, for the cultivation of cautiousness is one of the duties constantly enjoined on trainmen, and to censure for an excess of caution is delicate business; but simply to say what we said at the outset; ninety-nine and nine-tenths perfect—or even 99.99—is *not* a good percentage, when it comes to preventing collisions. There is no hope of reaching 100 per cent except by the use of the block system. The government report, by the way, says that this division of the Missouri Pacific is operated by "a manual block system;" but the order directing these two trains to meet at a side track not signaled, and unattended, was, of course, a suspension of the block system. For perfect service it is necessary to regard as essential elements of the block system (1) the beginning and the end of each block section to be unchangeable, permanent and immovable; (2) this location to be marked by a visual signal which the engineman can see, on every trip (so located that he cannot avoid seeing it if he is facing forward with his eyes open) and (3) every clear signal to give unqualified right of road to the next signal.

Is Your Oil-Burning Equipment Efficient?

Fuel oil has superseded coal and coke in many branches of industry. This is especially true in railroad shops and enginehouses where crude oil is the fuel commonly used in furnaces for heat treating, flue welding, forging and riveting. With a coal shortage impending, oil furnaces will probably be installed to a greater extent than ever before and the need for efficient utilization of oil, as well as all other fuels, is self evident. Under present conditions more or less oil is being wasted because in many railroad shops both the furnaces and oil burners have been made locally, representing the ideas of some all-around mechanic. It is not flattery but an expression of undeniable truth to say that the manufacturers of modern oil-burning equipment, having spent years studying combustion problems and developing efficient oil furnaces, know a thousand times more about such equipment than shop men who have not given the subject special study. At first blush it may appear a simple thing to connect fuel oil and air pipes to some sort of combining tube and project the resulting flame into a furnace or onto the work to be heated. Satisfactory results cannot be secured in this way, however, as has been demonstrated by costly experience. Three fundamental operations are carried to completion in every oil-burning furnace which is economical in the use of fuel. In the first place, there must be atomization or breaking up of the more or less highly viscous oil into minute particles; the second operation is to change these particles of oil into gas; the third is to supply just enough air for complete combustion. All of these operations must take place before the flame is directed on the work, otherwise heat units will be wasted and an oxidizing or reducing flame produced with undesirable effects on the work itself. It stands to reason that these three functions cannot be performed except in a suitably designed furnace and with a burner scientifically constructed. What the average railroad saves in attempting to make this equipment instead of buying it of reputable manufacturers is probably lost in a single month in fuel alone to say nothing of the loss from imperfect work. A neutral flame must be maintained in heat treating furnaces or expensive dies may be ruined; in flue-welding furnaces there is a formation of scale or carbon, resulting in defective welds which are always costly and especially so when they do not develop until placed in service. Railroad mechanical officers should take the first opportunity to examine the oil-burning furnaces, making careful tests of their efficiency and replacing them wherever necessary with reliable modern equipment.

The Sulphur Springs Collision

THE COLLISION on the Missouri Pacific at Sulphur Springs, Mo., reported in the last issue of the *Railway Age*, again shows that no matter how perfectly a signal system may be working, the signals will not prevent disaster if they are disregarded by employees. Train control probably would have prevented this accident. However, if other conditions had been different this accident might not have occurred. It is of these we speak, rather than of train control, because they exist on other roads in automatic block signal territory and steps should be taken to remove these "potential danger points."

Trains in the territory where this accident occurred are operated under two systems, one consisting of the time table, train order and telegraph or telephone, and the other the automatic block signal and interlocking system. The train order signal at Riverside, Mo., is connected into the automatic signal circuits so that when it was displayed for train No. 4 on the evening of the accident it caused the automatic distant signal to assume the "caution" position. This distant signal thus gives a caution indication when the train order signal is displayed, and also when its home automatic signal indicates "Stop" or when both the automatic home signal and the train order signal give their respective indications. One system is tied into the other.

This particular condition may account for the engineman on No. 4 running the home automatic signal, which is located around the curve 1,378 ft. in advance of the train order signal. The engineman, slowing down to about 25 m.p.h. to pick up the "19" order, may have assumed that the distant signal was at "Caution" because of the order board, and thinking No. 32 was out of the way may have been busy reading the order and passed the home automatic signal in the "stop" position without observing it. This would not, however, account for his disregard of the distant signal, which was located approximately 2.5 mi. north of the home signal at Riverside, and also of the northbound home signal at the point of the accident.

While the connecting in of train order signals to the automatic block system is considered good practice, in the light of this accident it would appear to introduce a dangerous condition, particularly when signals are located as in this case. Why is it necessary to retain two systems? It would seem that in automatic signal territory the train order signals at stations might well be a pair of home automatic signals in which their O-45 deg. control circuits are broken through a switch in the operator's office. This would enable the operator to control their indication when an order is to be delivered, and when there were no orders or the office was closed these signals would perform their function as part of the automatic signal system. It is because of the above conditions that the question is raised as to the necessity for the continued use of a double signal system, since one system can be made flexible enough to meet all requirements of train operation by signals.

In this connection it may not be amiss to quote from an editorial entitled "Is a Double Signal System Necessary?" which appeared in the *Railway Age* of April 1, 1921, in connection with the Porter, Ind., accident. The quotation follows:

"Each system is largely independent of the other and progressive managements are now directing their efforts towards the co-ordination of the two into one well rounded system. It is realized by operating officers and signal engineers that many 'potential danger points,' such as the one at Porter, Ind., exist and they realize further that 'something' should be done to eliminate this condition.

" 'Something' will be done when the railroads conclude that one flexible system is desired—not one superimposed on the other. It is difficult and sometimes unwise to change

from old established practices too rapidly, but if progress is to be made along any line old practices must give way to new. Railroad officers can well consider the advisability of requiring the automatic block signal system to be self-contained and so complete as to meet all signal requirements. In this way they will obtain greater and better operating results on the initial investment made. The proper co-ordination of signal systems will also remove 'potential danger points.'"

The Next Step

H. G. Wells in "An Outline of History," discussing the Prussian spirit shown in the world war, makes this statement. "A teacher, a professor, who did not teach and preach in and out of season, the racial, moral, intellectual and physical superiority of the Germans to all other peoples, their extraordinary devotion to war and dynasty, and their inevitable destiny under that dynasty to lead the world, was a marked man, doomed to failure and obscurity. . . Only a mind of extraordinary toughness and originality could resist such a torrent of suggestions . . . Frederick Pierce, commenting upon this in his book "Our Unconscious Mind," draws this conclusion: "Reinforce them through all the formative years with such methods and ideas as we have been describing in the quotation, and we shall have a man who may be expected to welcome war exactly as the Prussians welcomed it. To expect anything else would be blind folly from the point of view of psychology."

Let us think for a moment of what has been taking place among railroad men in this country for many years and particularly during the past five years. The propaganda which has been developed by the advocates of the Plumb Plan and the statements and editorials which have been going to the union men from their leaders and through their publications were bound to bear fruit. The present unrest and insubordination among the employees of the railroads it not to be wondered at. The situation has been aggravated by the fact that Congressional committees and the Labor Board have sat patiently listening to the most misleading and extravagant statements from the labor leaders and so-called labor experts without even challenging them or forcing the witnesses to substantiate their statements.

There is no question but what a large proportion of labor union men think for themselves and have not been in entire sympathy with the actions and statements made by their leaders, and yet dissatisfaction has not taken such form as to check the leaders or replace them.

If these conditions are allowed to continue the American railroad systems will eventually be broken down completely, with disaster to the country at large. It is high time that men with a large vision, on the railroads and in public life, should devise ways and means of offsetting malicious propaganda which has been circulated so freely among the men. This is not a simple problem. The average railroad employee is not going to read the editorials in the more thoughtful newspapers and periodicals; nor will he be apt to study treatises on economics. He must be supplied with the simple facts relating to the railroad business and his connection with it, presented in an interesting way and in language which he can appreciate and understand. He is no exception to the general public. Cartoons, pictures and the simplest kinds of charts will catch his eye and appeal to his imagination.

Educational processes of this sort are slow, but they are sure. Economists indicate that we have passed through the period of brute force (although we often revert to type, even now) into a period of competition, and that we are now entering the more advanced stage of civilization—the period of co-operation. In discussing how our citizens may be better prepared to function properly in this more advanced stage, Pierce in "Our Unconscious Mind" makes several suggestions. Naturally he starts with the education of the children, but the same principles will, of course, meet with effective results if applied generally. Following is an example. "Two or three times a week each teacher takes five minutes at the close of the day to report the most notable example of co-operation that has come to her attention, not sentimentally, but in precisely the same spirit as mention of a soldier in dispatches. The ideal held before every child is that to win honor and esteem there must be something achieved in the way of help to another. Disputes shall invariably be settled by one or more referees."

People are thinking much in these days in terms of making regulations and laws which will prevent strikes and industrial difficulties, such as those through which we are now passing. These deal with the results and do not necessarily touch or remove the underlying causes. If we are to get real results it will be necessary to go far deeper and to lay a solid foundation which will insure permanent results. This can only be done by the most scientific, thorough and intelligent educational work among the workers, throughout the communities and in the public schools. Such efforts work slowly, but they are absolutely sure of producing real and permanent results. Is it not high time that a start was made in this direction?

Lest We Forget

On October 10 the Chicago, Rock Island & Pacific will celebrate the seventieth anniversary of the operation of its first passenger train. At that time special programs will be presented over the system depicting the various stages in the development of this railway from a line of less than 40 miles, traversing only 2 counties of one state to a system of more than 8,000 miles in 14 states. This development has taken place in a period of less than three-quarters of a century. In this growth the Rock Island has been typical of the roads which now form a network of transportation arteries across the vast prairie areas west of Chicago and to only a slightly less extent those of the entire United States and Canada.

Pushing west from Joliet, the Rock Island was the first road to reach the Mississippi river, building into the city whose name it carries in 1854. It reached the Missouri river at Omaha in 1869 and at Kansas City a few years later. It acquired the Chicago, Kansas & Nebraska, comprising 1,500 miles of lines in Kansas, Nebraska, Colorado and that portion of Oklahoma then known as Indian Territory, at a foreclosure sale in 1891. At later dates it also acquired control of other roads, most prominent among which were the Burlington, Cedar Rapids & Northern, and the Choctaw, Oklahoma & Gulf. The result of this era of construction and purchase is the system of today, a collection of lines aggregating over 8,000 miles, affording the sole means of transportation to hundreds of communities and a competing outlet for an even larger number.

Anniversaries such as these impress one with the newness of our transportation system. Starting from nothing, only 90 years ago it has developed into a system which comprises more than one-third of the railway mileage of the world. It has pioneered in the opening up of vast areas for agricultural and industrial development. It has made it possible for the Kansas farmer to dispose of his wheat in the markets of the world and for the dweller in the Eastern cities to eat Oregon strawberries.

In the enjoyment of these advantages of our transportation we are prone to lose sight of the fact that they have been made possible by the courage and daring of the early pioneer who more frequently than otherwise lost more than he gained. Few of the early railways in the West escaped receivership

and reorganization with the resulting sacrifice by the original owners of a large part of their investment. The difficulties experienced by the lines which are now the main arteries of the Rock Island system in the Southwest were typical of the roads of this entire area. In thinking of the railways of today we should not forget the pioneers who laid the foundations for the present system and the fruits of whose courage we are enjoying.

Arbitration or Anarchy?

THE COAL MINERS' and railroad shop employees' strikes have caused many people not ordinarily prone to pessimism to consider seriously the question whether this country is drifting toward anarchy. It may be predicted with some confidence that this will not be the result of these particular strikes, although there are persons in high places who have expressed fear that even they may produce conditions that will cause a revolution. It is probable that these strikes finally will be settled in some way. But the controversies which caused them and incidents which have resulted from them are sufficient to make even those ordinarily disposed to be optimistic to regard the future with grave apprehension.

Developments which preceded and which have occurred during these strikes disclose differences between the employers and the labor unions which are fundamental and irreconcilable. Some of the points regarding which developments before and since these strikes began have disclosed irreconcilable differences between employers and employees in large scale industries are the following:

First, labor unions insist upon national negotiations and action. Their leaders do this principally because they believe that negotiations and action by the labor unions on a national scale will give them the maximum possible power to enforce their demands. Employers oppose national negotiations and action because they probably do give labor unions the maximum possible power and because employers naturally are unwilling to agree to a policy having the purpose and effect of giving labor unions so much almost irresistible power.

Second, the labor unions demand wages which are based upon estimates of the needs, real or imaginary, of their members and their families. Employers will not and, in fact, cannot grant what the labor unions demand, because under present conditions industry cannot produce enough to give the members of the labor unions what they demand.

Third, in seeking the maximum possible power and in making demands which it is economically impossible to grant, some of the largest and most important labor unions are trying to overthrow the present system of private ownership and management of certain industries and to replace it with some such system as the Plumb plan. Employers engaged in private industry never will long grant demands which they know are made with the purpose of overthrowing private ownership and management, and the granting of which will tend to produce that result.

Fourth, some of the largest and most important labor unions refuse voluntarily to arbitrate any controversy, and claim for themselves the right, when a government arbitration body such as the Railroad Labor Board makes an award, to accept it or to reject it and strike according to whether they like it or not. They maintain that the right to strike is a fundamental right of man. At the same time that the shop employees' unions are striking against an award of the Railroad Labor Board their leaders, with the greatest inconsistency, exaggerate and denounce the comparatively few instances in which the railways have failed to carry out orders of the board. The railways maintain that all important controversies between them and their employees should be submitted to arbitration, and of course never can agree that it is a crime for the railways to disregard an award of the Labor Board merely the exercise of a fundamental human right for the employees to disregard and strike against an award of the board.

Fifth, the labor unions maintain that when their members strike even against a decision of the Labor Board they retain unimpaired their rights to the jobs at which they have quit working, and that this carries with it the right on their part to prevent other men from taking these jobs, and the right to be restored to them when the strike is settled. Neither the railways nor any other class of employers ever can accept this principle, because its acceptance necessarily would give men disposed to work almost no incentive to do so, and men disposed to strike every incentive to do so, and render victory for the strikers practically certain in every strike.

Sixth, the labor unions claim for their members the right to put pickets at every point affected by a strike, and to have the pickets use every form of "persuasion" to keep men from working. In every important strike such picketing results in violence. The pickets may be the authors or the victims of the violence, but experience shows that where picketing is done violence is practically inevitable. Violence results in most communities in local police, United States marshals or troops being called to suppress and prevent it. In the shopmen's strike, not only the strikers but employees in train service who sympathize with them, have resented the use of armed guards to protect men who want to work, and in some cases have struck in plain violation of their contracts with the railways rather than work where there are armed guards. But employers never can agree to the labor union theory that they should not seek police or military protection for property and men who are willing to work, for this, like agreeing to the labor unions' theory regarding seniority, would be to concede victory to the strikers from the very start.

Since such irreconcilable differences exist between certain classes of employers and labor unions, it is plain that strikes in large scale industries with resulting assaults, murders, destruction of property, and most serious interference with business of all kinds, are inevitable, unless the public intervenes to prevent them.

It seems evident, therefore, that the public must make a definite choice in the comparatively near future between compulsory arbitration of labor disputes in large industries, on the one hand, and strikes having the most serious possible consequences, on the other hand. It must require the parties to these great controversies to submit their differences to determination by bodies on which representatives of the public hold the balance of power, and then compel both sides to accept the awards, or prepare for the inevitable outcome of even worse strikes than those now in progress, and that is anarchy. The great question presented to the people of the United States by the coal strike and the shopmen's strike is —Arbitration or anarchy?

It looks very much now as if in the long run the question will be decided in favor of anarchy. Employers in the railroad and some other industries are just as inflexibly determined not to yield to the labor unions as the labor leaders in these industries are to force them to yield, and unless the public will step in and for its own protection exert for industrial peace a power greater than that of either side the results in the long run will be appalling.

It may reasonably be asked, if the public, through the governments, local, state and national, will not intervene either to prevent or punish such outrages and crimes as have been committed in connection with the present strikes, how can it be hoped that it will establish a policy of compulsory arbitration and enforce the resulting awards? This cannot reasonably be hoped for unless the people of the United States can be aroused to an understanding of the significance of such developments as strikes in defiance of awards made by a government body, wholesale murder such as occurred at

Herrin, Ill., and sympathetic strikes in violation of solemn contracts against the use of police and military for the protection of property and lives, even where property already has been destroyed, and people, even including public officials, already have been shot. The difference between such a situation as already exists and that of absolute anarchy is merely one of degree and not of kind.

A man must be very prejudiced or very blind who does not see that unless the public through its government, does forcibly intervene the struggles between employers and labor unions are going to grow more extensive, more bitter and protracted, more lawless and ruinous, and that only enforcement of the principle of arbitration and enforcement of the laws against violence, whatever its pretext or purpose, can save the country from drifting sooner or later into a condition of affairs far worse than that which exists at present.

Labor Union Theory of Seniority

RAILWAYS having most of mileage in the country have accepted President Harding's proposal that the striking shop employees shall be put back to work and the seniority issue submitted to the Railroad Labor Board for determination subject to certain conditions. One of these is that the status of men now at work shall not be disturbed until the seniority question is settled. Another is that former employees who have been proven guilty of violence shall not be taken back. Railways having about 57,000 miles of line have agreed to take strikers back and submit the question of seniority to the Labor Board subject to the foregoing conditions, and also to the further condition that they and their employees shall not be deprived of the right of review by the courts of any decisions of the Labor Board which may affect agreements now in existence between the railways and their employees.

The labor unions composed of the strikers still maintain their stand that the strikers must be taken back with their full seniority rights. In this position they are given the backing of other railway labor unions, and especially of the train service brotherhoods, whose heads have been trying to mediate between the railways and the strikers. The principle upon which the labor leaders base their claim that the strikers should be taken back to work with their full seniority rights has been stated as follows by L. E. Sheppard, president of the Order of Railway Conductors: "The real issue as we see it is the status of the men on strike. We hold that they are not dismissed from the service—that they have not resigned. They are awaiting a settlement of their differences and all rights as employees are suspended, so to speak, contingent on whether or not they go back to work."

This means in substance that if an organized body of workers leave their jobs in concert for any period, however long, to compel an employer to grant demands that the strikers have made, they retain the same rights to their positions that they had before they quit work. It means, in other words, that they own their jobs as they may own property, and that like the owner of any other property they do not lose their ownership of them unless they abandon them with the avowed purpose of never trying to recover them.

Of course, this principle is the direct negation of the principle of private property as established and recognized by the laws of every country in which private property exists. It is an economic impossibility for one man or group of men to own a manufacturing plant or a railway shop, and for another group of men at the same time to own the jobs in the plant or shop. Even when the owner of a plant makes a contract with an employee the law does not give the employee the ownership of the job. The employer may discharge the employee and thereby takes the job from him at any time. The employee may sue the employer for any damages caused him by the violation of the contract, but no law will require the employer to restore the job to the employee upon the theory that the job is the employee's property.

If the labor leaders' claim is the result of any process of reasoning, the conclusion they have reached, and which Mr. Sheppard has stated, must be that the striking employees have a *moral* right to recover their jobs with all the rights and privileges associated with them before they left them. There is no question whatever that an employee has a moral right to any position in which he does his work faithfully and well and in which the financial circumstances of the employer enable the employer to retain him. But do employees, who leave their jobs in concert for the express purpose of stopping the operation of a plant and inflicting such injury upon the employer that he will be compelled to grant their demands, retain the moral right to be restored to their jobs? Do they retain moral rights to their former jobs superior to the rights to these jobs of men who stay at work or who go to work during the strike? How can men who take concerted action for the avowed purpose of so injuring an employer as to compel him to agree to their terms have a moral right to the same kind of treatment from the employer that he would have been obligated to give them if they had not concertedly taken steps to injure and coerce him? The principle stated by Mr. Sheppard is an ethical absurdity.

The simple truth is that lockouts and strikes are a form of warfare. When nations are at peace they have certain moral claims upon one another. When they go to war they cease to have any moral claims upon each other except that in carrying on warfare they should not resort to inhuman methods.

When their representatives sit down after the struggle to make peace they make it on the basis of the status which has been created by the struggle. The same thing must be recognized as true of lockouts and strikes. They disrupt all moral obligations which each party owed to the other before the strike or lockout. If neither party has won a decisive victory the settlement is a compromise in which each party concedes what it chooses to or must. If either party has won a decisive victory it dictates the kind of settlement which it believes will best promote its own interest in the long run.

No group of employers ever can or ever should accept the principle stated by Mr. Sheppard. For the benefit of all concerned, including especially the public, arbitration should be substituted for lockouts and strikes. If, however, lockouts and strikes are to occur the principle must be recognized that when they occur all relations between the employers and employees involved are dissolved, and that when the struggle is terminated, whether by agreement or the victory of one side, the new relations established will be similar to or unlike those which existed before, according to the outcome of the struggle.

To recognize the principle that men may strike at any time they like about anything they please without thereby losing anything except their wages while they are out would be to recognize a principle which would tend to cause employees to take a holiday every time they felt like it and to render it impossible to conduct any business with success. To the successful conduct of any business it is essential that the management should be able to make contracts covering long periods of time and to plan its operations so as to fulfill these contracts. Frequent interruptions of operations will render it impossible for any management to make and carry out plans covering a long period.

Acceptance of the principle stated by Mr. Sheppard would, in the long run, be as ruinous to the workers as it would be to the employers, because the welfare of the workers depends as much as that of the employers upon continuous operation and successful management.

Letters to the Editor

[*The* Railway Age *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.*]

Vacuum Brake Tests on English Freight Trains

Derby and Doncaster, England.

To the Editor:

In the article which appeared in your number dated April 1, 1922, pages 823, 824, and 825, on the tests of vacuum brakes described in our paper before the Institution of Civil Engineers, it is pointed out that the retarding effect of the vacuum brake compares unfavorably with tests with the Westinghouse brake made in America as far back as 1887.

We wish to point out that the tests on the Great Northern Railway were in no way intended to ascertain the shortest distance in which a freight train fitted with vacuum brake could be stopped; the object of the tests was to ascertain whether satisfactory stops with existing equipment could be made with what are, in this country, long freight trains consisting of up to 100 wagons. The wagons were not fitted with special apparatus to give the highest braking effect and the results, therefore, should not be compared with the Westinghouse brake as regards stopping distance.

As a matter of fact, tests made in this country and also on the continent, indicate that long freight trains fitted with the vacuum brake stop in as short a distance as trains fitted with the Westinghouse brake.

(Sir) Henry Fowler,
Chief Mechanical Engineer, Midland Railway.

H. N. Gresley,
Locomotive Engineer, Great Northern Railway.

Specialists Needed for Car Repair Work

Chicago.

To the Editor:

The methods of repairing freight cars, both wood and steel, as used on the railroads are in most cases extremely inefficient. The principal reason is lack of knowledge on the part of the men in charge who are usually loaded down with details and have so many duties that they cannot supervise the work properly. These are the conclusions I have reached after many years in the car department, based on personal observations in a large number of shops.

There are thousands of men supervising freight car repair work at salaries from $200 per month up, working under superintendents of motive power who in most cases have no first-hand knowledge of car repair methods. Railroads are paying high salaries to general officers to secure efficiency and conduct transportation at a profit, while some of the men on the mechanical staff are allowing hundreds of thousands of dollars to slip through their fingers on account of inefficient methods, lack of proper organization of freight car repairs, lack of proper knowledge of what appliances to use to get the best results and most important of all, lack of ability to recognize wasteful acts or methods, or knowledge of how to correct them if recognized.

There is a field for specialists or experts in the repair of freight cars, especially steel cars. By this I mean, men who thoroughly understand the scheduling of classified repairs on both steel and wooden freight equipment as well as the building of new equipment; men who actually know just what shop tools are necessary for the maintenance and repair of cars, who will not waste thousands of dollars for facilities where they are not needed; men who can say positively how to better conditions and output on this class of work—in short, men who have mastered the subject of car repairs.

It would pay the railroads to engage men who have the experience and knowledge to effect savings that are possible in car repair work, using such men in an advisory capacity. It is probably not necessary to make the position permanent but it would be necessary to pay what the service rendered is worth. In the past, railroads have not been willing to do this and have kept the wages of the supervisory forces at a low level. This is the reason that most of the best men in the car department enter the employ of the car builders. It probably also explains why the car builders can handle the work more cheaply than the railroads. The field is so large and the present lack of efficiency is so great that there should be a place in the railroad organizations for a man who has the ability to handle freight car repair work economically. Can the railroads be made to recognize the true value of the services of such men?

M. C. B.

Talk Money to Employees

Haileyville, Okla.

To the Editor:

The article by Grant Gibson, on the above subject, in the *Railway Age* of July 1 is certainly worthy of serious consideration by those who are responsible for expenditures on the railroads. There are very few men who work in the offices or shops, or on tracks or bridges, or in any department for that matter, that know the value of the material, tools, etc., with which they work. From a train dispatcher's standpoint, we doubt extremely if there are ten per cent of the train dispatchers who know just what the fuel on the engines costs and how much coal it requires to handle a ton of freight one mile; or what the running repairs of a locomotive per mile amount to in dollars and cents. How many of them stop to figure how much wages in money is lost by a gang of men with a work train when the work train is standing on the side track waiting for trains to pass, some of which are way off the time the work train had on them?

How much is lost in money for switch engines standing still in the yard waiting for delayed passenger trains which are off the time given the yard engines? Does the operator at a small telegraph office stop to figure how much money is lost by his causing a train to stop at his station by reason of a "19" order which he was slow in trying to make delivery? Does the agent stop to consider how much money he has lost to the company because he was late in sending in certain reports, thereby causing the division office to wire or write him for them? Sometime ago it was calculated that each letter written cost about 18 cents. We believe it would be well for the railroads to do a little more talking along the line of money and make up a few statistics to be posted in front of many employees, and supervisors for that matter, to call their attention to just what their carelessness costs the company in dollars and cents. An honest and conscientious employee knowing the facts will try to improve.

J. L. Coss,
Train Dispatcher, Rock Island Lines.

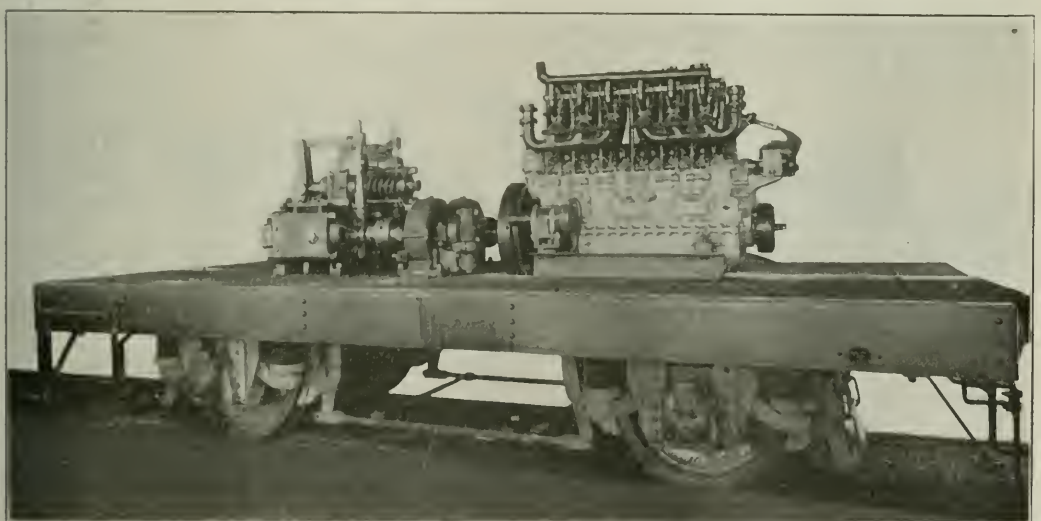
The Southern Pacific in 1921 distributed throughout the United States and Europe 6,200,000 folders, maps, pamphlets, and other pieces of advertising matter.

Hauling 14 Cars Weighing 645 Tons with a 150-Horse Power Gasoline Locomotive.

Gasoline Switching Locomotive with Hydraulic Drive

Universal Oil Transmission Governs Speed and Direction and Gives Remarkable Flexibility of Control

ONE OF THE MOST promising developments in the application of the internal combustion engine for railroad motive power is a gasoline switching locomotive designed by John Robson, chief engineer of The Universal Engineering Corporation, Montreal, Can., and recently built under his supervision at the plant of the Canadian Car & Foundry Company, Montreal. The most notable feature of the equipment is the arrangement of power transmission and speed control. This is effected by a Waterbury hydraulic variable speed gear, built in this country by the Waterbury Tool Company, Waterbury, Conn., which gives any speed from zero to the maximum in either direction without steps or gradations and without varying the speed or direction of rotation of the engine. The power to drive the locomotive is supplied by a 150-hp., six-cylinder Ricardo gasoline engine, the engine and transmission being arranged to give a maximum tractive effort of 12,000 lb. and a maximum speed of 12 miles an hour. The locomotive is intended for switching service and has two independently driven axles. It is 19 ft. long and weighs 53,000 lb.



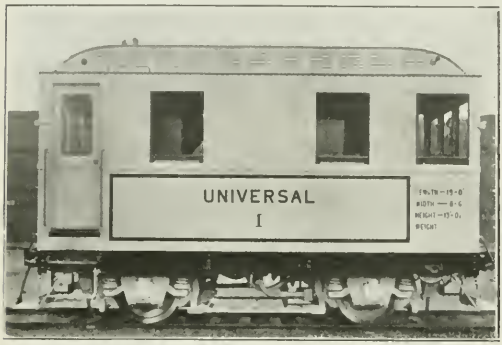
Locomotive with Power Plant and Transmission in Place, Before Cab Has Been Applied

Advantages of Hydraulic Transmission

In practically every design of railroad equipment using internal combustion engines built heretofore, the transmission of power has been effected by shifting gears and clutches, or by electric generators and motors. Neither of these methods is entirely satisfactory. While gasoline-electric equipment affords the necessary flexibility, the control is compli-

cated and the motors and generators increase the weight very greatly. Mechanical devices for changing speed by shifting gears cannot be satisfactorily designed for any large number of speed ratios and this form of transmission can be used only for small size engines due to the limited amount of power that can be transmitted through a friction clutch.

The hydraulic variable speed gear used in this locomotive is comparatively light in weight, easily and simply controlled and gives any desired speed of the locomotive while the engine is governed at a constant speed. Control of speed and

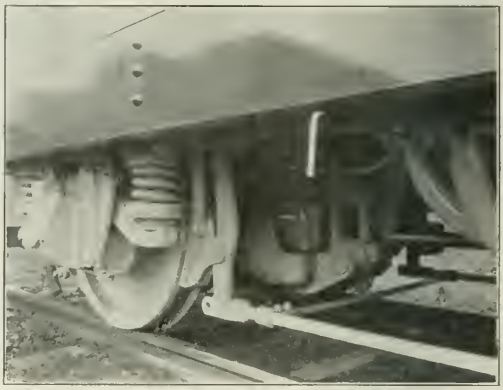


In Appearance the Locomotive Resembles a Small Electric Car

direction can be effected with a minimum of effort on the part of the operator regardless of the load on the locomotive, the flexibility and ease of control being such that complete reversal can be effected as quickly as desired without any undue peak load on the engine, thereby avoiding excessive stresses in the working parts. By the use of an automatic pressure control device the speed of the locomotive is regulated by the drawbar pull entirely independently of the operator in such a manner as to prevent overloading and possible stoppage of the engine owing to stalling.

Description of the Gear

The Waterbury variable speed gear consists of an oil pump, designated as the A-end, and a hydraulic motor, designated as the B-end. The A-end, which is driven by the gasoline engine, delivers oil to and receives it from the B-



A View Under the Body Showing Hydraulic Drive and Suspension

end, the direction of flow and the amount of oil being controlled by a regulating device. The B-end rotates at any speed up to that of the A-end and in either direction, depending upon the quantity and direction of delivery of the oil it receives from the A-end.

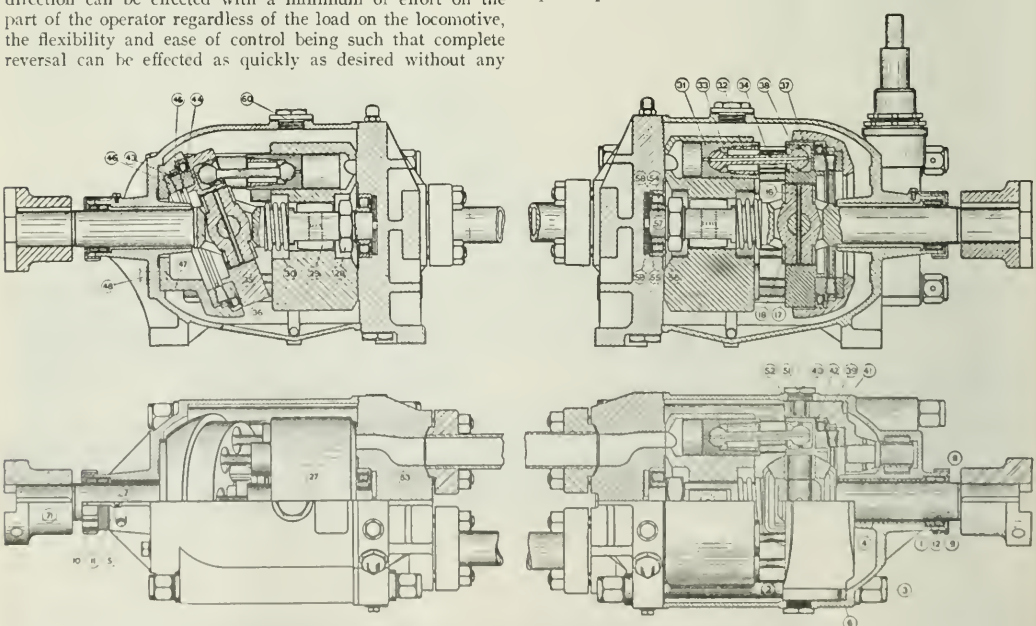


Fig. 1—Sections Through the Pump Unit (Right) and Motor Unit (Left)

The construction and operation of the gear can readily be understood by referring to Fig. 1. In this drawing the driven shaft of the A-end, which receives the power from the gasoline engine, is shown at the extreme right hand side while

the driving shaft of the B-end is at the extreme left. A cylinder barrel (27) is keyed to the inner end of each shaft. Each barrel has nine cylinders parallel to the shaft and fitted with pistons. When the barrels revolve, their inner faces slide on the valve plates (53), each of which has two ports, the ports in the A-end being connected to those in the B-end by

the shaft their planes of revolution may be at any angle with the shaft provided by the setting of the roller bearings on which the socket rings revolve.

In the B-end of the gear the socket ring runs in an angle box secured in the end of the case and making a fixed angle of 20 deg. with the shaft. Thus as the shaft, the barrel and

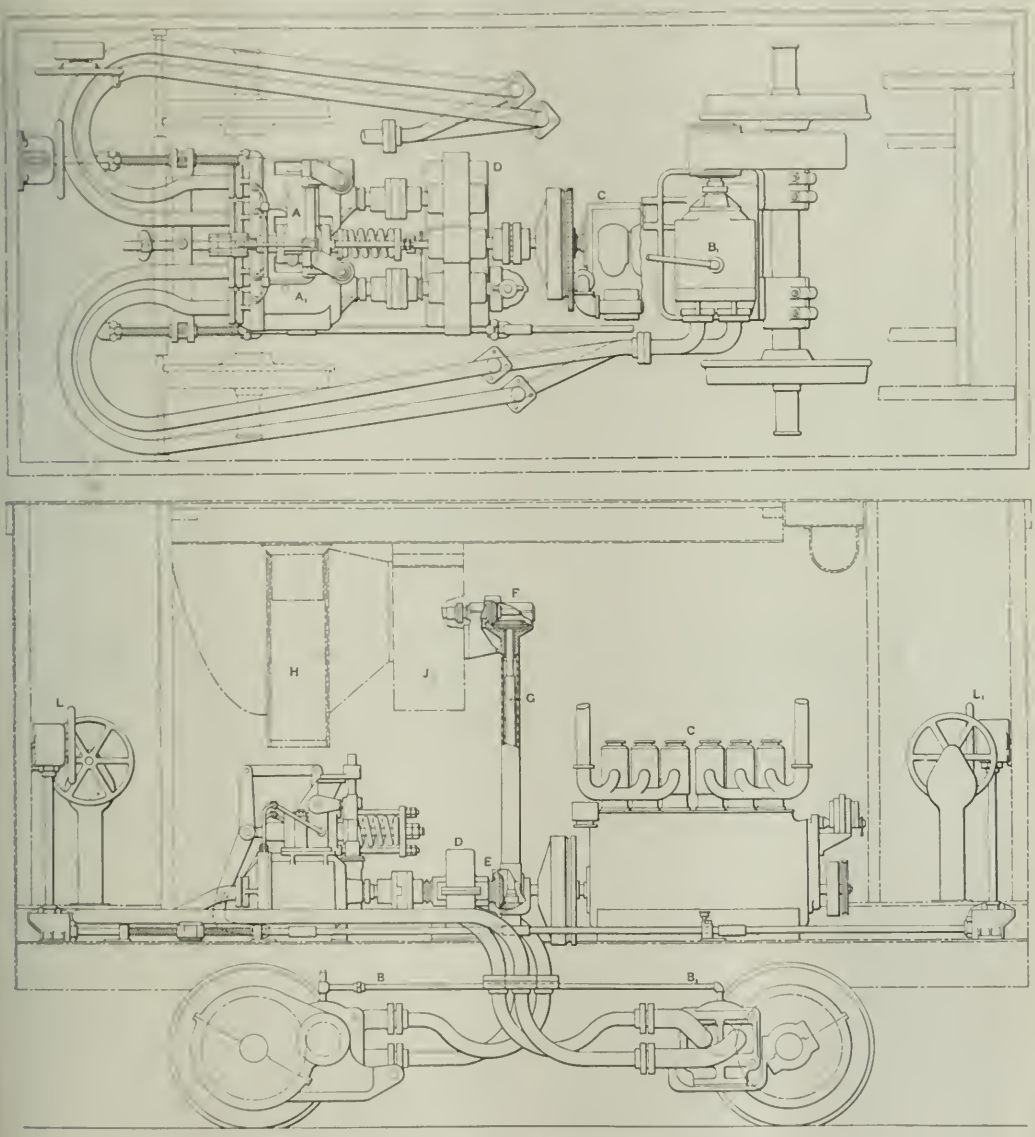


Fig. 2—Plan and Elevation of Gasoline-Hydraulic Locomotive

piping. The cylinder ports in the barrel faces register with semi-annular passages or ports in the valve plates, except at the bridges at the top and bottom of the plates. The connecting rods have one end secured in the piston and the other in the socket ring (35). The socket rings are connected by universal joints with the shaft so that while they revolve with

socket ring revolve in the B-end, the pistons will have a reciprocating motion with a constant stroke. In the A-end the angle box is hung on trunnions and may be adjusted to any desired angle while the gear is running by means of the control shaft. If the angle box in the A-end stands in the neutral position at right angles to the shaft, the pistons are

carried around with the cylinder barrels but have no reciprocating motion. No oil is therefore taken from or delivered to the passages in the valve plates. If the tilting box is inclined by moving the control shaft, the pistons begin to reciprocate, the stroke depending on the angle between the socket ring and the axis of the shaft. Every cylinder during one half of the shaft's rotation is drawing in oil from one of the passages in the valve plate which it carries over and delivers into the other passage during the next half of the shaft's rotation.

The oil from the A-end is forced into one of the passages of the valve plate of the B-end. The cylinders of the B-barrel in communication with this passage make room for the oil by sliding back from the valve plate, but they cannot do this without forcing their respective sockets in the socket rings farther from the valve plates. This can only be done by turning the socket ring as a whole in its inclined plane in the angle box. While the pistons facing the pressure passage

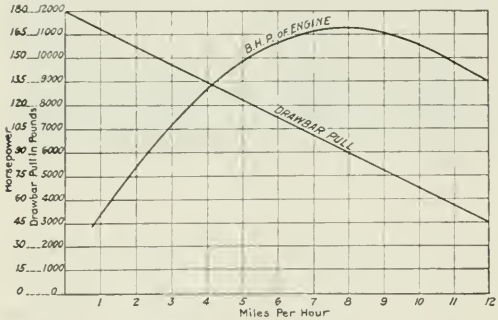


Fig. 3—Drawbar Pull and Brake Horsepower Curves

of the B-valve-plate are receding to make room for the incoming oil and so imparting rotation to the B-shaft, the pistons facing the no-pressure passage are moving toward the valve plate and delivering oil into the respective cylinders of the A-barrel. Since the receiving capacity of the B-cylinders is constant and the delivery capacity of the A-cylinders is varied at will by turning the control shaft, the speed of the B-shaft is correspondingly varied. With the engine running at constant speed the speed of the B-end depends upon the angle which the socket ring in the A-end makes with the shaft, while the direction in which the B-end revolves is governed by the direction in which the socket ring in the A-end is moved from the neutral position.

The efficiency of this type of transmission is high, ranging from 68 per cent at 25 per cent of normal speed to 82 per cent at full speed. The combined A- and B-ends weigh less than 25 lb. per horsepower transmitted. The pressures on the sliding surfaces are largely balanced so that little wear takes place and the pistons have long bearings in the barrel. In spite of the high pressures carried, leakage is negligible.

The appearance of the completed locomotive and the arrangement of the engine and hydraulic speed gear are clearly shown in the photographs. The operation will be readily understood by reference to the plan and elevation drawings.

The power for the locomotive is obtained from a six-cylinder Ricardo gasoline engine *C* with pistons of 5⅝ in. diameter and 7½ in. stroke, capable of delivering 150 brake horsepower when running at a normal speed of 1200 r.p.m. This engine drives through a double-helical reduction gear *D*, two size 50 pump units *J* and *J1*, at 345 r.p.m. From the valve plates of these pump units, piping conveys the oil which is used as a transmission medium to two size 50 speed gear motor units, *B* and *B1*, each of which is connected by spur gearing to one of the driving axles of the locomotive

The casings of the speed gears are connected by piping to a common oil reservoir placed in a convenient position on one of the bulkheads of the engine room, the oil in this reservoir being subject to atmospheric pressure only. Flexible couplings are used between the gasoline engine and the reduction gears as well as between these gears and the pump units of the speed gear in order to allow for any vibration or springing on the framing of the locomotive.

The engine is cooled in the ordinary manner by means of a tubular radiator and fan, the latter being driven from an extension of one of the reduction gear shafts through bevel gears, *E*, *F*, and the vertical shaft *G*, the radiator *H*, and fan *J*, being suspended from the roof of the locomotive, where both the inlet and outlet passages for the fan are provided. The motor units, *B* and *B1*, of the Waterbury speed gear, together with the housing for the spur reduction gear between these units and the axles, are carried on cradles with link and swivel suspension to the under side of the frame-work, as clearly shown in one of the photographs. In this way vertical movement of the axles is provided for without interference with the gearing.

The control of speed and direction is effected by means of either of two hand wheels, *L* and *L1*, placed in the driving compartment at each end, one man only being required to operate and control the locomotive, the speed of which is governed automatically by a hydraulically operated control gear, which acts independently on the control shafts of the pump units as soon as the drawbar pull exceeds a predetermined amount. By the action of a plunger and spring, the stroke on the pistons is regulated in inverse ratio to the oil pressure and in consequence it is not possible for the operator to overload the engine. The pressure range through which the control is designed to act, is from 300 lb. up to 1,200 lb. per square inch, so that on very short piston strokes a torque of approximately four times the normal can be obtained on the axles of the locomotive.

Hand operated brakes of standard pattern are provided and work by a hand wheel placed in each compartment, these brakes being used only for emergency purposes as the stopping and starting, as well as acceleration and deceleration are controlled entirely through the speed gears. For use in coupling the locomotive with freight cars, standard air connections and cylinders are provided for operation in the usual manner from the driving locomotive.

The curve illustrated in Fig. 3 shows the relation between drawbar pull and speed up to 12 miles an hour with the control hand-wheel set for full stroke on the pump units of the hydraulic speed gear, the actual stroke, speed and horsepower of the engine being regulated by the automatic adjustment of the pressure control piston.

In actual service the locomotive has shown remarkable flexibility, which is particularly advantageous in switching service where high starting tractive effort and rapid acceleration are required. The locomotive may be started under a dead load of any amount without overloading the engine. Three turns of the hand-wheel from the neutral position will bring the locomotive up to its full speed. In stopping, the locomotive is gradually brought to a standstill by turning the control shaft to neutral, and in this position the B-end is positively locked against motion in either direction.

Several trials have been made at the plant of the Canadian Car & Foundry Company which have been entirely satisfactory. The locomotive exerts a tractive effort of 12,000 lb. at starting and 3,000 lb. at 12½ miles an hour. On level track a load of 645 tons has been handled readily. In one trial the locomotive took three cars weighing 150 tons up a four per cent grade, stopping at the steepest point and starting again under full load without difficulty. The Universal Engineering Corporation intends to apply the variable speed hydraulic gear to a locomotive of similar type designed for passenger service and also to high-capacity passenger cars.

Commission Orders Increase in Divisions for K. C. M. & O.

WASHINGTON D. C.

THE INTERSTATE COMMERCE COMMISSION in a decision made public on August 14 has ordered that the divisions received by the Kansas City, Mexico & Orient out of joint rates maintained with 13 of its principal connections shall be increased on and after September 15 by amounts ranging from 10 to 30 per cent of the divisions now received by the connecting lines. The decision was rendered by Division 4 of the commission without dissent and is the result of an application filed by the receiver of the Orient and its Texas company for an increase in divisions and the diversion of traffic to the road.

The Orient alleged that its revenues were insufficient to enable it to pay operating expenses, taxes and a fair return on its property or to enable it to perform properly its function as a common carrier and contended that this condition can be remedied only by increasing its divisions or by increasing, through changes in routing, the amount of traffic it handles as an intermediate carrier. The request for changes in routing is before the commission as a separate proceeding. A series of conferences between representatives of this road and its connecting lines and the state authorities was held under the auspices of the Interstate Commerce Commission in July, at which efforts were made to find an immediate remedy for the condition of the road, but no result of these meetings had been announced prior to the issuance of the commission's decision.

Wanted Sufficient Relief to Continue Operation

The commission in its report says that the Orient asked only a sufficient measure of relief to enable it to continue operation and made no request for return upon the investment. The road has shown deficits each year since 1916 and, the commission says, the enormous increase commencing with 1918 is apparently due both to decreased revenues and largely increased expenses. It was claimed that the loss of revenue during the period of federal control was largely due to changes in the routing of through traffic and that since the termination of federal control the former conditions have not been restored. The record indicates that a substantial proportion of the through traffic of the Orient was received from the Southern Pacific and that this carrier reduced its deliveries on account of alleged unsatisfactory service of the Orient. The report points out that the Orient serves an area of about 23,272 square miles with a population of approximately 500,000 and a property value exclusive of cities and towns of $204,250,000. It refers to a statement by the commission on the application of the Orient for a loan that it is not disputed that the Orient system, or at least that part within the United States, is of essential importance in meeting the transportation needs of the public in the territory which it serves, and adds that nothing appears of record in the present case to justify any different conclusions.

The deficits in railway operating income for 1920 and 1921 were $1,407,106 and $860,740, respectively, and, according to the estimate of the Orient, the deficit for 1922 will amount to $1,590,213. For 1921 interest accruals amounted to $514,665, of which only $150,000 was paid, this being applicable to a loan of $2,500,000 to the government. No allegation of inefficient operation appears in the record against the Orient or any of the respondent connecting lines.

Various methods of increasing its revenues had been suggested. Application has been made to the Railroad Labor Board for authority to reduce wages and change rules, which, if granted, will result in an estimated saving of about $525,000. Increase in all rates is not considered feasible for the present for the reason that it is believed that sufficient tonnage would be given to competing lines by the shippers to offset any increase in revenues from higher rates and for the further reason that shippers on the Orient cannot compete with shippers on other lines in the same territory. However, the report says, this matter is receiving consideration. Increasing the volume of traffic handled by the Orient, the report says, would automatically increase its revenues and the commission believes this can be accomplished by designating this line a "differential" route on certain commodities. For instance, a differential of 1 cent per 100 pounds under the established rate on grain to Gulf ports should attract a considerable volume of tonnage. The report says this question should be made the subject of conference between the Orient and its connections and the necessary steps should be taken to accomplish this object. Five of the connecting lines are said to be favorable to the adoption of a plan of differentials.

Details of the Decision

The report continues in part as follows:

The gross revenue of the Orient per equated ton-mile is greater than that of 9 of its connections, and its earnings per car-mile are substantially smaller than 11 of the 13 connections, while the earnings per train-mile are in each instance materially less, thus evidencing a smaller and less profitable train and car load, the usual incident of a light traffic. The operating expenses per equated ton-mile are greater than those of any connection except two small roads, namely, Abilene & Southern and the Clinton & Oklahoma Western, and its expenses per car-mile are substantially greater than those of the nine larger roads, while the expenses per train-mile are in six instances materially less. The general result is that while the Orient sustained a deficit in its net railway operating income of 69 cents per train-mile, all of its connections received incomes ranging from 30 cents per train-mile in the case of the Galveston, Harrisburg & San Antonio to $1.84 per train-mile in the case of the Fort Worth & Denver City.

In other calculations the results as distinguished between freight and passenger traffic have been separately considered based upon an allocation in accordance with our plan to include all operating revenue accounts. The operating ratios of the carriers concerned in respect of all revenue received show that the freight operating ratio is less than the passenger operating ratio with exception of the Atchison, Topeka & Santa Fe, Fort Worth & Denver City, St. Louis-San Francisco, and the Texas & Pacific, for which the freight ratio is higher. In the case of the Fort Worth & Denver City, Missouri, Kansas & Texas of Texas, and Midland Valley, the two ratios are substantially equal, which is also true of the combined result of the 11 major roads used in the calculations. It also appears that the freight ratio of the Orient (1.0791) is approximately 141 per cent of the average freight ratio of the other connecting lines (0.7663) while the passenger ratio of 1.3518 is approximately 175 per cent of the average passenger ratio of (0.7718) the 11 major connections.

The disparity of 41 per cent in the case of freight service and 75 per cent in the case of passenger service would seem to indicate that the passenger fares and freight rates and divisions accorded this carrier are not sufficient to meet even the maintenance, traffic, transportation, and general expenses properly to be charged against either the freight or passenger traffic, to say nothing of taxes, equipment rental and a fair return on the property investment used in the service. As stated above, however, the Orient is seeking only such revenue as will enable it to operate the road and is asking nothing for its security holders.

It is alleged that in many instances where divisions have been established by its connections on an arbitrary basis, these connections have declined to shrink their arbitraries when the through rates have been reduced.

In *Increased Rates*, 1920, 58 I. C. C., 220, we authorized certain percentage increases in order to permit a return of 6 per cent on the aggregate value of carrier property held for and used in the service of transportation within the boundaries of each rate-making group, under normal traffic conditions. In *Reduced Rates*, 1922, 68 I. C. C., 676, we found that 5½ per cent on the aggregate value of such property would constitute a fair return after March 1, 1922. It is apparent, however, that the Orient has not received and is not receiving the share of the revenue within the group in which it is included to which it is

properly entitled on basis of the amount and character of service performed.

Other than filing statements containing information called for by the commission's order, the respondent carrier submitted no evidence at the hearing in this case.

The Orient and each of its connections is ordered to report to the commission on or before September 15 the divisions established according to the rules prescribed in the report and thereafter to jointly report the results of the applications of these divisions for business actually interchanged in 1922 and from January 1 to June 30, 1923.

At one of the conferences held since the hearing in this case the representative of the state of Texas stated that a large number of counties in that state had expressed their willingness to assess the Orient for taxation purposes at the nominal value of $100 per mile. The commission expressed the opinion that other states should follow the lead of Texas in this respect and says that in fact complete exemption from all taxes until the Orient can earn something is demanded in the public interest. This course is earnestly recommended to the respective state authorities. It is also stated that through the proper channels steps have been taken to route government freight over the Orient so far as practicable.

Report on Collision Near Leeds, Mo.

The Interstate Commerce Commission has investigated a collision between westbound passenger No. 11 and eastbound freight No. 92 on the Missouri Pacific, at Hy-tex siding, about two miles west of Leeds, Mo., on July 12, about 6:40 p. m.; three passengers and the engineman of the freight train were killed and 91 passengers, 10 employees and two mail clerks were injured. It fixes the blame on the passenger train. The trains were ordered to meet at Hy-tex, but the passenger train ran past the switch for nearly a mile. The view of the engineman is somewhat obstructed by trees on both sides of the track, the line traversing several curves; and another railroad lies adjacent to the Missouri Pacific, so that it is difficult for enginemen to tell on which track an opposing train is moving.

At Leeds the passenger train received several orders, including the one to meet the freight at Hy-tex, and also a clearance card and a block signal caution card calling attention to the meet. The trains met at 25 or 30 miles an hour. Both locomotives were knocked off the track and the first passenger car in No. 11 was telescoped by the baggage car for about 25 feet.

Continuing, the Commission's report says:

"Operator Roberts, on duty at Leeds, handed on three sets of orders to train No. 11, one to the fireman, one to the porter, and one to the flagman. Fireman Steck said he immediately handed his set of orders to the engineman, who read them and handed them back to him, and that he himself then read them. Approaching the point of accident he had been working on the fire, and on looking out on the inside of the curve saw the approaching train, called to the engineman and jumped. Porter Bryant had given the orders he received to Conductor Bonnette, who read them aloud to him and told him to watch out for the meeting points. The conductor was near the rear of the third car when he saw that the train was within a train-length of the west switch at Hy-tex and still traveling at high speed. He said he looked for the emergency cord, but did not see it right away, and then ran to the front of the car, opened the vestibule and looked out; he then ran into the car ahead and asked the porter and also Conductor Furness, who was riding as a passenger, if they had seen train No. 92; and when they replied in the negative he said to apply the air brakes; and at the same time jumped upon a seat and opened the emergency valve. Conductor Furness said he thought that at the time Conductor Bonnette spoke to him the train was within ¼ mile of where the accident occurred. Porter Bryant apparently had not been paying much attention to the operation of the train, and was still sitting down in the second car when the conductor came in. Flagman Jones said that when the train did not stop at Hy-tex he took out his orders and read them again to see if he had been mistaken, following which he also opened the emergency valve in the car in which he was riding.

"None of the members of the train crew heard the engineman sound the meeting-point whistle signal, Conductor Bonnette saying this might have been due to the noise of a train passing on the track of the adjoining railway when his own train was in the vicinity of the east switch.

"On account of serious injuries sustained by Engineman Moses of train No. 11, no statement from him could be obtained."

Conductor Bonnette and Engineman Moses, being in charge of the train, are held primarily responsible, but all the other members of the crew were aware of the contents of the order and "there is no excuse for their failure to operate their train properly. * * *"

On the Rhaetian Railway, Switzerland

Baltimore & Ohio Systematizes Terminal Operation

Has Concentrated Classification and Inspection of Cars and Lengthened Locomotive Runs

EARLY IN 1919 the Baltimore & Ohio put in effect a plan for the making up of trains to avoid intermediate switching enroute and to enable them to be moved with the minimum of break-up between origin and destination. This plan, which was described in the *Railway Age* of August 6, 1921, page 254, was extended over the entire system early in 1921. Unlike the practice which has been followed at times in the past where classification of this character has been attempted, it has not been confined to live-stock, perishable and through high-class merchandise, but has included all traffic handled by local as well as through freight trains, including empty as well as loaded cars. In other words, the system of "divisional and through classification" in effect on the Baltimore & Ohio includes livestock and perishable traffic, quick dispatch merchandise, expedite or time freight, dead freight, empty equipment (home and foreign), solid trains of coal and coke to tidewater, returning empties from the piers at tidewater to the distributing points in the coal fields, coal moving to the lakes, ore moving from the lakes to the ore-consuming districts, and limestone and dolomite from the quarries to the furnace districts.

Solid Trains Designated "Main-Trackers"

The solid trains of these various classes of traffic are designated as "main-trackers" or "trains that are made up and dispatched from a terminal for continuous movement to destination, or to a breaking-up yard, and in their movement pass through intermediate yards and terminals." Under this plan many trains operate as "main-trackers" for distances ranging from 182 to 640 miles without pulling a pin, while others stop at intermediate division yards only for the purpose of consolidation or putting on additional cars at the head or rear end.

The success which attended the operation of the "main-tracker" trains suggested the possibility of increasing the daily engine miles and thereby securing greater use of the power with a reduction in engine terminal expense through less hostling and shop attention, and ultimately discontinuing entirely, at a number of the existing roundhouses, fire cleaning and light repairs of through freight engines. Therefore, beginning about the first of the present year, the runs of through freight engines were extended to conform to the movement of "main-trackers" until now freight locomotives are operating successfully in both directions without change between.

New York terminals and		Baltimore, Md.	180 miles
Philadelphia, Pa.,	"	Brunswick, Md.	182 "
Baltimore, Md.,	"	Cumberland, Md.	189 "
Brunswick, Md.,	"	Connellsville, Pa.	195 "
Cumberland, Md.,	"	Pittsburgh, Pa.	150 "
Cumberland, Md.,	"	Parkersburg, W. Va.	205 "
Parkersburg, W. Va.,	"	Cincinnati, O.	195 "
Cincinnati, O.,	"	Washington, Ind.	169 "
Washington, Ind.	"	East St. Louis, Ill.	165 "
Cincinnati, O.,	"	Toledo, O.	203 "
Connellsville, Pa.	"	Willard, O.	264 "
Pittsburgh, Pa.	"	Willard, O.	200 "
Pittsburgh, Pa.	"	Fairport, O.	135 "
Willard, O.	"	Chicago, Ill	278 "

From the reports covering these operations it is possible to supervise closely the movement of "main-trackers" and other details involved in the strict observance of divisional and through classification regulations which have been arranged. From these reports it became evident that certain delays were occurring from time to time to these through trains because of the method of freight car inspection in vogue. A study of these questions led to the changing of the method of inspection, as a result of which a system of freight car inspection was established at originating points as well as at points enroute to final destination, conforming to the makeup and dispatchment of "main-tracker" trains in both directions. This involved the separation of the inspection into what is termed "A" inspection, which is given at originating and breaking-up points, and "B" inspection at intermediate points. The "A" inspection is such as will disclose all defects existing on equipment that can be detected without dissecting the car, while the "B" inspection is an intermediate passing inspection for safety which is given at points at which the train stands a sufficient length of time to make the inspection when changing engines and train crews. This latter inspection is for the purpose of detecting new defects that have developed since the cars received an "A" inspection.

When "A" inspection has been applied and it is impracticable, by reason of lack of men or of material, to make the needed repairs at the point where the inspection is made, the cars are side-carded, billed and forwarded to any large car repair point. When so forwarded, in order to avoid the breaking-up of "main-trackers" enroute the cars are placed in classification order for such repair points rather than for final destination.

This system of inspection has been productive of most gratifying results. It has practically eliminated the necessity for cutting cars out of "main-trackers" because of defects; has reduced the number of bad-order loads; is expediting the repair of freight equipment; admits of greater regularity in, and more economical distribution of, the car repair forces, inasmuch as the bad-order repairs are now concentrated at originating or breaking-up points; and has made possible a material saving in the cost of inspection, a much smaller force of inspectors now being necessary.

To complete the steps necessary to secure the full benefits of the classification system, the officers of the Baltimore & Ohio are working on the revision of the plan for weighing and check-weighing carload freight received from connections and originating on the line.

Detailed Instructions Issued in Book Form

To make the plan for the concentration of the classification of cars effective, detailed instructions were prepared in the form of a booklet which has been distributed to all employees concerned engaged in this work. These instructions outlined the classifications which are to be made at each terminal and the trains into which each car should be placed. Similarly detailed instructions for the "A" and "B" inspection of cars at each terminal have been prepared to govern the character of inspection which is to be given the cars passing through each terminal. In recent years working books of the New York, Baltimore, Cincinnati, Pittsburgh, East St. Louis and other terminals, including all train yards, have been prepared, in which the work as assigned to each crew in these terminals and yards is shown in complete detail.

It is not possible to gage accurately in dollars and cents, what the saving to the Baltimore & Ohio has amounted to through the adoption of the divisional and through classification and the inauguration of the improved yard and terminal operating methods, but it is believed to run into the millions annually. By reason of the greater use of power, the continuous movement of freight equipment and the diminished need for enlarged or additional yards, the capital outlay, it is felt, is less than it otherwise would be. There

have been reductions in per diem expense, in the amount of damage to equipment, and in the amount paid for loss and damage to freight. Congestion in yards and terminals is avoided, thereby contributing to the successful operation and maintenance of freight schedules.

This plan for the systematic classification of cars and for freight car inspection has been developed under the direction of the chief of yard and terminal operations of the Baltimore & Ohio, to whom we are indebted for the above information.

Coal Distribution Work Meets Varied Problems

Improvement in Car Supply on Coal Carrying Lines Increases Output. Results of Cleveland Settlement Awaited

WASHINGTON, D. C.

COMPLICATIONS IN the distribution of available coal supplies occasioned by the activities of railroads engaging in brisk competition for fuel, thereby creating a tendency toward the inflation of prices, have caused the Federal Fuel Distribution Committee to take steps looking toward the removal of this condition. Railway interests have been requested to discontinue the practice of competitive bidding for coal and to keep the central fuel committee informed as to difficulties experienced in the obtaining of urgent coal requirements at fair prices. In such cases, the committee has assured the railroads that the application of priority No. 1 orders will be used to insure the companies their equitable proportions of available fuel supplies. The message sent by Fuel Distributor H. B. Spencer on August 15 is as follows:

"General information is coming to this office that the railroads are disturbing the coal situation very seriously by bidding in the fields prices in excess of the Hoover fair price agreement. In order that this coal may be handled in an orderly manner and in such a way as to protect the railroads and others likewise vitally interested it is necessary that instructions be issued by you that no prices be offered in excess of the Hoover fair prices. Report to your purchasing committee in Washington any failure to get coal at these prices and we will arrange to put the railroads who are in a situation as to stocks requiring emergency action in priority number one."

Some Railway Fuel Put in Class 1

As the disposition of the railroads to bid for coal to the demoralization of the Hoover fair price schedule is entirely traceable to their apprehension in the matter of obtaining adequate fuel supplies, it is believed that the reasonable assurance of the maintenance of adequate stocks given in the central fuel committee's policy of placing urgent railway fuel orders in class 1 designation will allay their uneasiness and work toward the remedying of the price situation.

Authorizations for railroad fuel to come from Alabama for certain southwestern systems running out of St. Louis, and other railway lines centering in Chicago have been advanced from Class 2 priority to Class 1. The committee's policy of handling the country's more urgent fuel requirements through Class 1 priority was influenced to some extent by the necessity of allaying the apprehension of coal operators who hesitated to divert coal under contract to regular customers for the filling of priority No. 2 orders. Under a recent opinion from the Department of Justice, the placing of coal orders under No. 1 priority by the Federal Fuel Committee takes legal precedence over general contracts for coal entered into before the arising of the present emergency.

The question as to whether grain elevators should be classed as public utilities in the present coal emergency has been submitted to the central fuel committee. The operation of large elevators in Kansas City, Omaha, Wichita and other mid-western cities is a matter of some urgency at this time when shipments of western grain are near the peak. The needs of these elevators are considered by the committee as coming within the jurisdiction of the various state fuel administrations.

A governmental fuel committee, comprising members from each federal department, has been organized for the purpose of facilitating the orderly movement of government coal supplies, generally given No. 2 classification. This committee will act with the Federal Planning Committee in the allocation of coal purchases to avoid duplication and confusion. In line with this policy, the Navy Department has transferred a certain tonnage to the immigration station at Ellis Island, where supplies had been seriously depleted.

Encourages Importation of British Coal

In the matter of provision of fuel for river steamers, a differentiation is made between vessels engaged in the transportation of food supplies and mail, and those devoted to purely excursion purposes. The needs of the first-named class of vessels will naturally be given first consideration.

The Fuel Distribution Committee is inclined to encourage the utilization of stocks of British coal being received in the port of New York. Because of the fact that domestic coal being purchased by many large consumers in that territory is obtained at somewhat lower rates than that asked for English and Welsh coal, the importation of foreign coal has lagged. The Fuel Distributor feels that there is a real need for all British cargo coal, and that it should help to meet the requirements of many consumers in New York and New England.

Revised figures from the Geological Survey place the total coal production of the country for last week at 4,550,000 tons. Estimates which leave out of consideration possible new production from union mines as a result of developments at the Cleveland, Ohio, conference are for a total production of 4,200,000 tons this week, of which 3,800,000 tons should come from territory east of the Mississippi. It is estimated that 15,000,000 tons of bituminous lump coal will be needed to replace the anthracite deficiency. State Fuel administrations in Rhode Island and Massachusetts are advising many anthracite consumers that they will be compelled this season to use bituminous lump as a substitute.

A gradual improvement in the car-supply situation is noted on coal-carrying lines. Adjustment of labor difficulties on the Louisville & Nashville, where conditions have been affected by the walk-out of railway employees at Corbin, Ky., the pivotal point in the movement of coal from the Hazard field in southeastern Kentucky, is expected to facilitate coal movements on that system. Normal transportation conditions are said to have been attained on the Norfolk & Western railway, while improved conditions are reported on the Chesapeake & Ohio and the Virginian systems.

Consideration is being given to a proposition for the westward movement of Pennsylvania and Northern West Virginia coal, supplies for use in Pennsylvania to be replenished by tide-water coal from the Hampton Roads district. It is pos-

sible that some movement of coal may be undertaken by water to Montreal, Canada, or Portland, Maine, for transshipment to Canadian provinces where the fuel situation is critical. It is the general policy of the Fuel Distribution Committee to give careful consideration to Canadian requirements. In this connection, it is recognized that some coal from British Columbia is being imported into the United States.

Authorization for approximately 150,000 tons of coal for lake movement from Kentucky and the Virginias has just been granted by the central committee. The committee's program calls for a lakeward movement of 6,250 cars this week and 8,000 cars next week. This movement will for the present be accomplished by the dispatch to the lakes of all loadings in certain districts on Mondays, Wednesdays and Saturdays of each week. The demands of numerous public utilities in Indiana, Ohio, Michigan and other mid-western states must be considered in connection with this movement of lake coal.

Lake Movement Special Problem

Such new coal production in Ohio and Pennsylvania as may result from developments at the Cleveland conference is expected to help alleviate the lake coal situation. The transportation conditions of certain railroads on which these newly-producing mines are located, are, however, a factor in this situation.

The problem of expediting coal shipments to the upper Great Lake region in order to attain the necessary total coal movement to that territory before the close of lake navigation was given the serious attention of the Federal Fuel Distribution Committee, this week. It was expected that shipments aggregating 250,000 tons of coal will be made toward the lakes in the present week as compared with an estimated shipment of 140,000 tons for last week. A figure of 400,000 tons has been set for lake movement during the week beginning August 21.

The ability to supply urgent lake requirements is said to depend largely upon the coal production situation in Pennsylvania. Mines in Pennsylvania that ordinarily make shipments of lake coal are at present closed, and the question of whether Pennsylvania coal will be available in considerable quantity for early lake shipment hinges largely on the question whether the coal tonnage produced in Pennsylvania will be sufficient to take care of that state's own urgent needs and to allow of a supply for diversion to the lake country. A partial solution to the problem may be found by replacing Pennsylvania lake shipments by importations into that state of tide-water coal from the Southern Appalachian district.

Increased Loadings in Non-Union Areas

A delegation comprising members of the Northwestern Coal Dock Operators' Association and members of the Minnesota State Fuel Committee, who presented the fuel requirements of five northwestern states, were assured by Fuel Distributor Spencer that movements of coal in that direction would be made as rapidly as production would admit.

A total of 13,258 cars of coal were loaded throughout the country on Friday, August 11. This represents an increase of 753 car loadings over the same day of the previous week. Loadings of 69,000 cars were reported for the first five days of last week, an increase of 5,660 cars over the corresponding number of days of the previous week. Loadings of coal on the Chesapeake & Ohio, Friday, amounted to 1,319 cars; on the Norfolk & Western, 2,115 cars; and on the Louisville & Nashville, 1,609 cars. Coal loadings on these three lines represent an increase of more than 400 cars over the figures for Friday of the previous week.

Inquiries from Kansas and other trans-Mississippi states relative to the obtaining of coal supplies from producers in the Rocky Mountain region are being referred by the central fuel committee to the coal distribution agencies in the states now producing coal in that territory.

Representatives of a large industrial concern owning its own coal mines conferred on Monday with the Fuel Distribution Committee relative to placing the entire coal production of this mine subject to the orders of the fuel committee for use by essential industries.

Senator Swanson and Representatives Harrison and Bland of Virginia, accompanied by Maj. Alexander Forward, state fuel administrator, and a delegation of prominent citizens of the state, called upon Fuel Distributor Spencer on Monday to ask that a specific allotment of coal be turned over to the Virginia committee for distribution among essential industries in accordance with the plans of the federal organization. The suggestion was made by the central committee that an organization for the distribution of fuel supplies be formed in Virginia similar to that organized in other states to co-operate with the State Fuel Administrator.

Authorizations issued Friday by the central committee provide for the movement of 100,000 tons of coal to Toledo and Sandusky, Ohio, for shipment to Lake territory. Other authorizations issued provide for the more pressing fuel needs of public utilities in Baltimore and Detroit and for electric traction purposes in New York City. A considerable tonnage was placed at the disposal of the Delaware Coal Commission for distribution within that state in accordance with the plans of the fuel distributor.

Class 1 Priority to Be Guarded

The problem of the distribution of car supply between mines engaged in the shipment of coal classified under No. 1 priority and those shipping coal to public utilities and other consignees under previously-made contracts continues to demand the attention of the Fuel Committee. While it is desired to preserve the integrity of contracts as far as possible, the feeling is that general contracts must in a measure take secondary position to the meeting of particularly urgent coal necessities created under an exigency which has arisen since such contracts were entered into. Present plans of the Fuel Distribution Committee are that orders for Class No. 1 coal shall be so distributed as not to disturb seriously the proper distribution of cars. All orders for coal considered to be within that classification will go to the district committees who will apportion the orders among the mines in their districts. In such apportioning of orders it is expected that contracts will be observed as far as possible. In this connection it is pointed out that many operators, having in mind the maintenance of their normal business relations, would prefer to devote their energies to filling their regular contracts.

The Fuel Committee is seeking a practical method of insuring that coal ordered through a retail dealer for the use of public utilities or hospitals will not be diverted to other channels. Where it is manifest that an order for coal comes within a particular classification, it will not require any certification to the railroad to secure priority under order No. 23, of the Interstate Commerce Commission. Where, however, the consignee of a shipment does not show the character of the coal and its uses it will be necessary for the shipper to obtain a certificate from the State Fuel Administrator that the coal is to be used in Class 2 priority, and a certificate should accompany the consignee's order to the mine. This will obviate taking matters of this kind to the Washington Central Committee, as it will give the mine operator the information needed to enable him to obtain from the railroad, cars to which he is entitled in making shipments of priority coal.

An estimate of 765,000 tons of bituminous coal weekly as being required to meet the immediate needs of gas and electric public utilities and domestic consumers in the territory east of the Mississippi River is made by the United States

Geological Survey. Of this amount, New England would require 9.2 per cent; the non-coal-producing states of the coast region, exclusive of New England, 21.6 per cent; coal-producing states of the coast region, 22.9 per cent; and Ohio, Indiana, Illinois and Michigan, 46.3 per cent. Railroads in the same territory will require 2,000,000 tons weekly, making a total emergency requirement of 2,765,000 tons. Coal is now being produced in this territory at the rate of 3,800,000 tons weekly.

Railway Fuel

The railway fuel situation last week was especially acute in Michigan, on certain lines in Illinois and on some of the southwestern lines running out of St. Louis. Certain lines traversing Pennsylvania and New Jersey report seriously depleted supplies.

An extended utilization of the port of Charleston, S. C., as an outlet for Tennessee coals destined for New England is under consideration by the Fuel Distribution Committee.

An outline of the more urgent requirements of the various eastern and middle western railroads was sent last week to the district fuel committees, functioning in Kentucky, Tennessee and the Virginias. These requirements for railway fuel are already covered by contract. This movement of railway fuel is to be co-ordinated with the movement of tonnage urgently required for the upper lake country.

Authorization for considerable tonnages of coal to go from the Bluefield and Thurmond districts of West Virginia to New Jersey, for railway fuel purposes, have been issued.

Protests are being made from certain quarters against the use of railway fuel supplies for the operation of excursion trains. The point is made that this is an unnecessary use of railway fuel, which, under the Fuel Distribution Committee's plans, is given first consideration.

It was announced last week that the railway mechanical situation on coal-carrying lines in the Virginias, which had been hampering the shipment of coal, continued to improve with the importation of mechanics from eastern and western lines. The requirements of the Chesapeake & Ohio and the Norfolk & Western were said to have been practically met, and mechanics were diverted to the Virginian. Later it was stated that the Virginian had about filled its requirements for employees. Shipments of coal from southeastern Kentucky were retarded to some extent by conditions at Corbin, Ky., where more than 300 railway mechanical employees are said to have left their employment because of threats of violence. An unusual situation prevailed in the western Kentucky field, where coal production was accelerated by the existence of a 100 per cent car supply.

An opinion from the Department of Justice is that priority orders for coal issued under Classification No. 1 of the Interstate Commerce Commission have preference over other orders which operators may have on their books.

I. C. C. Worns Against Confiscating Coal

The Interstate Commerce Commission on August 14 issued the following notice to carriers: "The commission's attention has been called to the fact that railroads frequently confiscate coal which is being moved under priority of equal or higher class than coal for railroad fuel as ordered by the commission. This practice is not consistent with the spirit of the service orders of the commission and tends to defeat the efforts now being made to insure the most efficient distribution of coal. All railroads should refrain from confiscating coal consigned under Class 1 and Class 2, paragraph 7, our Service Order 23, and Amendment No. 1 thereto."

The commission also on August 15 issued a notice to the carriers directing attention to the following action of Division 5 of the commission, taken on that day:

Voted, That the Commission considers that the application of the so-called "railroad assigned car rule" as carried in paragraph 8 of Supplement 1 to Car Service Circular No. 31 of the American Railway Association, is inconsistent with the plan of priorities prescribed in Service Order No. 23 as amended of the commission as necessary to meet a national emergency, and that rule should not be invoked by railroad carriers subject to the provisions of that service order as against the priorities therein required, during the continuance of the order and emergency declared by the commission. Carriers must meet their needs for fuel in some way which is consistent with the Service Order and not in conflict therewith.

The whole subject of the propriety of the rule mentioned is before the commission in a formal proceeding, and this announcement is not to be taken as prejudging or prejudicing the decision to be made in that case, in which the record has not yet been completed.

The commission also issued Amendment No. 2 to Service Order No. 23, appointing as additional agents of the commission "for the more prompt and effectual administration during the present emergency of the authorizations, directions and requirements of paragraph 7 of Service Order No. 23" the following: John T. Marchand, J. A. Emmart, W. L. Lloyd, A. R. Layman, Delbert Garman, F. F. Engles, L. P. Green, T. L. Stevens, C. J. Bailey, C. D. Thomas, W. S. Rice and W. D. Anderson.

The commission has postponed the hearing on revised coal car distribution rules proposed by the American Railway Association, which had previously been adjourned to August 14 because so many of the witnesses required were unable to be present on account of the coal and railroad strikes.

It has been decided that legislation to strengthen the authority of the coal committee over the distribution of coal and in its efforts to prevent price increases will be necessary even with the increase in production to result from the settlement of the coal strike, but it was stated that developments of the next few days will decide what will be necessary.

Rail Union Heads in Session at Washington

The Facilities at Carbondale with the New Treating Plant and Pump House on the Right.

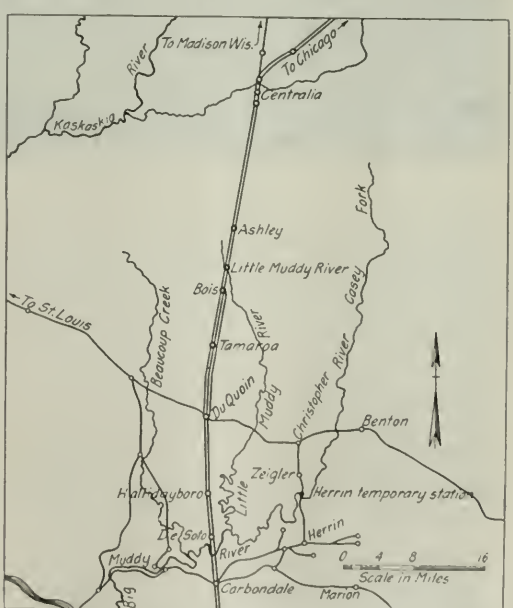
How the Illinois Central Overcame a Water Shortage

Interesting Development in Southern Illinois Affords Solution of a Serious Problem at Small Expense

DURING THE LAST few years a water supply development has been carried out by the Illinois Central in the vicinity of the coal fields of southern Illinois, which has not only solved a serious operating problem at a relatively small expenditure but also has afforded an attractive source of revenue from the sale of water as well as a protection to the company from loss of business in the vicinity affected. Necessitated by reason of a series of annual water shortages sufficiently acute to require the hauling of water in trains for considerable distance at much expense, and not only seriously interfering with the orderly and economical movement of traffic but actually threatening production of the mines in the vicinity, a program was launched in 1918 involving extensive alterations at several water stations and the installation of a new pumping station. The work was carried out over a period of years and involved a total expenditure of approximately $240,000, as a result of which the region is adequately protected against trouble from this source for several years to come and a revenue has been afforded from the sale of water to interests not having supplies of their own which has already paid a substantial portion of the entire investment.

The lines under consideration extend from Centralia, Ill., on the north to Cairo on the south, where they not only constitute the middle link of the main line but form a neck in the bottle between the main line and the important branch diverging to Freeport on the north line of the Illinois Central and the main line and the Birmingham line of the Illinois Central to the south, as well as including the terminus of the line to St. Louis. Further than this the Illinois Central system at this point passes through one of the largest coal producing fields west of the Alleghenies, where it has numerous branches and maintains an extensive switching service.

This is a region in which the subsurface water contains such a high content of scale-forming salts as to warrant its use only as a last resort. It is also an area in which the few streams carry much suspended matter and are otherwise more or less undesirable for use because of pollution from mine drainage. As a result it had become a practice for the railroads in this vicinity to obtain their supply from surface reservoirs of their own construction or the property of neighboring towns. The topography of the country lends itself to this purpose and these reservoirs have invariably afforded supplies of very satisfactory quality for locomotive use. Unfortunately, however, the region is subject to protracted periods of dry weather. This condition, in the face of the heavier demand for water not only because of the greatly increased railway traffic and mining activity and in the case of municipal supplies, due also to the increases in population,



The Main and Branch Lines of the Illinois Central in the Coal Area

precipitated a situation in which the railroads in that vicinity were confronted annually with a threatening or actual shortage of an increasingly serious nature.

Of the several points on the Illinois Central where trouble

was encountered, the situation was most acute at DuQuoin 35 miles south of Centralia. This is a junction point between the main line and the line to St. Louis, upon which business had increased approximately at the rate of 10 per cent a year for five or six years. The supply at this point was obtained from a reservoir whose capacity had been outgrown by the demand. It was a regular occurrence for it to become exhausted about September 1, and it would remain so until about the first of the year, either because there was no water available or because of the freezing during the winter of what little water remained in the reservoir.

The Principal Shortage Occured at DuQuoin

As it was essential that a supply be maintained at this point it became necessary to haul water in cars from Carbondale, 20 miles south, or from a branch line station at Sand Ridge, a distance by track of about 50 miles. As an indication of the acuteness of the shortage it was not unusual for as many as three trains of 20 cars each to be operated daily to serve the one station, and during the months of November and December, 1917, and January, 1918 (the most difficult time of the year to haul water) as many as 3,000 cars of water were hauled to this point and emptied into the reservoir. This was an expensive procedure, the cost of hauling water to the one station, in fact, exceeding $25,000 in 1917, exclusive of rentals and maintenance of equipment. Moreover, these trains seriously interfered with the normal operation of regular traffic and because of the impossibility of hauling the water in ordinary tank cars at that season of the year, because of weather conditions, the situation required the use of coal cars at a time when these cars were in the greatest demand at the mine.

An annoying situation also presented itself at Bois, midway between DuQuoin and Centralia, where the supply was obtained from the Little Muddy river and from an impounding reservoir of approximately 50,000,000 gal. capacity. While the reservoir water was entirely satisfactory in quality and the Little Muddy river a water of fair quality, and while no shortage had actually occurred at this point up to the time the water supply program was undertaken, a threatening situation existed in the fact that the creek could not be relied upon for the required supply during more than three to six months of the year, during a part of which time it also carried considerable matter in suspension. Neither could the water shed be relied upon to keep the reservoir filled to its capacity. In addition the old pumping plant had become inadequate to handle properly all the water required during normal times, not to mention the period when a shortage was encountered at other points, particularly at DuQuoin.

Hallidayboro, located 12 miles south of DuQuoin, presented a condition somewhat like that at Bois. Deriving its supply from an impounding reservoir of approximately 40,000,000 gal. capacity, from which water was delivered by a steam pump through a mile of six-in. pipe to the storage tanks, this station afforded an adequate supply of water of good quality under normal conditions, and as a matter of fact had never become exhausted. But Hallidayboro was not an economical stopping place for trains and it presented a cause for concern when by reason of shortages elsewhere, it became necessary to take more water than usual at this point.

The Quality of Water Was Also a Feature

The situation at Carbondale, the next station south on the main line, presented another aspect to the problem than that of shortage. Situated 30 miles south of Hallidayboro and at the junction of the main line with the coal branches, where it was customary for all trains to take water and where as many as 1,500 cars of coal a day were received from the coal producing section, this station was one of the most important on the system. To meet the demands made upon it, water was pumped from a steam plant on the Big Muddy river, 4½ miles west of Carbondale, through three miles of 8-in. cast iron pipe and one mile of 12-in. pipe to service tanks at the roundhouse and in the yards having a total capacity of 100,000 gal. Aside from a little trouble occasionally encountered by the pipe line being too small, this supply was adequate at all times for the demand made upon it, but the quality of the water was bad. As suggested by its name, the Big Muddy river carries large quantities of silt at certain seasons of the year but in addition to this it also carries matter in solution ranging from 1 to 7 lb. per 1,000 gal. of which from 1 to 5 lb. is scale-forming solids. Because of this, considerable trouble from leaking of flues was encountered during low water periods, by reason of which it became advisable at such times for trains to take water at less advantageous points from an operating standpoint.

A Portion of the Reservoir at Bois

Shortage in the Mine District Threatened Production

The Illinois Central maintained no water stations in the vicinity of the mines tributary to its tracks, but depended for its supply upon the towns of Christopher, Benton, Herrin and Marion, shown on the accompanying map. All of these towns were supplied from impounding reservoirs. With the normal increase which had taken place in the population of these towns, as well as the increased demand for water made upon them by the mines and the railroads, it had become a regular thing for the towns to suffer from water shortages during the late summer and early fall, and when these shortages occurred it became necessary for engines to run for water

to DuQuoin or Carbondale, the average distance ranging between 5 to 12 miles each way. With the interruption to the regular operation of trains by reason of this continual running for water during uncertain seasons, together with the facts that the supply at Carbondale was anything but satisfactory, that the supply at DuQuoin was obtained only by hauling water from other points; and that there was a tendency for the shortages of water purchased from the towns to increase with the growth of the demands made upon them, the situation was becoming a serious one.

Confronted with this state of affairs in the vicinity of the mines, and on the main line, it was evident that something more substantial in character and less expensive in kind was required to remedy the trouble than the hauling of water from points where it could be obtained, and investigations were accordingly made to this end.

DuQuoin Required a New Reservoir

At DuQuoin, where about 75 per cent of the shortage occurred, it was not possible to overcome the difficulty inexpensively. With no creek at this point and with the poor quality of the ground water eliminating it from consideration as an auxiliary supply, only two alternatives remained; one, that of deepening the existing reservoir and the other of building a new one. An investigation revealed the fact that even if the deepening of the existing reservoir was not prohibitive in cost there was no assurance that when once deepened the water shed could be relied upon to provide the additional water. It was decided, therefore, to build an additional reservoir and to replace the old pumping plant. The new reservoir was constructed in a valley adjacent to that in which the old reservoir was located. This required the construction of a dam at an expense, along with other details, of about $128,000. Supplementing this, a new pumping plant was built which consists of two 25-hp. semi-Diesel engines, belt connected to two 500 gal. per minute centrifugal pumps. In addition the six-inch pipe line was replaced by one and a half miles of eight inch pipe line, salvaged from improvement work at Carbondale, and a 100,000 gal. service tank was erected to increase the track storage to 190,000 gal.

An Interesting Solution Was Worked Out at Bois

At Bois, as has been mentioned, the water supply was obtained from a stream that could be relied upon for an adequate supply only about six months in the year and from an auxiliary reservoir, having an insufficient draining area. The problem, therefore, was one of increasing the water supply. The solution at first appeared to be one of enlarging the impounding facilities and at the same time increasing the watershed, a work which would require the constructing of a second dam across the main valley below the main reservoir and the purchasing of a large tract of land for a reservoir site, at a cost ranging anywhere from $100,000 and $150,000 over and above the cost of increased pumping facilities. In working up the plans for the new pumping station, however, the idea was conceived of so arranging the plant that the old reservoir could be filled from the stream during its high water period and then held in reserve for the period when a supply could no longer be obtained from this source.

Working on this basis, the old steam plant was replaced by a new plant, which at DuQuoin, consisted of two 25-hp. semi-Deisel engines, belt connected to two 500 gal. per minute centrifugal pumps arranged in duplicate and capable of pumping against 100 ft. head. In addition to this the six-inch line to the reservoir was replaced by a 10-in. line, an additional storage tank was provided and a water column shifted to a more advantageous location. This work, although it involved a total expenditure of only $30,000 approximately, has proved entirely adequate for the purpose, the creek affording a certain supply until about September after which the reservoir can be relied upon for a period of from four to five months. As indicating the economy of this plan over the original one of providing a new impounding facility, approximately 30,000,000 gal. of water was pumped into the reservoir from the creek at a cost not exceeding $150, while if the additional storage and water shed had been provided the interest and depreciation expense alone at six per cent would have been anywhere from $6,000 to $9,000 annually.

The Northern End of the Bois Reservoir

Having remedied the situation at DuQuoin and Bois it was found unnecessary to make immediate changes at other points on the main line, other than at Carbondale where the facilities for handling the water were increased by replacing three miles of 8-in. pipe with a 12-in. line and installing a water treating plant to remove the incrusting solids and suspended matter from that water. The total cost of the latter project approached $68,000.

The Temporary Plant Paid for Its Cost Many Times Over

This having been done, the development was completed by building a temporary station at a point about midway between Herrin and Ziegler on the Little Muddy river. At this point the river is above the principal mine drain inlets and affords a water seldom exceeding 1½ to 2 lb. of encrusting solids per 1,000 gal. as compared with 5 lb. at Carbondale. The equipment at this point consists of a steam plant of two 45-hp. boilers and a 50,000 gal. tank, constructed from material salvaged from other points at a cost not exceeding $16,000. While this plant is not located as con-

veniently as could be desired to the switch engines operating in this district it has proved a boon not only to the railroads in the vicinity but to the mines as well, by affording a suitable supply of water at times when it could not be obtained from the adjacent towns. In the fall of 1919, for example, in addition to providing all the water required by the Illinois Central, several thousand cars of water were hauled from this station to the mines, the number of which in November, 1920, alone aggregated 838 cars or about 1,000,000 gal. of water.

At a total cost therefore of about $240,000, a program was carried through which has eliminated entirely a recurring condition characterized by much running for water as well as the hauling of water in train loads with the interruption it entailed to the normal dispatch of trains as well as its expense (the total out of pocket cost of hauling water in

A New Pump House Was Built at Bois

1917 approximating $40,000 excluding the cost of rentals, maintenance equipment, etc. The work has resulted also in a great improvement in the water at Carbondale, and has worked an appreciable benefit to the company directly and indirectly by eliminating any necessity for curtailment in coal production by reason of water shortage and by affording a considerable source of revenue from the actual sale of water to mines for coal washing and steam generating purposes. To indicate the size of this business, during one month 111 tank cars of water were furnished to the mines from the new station at DuQuoin, 85 from Colterville, 118 from New Athens and 7 from Carbondale, all in addition to the 838 cars from the Herrin-Ziegler pumping plant.

These improvements were designed and undertaken under the direction of F. L. Thompson, chief engineer, A. F. Blaess, engineer maintenance of way and C. R. Knowles, superintendent of water service of the Illinois Central, and were carried forward in easy stages up to their completion in 1920.

Block Signal Statistics for 1921

The Interstate Commerce Commission has issued its annual tables, for January 1, 1922, showing the mileage of railroads in the United States operated by the block system, with collateral information concerning kinds of apparatus and methods of operation. The tables are in the usual form, with which the interested reader is familiar.

The total length of road block signaled on January 1 was 102,468 miles, which is 52.4 per cent of the mileage *of the roads reporting*, excluding lines which are used only for freight. Of the total railroad mileage of the country it is about 40 per cent.

The total now reported is made up of 63,406 miles using the manual block system and 39,062 equipped with automatic block signals. The latter figure is about 20 per cent of the length of the roads reporting and 16 per cent of the total mileage of the country.

The total automatic mileage (39,062) is 518 miles greater than was shown for January, 1921, and the non-automatic (63,406) is 66 miles greater.

A few of the larger increases and decreases in the totals reported by individual roads are shown in the bulletin, in a separate statement (see below): but comparisons with statements which were furnished by the railroads for use in the annual review of the *Railway Age* (printed January 7, page 137) indicate that there are numerous discrepancies; and there are some manifest errors. The increase in automatic mileage on the Illinois Central, given as 69.7 miles, appears to be 48½ miles too large; while the *Railway Age* table shows it to be 50 miles too large.

The mileage of road on which automatic signals are worked "normal danger" shows a large increase over 1921, but here again numerous errors apparently vitiate the totals, both of normal danger and normal clear. The Baltimore & Ohio reports an increase in normal danger of 458 miles and a decrease in normal clear of 431 miles. Errors, omissions, and corrections of former errors in the statements of several roads leave the grand total much in need of amendment.

The Delaware & Hudson reports electro-gas signals in use on 174 miles of road, 82 miles less than the year before, with a corresponding increase in electric motor signals. The Pennsylvania's mileage of position-light signals, 114 miles, is five miles greater than in 1921.

The Fort Worth & Denver City reports to the Commission that its mileage of road operated under the manual block system is 114 miles (single track) or 106 miles less than one year before, but its report to the *Railway Age* indicated 141 miles *added* in 1921. In the government report for the earlier year there was a foot note to the effect that on this road the space interval was in use only as between passenger trains following one another.

The Great Northern reports the electric train staff in use on 15 miles of road, as compared with 79 miles a year before, while the St. Louis-San Francisco has increased its staff mileage from 10 to 17. The Great Northern seems to have substituted automatic signals for the train staff.

Increases and Decreases in 1921 (Miles of Road)

Name of road	Increase		Decrease
	Automatic	Non-automatic	non-automatic
Atchison, Topeka & Santa Fe	....	37.4	....
Cedar Rapids & Iowa City	....	27.0	....
Chicago & North Western	....	56.7	....
Chicago, Burlington & Quincy	33.2	....	24.9
Chicago, Milwaukee & St. Paul	....	....	200.5
Cleveland, Cincinnati, Chicago & St. Louis	69.6	....	66.5
Duluth, South Shore & Atlantic	....	28.6	....
Fort Worth & Denver City	....	....	106.5
Great Northern	53.7	....	63.6
Gulf, Florida & Alabama	....	143.0	....
Illinois Central	69.7	....	....
Missouri, Kansas & Texas	79.1	....	....
Northern Pacific	....	33.1	....
Pennsylvania	9.9	58.6	....
Tremont & Gulf	....	67.0	....
Union Pacific	65.3	....	....

Telephones. Table No. 6 shows that telephones are now used for transmission of train orders on 123,253 miles of railroad, 1,231 miles more than on January 1, 1921; while the mileage on which the telegraph is used (132,682) has decreased 635 miles. The total mileage of the roads represented in table No. 6 is 246,414. Some roads report both telegraph and telephone in use on the same divisions or sections.

Boston Switching Rates—Studies in Cost of Service

Elaborate Analysis of Operating Costs in a Large Group of Busy Freight Yards at Boston, Mass.

By John C. Owers

AN INTERESTING feature of the railroads' defense in the case of the Boston Wool Trade Association, decided by the Interstate Commerce Commissioner on June 6* consisted of cost of service studies which were made between the date of filing the complaint and the hearing.

These studies, which were first started on the New Haven, were made upon a general plan worked out by J. E. Slater, special assistant to the general manager of that company, and were adopted by the other roads. They were made to determine the actual car movement performance per engine hour in each of the yards of the Terminal district, the number of movements made per car while in transit from point to point in one terminal, or in interchange; and the expenses of operation per engine hour, including a six per cent return on the property investment.

Railroad Freight Lines in Boston and Environs

The first element of cost was ascertained by assigning men to each switching crew to record the engine movements and the number of cars moved on each occasion. These men made reports showing the number of cars handled in each movement, the tracks and yards from and to which the cars were switched, and the time consumed; and, so far as possible, the same cars were not counted more than once unless the second handling was entirely dissociated from the first.

The information secured from these reports established the number of car movements made in each yard per hour, which, for cost purposes, were expressed in decimal fractions of an engine hour per car movement.

The second factor was arrived at by observation of individual cars moving within the terminal and by studies of normal car movements made in accordance with the accepted principles of yard operation.

Determination of the cost of operation was, to the greatest possible extent, based on actual expenditures during the period of the study; but it was found necessary to allocate a considerable number of accounts, principally those of overhead.

The charge against maintenance of way was made by dividing the actual expenses of six representative months by the engine hours for the same period and multiplying the result by the engine hours for the period of the study. Maintenance of equipment charges were actual, except for back shop repairs, which were based on the average back shop expense per switch engine mile; but the items of superintendence, injuries to persons, loss and damage, stationery and printing, general expenses and similar accounts were generally allocated in the ratio that the direct charges bore to the total of the account for the operating division or for the entire road, as circumstances required.

The fixed charges were based on six per cent return on the value of the terminal property as obtained from the valuation engineers, actual tax payments and a six per cent charge on the value of the engines actually used in switching service. In setting up the land and construction valuation, all main line tracks, freight houses, docks, passenger terminals and other property not concerned in actual freight yard switching were excluded, the object being to restrict this factor to the actual investment on freight yard property.

The total expenses divided by the engine hours showed a cost per engine hour of between nineteen and twenty-one dollars for each road, and this sum multiplied by the engine hours per car movement in each yard unit gave the individual yard cost, which varied somewhat in accordance with the class of work done.

Having reached this point, the actual cost of typical switching movements was determined by ascertaining the number of handlings per car and amount of engine time per yard, and multiplying the total time by the rate per hour. In addition to the actual switching costs, a per diem charge of $1.80 was made; but in movements involving two roads only 90 cents each was allowed, this amount having been decided upon as conservative after careful consideration of the subject.

In reaching final conclusions as to the details of the studies and the various formulæ used for allocation of charges, there were several conferences between representatives of the railroads and Professor W. J. Cunningham of Harvard University, who, at the request of President Hustis, of the Boston & Maine, had an oversight of the work with a view of securing unity of method and harmony of results.

*Reported in the *Railway Age* July 15, page 130.

EXHIBIT A.—ANALYSIS OF YARD SWITCHING EXPENSES PER ENGINE HOUR—BOSTON FREIGHT TERMINAL YARDS, NEW YORK, NEW HAVEN & HARTFORD RAILROAD. (BASED ON EIGHT WEEKS ENDING JANUARY 29, 1920)

Account	Operating expenses: Direct	Allocated	Total	Bases of allocation
Maintenance of Way and Structures:				
201 Superintendence	.....	$1,042.83	$1,042.83	C
202, 212 / 214, 216 / 218, 220 Roadway and track	$11,670.30	.....	11,670.30	B
229 Roadway buildings	.....	48.29	48.29	C
231 Water stations	.....	214.71	214.71	D
233 Fuel stations	.....	295.87	295.87	D
235 Shops and engine houses	.....	1,431.46	1,431.46	E
247 Telegraph and telephone lines	192.32	.....	192.32	A
249 Signals and interlocking	144.64	.....	144.64	A
271 Small tools and supplies	.....	144.52	144.52	C
272 Removing snow, ice and sand	.....	115.75	115.75	C
274 Injuries to persons	.....	114.68	114.68	C
275 Insurance	.....	61.57	61.57	C
276 Stationery and printing	.....	21.77	21.77	C
Total	$12,007.26	$3,491.45	$15,498.71	
Maintenance of Equipment:				
301 Superintendence	.....	$487.50	$487.50	F
302 Shop machinery	.....	195.52	195.52	F
304-a Power plant machinery shops	.....	34.98	34.98	F
308 Steam locomotives—repairs	12,367.58	.....	12,367.58	G
309, 310 Steam locomotives—depreciation and retirements	.....	1,211.52	1,211.52	H
332 Injuries to persons	.....	52.82	52.82	F
333 Insurance	.....	83.76	83.76	F
334 Stationery and printing	.....	22.54	22.54	F
Total	$12,367.58	$2,088.64	$14,456.22	
Transportation Expenses:				
371 Superintendence	.....	$2,249.61	$2,249.61	I
373 Station employees	$255.84	.....	255.84	A
377 Yardmasters and yard clerks	10,784.55	.....	10,784.55	A
378 Yard conductors and brakemen	23,117.06	.....	23,117.06	A
379 Yard switch and signal tenders	5,376.55	.....	5,376.55	A
380 Yard enginemen	15,365.88	.....	15,365.88	A
382 Fuel for yard locomotives	20,519.12	.....	20,519.12	A
385 Water for yard locomotives	600.11	.....	600.11	K
386 Lubricants for yard locomotives	363.03	.....	363.03	A
387 Other supplies for yard locomotives	469.18	.....	469.18	L
388 Engine house expenses—yard locomotives	6,871.84	.....	6,871.84	L
389 Yard supplies and expenses	770.11	.....	770.11	L
405 Crossing protection	766.68	.....	766.68	A
407 Telegraph and telephone oper'n	731.36	.....	731.36	A
410 Stationery and printing	.....	855.17	855.17	I
414 Insurance	.....	71.75	71.75	I
415 Clearing wrecks	.....	436.75	436.75	I
418 Loss and damage—freight	.....	4,763.40	4,763.40	I
420 Injuries to persons	.....	1,395.28	1,395.28	I
Total	$85,991.31	$9,771.96	$95,763.27	
General Expenses:				
451, 459 Total	.....	$4,339.05	$4,339.05	M
Total operating expenses	$110,366.15	$19,691.10	$130,057.25	
Total engine hours			11,848	
Cost per engine hour			$10.98	

FIXED CHARGES

Item	Fixed charges	Bases of allocation
Taxes	$18,105.25	N
Return on railroad property	105,433.70	O
Return on equipment	1,817.28	P
Total	$125,356.23	
Total engine hours	11,848	
Cost per engine hour	$10.58	
Grand total cost per engine hour	21.56	

EXHIBIT B.—ANALYSIS OF COST OF TYPICAL MOVES UNDER SWITCHING TARIFFS, BOSTON FREIGHT TERMINAL

Movement	No. of moves	Cost per car
Between Boston Freight Terminal Yards and Sidings and Boston & Albany Railroad:		
Yard 1 to B. & A.	7	$10.17
B. & A. to Yard 1	8	11.05
Yard 1 to B. & A.	7	8.55
B. & A. to Yard 2	6	7.58
Yard 3 to B. & A.	7	10.17
B. & A. to Yard 3	8	10.84
Yard 5 to B. & A.	7	8.87
B. & A. to Yard 5	8	9.43
Yard 7 to B. & A.	7	9.20
B. & A. to Yard 7	8	9.87
State Yard to B. & A.	7	8.98
B. & A. to State Yard	8	9.65
Mass. Ave. & Southampton St. to B. & A.	7	10.28
B. & A. to Mass. Ave. & Southampton St.	8	10.94
Average		9.92
Between Boston Freight Terminal Yards and Sidings and Union Freight Railroad:		
Yard 1 to Union Freight	6	$7.58
Union Freight to Yard 1	7	8.47
Yard 2 to Union Freight	6	5.96
Union Freight to Yard 2	5	1.99
Yard 3 to Union Freight	6	7.68
Union Freight to Yard 3	7	8.25
Yard 5 to Union Freight	6	6.29
Union Freight to Yard 5	7	6.85
Yard 7 to Union Freight	6	6.61
Union Freight to Yard 7	7	7.28
State Yard to Union Freight	6	6.40
Union Freight to State Yard	7	7.07
Mass. Ave. & Southampton St. to Union Freight	6	7.69
Union Freight to Mass. Ave. & Southampton St.	7	8.70
Average		7.17
Intra-Terminal Moves:		
Yard 2 to Yard 3	8	$9.31
Yard 5 to Yard 1	8	9.66
Yard 5 to Yard 6	8	9.21
State Yard to Yard 7	8	9.17
Yard 1 to Mass. Ave. and Southampton St.	9	12.25
Average		10.07

Key to Method of Allocation

A—For all these accounts, the actual expenses chargeable to switching in the Boston Freight Terminal Yards for this period are shown.

B—These figures are based on an analysis of the actual expenses of maintenance for the Boston Freight Terminals Yards for six representative months of the year 1919—March, May, June, August, September and November.

C—These expenses are allocated from corresponding expenses of the railroad for the calendar year; the basis of allocation being the percentage which the total of Accounts Nos. 202, 212, 214, 216, 218, 220, 231, 233, 235, 247 and 249 in this study bears to the total of Accounts 202-261, both inclusive, for the railroad for the calendar year.

D—Based on the proportion which the amount of coal used in Boston Freight Terminal switching service bears to the total amount of coal consumed on the railroad for the calendar year. This proportion was then applied to Accounts 231 and 233 for the calendar year for the railroad.

E—Based on the proportion which switching locomotive miles for the Boston Freight Terminal bears to the total locomotive miles for the railroad; this proportion being applied to the total of Account 235 for the railroad for the calendar year.

F—These expenses are allocated from the corresponding expenses of the railroad for the calendar year; the basis of allocation being the percentage which Account 308 in this study bears to the total of Accounts Nos. 308, 311, 314, 317, 320, 323, 326 and 329 for the railroad for the calendar year.

G—Running repairs and back shop repairs were computed separately. The running repairs (labor and material) are based on the actual charges against switch engines in the Boston Freight Terminal for the period of the study. Back shop repairs are based on the average cost per mile for back shop repairs for the type of switch engine working in the Boston Freight Terminal, multiplied by the actual switch engine miles of engines in the Boston Freight Terminal for the period of the study.

H—Based on depreciation rate of four per cent per year, applied to the original cost plus cost of additions for the engines working in the Boston Freight Terminal.

I—These expenses were allocated from the corresponding expenses of the railroad for the calendar year; the basis of allocation being the percentage which Accounts Nos. 373, 377, 378, 379, 380, 382, 385, 386, 387, 388, 389, 405 and 407 in this study bears to the total of Accounts 373-408, both inclusive, eliminating Accounts 390 and 391, for the railroad for the calendar year.

K—Allocated on the basis of an engineering formula for the amount of water evaporated per pound of coal burned, applied to the actual coal burned by switching locomotives in the Boston Freight Terminal, amount of water so obtained being charged out at the water rate for the city of Boston.

L—Based on the average cost per switching locomotive mile for the railroad for the calendar year, applied to the switching locomotive miles in the Boston Freight Terminal for the period of the study.

M—These expenses were allocated from the total of Accounts 451-459, both inclusive, of the railroad for the calendar year; the basis of allocation being the percentage which the total of the Maintenance of Way, Maintenance of Equipment and Transportation Expenses in the study bears to the total Maintenance of Way, Maintenance of Equipment, Traffic, Transportation and Miscellaneous Operating Expenses of the railroad for the calendar year.

N—Based on the taxes paid on assessed valuation of the Boston Freight Terminal at the present tax rate for Boston, the valuation excluding freight houses, piers, docks, coal dock and other items not directly concerned in switching operation at the Boston Freight Terminal.

O—Based on a six per cent return on the value of the land and yard facilities in the Boston Freight Terminal, the valuation excluding freight houses, piers, docks, coal dock and other items not directly concerned in switching operation at the Boston Freight Terminal.

P—Based on 6 per cent return of the original cost, plus cost of additions of locomotives used in the Boston Freight Terminal.

Note 1. In making the direct charges and allocations in the manner above described, figures are, in all cases, reduced to a basis of the eight weeks' period which is covered by the study. Note 2. The term "railroad" refers, in each case, to the New York, New Haven & Hartford. Note 3. The term "calendar year" refers to the year ending December 31, 1919.

Boston Railroad Map

The Union Freight Railroad, which is laid in the street, extending from the South station to the North station, is shown in our sketch by a dotted line. The Boston & Albany is shown in a broken line. Those parts of the line which are broken into very short pieces (parts of the Grand Junction branch) represent sections where the tracks of the Boston & Maine and those of the Boston & Albany are side by side. All of the other lines on the map belong to the Boston & Maine, or the New York, New Haven & Hartford; the Boston & Maine's lines being on the north side of the city and those of the New Haven road on the south side.

Numbers on the map mean—

1—N. Y., N. H. & H. principal freight terminal.
2—Mystic Dock, Boston & Maine.
3—Boston & Maine docks.
4—South Station.
5—North Station.
6—East Boston docks.
7—Back Bay Station.
8—South Boston Station.
9—Brookline Junction.

The yards of the Boston & Albany are: (a) at the terminus, near South station; (b) between Back Bay (Huntington avenue) and Brookline Junction; (c) near the intersection of the main line and the Grand Junction Branch; (d) at East Boston.

The yards referred to in Exhibit B, except those of the Boston & Albany and the Union Freight Railroad, are all parts of the New Haven freight terminal. The principal part of this terminal, indicated by Fig. 1 on the map, is on and near the tract called South Boston docks. These terminal tracks join the main line tracks just south of the South Boston passenger station, indicated on the map by "8." The Massachusetts avenue yard and the Southampton street yard are south of this junction.

At the time when these studies were made, the connection between the New Haven road and the Union Freight Railroad was made at the west side of South Station (4), but since then a connection has been made by way of Northern avenue bridge, the route shown by a short line of crosses, extending west from "1."

Each road has within the metropolitan district several small delivery yards which serve the industries of their particular localities. Some of these yards are merely auxiliaries to the main plant, within switching limits; others are operated as independent freight stations. The Boston & Albany's Grand Junction freight branch, connecting with the Boston & Maine and to the East Boston elevator and docks is nine miles long.

The Union Freight Railroad on Atlantic avenue accommodates numerous industries having private tracks and also handles the interchange between the New Haven and the Boston & Maine.

It has been estimated that the Boston terminal facilities provide accommodations for about 14,000 cars. The Boston & Maine has the largest plant, and can handle in the vicinity of 8,500; the New Haven, somewhere above 3,000; and the Boston & Albany the balance. The Boston & Maine terminal, which is operated as a division, is divided into 24 yards, and under normal traffic uses 45 switching crews. The New Haven plant at South Boston has 10 yard units, and under capacity operation uses 30 crews. The Boston & Albany terminal consists of several rather widely separated units, and under good business conditions, requires 25 crews. The Union Freight generally employs five crews; so that over 100 yard crews are needed to handle the city's normal traffic.

There is comparatively little car floating in Boston Harbor, although facilities for this purpose exist and are in regular use, principally between the railroads and the steamship docks.

The Interstate Commerce Commission's report on the switching rate controversy discussed at length the details of the claims made by the wool merchants and the arguments presented by the railroads. On the question of costs it said, in part:

The Commission's Criticisms

Defendants contend that the cost of switching at Boston is high and greater than at other comparable points. Studies of costs at Boston were submitted by the New Haven and the Maine, but not by the Albany. The New Haven figures include as costs not only operating expenses and taxes but a 6 per cent return on the estimated value of land, tracks, and locomotives used for switching purposes.

During the study period of eight weeks at the New Haven terminal, 42,890 loaded cars were received or forwarded at Boston, including loaded cars interchanged with connections. The total cost during that period is given as $255,413, made up of $150,057 for operating expenses plus $125,356 for taxes and the 6 per cent return. The average cost of handling each loaded car received or forwarded, so computed, was $5.95 per car. Confined to operating expenses alone it was $3.03 per car.

A striking feature of these studies is the large part of the total estimated cost which is accounted for by so-called fixed charges. In the case of the New Haven these account for 49 per cent of the total, and in the case of the Maine for 54 per cent. The great item in these amounts is a 6 per cent return on the estimated "present value" of the land used in switching operations. This present value is based upon what is said to be the market value of adjoining property, and, as much of the terminal land at Boston was acquired many years ago, it is in general vastly in excess of original cost. If the New Haven or the Maine, therefore, should earn 6 per cent upon this present value, a very handsome profit on actual investment would be realized. On the other hand, this liberality in estimating switching "costs" is in part offset by the fact that the figures were prepared early in 1920, when railroad wages were somewhat lower than they are now.

The cost figures are open to other criticisms. The controlling factor in the computation seems to be the number of cars handled in each switch movement. The observations, however, were made in winter, when the volume of business was relatively light and costs of operation probably above normal. Conditions in switching yards change continually and economy of operation necessitates increase or reduction of the switching force from time to time, with realignment of the work in each case. The interrelation of line-haul and switching traffic at Boston is such that it is exceedingly difficult, if it is possible at all, to segregate properly the expense of handling purely switching movements from the expense of switching through line-haul cars. Switching costs can probably be ascertained with approximate accuracy only through a system of accounts designed for the purpose and maintained over a considerable period of time.

The record also furnishes ground for doubt whether switching operations in Boston are economically conducted in all respects. A carload of freight for export arriving over the Fitchburg division of the Maine for delivery to ship side at the Mystic docks is switched into seven distinct yards and classified six different times during the movement to the docks from the West Cambridge yard. Defendants, however, maintain that the costs shown by their studies are conservative, and that nothing is allowed for weighing of cars, or for car maintenance, or for maintenance of main-line roadbed and track used to a certain extent in switching operations. Cost studies of this character are necessarily based upon many more or less arbitrary assumptions and at best furnish only rough approximations. Upon the whole, we think that the figures submitted by the Maine and the New Haven do not understate the real costs and are liberal, even under existing conditions, particularly when the land values used are taken into consideration. They are of especial value in indicating the relative costs of certain general classes of switching movements.

Executives and Train Service Leaders Confer

Meeting in New York Thursday Adjourns Until Friday, With Secrecy Surrounding Proceedings

As THE *Railway Age* goes to press on Friday morning developments in the railway shopmen's strike situation await the outcome of the conference between the committee of the railway executives and the leaders of the train service brotherhoods and also the recommendations which may be made by President Harding in his address to Congress.

The conference between the railway executives and the train service leaders began at the offices of the Association of Railway Executives, 61 Broadway, New York on Thursday afternoon at 2 o'clock. The first session adjourned at 6:15 and the only announcement made then was that the meeting had adjourned until the following morning. This was contained in a statement issued by Chairman T. DeWitt Cuyler of the Association of Railway Executives as follows:

"A conference was held this afternoon between a committee of the carriers and the heads of the five train service organizations, who wished it to be distinctly understood that they appeared as mediators of their own motion. A discussion of the present railroad situation, so far as it relates to the shopcraft strike took place. The questions involved were discussed with the earnest desire to arrive at a solution of the problem, if possible. No definite conclusion was arrived at, and the conference was adjourned until tomorrow morning."

Representatives at the Meeting

The representatives of the train service organizations were Warren S. Stone, president of the Brotherhood of Locomotive Engineers; L. E. Sheppard, president of the Order of Railroad Conductors; W. N. Doak, vice-president of the Brotherhood of Railroad Trainmen; E. H. Robertson, president of the Brotherhood of Locomotive Firemen and Enginemen, and F. C. Cashen, president of the Switchmen's Union of America. Representatives of the 16 other striking and non-striking railway unions, including B. M. Jewell, president of the Railway Employees' Department of the American Federation of Labor, were in New York and within call, had it been advisable or necessary to bring them into the conference.

Those who represented the railway executives in the conference included T. DeWitt Cuyler, chairman of the Association of Railway Executives; W. W. Atterbury, vice-president of the Pennsylvania; Howard Elliott, chairman of the Northern Pacific; Hale Holden, president of the Chicago, Burlington & Quincy; Julius Kruttschnitt, chairman of the Southern Pacific; W. L. Mapother, president of the Louisville & Nashville; C. H. Markham, president of the Illinois Central, and A. H. Smith, president of the New York Central. Alfred P. Thom, vice-chairman and general counsel of the Association of Railway Executives, was also present. This was the same committee which presented to President Harding on Saturday the majority and minority resolutions voted at the Executives' meeting the previous day.

The results of the Thursday afternoon session of the executives and train service leaders were shrouded in secrecy. No inkling whatever is available at this time as to what had been discussed at the meeting. It is naturally to be presumed that seniority was a leading issue. The four-hour session and the fact that the meeting was carried over until the next day, without any pronouncements being made by either side gave rise to considerable optimism as to the outcome.

During the evening the train service leaders met with the shopmen's leaders for whom they have intervened. No statement was given out about the meeting.

B. M. Jewell Discusses Car Supply

B. M. Jewell, head of the Railroad Department of the American Federation of Labor, gave out a prepared statement dealing with the demands upon railroad equipment from the settlement of the coal strike and not at all with the day's proceedings.

Mr. Jewell's statement follows:

"The settlement of the coal strike will, to a large degree, determine the settlement of the railroad strike. The resumption of coal mining and the vastly increased demand for coal resulting from depleted stocks will force the railroads to move more coal in the next few weeks than ever before in history. This means a record-breaking demand for cars.

"In the face of this demand there is at the present time a record-breaking shortage of good order coal equipment. The railroads will be required by urgent necessity to repair their coal cars in the shortest possible time. This will bring the most insistent kind of pressure upon the roads to get a maximum number of skilled mechanics into their shops. It is safe to say that there will be places for one and a half times the normal number of men in coal repair shops alone.

"The normal number of cars suitable for moving coal in need of repairs is about 5 per cent of the total number on the line. Even before the strike was called, there was an unprecedented proportion of bad order cars. The American Railway Association figures show that on July 1, 14½ per cent needed repairs—nearly three times the normal number. On July 15, before the effects of the strike had become to be seriously felt, the association figures showed 15⅓ per cent in bad order—and this is a low estimate because some of the roads hardest hit by the strike refused to give out the facts. These are the latest published figures. We estimate that at the present time, however, there are from 20 to 25 per cent of the total number of coal cars in need of repairs—about 200,000 cars.

Effect Will Be Serious, Says Jewell

"Even in normal times with a low percentage of bad order equipment, there are not enough coal cars to meet the demand. The year 1920 is a typical illustration. In August, 1920, there was an average weekly shortage of no less than 44,927 cars in spite of the fact that there had been no strike, coal reserves were high and business was facing a period of depression. With reserves depleted by four and a half months' tie-up of the mines and with business approaching a boom, in addition to the normal demand, it is safe to say there would be a shortage of at least 75,000 cars a week, the moment the strike is settled, owing to the requirements of traffic alone. The abnormal number of cars now out of service for want of repairs will raise the weekly shortage of cars close to 100,000.

"The effect of this shortage on coal consumers will be serious in the extreme, even if the railroad strike is settled this week. A shortage of 100,000 coal cars a week means that 30 per cent of the coal mined will be withheld from the consumer through lack of transportation facilities. The mines produce about 1,000,000 tons of coal a week when operating at a maximum. The average coal car capacity is about forty-five tons. A shortage of 100,000 cars a week will, therefore, prevent 4,500,000 tons of coal a week from reaching the consumer—or 22 per cent of the weekly output."

President May Suggest Changes in Law

President Harding was to address Congress Thursday but postponed it until Friday because of the conference in New York. The impression prevails at this writing that he will review the facts relating to the shopmen's strike and possibly suggest some changes in the Transportation Act. One of these suggestions is expected to be that the headquarters of the Labor Board be moved from Chicago to Washington so that it may be in close touch with the Interstate Commerce Commission and other government officers.

President's Plan Rejected by Shop Crafts

Railroads Accept Conditionally. Committee of Non-Striking Labor Leaders Reopens Negotiations

WASHINGTON, D. C.

IT WAS OFFICIALLY announced at the White House on Tuesday that the President would appear before the Congress within 48 hours and place the entire strike situation before it, giving the whole story as the President has learned it through weeks of interviews, correspondence and mediation with representatives of both sides. He proposed to lay the situation fairly and frankly before Congress, and in that way before the country, but it was stated that the President was not yet in a position to say what, if any, recommendations he would make, as the character of his statement might be affected by the changing conditions as they exist at the time. It was stated that the President will not interfere with the efforts of anybody to bring about a settlement outside, but so far as the Executive is concerned there is no ground on which to stand except that which he has already taken. The announcement was made following a Cabinet meeting devoted to a discussion of the strike situation and after the President had conferred with Senators Watson and Kellogg.

The President's latest proposal for a settlement of the shop strike having failed because of its rejection by the shop crafts, although the railroads had agreed to take back as many of the strikers that have not been guilty of violence as they can find room for and to submit unadjusted questions as to seniority to the Labor Board, the principal developments at Washington during the early part of the week centered around the efforts of the labor organization executives to find a way to reopen negotiations for a settlement.

The committee of railway executives which came to Washington on Saturday to present the replies of the railroads to the President's proposal of August 7 left the city on Sunday, after having rejected a proposal that the question of seniority be submitted to arbitration outside the Labor Board, and prepared to resume their efforts to maintain service without the assistance of the shop craft organizations. They also hoped they had been able to convince the President that continued activity in Washington looking toward a compromise settlement would merely delay the collapse of the strike by encouraging the men still out to hold out a little longer.

Non-Striking Labor Leaders Acting as Mediators

Meanwhile the officers of the 17 railroad labor organizations, 8 of them on strike and 9 not striking or only "sporadically" striking, remain in Washington, the striking organizations having placed their case in the hands of the other labor leaders who are still trying to open a way for the return of the strikers to their former jobs, without any consequences to themselves in the way of impairment of seniority rights as the result of their "temporary declination to render service." Incidentally, the non-striking organizations are manifesting considerable interest on their own account in trying to prevent the establishment of a precedent that when members of a labor organization go on strike they forfeit their rights as employees.

The White House statement on Tuesday was taken as a clear indication that the President is through with acting as a mediator and offering settlement proposals and is now prepared to exercise the authority of the government to maintain law and order in the hope that with reasonable protection for the men who are willing to work the railroads will be able to maintain an adequate service.

Also the Attorney General, with the approval of the President, has taken steps to deal under the conspiracy statutes with the train and engine men who have allowed their fear of being accidentally shot by armed guards to overtake them suddenly at points where their abandonment of trains happens to be most inconvenient to the passengers or will interfere most with coal movement.

Conferences at the White House

The President's proposal that the strike be called off and the question of seniority be submitted to the Labor Board, as well as the entire situation, was considered at a meeting of the seven striking organizations—the six shop crafts and the stationary firemen and oilers—on Thursday and again at the general conference of the 17 railroad labor organization executives under the chairmanship of W. S. Stone, grand chief of the Brotherhood of Locomotive Engineers, on Friday and Saturday morning. The striking organizations then had no further conference with the President but their reply was delivered at the White House about noon Saturday by W. H. Johnston, president of the International Association of Machinists.

At 2:30 the heads of the nine non-striking organizations went into conference with the President. Secretaries Hoover and Davis, Chairman Hooper of the Labor Board, and Senator Cummins also took part in the conference. At 4:30 the committee of railway executives, headed by Mr. Cuyler, arrived and went into conference with the President, while the labor leaders were taken into another room. The labor leaders left the White House about 6:30 and the executives about 7:00, both explaining that their statements to the President would not be made public for the present, at his request.

Shopmen's Case in Hands of Brotherhood Leaders

L. E. Sheppard, president of the Order of Railroad Conductors, told the newspaper men that the representatives of the organizations not on strike had told the President "of the troubles we are having growing out of the strike, our difficulty in keeping everyone at work, the condition of affairs in the way of engines and equipment that are in bad shape," and that they also had offered their good offices if they could be of any service or act as mediators in the controversy with the shopmen. "We are quite prepared to do anything we can to help the situation," he said. "The shopmen have left their case in our hands." Mr. Sheppard said that a formal statement had been made to the President which might be made public later, and that a committee had been appointed to remain in Washington for a few days. He said the labor leaders had not seen the railway executives and did not know what they would do. He also appealed to the newspaper men to write as conservatively as possible, avoiding "sensational stuff" and to "get after the headline writers."

The labor leaders who were at the White House conference were: Warren S. Stone, grand chief, Brotherhood of Locomotive Engineers; L. E. Sheppard, president, Order of Railway Conductors; D. B. Robertson, president, Brotherhood of Locomotive Firemen and Enginemen; W. N. Doak, vice-president, Brotherhood of Railroad Trainmen; E. F. Grable, president, United Brotherhood of Maintenance of Way Employees and Railroad Shop Laborers; T. C. Cashen, president, Switchmen's Union; E. J. Manion, president, Order of Railroad Telegraphers; J. G. Luhrsen, president, Train Despatchers Association; and D. W. Helt, president, Brotherhood of Railroad Signalmen. E. H. Fitzgerald,

president, Brotherhood of Railway Clerks, was not included because his organization is striking on some roads.

Executives and Labor Leaders Meet

Late Saturday evening it was discovered that the railway executives and some of the labor leaders had held a conference at the Willard Hotel, which, it is understood, had been arranged by the President, and at which the proposal for outside arbitration was rejected by the railroad executives. The latter again conferred with the President for about an hour and a half on Sunday morning and then left the city. The labor leaders did not meet with the President on Sunday, but the brotherhood officers were in conference among themselves.

During the day the President gave permission for the release of the replies that had been made to his proposal and the statement presented to him by the labor leaders acting as mediators. Although the text of the shopcrafts' reply was not made public until Tuesday it was learned that they had definitely rejected the proposal and said that they could agree to no settlement that did not guarantee the restoration of seniority rights unimpaired, as proposed by the President on July 31.

Majority and Minority Reports of Railway Executives

The replies of the railroads were announced in the following statement issued by Thomas DeWitt Cuyler, chairman of the Association of Railway Executives:

"At the meeting of the railroads in New York on Friday, August 11, 1922, they with practical unanimity responded favorably to the President's call that the seniority question be left to the United States Railroad Labor Board.

"Approximately three-quarters of the mileage responded favorably to his call that all striking shop craftsmen be reemployed, and the balance that all such strikers be reemployed as far as practicable.

"The resolutions acted on by the meeting have been submitted to the President.

"The following resolutions were adopted by roads having a mileage of 151,824 miles:

"The telegram of the President, dated August 7, 1922, having been considered, and in response to his call to the carriers and the striking workmen, the following resolutions were adopted:

"Resolved, that the proposal of the President to the striking workmen to return to work, and to the carriers to assign them to work, leaving the disputed question of seniority to the Labor Board under the provisions of the Transportation Act for decision, be accepted, understanding as we do that such acceptance involves no surrender of the principles with respect to seniority adopted by the carriers on August 1, 1922, but recognizes that the proposal of the President invokes the jurisdiction of the Labor Board under the Transportation Act to pass upon the relative seniority of those loyal employees who have remained at work and those new employees who have since accepted service (the rights of both of which classes to seniority we feel bound in justice to defend before the Labor Board) with the strikers who may re-enter the service under the proposal of the President.

"Therefore, be it Further Resolved:

"(a)—All former employees who have not been guilty of proven violence against the employees or property of the railroad shall be assigned to their former positions where vacancies exist.

"(b)—Where the positions they formerly held have been filled, other employment of the same class will be found for such employees as have committed no acts of proven violence against the employees or the property of the railroad.

"(c)—If, after these men have been assigned, questions of seniority arise with them which cannot be settled locally, they will be referred to the United States Railroad Labor Board for review.

"Further Resolved, that the strike is to be called off with the understanding and agreement by all parties that no intimidation nor oppression shall be practiced or permitted as against any of the employees who have remained or have taken service, or against those who may return to service under the proposal of the President."

The following minority report was supported by roads having a mileage of 57,222 miles.

"Resolved, that the Chairman be authorized to reply to the President's telegram of August 7th, that the railroads represented at this meeting are willing that:

"(a)—All former employees who have not been guilty of violence against the employers' or the property of the railroads shall be assigned to their former positions where vacancies exist.

"(b)—If after these men have been assigned, questions of their seniority arise which cannot be settled locally, they shall be referred to the United States Railroad Labor Board for review.

"(c)—In agreeing to submit questions of seniority as provided above to the United States Railroad Labor Board for review, it is understood that neither the railroads nor their employees shall be deprived of the right of review by the courts of such decisions if they affect agreements in existence between any railroad and its employees."

At the meeting in New York on August 11 the President's proposal of August 7 was referred to a committee consisting of R. S. Lovett, W. R. Cole, Hale Holden, W. W. Atterbury, C. H. Markham, A. H. Smith, and Julius Kruttschnitt, which brought in two reports which were then debated at length in the general meeting. The vote in favor of the majority report was 191 to 79 (each road having one vote and additional votes being accorded on a mileage basis), while the vote on the minority report was 77 to 192.

The roads voting for the majority report were:

Ann Arbor.
Atchison, Topeka & Santa Fe.
Gulf, Colorado & Santa Fe.
Baltimore & Ohio.
Buffalo, Rochester & Pittsburgh.
Central of Georgia.
Chesapeake & Ohio Lines.
Chicago & Northwestern.
Chicago, Burlington & Quincy.
Colorado & Southern.
Chicago & Western Indiana.
Chicago Great Western.
Chicago, Indianapolis & Louisville.
Chicago, Milwaukee & St. Paul.
Chicago, Rock Island & Pacific.
Chicago, Rock Island & Gulf.
Chicago, St. Paul, Minneapolis & Omaha.
Cumberland & Pennsylvania.
Duluth, South Shore & Atlantic.
El Paso & Southwestern.
Erie.
Grand Trunk System—Lines in U. S.
Grand Trunk Western.
Great Northern.
Hocking Valley.
Illinois Central.
Lake Erie & Western.
Lehigh & New England.
Minneapolis & St. Louis.
Minneapolis, St. Paul & S. S. Marie.
New Orleans Great Northern.
New York Central Lines.
C. C. C. & St. Louis.
Michigan Central.
New York Central—inc. Boston & Albany.
Pittsburgh & Lake Erie.
New York, Chicago & St. Louis.
New York, Ontario & Western.
Norfolk & Western.
Norfolk Southern.
Northern Pacific.
Northwestern Pacific.
Philadelphia & Reading.
Rutland.
St. Louis-San Francisco.
San Antonio & Aransas Pass.
Seaboard Air Line.
Southern Pacific Company.
Southern Pacific Lines in Texas and Louisiana.
Ulster & Delaware.
Union Pacific.
Oregon Short Line.
Oregon-Washington R. R. & Navigation Co.
Virginian.
Western Pacific.
Wheeling & Lake Erie.
Trinity & Brazos Valley.

The roads voting for the minority report were:

Atlanta & West Point.
Western Railway of Alabama.
Atlantic Coast Line.
Boston & Maine.
Central of New Jersey.
Chicago & Eastern Illinois.
Chicago & Western Indiana.
Chicago Great Western.
Cincinnati, Indianapolis & Western.
Delaware & Hudson Company.
Delaware, Lackawanna & Western.
Denver & Salt Lake.
Florida East Coast.
Gulf Coast Lines.
Gulf, Mobile & Northern.
Kansas City Southern.
Lehigh Valley.
Long Island.
Louisville & Nashville.
Midland Valley.
Missouri, Kansas & Texas.
M. K. & T. of Texas.
Wichita Falls & Northwestern.

Missouri Pacific.
Nashville, Chattanooga & St. Louis
New York, New Haven & Hartford
Pennsylvania System.
Pere Marquette.
Richmond, Fredericksburg & Potomac
Texas & Pacific.
Wabash

Committee Takes Report to President

A committee consisting of Mr. Cuyler as chairman and Howard Elliott, W. L. Mapother, Hale Holden, W. W. Atterbury, C. H. Markham, A. H. Smith, and Julius Kruttschnitt was then appointed to take the report to the President not only for the purpose of submitting it but also in order to have such conference as the President might think desirable. In presenting these resolutions it was pointed out that the majority vote of members of the Association of Railway Executives cannot bind the minority and that the different positions taken by different roads represents differences in the equities of their situations without sacrifice of principle. Many of the roads felt that with the large increase in business in sight and the accumulation of maintenance work on cars and locomotives even before the strike they could readily make use of a greater number of men than they had in service when the strike was called, while the roads that voted for the minority report have taken on so many new men and have given such definite assurances of employment to those who prove competent as to be unable to agree unreservedly to the President's proposal.

Shopmen's Case in Hands of Brotherhoods

After the reply of the railway executives had been made public Sunday afternoon and it had been stated that the President had given permission for the release of the reply of the organizations on strike and the letter from the non-striking organizations, newspaper men were told that copies were ready and that they would be given out by E. J. Manion as soon as word had been received from Mr. Stone. Mr. Stone and the other brotherhood executives were then holding a meeting of their own. Early in the evening Mr. Sheppard, Mr. Doak and Mr. Robertson, without Mr. Stone, joined some of the other labor leaders and after a consultation Mr. Sheppard informed the waiting newspaper men that it had been decided not to give out the statements made to the President. Although Mr. Stone is chairman of the labor leaders' committee and Mr. Manion secretary, Mr. Sheppard apparently was elected as the official spokesman.

"We don't know just where we are at," he said. "We are awaiting developments and don't want to say or do anything to embarrass either side. We are hoping to find some way to help the situation. Whether we can or not is problematical. We will stay here at least until Congress convenes or if the President wants to see us. We will keep the same committee here and as soon as we can make a statement that will help will make it."

Mr. Sheppard said that the railroads have worked the seniority issue "overtime." "It is only one of several fundamentals applying to men who are on strike," he said. "The real issue as we see it is the status of men on strike. We hold that they are not dismissed from service, they have not resigned, they are awaiting the settlement of their difficulties and all their rights as employees are merely suspended so to speak, contingent upon whether they go back. This applies to their right to strike, pension rights, insurance rights and seniority. Seniority is only one of the rights involved. In all disputes in years gone by we have usually gone back with all our rights by agreement and we see no reason why the policy of the companies should be changed this time. I am merely expressing one of the fundamental principles of labor organizations, the rights of those temporarily declining to give service."

Mr. Sheppard denied that the non-striking organizations had proposed arbitration of the seniority question but declined to state who had proposed it. He said they had been asked about it but considered it unwise to arbitrate the rights of men on strike.

Mr. Sheppard said "the shopmen's case is in our hands and we are not taking any chance of closing the door to negotiations. If the President wants to see us we are at his service." He said the labor leaders had been notified by Secretary Hoover that the railway executives had left the city.

On Monday the railroad labor leaders held a meeting lasting nearly all day and Mr. Sheppard and Mr. Doak called on Secretary of Labor Davis who arranged another conference with the President for five o'clock. They were with the President for about two hours and Mr. Sheppard announced afterward that he was hopeful a meeting with some of the railroad executives "not so tenacious as the others" and who might see the "fundamental rights of men on strike" are involved rather than the question of seniority, could be arranged. Mr. Stone also had a conference Monday with President Willard of the Baltimore & Ohio and on Tuesday he announced that the labor leaders had asked Mr. Cuyler for another conference with the executives.

It is understood that the labor leaders appealed to the President to use his influence to bring about another conference with the railroad executives but that he was not favorable to the proposal that he take any further action in the capacity of a mediator. He is said to have approved of the spirit shown by the railroads and to have taken the position that he cannot fairly ask any further modification of their position.

Mr. Stone asked that a special committee be appointed to meet with the executives of the five organizations of transportation employees to consider an adjustment of the shop strike controversy at New York on Thursday. Later it was announced that Mr. Cuyler had agreed to a conference. The account of the meeting will be found on another page of the present issue.

Shop Crafts Reject Proposal

The reply of the shop crafts to the President's proposal was finally given out on Tuesday, as follows:

"We are in receipt of your telegram of August 7, referring to your message to us of July 31, and our reply of August 2.

"In your telegram of August 7, you request that striking railroad employees return to work and leave to the decision of the Railroad Labor Board, after they have returned to work, the question of seniority as covered in the third paragraph of your telegram of July 31.

"This request has been fully considered by the Executive Council of the Railway Employees Department who represent the railway employees affected, and you are hereby advised that the proposal contained in your telegram of August 7, has been unanimously declined for, among others, the following reasons:

"1. On July 31, you submitted to the representatives of the railroad employees in question and to the railway managers 'the terms of agreement upon which the railway managers and united shop craft workers are to unite preliminary to calling off the existing strike.'

"Your terms of agreement above referred to were accepted by the representatives of the employees. On the seniority question your terms of agreement were, 'all employees now on strike to be returned to work to their former positions with seniority and other rights unimpaired. The representatives of the carriers and the representatives of the employees. On the seniority question there will be no discrimination by either party against the employees who did or did not strike.' This clearly provides that the seniority question was to be settled before the employees returned to work. Your proposal of August 7, is that it be agreed to, or rather disposed of, only after they have returned to work.

"This strike cannot be, and no other railroad strike has been settled until it was agreed that all employees on strike are to be returned to work and to their former positions with seniority and other rights unimpaired.

"2. Seniority was not and is not now, by right, an issue or a dispute in this strike. The authors of the Transportation Act have, on many occasions, stated that there is no penalty in the Transportation Act against employees who strike when an in-

justice is done through a decision of the Railroad Labor Board. Admittedly they have the right to strike and, therefore, they do not forfeit their standing as railroad employees because they strike. Any other construction of the law would read into the Transportation Act a penalty which is not contained therein.

"3. On August 2, we acquiesced in the terms of agreement which you declared to be just, fair and reasonable, and we are willing now, in the interest of all concerned to settle the strike in accordance with the terms of that agreement. We are, of course, unable to understand why, after we had accepted your own terms of agreement, you should now request us to accept a proposal which is directly in conflict with your former proposed agreement.

"4. Your latest proposal is impracticable and would create a chaotic condition because of the undetermined seniority status of the employees.

"Railroad employees are ever mindful of the public interest. They have accepted your own terms of agreement, which called for no sacrifice on the part of the railroad executives, but which did require that the employees make a concession of practically every issue which brought about the strike. We have repeatedly called attention to the fact that the campaign against the organized railroad employees was a part of the general "open shop" drive, and if press statements are correct, the managers of some of the railroads the last few days have frankly admitted that they do not desire at this time to settle the strike, but hope to be permitted to continue their efforts to disintegrate the organizations of railroad employees."

This was accompanied by the following statement:

"The Association of Railway Executives have again, in their letter of August 11, declined to accept the President's proposition of August 7. They have not even agreed to permit all employees now on strike to return to work.

"The railroad managements apparently intend to be the court, judge and jury for the trial and conviction of those employees whom they do not intend shall return to work."

The Fundamental Issue

The calling in of the executives of the unions not on strike has served to emphasize the fundamental issue which has developed out of the strike as to the status of employees on strike, the labor organizations adhering to the position that men on strike are still employees who are "temporarily refraining from rendering service" and whose rights are only held in suspense, while the railroads are emphasizing the repeated decisions and warnings of the Labor Board that an organization on strike has forfeited its rights and that the loyal and the new employees are the only present employees of the railroads. They insist that if the authority of the Labor Board is to be maintained it must be established that men who defy its decisions are liable to the penalty of loss of their seniority rights; otherwise the public has no more protection against strikes than it had before the Labor Board was established.

In this connection the railroads point to Decision No. 299 (Docket 845) of the U. S. Labor Board of October 29, 1921, in which it said:

"The Board further points out for the consideration of employees interested that when such action does result in a strike, the organization so acting has forfeited its rights and the rights of its members in and to the provisions and benefits of all contracts theretofore existing, and the employees so striking have voluntarily removed themselves from the classes entitled to appeal to this board for relief and protection."

The same idea was repeated in the resolutions adopted by the board on July 3, and Chairman Hooper had later issued a statement, while the roads were still giving their men an opportunity to return warning that if their places were taken the new employees would acquire seniority rights that the board could not ignore. The railroad executives in talking with the President took the position that the only way to put a stop to the constant recurrence of strikes and threats of strikes, is to provide some penalty for striking and that if they should yield to pressure and purchase peace by an unwise compromise the temptation for the organizations to strike at any time they feel dissatisfied with decisions of the board would still remain. They also explained that the roads as a whole now have approximately half of a normal shop force working overtime and that reports of the condition of equipment circulated by the labor leaders are greatly exaggerated. They pointed to the improvement in coal loading and the large volume of traffic being handled by the railroads in spite of the strike as evidence that in general the public is not suffering as a result of the efforts of the declination of the railroads to surrender.

Prompt Action in Santa Fe Case

The administration acted rather promptly to deal with the new condition created by "sporadic" strikes of train and engine employees who left their trains at places where they could cause the most inconvenience on the pretext that they were afraid of armed guards. The Attorney General took the position that this action of the train employees strongly savored of conspiracy. That "no strike anywhere or of any character can prevent the government from authorizing the agencies of law and order to protect life and property," was the official statement given out at the White House on Friday in response to questions as to the attitude of the government toward strikes against the use of armed guards, and on Saturday, after a conference with the President, Attorney General Daugherty wired to the United States attorney at Los Angeles as follows:

"Report to United States district judge any violation of injunctions and institute proper proceedings to hold violators for contempt. Investigate quickly and ascertain if abandonment of trains was result of conspiracies, by those operating them or others, to interfere with interstate commerce and handling of the mails. If proof sufficient, present matter to grand jury immediately. If grand jury not in session, present to court the necessity of calling special grand jury. Department will give you all necessary support and assistance. The interference with and abandonment of trains strongly indicates the existence of a conspiracy and the government will take all necessary steps to prevent its continuation or like conspiracies elsewhere. Advise me of results."

"It has been reported to this department from certain places, especially southern California and Arizona, on the Santa Fe system," said Mr. Daugherty in announcing this action, "that trains have been and are being abandoned by trainmen and employees. It has occurred at places most inconvenient (Needles, Calif., for instance), and not only results in interference with and obstruction to interstate commerce and the transportation of the mails, but in great suffering and distress among men, women and children who are passengers."

On Monday the telegram was duplicated to the district attorneys for the districts of Northern California, New Mexico and Arizona.

President Harding on Sunday sent a telegram to Governor Campbell of Arizona regarding the marooning of Santa Fe passenger trains at junction points in that state because of their abandonment by their crews, saying: "It is the obligation of the government to relieve the people who are thus shamefully subjected to hardships" and "If you have not the facilities for the relief which I know you will gladly bestow, then army forces at the command of the federal government will be promptly ordered to your assistance. Kindly advise whether such assistance is needed."

Possible Amending of Transportation Act Considered

On Tuesday afternoon the President conferred with Secretary Hoover, Chairman Hooper of the Labor Board, who has been in Washington since Friday discussing possible amendments to the labor provisions of the Transportation Act, and Chairman McChord and Commissioner Aitchison of the Interstate Commerce Commission. Chairman McChord is in direct charge of the commission's bureaus of safety and of locomotive inspection and was in a position to

discuss the condition of equipment as the result of reports of the commission's inspectors and Commissioner Aitchison is particularly in charge of car service matters. The commission is preparing a report in response to the Senate resolution calling for information regarding the enforcement of the locomotive inspection act, with the expectation of submitting it by August 25.

I. C. C. Advises of Progressive Locomotive Deterioration

After the conference the following correspondence between Chairman McChord and the President was given out:

"Dear Mr. President: In the administration and enforcement of the locomotive inspection and related safety appliance acts of Congress the commission has observed with concern the progressive deterioration of motive power upon certain of the important carriers of the country since July 1, 1922, and during the present strike.

"The effect of deferred repairs is cumulative and becomes increasingly felt as time goes on. The acts which we are called upon to administer leave little discretion with the commission as to enforcement when violations come to light.

"In the continuance of our enforcement of the law we are taking steps and will be compelled to continue to proceed in a manner which must bring about serious withdrawals of motive power from service. Certain violations of the acts we report to the Attorney General for appropriate legal action. With a continuance of existing conditions these will be increasingly frequent.

"Knowing your interest in the matter we felt you should be advised of the facts. Faithfully yours, C. C. McCHORD, Chairman."

"My Dear Chairman McChord: I have yours of even date, in which you call to my attention the progressive deterioration of motive power upon some of the important railroad lines of the country as the outgrowth of the prevailing strike. This growing menace to maintained transportation has been called to my attention unofficially in various ways. Under all the circumstances I know of nothing to be done except to insist upon the full enforcement of the law.

"It is a very natural thing under circumstances which exist at the present moment to waive the exactions in behalf of safety in seeking to maintain transportation. In my judgment it is better to have the service diminished rather than attempt the movement of trains on which safety is not assured so far as compliance with the law may provide it.

"I trust that your inspection forces will exert themselves to the utmost in order to be able to pass upon safe equipment, because the official sanction of the government will remove all questions of dispute. Very truly yours, WARREN G. HARDING."

Senator Cummins is reported to have prepared a more or less tentative draft of a bill to give the President full authority to take over the railroads, or any of them, if he should deem the emergency sufficient to require such action. The Senator has denied that he has been requested by the President to draft such a bill, but he admits that he has given some consideration to the form of a bill.

Train Service Men Abandon Trains in Desert Towns

The sporadic strikes of members of the train service brotherhoods at various points have been the outstanding development in the strike situation in the west during the past week. Accompanying this development, though not necessarily a part of it, has come another wave of violence composed not only of intimidation and attacks directed at individual workers, but at railroad property and in many cases at trains and other facilities being used by the public. Thus while the larger moves in the three-cornered controversy are being directed and are centered in Washington, the west, particularly the states of California, Missouri, Illinois and Arizona, is furnishing the ammunition for employees, employers and the government alike in presenting their positions to each other and to the public.

The cue for the strikes of discontented train service employees was found in the approval by the national leaders of the brotherhoods of the walkout on the Elgin, Joliet & Eastern at Joliet, Ill. The trouble at that point was briefly described in last week's issue of the *Railway Age*. The train service employees refused to work until state troops, stationed there following serious rioting a few days previous, were withdrawn. Approval of their action was received from the national officers of some organizations involved on August 10. At the same time telegrams were sent to members of some of the "Big Four" brotherhoods at points where walk-outs seemed to be impending, stating that "the men will not be required or requested to work" unless conditions against which they protest are remedied. The result of this action was to place the matter in the hands of the local organizations and it was only a matter of hours until reports began to be made of the refusal of these employees to operate trains in various sections of the west. By coincidence perhaps these reports all concerned train service employees of large roads which have largely overcome the difficulties accompanying the shopmen's strike and at strategic points where the refusal to operate trains would have far reaching effect.

The first reports of trouble of this kind relate to the Atchison, Topeka & Santa Fe, the train service employees of that road operating in and around Needles, Cal., announcing their refusal to continue work until armed guards were withdrawn from the railroad property at that point. Another report involved the same road at Bakersfield, Cal., and within a few hours several trains on the Arizona division of that road were tied up. Similarly Fresno, and Barstow, Cal., and Seligman, Ariz., and several other points were involved in later reports on the same day.

Train Service Employees Abandon Trains in Desert Towns

The most serious consequences of this action on the part of the brotherhood came from the abandonment of passenger trains at desert towns, giving the passengers on these trains no opportunity to prepare for the situation or to escape from the intense heat. Approximately twelve transcontinental trains were stalled at various desert points in the west either through the refusal of employees to operate the trains or a similar refusal at other points, which resulted in an inability to move the trains involved any farther. By August 11 east bound passenger service on the Santa Fe had been tied up, and General Manager I. L. Hibbard announced that no through trains would leave Los Angeles until the trouble on the Arizona division centering at Needles had been cleared up.

Rescue trains, manned largely by railroad officers, immediately began the task of moving several thousand passengers to points of less discomfort, the Santa Fe removing practically all of the passengers marooned at Needles on August 13. On August 15 General Manager Hibbard reported that 19 west bound trains with approximately 1,700 passengers were being held up. Of these passengers 297 were at Seligman, Ariz.; 188 at Williams, Ariz.; 236 at Ash Fork, Ariz., and about 1,000 at Albuquerque and Belen, N. M.

Santa Fe Issues Ultimatum to Brotherhood Leaders

On August 15, A. G. Wells, vice-president of the Santa Fe, in a telegram addressed to the leaders of the train service brotherhoods, warned them that if they could not get their men back to work the company might be forced to accept "the only alternative left it in its duty to the public and engage men to fill the places of those on strike."

After noting the threatened spread of the "sympathetic and

illegal" strike of the brotherhood members in northern California, the message says:

"At 7 o'clock last night our superintendent at Winslow, Ariz., was handed the following:

"'Effective 8 p. m., Aug. 13, owing to the general unsafe conditions of equipment and improper brake inspections of trains, of which we have sufficient individual protests on file and copies sent to our general chairmen, we deem it necessary to withdraw our services from the A., T. & S. F. Railway at this point until equipment is placed in a safe condition and competent men placed on inspection of trains satisfactory to the following general grievance committee of the coast lines, B. of L. F. & E., B. of L. E., O. R. C., and B. of R. T. and all men returned to work with full seniority rights.'

"It will be noted that in this ultimatum no reference is made to the objection to guards, which was the main cause of complaint in the Needles environment, but a new element in introduced, that of competent men to be employed for inspection of trains, which has no more foundation in fact than the claim of unsafe engines.

"Your attention is called to the language of the ultimatum delivered at Winslow and above quoted. It stipulates that certain conditions must be met satisfactorily to the general grievance committee of the Big Four. This warrants the deduction that the committee at Winslow is acting under the direction of the general chairmen and certainly constitutes an unwarranted and sympathetic strike approved by the four organizations in flagrant violation of your constituent obligations under the existing agreements between this company and its train and engine service employees.

"I ask you each to declare whether you will immediately order, and require compliance with your order, that they shall return to work and perform their accustomed duties, advising them that failure to comply will result in your co-operating with the company to supply men to take the places which they have vacated, or shall the company proceed at once to accept only alternative left it in its duty to the public and engage services of men to fill the places of those on strike? I desire an explicit answer on the point from you today."

Reports from the west on the same day indicated that steps would be taken to operate passenger trains through the districts affected by the train service strike, and also that practically all of the trains marooned at desert points were moving, in many cases through the efforts of company officers.

The result of Mr. Wells' telegram was the forwarding of telegrams to the leaders of the local organizations involved in the walkouts on the Santa Fe advising them that they should perform their duties as usual and that their action in striking was illegal.

Strike Fever Spreads

The strike fever spread very rapidly in the western territory after the first outbreak on the Santa Fe. Within three days walkouts were either called or threatened on the Union Pacific at Caliente and Las Vegas, Nev.; on the Western Pacific at Stockton, Oakland and Oroville, Cal.; on the Santa Fe at Prescott and Winslow, Ariz.; and Albuquerque and Raton, New Mex.; on the Missouri Pacific at Pueblo, Colo.; the Illinois Central at Memphis, Tenn.; the Wabash at Moberly, Mo.; the Louisville & Nashville at Evansville, Ind., Madisonville and Atkinson Junction, Ky., and on the Southern Pacific, Oregon Short Line, Union Pacific and Denver & Rio Grande at Ogden, Utah. At some of these points the strikes were of but a few days' duration. The engineers and firemen at Moberly, Mo., for instance returned to work on August 11 and the train service men on strike at San Bernardino returned on August 14.

The effect of these strikes was in practically all cases to tie up the divisions on which they occurred temporarily. The latest reports indicate that the most serious effect of these moves has been the discomfort and inconvenience caused to the passengers who were marooned in desert towns for several days.

The action of the national leaders of the four train service brotherhoods in regard to these sporadic strikes has again disclosed the difference of opinions which played such a large part in ending the threatened nation-wide strike of train service employees last October. Whereas the heads of the engineers' and firemen's organizations have openly approved the action of various local organizations in refusing to work, W. G. Lee, head of the Trainmen's Brotherhood has endeavored to hold his men in line, directing them to abide by their schedules with the individual railroads, instructing the local officers of the organization to do everything possible to avert a strike, and demanding conformity with the union's laws for calling strikes.

The wave of violence which came during the past week was not confined to any one point or locality but seemed to be widespread. Every day new reports of slugging, killing, rioting and bombing at many points were circulated. At San Bernardino, Cal., for instance, 23 bombs were exploded at intervals on the morning of August 11, within 200 ft. of the Atchison, Topeka & Santa Fe roundhouse at that point. No one was injured in these explosions and the property damage was comparatively light. Similarly five bombs were exploded on August 12 in the yards of the Southern Pacific at Roseville, Cal., the bombing being followed by an exchange of shots between company guards and men supposed to be strikers or strike sympathizers. On August 13 the St. Louis-San Francisco bridge over the Sac river near Ash Grove, Mo., was dynamited and at Wichita Falls, Tex., the car shops of the Wichita Falls & Northwestern were destroyed by a fire of unknown origin, destroying three locomotives as well as a number of cars. Many other instances of violence on the part of strikers or their sympathizers similar to those described here were reported during the past week. In fact, these reports have become so numerous that it is not possible to verify all of them in time for this issue of the *Railway Age*.

By August 15, traffic had been partially resumed on the transcontinental roads affected by the sporadic strikes of the train service employees and the wave of violence noted above had greatly declined.

Continued Improvement in East

Following a meeting of the Eastern Presidents' Conference on Tuesday, Chairman L. F. Loree, president of the Delaware & Hudson, issued a statement in which he said that:

"As against 103,528 shopmen working on the Eastern railways on August 4, there were working on August 11, 111,324, an increase during the week of 7,796 men. This raises the percentage of the force working to the normal force from 64.7 per cent on August 4 to 69 per cent on August 11.

"When due allowance is made for the men who remained loyal or have since returned to work, it is safe to say that in the Eastern region there are now more men on the companies' payrolls in the six shop crafts than there are out of service on strike."

The general strike situation on the roads in the east during the past week has continued the gradual improvement which has now been going on for the past few weeks. Developments have been very much subordinated to the greater interest in the more general developments at Washington and to the interest surrounding the abandonment of trains by the train service employees in the west. In the east some cases of violence continue to be reported, the outstanding instance of which was an attempt made by strike sympathizers, it is believed, to dynamite a train on the West Shore. Service continues normal except for minor delays in freight service, the causes of which are explained as being possibly due as much to difficulties of fuel supply, to congestion naturally resulting from the heavy traffic movement as to the strike itself.

In the Pocahontas district, the Chesapeake & Ohio, the Norfolk & Western and the Virginian report a rapid improvement from the serious condition they were in two or three weeks ago. In this improvement they have been as-

sisted by the shopmen sent to them by roads' recruiting men in the northeastern industrial centers. The improvement is indicated by increased loadings of coal. The volume of non-union coal moving, however, has not yet approached the high figures reached in June before the beginning of the shopmen's strike. In the south, the Southern Railway, which at first did not attempt to fill the places of its shop strikers, has now announced that it will employ other men, a statement to that effect having been issued on Monday.

Railways Deny Equipment Deterioration

The condition of cars and locomotives continues to be a leading subject of discussion between the railways and the publicity men of the shop crafts unions. The New York Central on Friday drew attention to a statement of the New York Public Service Commission at Albany, in which Charles H Vanneman, chief engineer of the commission, was quoted as follows:

"Since the first of July we have had our inspectors at the Union Station (Albany) and they have been making daily verbal reports concerning the condition of locomotives. These reports are growing much better daily. Where our inspectors have found defects they have reported them to the officials of the railroad who in turn have directed the force of mechanics kept on duty at the Union Station to make the repairs. Where this has not been possible the engine has been taken out of service and another substituted.

"Several defects have been found which would not otherwise have been noted. These defects have been remedied wherever possible where this could be accomplished without serious delay to the trains. If the repairs could be made without sending the locomotive to the shops, this course has been followed."

The Pennsylvania on Tuesday announced that in the preceding week it had made more progress in the repair of freight cars than in any week since the shopmen's strike. "The car repair situation on the Pennsylvania System is practically normal," the statement said. Continuing, it said:

A report just compiled by the motive power department of the Pennsylvania System shows that during the last week 215 more cars were repaired than were sent to the shops for repairs in that period. The number of cars shopped during the week was 16,302. The number of cars repaired and turned out for service was 16,517

In comparison with the previous week, 1,170 more cars were taken in hand for repairs, and the number of cars actually repaired was 1,418 more than the number repaired the week before.

The explanation for this improvement is in the fact that more than 48,200 shopmen out of a normal force of 60,157 are now actually at work on the Pennsylvania System.

Southern Decides to Fill Strikers' Places

Fairfax Harrison, president of the Southern Railway, which has heretofore refrained from attempting to replace its striking shop employees and which offered to make a settlement on the basis of the President's original proposal to take back the men with seniority unimpaired, issued a statement on Monday announcing the intention of the company to employ others. He said that "if it means war to run the Southern Railway, let us have it now." Mr. Harrison's statement follows:

"Every effort has been made so to operate our property that our men could honorably return to work. Every effort has been made to settle with our men; we have gone to the extent of offering the terms that they had previously agreed to accept. We have thus held out every reasonable inducement, without result.

"We must now turn to employing others, for the road must be run; we must give those we employ protection, for it may be that those we have to this time protected by keeping their jobs open, may now turn against us, even to an attempt to prevent others from working.

"Call is now being made upon every employee, upon every patron of this company, and upon every citizen along its lines, to rally to the support of the road that has served you and protect your own interests in the maintenance of transportation. With your help we can run the road, and we pledge all the resources of the company to that end. If it means war to run the Southern Railway, then let us have it now—not later."

Bomb Outrage Near New York

On Sunday night, August 13, about 10 o'clock, a southbound suburban passenger train of the West Shore division of the New York Central was damaged by an explosion at a point five miles north of Weehawken, N. J., and 20 or more passengers were injured, five of them being sent to a hospital. The train was moving at full speed and it was believed that three or more dynamite bombs were thrown against the sides of the coaches. The injuries were mostly cuts made by broken glass. A bridge which carries the New York Central over the northern division of the Erie was slightly damaged. The scene of the explosion is near a car repair shop of the New York Central.

Canadian Wage Reduction Suspended

The Canadian railways, following conferences early in the month ordered a general reduction in the wages of their shopmen to go into effect on August 15, although the employees, said to number 37,000, had threatened to strike if the reduction should be ordered before the Board of Conciliation had approved the new rates. Premier King had notified the roads that he indorsed the opinions of the Departments of Labor and Justice that the reductions cannot be enforced until the Conciliation Board acts; and on the evening of the 15th it was announced that the presidents of the Canadian National, the Grand Trunk and the Canadian Pacific had telegraphed Premier King that the cut would be rescinded and the men would be paid at their old rate. The view of the government is that a reduction of pay is a "condition affecting employment" which, under the Act of 1907 regulating industrial disputes, cannot be changed except on 30 days' notice and opportunity for governmental investigation.

TWELVE MILLION PERSONS used the Southern Pacific ferries across San Francisco Bay in six months ending June 30 last. On one day during the Shriners' convention 120,000 passengers were carried.

International Newsreel Phot.

A Group of Brotherhood Officials Leaving the White House on August 12

The Status of Railroad Electrification*

The Railroad Man's Position Is Presented to the Electrical Engineers by One of Them

By Calvert Townley
Westinghouse Electric & Manufacturing Company

When we electrical engineers have discussed railroad transportation we have always done it from the standpoint of proving how desirable it is for the steam railroads to electrify, and when we have invited our steam railroad friends to participate in our discussions, they usually refrain from courtesy or some other reason from telling us absolutely and entirely what they think of us. It has therefore occurred to me that it might be worth while for an electrical man to say a few words about the railroad man's natural objections to electrification and to give some of the reasons why he is not always willing to fall upon our necks and welcome us as saviors.

Having enjoyed for many years an association with the big railroad system which serves this community, I have had an opportunity to learn something of the railroad man's point of view from the inside.

Electrification Expensive

In the first place, electrification is very expensive. It involves not a small but a tremendous addition to the investment per mile, with the consequent difficulties not only of earning the additional interest charges thereby involved, but also those of financing—of raising the money. These are by no means minor objections. The day has gone by when the management of a railroad property can have a free hand in issuing securities. Through their various governmental agencies the public has established a strict supervision over railroad earnings, is reluctant to permit the capitalization of values created by earning power and is prone to regard railroad securities as having so stable a value that their yield must be limited to a minimum annual interest with little opportunity for the stockholders of the road to obtain large profits from courage and initiative; that is to say, stated in another way if a railroad by far-sighted and wise expenditures should be able to earn a rate of return such as is freely permitted and often applauded in private industry, such as for example as 15 per cent to 20 per cent per annum, it is most probable that this additional yield would be shortly taken away from it by a forced reduction in its rates. I am one of those who believe this public policy is founded on a misconception; is in fact practically an economic crime, because I think it is obvious that if a dollar invested in a railroad is not permitted as good a chance as one invested in a shoe factory or a flour mill, that dollar will tend to go into the factory or mill and not into the railroad, with the consequent hampering of that continued improvement and expansion of our transportation facilities so necessary to progress. I cannot escape what seems to me to be the obvious logic that if it be equitable for the public to prescribe a maximum rate of return on a railroad or any other investment, it should, as a necessary corollary, guarantee the same investment not less than a minimum return. However, our public policy has been pretty firmly established by now so that what I think about it is of only academic interest.

The art of estimating in advance the cost of new construction, no matter if practiced by the most competent engineers, has never reached or even approached perfection, therefore, where such large expenditures as those necessitated by electrification are contemplated it is always possible due to this fact and due to unforeseen contingent expenses that the estimated costs will be considerably exceeded. A combination of this contingency with the knowledge that should greatly increased profits result, the road may be deprived of them through the medium of rate reductions, may well cause the responsible executives to go slowly.

Departmentalization

Long experience has demonstrated the necessity and established the practice of well-defined and rather rigidly restricted departmentalization of railroad construction and operation; that is to say, the construction, operation, traffic and financing are each in charge of a responsible official who concentrates his attention each on his own department and who is most punctilious in keeping out of every other sphere. This practice results of course in a high degree of efficiency in the conduct of each department and is obviously dictated by a wise policy. However, it has the disadvantage of dividing the responsibility for general results and makes for a tendency to put departmental success ahead of general prosperity.

Substitutes an Unlimited Motive Power

Electrification upsets some of the fundamentals around which steam railroad practice has been built up, namely, it practically substitutes an unlimited for a limited motive power. This fact is well known to us all but it is so fundamental and so far-reaching in effect that it will bear restating and emphasizing many times. I refer of course to the fact that a steam locomotive which carries along its own boiler and is therefore in fact its own power house, is limited in the tractive effort it can exert by the steam which can be generated by that boiler, whereas the electric locomotive being only a translating device can call upon the entire capacity of all the power houses connected to the system. On account, therefore, of the large excess in such power house capacity over any possible demands of an individual train, on account also of the characteristic of electric motors to continue to exert more and more power, even to the point of self-destruction, and further on account of the possibility of operating two or more electric locomotives together in absolute synchronism with one crew and the consequent possibility of getting any desired weight on the drivers, there is practically no limit to the amount of tractive effort that may be utilized for any one train.

The consequences resulting from these facts are rather startling, for example, the long-established and accepted practice of calling two per cent the maximum grade over which a desired schedule may be made goes into the discard and much steeper grades become entirely practicable, likewise the tonnage and speed of freight trains previously limited by the power of a steam locomotive to pull is no longer so limited. Freight trains may be as long as the structural strength of the freight cars will permit or as may be handled in the yards and on the sidings. Schedule speeds may be increased to any point considered safe for the track and equipment, being no longer limited by the steaming power of the locomotive. Instead of accelerating from a standstill at the rate of one-quarter of a mile per hour per second as

*Address delivered before the Connecticut Section of the American Institute of Electrical Engineers, May 23, 1922.

is common steam locomotive practice, passenger trains may be accelerated at the rate of from one mile to one and one-half miles per hour per second.

We have always considered the above fundamental change as offering a wonderful opportunity for the improvement of traffic and they do offer such improvement but to get all the possible benefits requires the co-operative effort of the construction, operating and the traffic departments. It disturbs the existing order to a very considerable extent and redistributes the proportionate burden of expense among the different departments concerned so that any departmental head may be faced with the necessity of taking on some additional burden in his own department without any compensating advantage, i.e., the advantage goes to another department. In view of the well-established relationship between departments above referred to, railroad executives cannot be blamed if they regard such innovations with skepticism and retain a considerable reluctance toward their adoption.

Labor

The relation between railroad management and railroad labor is a source of continued and great anxiety. Owing to the meddling (and I use the word "meddling" deliberately and advisedly) of federal and other outside agencies in what may be well-meaning but is certainly a misguided effort, there has grown up an inflexibility in both the duties and the pay of railroad labor unparalleled in any other industry. Changes in operating methods are very difficult. Now electrification immediately requires a lot of changes. Not only have the engine drivers all to be educated to a new art but the duties of the fireman are revolutionized. In fact, except as a source of insurance against the death or disability of the engineer while driving his engine, the fireman is not needed at all. A new type of man, the electrical lineman and the electrical shop man is required and where a railroad operates its own power houses the power house crews are introduced. The transmission lines overlap two or more divisions of the road and confuse the duties of the division superintendents. The signal system has to be revamped. These and other features all tend to upset the existing order of relationship between the management and its labor, and the official whose duty it is to regulate these relations may be forgiven if he contemplates with extreme alarm the task presented to him.

Many if not all of the bunkers which I have mentioned are present on every railroad and you will note are not removed, even if it is known that railroad electrification would be advantageous. On top of this come all the questions of the actual virtue of electrification itself. It is perfectly true and I think now very generally admitted that all electrifications heretofore made have been successful and that no road which has electrified would now consent to return to previous conditions.

However, not more than about one per cent of the entire steam railroad mileage of the United States has been electrified as yet and the average railroad executive may be excused if he looks upon the existing examples as special cases and therefore as proving nothing with respect to his own particular problem. For example, the New Haven and the New York Central had to electrify out of New York City because of a law passed by the State of New York. The Pennsylvania had to electrify out of New York City in order to operate its subway river tunnels. The Norfolk & Western had a peculiar restricted neck to its bottle in the Elkhorn grades which would justify almost any expense to remove. In a like manner some special reason can be found for almost every large electrification project. However, it is perfectly safe to say that the attitude of mind of the railroad man has materially changed so that the question always first asked some years ago, "Can it be done?" has now been replaced by the entirely different question, "Will it pay?"

As many of you know, I have been and still am a consistent and an enthusiastic advocate of steam road electrification. In reciting the different objections of which I have spoken I do not intend in any way to indicate a change of opinion or a weakening of confidence but rather because I think it helpful to us all when we can look at any situation from the other man's point of view and because I firmly believe we can do the cause of electrification no greater harm than to ignore plain facts and out of well meaning but mistaken zeal advocate electrification where we are not reasonably sure that it will be economically right.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING during the week ended August 5, the fifth week of the shop strike, showed another drop of 8,382 cars, as compared with the week before, to 851,351. This represented a reduction of about 26,000 cars as compared with the loading before the strike, but was an increase as compared with the corresponding week of 1921 of 65,173 cars and a reduction as compared with 1920 of

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, AUGUST 5

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year	Corresponding year 1921	Corresponding year 1920
Eastern	1922	11,506	2,668	8,728	1,423	5,284	5,834	65,518	95,562	196,523	.....	.....
	1921	9,574	2,569	39,190	905	4,419	2,255	55,259	74,111	.....	188,302	230,454
Alleghany	1922	3,993	2,561	18,452	4,128	3,005	12,772	50,277	77,685	172,873	.....	.....
	1921	3,389	2,116	42,540	2,224	2,097	7,068	43,859	49,589	.....	153,282	192,994
Pocahontas	1922	211	141	19,555	243	792	33	3,879	2,944	27,798	.....	.....
	1921	220	155	16,533	73	1,055	9	4,524	3,946	.....	26,515	37,334
Southern	1922	4,474	2,351	17,015	814	17,803	1,063	34,379	35,736	113,638	.....	.....
	1921	4,182	1,778	19,009	250	13,645	214	35,804	33,674	.....	108,547	127,446
Northwestern	1922	12,325	6,609	6,546	1,278	14,723	44,164	28,124	41,146	155,225	.....	.....
	1921	12,967	6,940	7,805	436	10,320	21,243	27,740	33,030	.....	120,491	158,995
Central Western	1922	19,268	9,461	5,719	373	7,120	1,966	32,474	49,095	125,476	.....	.....
	1921	21,552	9,058	16,709	232	5,852	736	30,678	40,589	.....	125,406	125,014
Southwestern	1922	6,735	2,713	3,231	183	7,161	336	14,336	25,073	59,818	.....	.....
	1921	7,558	2,896	4,318	228	6,017	759	15,600	26,259	.....	63,635	63,293
Total western dist.	1922	38,328	18,783	15,496	1,834	29,014	46,516	75,234	115,314	340,519	.....	.....
	1921	42,077	18,894	28,832	896	22,249	22,738	74,018	99,878	.....	309,532	347,302
Total, all roads	1922	58,512	26,507	79,246	8,442	55,898	66,218	279,287	327,241	851,351	.....	.....
	1921	59,442	25,919	146,095	4,348	41,435	32,284	213,464	261,198	.....	785,178	.....
	1920	37,144	26,204	198,725	13,370	61,170	76,880	198,071	314,162	.....	.....	935,730
Increase compared	1921	.....	595	.....	4,094	12,463	33,934	15,823	66,043	65,173	.....	.....
Decrease compared	1921	930	.....	66,849	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1920	21,368	303	.....	.....	.....	.....	31,216	3,079	.....	.....	.....
Decrease compared	1920	.....	.....	119,483	4,928	5,273	10,662	.....	.....	84,376	.....	.....
August 5	1922	58,512	26,507	79,246	8,442	55,898	66,218	279,287	327,241	851,351	786,178	935,730
July 29	1922	59,170	27,104	76,374	9,112	58,197	64,147	234,567	331,062	859,733	795,432	936,366
July 22	1922	57,566	27,455	76,060	9,949	58,512	64,417	239,510	327,655	861,124	785,034	928,418
July 15	1922	48,911	30,216	77,334	9,698	58,121	69,162	241,180	326,285	860,907	774,884	942,851
July 8	1922	35,267	21,847	68,996	9,665	44,736	55,729	210,140	271,939	718,319	640,535	796,191

Compiled by Car Service Division, American Railway Association.

84,379. Coal loading increased as compared with the week before to 79,246 cars, but with the exception of ore there was a decrease in all other classes of commodities. As compared with the corresponding week of last year there were increases in all classes of commodities except grain and grain products and coal, and in all districts except the Southwestern. Although there has been difficulty in handling all the coal offered for transportation in the Pocahontas district it is noteworthy that the loading both of coal and of other commodities was in excess of that of last year.

Despite the coal strike, reports filed by the railroads with the Car Service Division show an increase in July, compared with the same month last year, of 10.6 per cent in the number of cars loaded with all commodities. The total for July was 4,176,979 cars, compared with 3,774,964 cars during that month one year ago, or an increase of 402,015 cars. Compared with June, 1922, freight loading last month showed an increase of .05 per cent, the total for June being 4,156,396, but compared with July, 1920, a decrease of 7.1 per cent was reported.

Coal loading for the month of July totaled 393,512 cars, a decrease of 46.2 per cent compared with July one year ago, when the total was 731,615 cars, and a decrease of 59.5 per cent compared with July, 1920, when 971,968 cars were loaded. Compared with June, 1922, the total for July was a decrease of 14.8 per cent.

Loading of all commodities, other than coal, totaled 3,783,467 cars in July, an increase of 24.3 per cent over July, 1921, and an increase of 7.4 per cent over July, 1920. An increase of 2.4 per cent was also reported compared with June, 1922, when the total was 3,694,480 cars.

During the week ended July 29, loading of all commodities other than coal amounted to 98.9 per cent of the total for the week of October 15, 1920, when the largest number of cars were loaded with freight in the history of the railroads. In three out of the seven districts, however, the previous record was excelled. In the Eastern district, freight loading amounted to 102.1 per cent of the total for that district for the week of October 15, 1920, while in the Allegheny district it was 106.8 per cent. In the Central Western district loadings were 101.7 per cent. The Southern district reported total loading of 94 per cent of that for the week of October 15, two years ago, and the North Western district, 94.3 per cent. In the Southwestern district it was 93.8 per cent. Owing to a falling off in coal traffic, loading in the Pocahontas region was only 62.8 per cent of that for the record week two years ago.

The total car loading from January 1 to July 29 this year, 23,548,742 cars, was 8.5 per cent greater than the total for the corresponding period of last year, a year of depression, but was 6.7 per cent less than the total for 1920, the boom year. The loading for that period of 1920 was, however, approximately the same as for 1918. For 1921 the loading to July 29 was 21,684,806 and for 1920 it was 25,075,940.

The railroads during the week of July 29, the fourth week of the shop strike, placed a slightly smaller percentage of the cars required for coal loading than they did the week before, 71 per cent as against 72, but the requirements were larger and they actually loaded 4,166 cars, or 6.1 per cent more than they loaded in the week of July 22. While the railroads of the Allegheny, Northwestern and Central Western districts furnished more than 100 per cent of the cars required for bituminous loading, the roads of the Pocahontas district furnished only 40 per cent, the Southern district 47 per cent, the Eastern district 97 per cent, and the Southwestern district 99 per cent. The cars required for coal loading, including 508 for anthracite loading, were 142,811. The cars placed were 101,023, and the cars loaded were 71,931.

The Chesapeake & Ohio, in the week ended July 29, placed only 30 per cent of the coal cars required, the Norfolk & Western 55 per cent, the Virginian 37 per cent, and the Louisville & Nashville only 33 per cent. The actual loading on the Norfolk & Western, however, increased 1,959 cars over the preceding week.

These figures are taken from weekly bulletins published by the Car Service Division of the American Railway Association. Later figures published by the Geological Survey, based on reports furnished by the A. R. A., show a steady increase in coal production and loading for the three weeks ending August 12. For that week it is estimated that the production was about 4,800,000 tons. The drop in coal production began during the last week of June, before the shop strike, and was due largely to congestion on the roads serving the non-union coal mines. There was then a decline for four weeks to July 22, but the trend since then has been steadily upward.

The railroads also placed 86 per cent of the total number of open-top cars required, 278,609, against requirements of 323,352. They loaded 244,518, a decrease, in comparison with the week before, when they furnished 282,679, or 89 per cent of the requirements. The loadings for the previous week totalled 246,833. For limestone the roads furnished 95 per cent of the requirements, ore 100 per cent, iron and steel 98 per cent, sand, stone and gravel, 95 per cent, coke 100 per cent, and miscellaneous 95 per cent. The low percentage was attributable chiefly to the low performance of the railroads in the Pocahontas and Southern districts, 43 and 58 per cent, respectively.

Car shortages began assuming appreciable figures during the period July 23-31. The shortages in that week amounted to 24,973, as compared with 15,366 during the preceding week. The car surplus, during the same period, amounted to 174,927, a decrease of 28,395. The shortages included 16,550 box cars, and 6,633 coal cars. The surplus included 21,367 box cars and 131,267 coal cars. The principal shortage was in the Southern district, 11,426. The principal surplus was in the Eastern and Allegheny districts, 63,960 and 59,407.

Grain and grain products loading for the week of July 29 was 59,170 cars, the highest since the week of September 3, 1921, and the cumulative loading this year, to July 29, was in excess of any of the preceding years. While similar records were not maintained before 1918, according to the weekly bulletin issued by the Car Service Division of the American Railway Association, it is safe to say that the loading this year to date was the largest ever made.

International Newsreel Photo

Fighting the Fire in the New York Central Yards at the North River and 63rd Street, New York, on August 12.

How Should Grain Door Reclamation Be Handled?*

Railway Superintendents' Association Advocates Private Bureau Where Business Justifies

IT IS NOT PRACTICABLE to maintain a uniform method of gathering grain doors and of storing, re-using and shipping them back to owning lines because of differing conditions. For instance, in some cities the elevators and mills are close together and handle so much grain that the grain doors which are not re-used accumulate in sufficient quantities to justify their being shipped back to the owning roads in cars, whereas at other places the elevators and mills are scattered and a carload of grain doors will not accumulate in a year. At such places, if the grain doors are not reclaimed promptly they are chopped up or stolen and it may, therefore, pay, where these accumulations are small and scattered, to have an automobile truck collect the doors once a week or oftener.

The grain door problem is, therefore, one for local bureaus or committees to solve in view of the conditions met in each locality. In doing this, however, there are a number of considerations which any plan, to be most effective, must take into account, a statement which also applies with respect to the coopering of cars. One of these considerations is that of establishing the rules under which the reclamation and coopering of and payment for grain doors is to be performed. As an example of what should be covered by such rules and how they should be drawn up, the following rules of one city are submitted.

Rules Governing Reclamation and Coopering

1. The party of the second part shall reclaim all grain door materials belonging to the railway company from all cars unloaded at the various industries within the switching limits, and shall return the same to the railway company or shall use the same in coopering cars for said railway company. When such material shall be returned in a serviceable condition the railway company shall pay to the party of the second part 8¾ cents for grain doors 26 in. in height or less; 15¾ cents for grain doors over 26 in. in height, and 7½ cent per foot board measure for loose boards.

2.—The party of the second part further agrees to cooper all cars for the railway company, for loading bulk grain, sacked grain, seed and other similar commodities, at all industries in the switching limits; and, furnish all labor, tools, nails and burlap, and such other material as may be necessary to make said cars grain-tight, except lumber material, using burlap at the sides, ends, over king bolts and at door posts. The railway company shall furnish the necessary lumber material for coopering sides, ends and other parts of the car. The party of the second part shall receive $1 per car for cars loaded with bulk grain and other bulk commodities, and $0.40 per car for sacked grain seed, and other such commodities.

3.—The maximum price per car to be paid by the railway company to the party of the second part for coopering shall be $1.15 per car, and for both reclaiming of grain door material and coopering shall not exceed $2.05 per car. The party of the second part shall furnish all labor, tools, nails and such other equipment as may be necessary for the performance of the work contemplated by this agreement, except the grain door material as hereinbefore provided.

4.—The party of the second part shall present to the railway company on or about the first day of each month itemized bills showing the service, and the compensation therefor, during the preceding month. The railway company shall pay said bills on or before 20 days after the presentation of said bills.

5.—The railway company shall arrange with other railroad companies within the switching limits for the switching movement on cars containing door material returned under the provisions of this agreement, at the cost of the party of the second part. The party of the second part shall keep a correct record of all grain door material reclaimed, delivered to, or used for the railway company, under the terms of this agreement.

6.—The railway company shall assist the party of the second part towards reclaiming grain doors from and at industries located on the lines of the railway company within the switching limits, and the railway company shall also permit the party of the second part to reclaim grain doors for other railroads at industries and at elevators on the lines of the railway company within the switching limits.

7.—As a special inducement for the execution of this agreement the party of the second part has and by these presents does agree to hold the railway company harmless from and indemnify it against all loss, cost, damage or expense, resulting from accident, injury or death to either the party of the second part, or to any person in his employ, while engaged in the performance of the work herein specified, or while upon the premises owned or controlled by the railway company for the purpose of performing the conditions of this agreement.

8.—Either party may terminate this agreement by giving 30 days' notice in writing to the other party of its intention to so terminate the agreement; otherwise, said agreement shall remain in full force and effect.

ADDENDA

1.—The grain door agent, in coopering outbound cars with doors and lumber received from cars on an inbound carrier, is only authorized to use such material in emergency cases and with the consent of the road owning it; the outbound carrier to pay the contractor $1 per car where the car is fully and newly grain doored.

2.—All grain doors and lumber furnished by the inbound carrier, including intact grain doors, will be charged against the outbound carrier at the rate of $0.46 per foot in height; no maximum allowance.

3.—Where the grain door agent is required to place doors in automobile and furniture cars, that class of cars having doors 7 ft. or over in width, the charge for coopering is $1.17.

4.—The coopering of cars for grain and other loading to points within the switching limits must be paid for by the shipper at the rate of $2.04 per car, the Grain Door Reclamation and Cooperage Bureau to collect this amount in each case from the shipper and pay to the railroad owning the grain doors $0.86 per car, retaining for the work of reclaiming, cleaning, repairing and coopering $1.18 per car.

5.—Reclaiming grain doors at outlying points, where automobile truck is used, $0.22 per door.

These rules have been found to be thoroughly practicable and fit the conditions. There is no doubt that similar local rules should apply in all large cities.

It Is Usually Better to Do Repairing at the Elevator

In cities where there is a great deal of grain-dooring of cars, the point has been made that it is cheaper to have a grain-dooring yard and to switch the cars rather than have a shifting force to go from elevator to elevator and do the work. While this is the practice at Buffalo, in other cities it is much more profitable and satisfactory to use intact grain doors, grain doors of neighboring roads, the local bureau to have a force at each elevator, or, where there is not much business, a traveling force, to take care of the work. One trouble which always develops when cars are not coopered at the elevator is that they are often found, on arrival at the mill or elevator, to be improperly coopered, or the doors knocked out and stolen, necessitating the assignment of another car.

The sweeping of sills outside the grain door after the car is loaded is important to avoid claims. When the sill is not swept and a car goes through to its destination it is often reported by inspectors as leaking and the grain which is found on the sill is mentioned in their reports as evidence that the car was leaking before it started on its trip. This militates against the interests of the handling roads. While it is apparently a small matter, it has a large effect in the avoidance of erroneous evidence on which claims are filed.

It Pays to Watch the Coopering

It is important that a bureau, a committee of railroad officers or railroad employees check the elevators on their loading of outbound cars to see that the elevators apply and apply properly, the top boarding after they have completed the loading, otherwise a loss of grain will occur enroute, which may result in a claim against the railroad. Another feature deserving attention is the damage at elevators by misuse of equipment. With a bureau or a committee watching this, reports of damage can be made and the elevators forced to pay for the damage which they do to the interior of the car or which is done by cornering the cars when the elevator does its switching with a capstan.

Wherever there are terminals of several roads, and as many as five superintendents, there should be a superintendents' association, so that a committee of such an association can form a bureau of its own or supervise an outside bureau to see that the prices are properly gaged. The conditions are sufficiently similar in different cities so that the cost of doors and coopering can be moved up and down in accordance with analyses made from time to time by a central bureau.

The trouble about a bureau operated by the railroads is that it is not as closely supervised as a private bureau. This arises from the fact that the private bureau depends for its

*From a report of the Executive Committee of the American Association of Railroad Superintendents.

revenue entirely on the activity of the bureau officials and its employees, while in the case of the railroads the supervision is usually left to some individual railroad officer. The latter has other work to do and, being overcrowded with it, the work of the bureau is allowed to drift along without the close supervision necessary for efficient and economical operation. It is better for adjacent cities to have a bureau representative of the several roads take charge of the work so that the overhead expense which is included in the cost per car will be as small as possible. The larger the organization that can be built up, the cheaper grain doors can be reclaimed for the railroads. Where the roads have been reclaiming lumber and grain doors in a loose manner the establishment of a bureau will result in 90 per cent more lumber and doors being reclaimed than was done before its inauguration and where bureau men are established around an elevator to reclaim grain doors and recooper cars there is 90 per cent less theft.

The bureau employees work in the joint interest of the elevator and the railroad because their positions depend upon their giving satisfaction to both sides. Their work and this interest save both sides in divers ways. The grain door reclamation bureau makes all repairs. If lining is torn out, grain door material is used for repairing. If the lining is torn loose it is nailed back into place. Also if outside sheeting is found loose it is nailed tightly to the sills and if storm doors have been torn off they are replaced. Under this plan cars are repaired which would otherwise go to the repair track, thus saving track labor and avoiding delays and the movement of the car back and forth through the yards.

Another advantage of the bureau organization lies in the check obtained upon the grain loaded into the cars. Elevators ordinarily weigh grain in hopper scales. If grain is lost while being moved from the scale to the car the bureau forces thus serve a valuable purpose in having a record taken of the car to prevent claims against the railroad. While the bureau employees do not handle any of the grain that falls out of the car on the ground, when a car is loaded at a mill or elevator, they do make a memorandum of the car number, initial and the elevator, so that in case a claim is presented the bureau is in a position to protect the railroad. In some cases where inspection shows cars unfit for grain loading and the elevator is notified, but where the elevators disregard the notice, the bureau organization renders a valuable service to the railroads also by keeping a record of the car and its movement so that the railroad will not participate in claim

Gasoline Motor Car for the Burlington

The Chicago, Burlington & Quincy has recently received from the Edwards Railway Motor Car Company, Sanford, N. C., a gasoline motor car which has been put into service on the line between Atchison, Kan., and Rulo, Nebraska. The car is mounted on two four-wheel trucks, the body being 52 ft. 7 in. long and the distance between truck centers 20 ft. 2½ in. The power to drive the car is furnished by a Kelly-Springfield four-cylinder motor, with cylinders 4½ in. by 6½ in. developing 60 hp. at 1,600 r.p.m. The drive is transmitted by chains to the four wheels of the rear truck. The car has a 12-volt electric lighting system, self-starter and Westinghouse straight air system with two Edwards special air compressors.

In the passenger compartment the car seats 39 passengers and there are folding seats in the baggage compartment for six additional passengers, making a total seating capacity of 45 persons. A toilet is placed in the forward end of the passenger compartment. The driving controls and driver's seat are on the right-hand side of the motor. The total weight of the car empty is 19,000 lb. On a trial run under full load the car developed a speed of 45 miles an hour. It is stated that the gasoline consumption was 10 miles per gallon.

Latest Design of Edwards Gasoline Motor Passenger Car

International Newsreel Photo

Train Wreck at Annandale, Minn.

General News Department

The Signal Section of the American Railway Association will hold its regular meeting on Tuesday and Wednesday, November 21 and 22 at Hotel McAlpin, New York City.

A fire on August 12 at the New York Central freight terminal at 63rd street, New York City, the principal freight yard of that road in the city, destroyed Pier D and 80 loaded freight cars, estimated loss $1,000,000. The fire is said to have been discovered first in a carload of grease.

Impact Loads on Track Bolts

Through several typographical errors the formulas on page 278 in the article on Determining the Impact Loads on Track Bolts in the issue of August 12 were given incorrectly. They should have read as follows:

$$P_1 = \frac{P}{2\pi r\left(r - \sqrt{r^2 - \frac{D^2}{4}}\right)}$$

$$P_1 = 2\pi r\, tt\left(r - \sqrt{r^2 - \frac{D_1^2}{4}}\right)$$

Ten Killed When Truck Wrecks Soo Line Train

Six passengers and four other persons were killed and a larger number injured when Minneapolis, St. Paul & Sault Ste. Marie passenger train No. 107, westbound, struck a motor truck on a highway crossing near Annandale, Minn., on August 12. The wreck was the result of the truck driver failing to heed the warnings of freight train men near by. He drove upon the track in front of the passenger train, the truck was hurled against a freight engine which was standing on a siding, and a switch-stand was knocked down so as to turn three coaches of the passenger train into the side track and against the standing freight train. The baggage car was crushed against the freight engine while several other cars were derailed. Most of the dead and injured were in the smoking car which fell over on its side. Two of the ten dead were occupants of the motor truck and two were train employees.

Dinner to S. M. Vauclain

Charles Riddell, manager of the Chicago office of the Baldwin Locomotive Works, gave a dinner in honor of Samuel M. Vauclain, president of this company, at the Chicago Club in Chicago on the evening of August 4. Mr. Vauclain was just returning from an extended tour throughout the west which he had made for the purpose of studying the general business situation. The dinner was attended by a large number of railway presidents and vice-presidents and other leading business men of Chicago.

Mr Vauclain delivered an optimistic address consisting largely of observations he had made on his trip. He expressed the opinion that fundamental business conditions are sound and that when the large strikes in progress are out of the way the country will enter a period of great prosperity. He described the trip of the "Prosperity Special" consisting of a solid train of locomotives built by the Baldwin Works for the Southern Pacific which was run clear across the continent, and which, as Mr. Vauclain remarked, entered the shops of the Southern Pacific at Los Angeles all ready for work on the very day when the road's shop employees struck. He said he had never seen such promising crops, or encountered more optimism among people, than in the west.

In concluding his remarks he referred in a complimentary way to the work done by Samuel M. Felton as director general of military railways in providing equipment for the United States forces overseas during the war, and Mr. Felton made a few brief remarks in which he told of the energy and managerial skill shown by Mr. Vauclain in turning out locomotives for the American forces with the greatest possible dispatch. Hale Holden, president of the Chicago, Burlington & Quincy, also spoke briefly.

Following the dinner Mr. Vauclain delivered an address to a large crowd in the Gold Room of the Congress Hotel on the general business situation and showed the moving pictures of the "Prosperity Special" on its flight from the Atlantic to the Pacific coasts.

Safety of Carbon Tetrachloride Fire Extinguishers

A few weeks ago a short circuit in the New York subways burned a considerable amount of paint, insulation and rubber on one of the cars filling part of the subway with smoke and fumes from which several persons were overcome. Shortly after the fire Mayor Hylan of New York blamed the Pyrene fire extinguisher for these casualties and the city departments recommended that they should not be used in subway cars. This led to a controversy over the dangers of carbon tetrachloride extinguishers. The reports of the Transit Commission which investigated the fire deal with this subject and absolve the extinguishers from blame for the noxious fumes.

The reports state that experts from the Bureau of Mines found there were apparently no serious cases resulting from the effects of possible toxic gases and that the symptoms were not characteristic of phosgene or carbon tetrachloride poisoning. These conclusions were sustained by the physician of the Transit Commission. The report further states that carbon tetrachloride is the standard fire extinguisher in general use, is approved by the National Board of Underwriters and is particularly adapted for fires produced by short circuits in electrical equipment because tetrachloride is a non-conductor and will extinguish ordinary electric arcs.

State Control Urged for K. C. M. & O.

Lieutenant Governor L. Davidson of Texas believes that state control of the Kansas City, Mexico & Orient is the only possible solution of the problem of saving the road from being junked. Not only should the state of Texas take this action, the Lieutenant-Governor declared, but he also urges that similar action be taken in each of the other states through which the road runs. Further, he said: "Both federal and state legislation exempting the road from the application of all transportation acts should be enacted, this exemption to continue so long as the road is in the hands of the states, or their agencies, legally created." He would thus modify the federal statutes on the condition that the agencies of the respective states should elect a managing agency from among their members. Mr. Davidson said, further:

"Six hundred thousand citizens are living in the towns and cities located on this railroad. There are 93 towns on it, 66 of which are in Texas. There are 735 miles of the railroad in the United States, 464 miles of which are in Texas, and there is a rural and urban population along the road equal in number, perhaps, to those in the cities. The Orient railroad must be conserved or else the state's custodianship of the citizens' welfare comes to a sorry accounting. Expediency would adopt the suggestion to deliver the Orient railroad to some line financially able to carry it for operation, and if that can be done, it is perhaps the best immediate disposition of the difficulty. A government-owned railroad, because of ensuing political management, is not the remedy. May the wisdom of the people save us from the Plumb plan or other similar socialistic schemes, and from government ownership of railroads."

Mass Meeting to Aid the Road At a mass meeting held in San Angelo, Tex., on August 7, the citizens of that community appointed a committee to urge the county commissioner to reduce the tax valuation of this railroad to $100 a mile. C. M. Reed, chairman of the Kansas public utilities commission, told the

meeting that this was one way to which the territory served by the road could aid in averting the threatened suspension of operation.

Wage Statistics for May

According to the Interstate Commerce Commission's monthly bulletin the number of employees reported by Class I railroads for May, 1922, shows an increase of 50,095, or 3.2 per cent, as compared with April. It appears largely in the maintenance-of-way group.

In the April statistics the decline in the total compensation from the preceding month was attributed to a decrease in the number of higher paid employees. Further analysis indicates that although it is true that the number of men and hours in the maintenance-of-way group increased, as against a decrease reported for the higher paid groups, the net effect of this, combined with other changes, was to leave the average earnings per hour for straight time practically the same, and the decrease in total compensation is to be attributed to the decline in the total hours worked in April, which had 30 days with 5 Sundays, as compared with March with 31 days and 4 Sundays.

Compared with April the returns for May indicate the following increases or decreases:

Executives, officials and staff assistants	D9
Professional, clerical and general	702
Maintenance of way and structures	40,795
Maintenance of equipment and stores	7,279
Transportation (other than train, engine and yard)	1,304
Transportation (yardmasters, switch tenders and hostlers)	D309
Transportation (train and engine service)	833
Net increase	50,095

A comparison of the number of employees and their compensation by months for the period covered by the new classification follows:

Month	Number of employees	Total compensation
July, 1921	1,634,872	$214,339,385
August 1921[1]	1,679,927	227,745,895
September, 1921[1]	1,718,330	233,972,822
October, 1921[1]	1,754,136	237,602,959
November, 1921[1]	1,732,353	225,304,006
December, 1921[1]	1,637,151	214,921,396
January, 1922[1]	1,552,014	205,178,639
February, 1922[1]	1,545,040	194,523,437
March, 1922[1]	1,570,158	216,704,408
April, 1922	1,578,133	203,413,071
May, 1922	1,628,228	216,672,028

[1]Excludes Detroit, Toledo & Ironton.

Illinois Central "No Exception" Month a Success

During June of this year the Illinois Central and the Yazoo & Mississippi Valley conducted a "no exception" campaign, during which time only 1,485 L. C. L. exceptions were charged to all stations on these carriers as compared with 1,933 in June, 1921, a decrease of 448, or 23.1 per cent. There were 150 carload exceptions charged to all stations during June, 1922, as compared with 374 in July, 1921, a decrease of 224 or 59.8 per cent.

The general plan of last year's campaign was followed this year. Superintendents, supervising agents, trainmasters, master mechanics, yardmasters and agents worked with the employees of all departments for the single purpose of eliminating freight claim causes. The employees were impressed daily by these supervising officers and department heads with the importance of prompt and proper handling of all freight shipments and were told that the final result desired was not only the conservation of foodstuffs and materials but the elimination of causes responsible for annual claim payments amounting to thousands of dollars. A special effort was made by platform forces to see that packages were properly marked, packed and in containers of sufficient strength to insure against damage while in transit; also to see that shipments were loaded correctly and that a waybill accompanied each shipment to insure proper handling en route and prompt delivery at destination.

A reduction was made in the number of bad order reports charged against L. C. L. shipments, the total for June, 1922, being 637, as compared with 935 in June, 1921, a decrease of 298 or 32 per cent. This reduction was accomplished largely by closer attention to the loading, stowing and bracing of the shipments and also the increased use of bulkheads in through cars at the larger platforms.

A novel feature introduced in this year's campaign was the showing of motion pictures illustrating the proper and improper methods of handling freight with the results of the latter. These pictures featured a test showing the speeds at which merchandise is damaged while being switched. This test was originally made with a specially constructed box car with one side and the roof removed. A wire screen of large mesh was placed on the open side of the car to prevent freight from falling out during the tests and also to permit the taking of the moving pictures, showing what actually occurred to the contents while the car was being switched and subjected to various shocks. Tests were made with merchandise properly trimmed down and also bulkheaded, an impact-recording device placed in the car indicating the degree of impact at various rates of speed ranging from 3 to 20 miles an hour. Up to and including the month of July, claim payments have been reduced over $1,000,000, or 60 per cent as compared with the same period last year.

Railway Revenues and Expenses for June

Reports filed with the Interstate Commerce Commission show that the 200 Class I railroads had a net operating income in June of $76,594,006. On an annual basis this represented a return of 4.78 per cent on their tentative valuation. The net operating income for those roads in June last year amounted to $51,067,115, or at the annual rate of return of 3.18 per cent, while in May this year it was 4.36 per cent.

The roads fell short $19,000,000 of realizing a return of 6 per cent on their tentative valuation, or $15,000,000 below the rate of 5¾ per cent, the figure fixed by the Interstate Commerce Commission in its rate decision.

Gross operating revenues amounted to $473,785,294, which was an increase of 2½ per cent over the same month last year; operating expenses $363,983,667, a decrease of 4½ per cent.

Fifty railroads—29 in the East, 1 in the South and 20 in the West—had operating deficits in June, compared with 56 in May.

For the first six months this year the net operating income of the railroads totaled $349,092,945, compared with $145,485,019 during the same period last year. This is at the annual rate of return on their tentative valuation of 4.43 per cent, compared with 1.85 per cent during the first half of 1921. Operating revenues for the first 6 months totaled $2,611,125,035, a decrease of 2½ per cent compared with the corresponding period last year, while operating expenses totaled $2,078,672,589, a reduction of 12.1 per cent under those for the first 6 months last year. The carriers during the first half of 1922 fell short $123,000,000 of realizing a 6 per cent return.

The commission's summary of revenues and expenses for June and for six months follows:

Item	June 1922	June 1921	Six Months 1922	Six Months 1921
Aver. miles operated.	235,128.28	234,669.97	235,162.87	234,689.95
Revenues:				
Freight	$331,872,368	$322,235,611	$1,865,403,583	$1,870,442,229
Passenger	[2]96,011,602	[2]99,752,616	[2]502,851,949	[2]574,939,925
Mail	7,463,385	7,687,246	44,686,812	49,116,169
Express	1,472,262	7,589,651	58,464,940	41,652,380
All other transp'tn.	15,808,829	13,831,257	83,659,726	77,536,336
Incidental	10,246,805	9,908,660	52,009,422	59,628,285
Joint facility—Cr.	1,081,515	645,339	5,089,610	3,902,742
Joint facility—Dr.	171,502	65,090	1,041,007	1,036,796
Ry. oper't'ng rev.	473,785,294	461,585,290	2,611,125,035	2,676,181,270
Expenses:				
Maintenance of way	70,436,736	68,183,317	316,072,512	370,383,937
Main. of equipment	102,329,966	99,687,504	590,949,651	641,851,672
Traffic	7,470,204	6,991,837	42,866,848	43,053,083
Transportation	166,872,625	186,612,715	999,822,862	1,198,287,134
Misc. operations	4,277,142	4,404,514	22,791,484	25,110,219
General	13,179,328	14,306,618	78,952,058	87,639,917
Transportation for investment—Cr.	582,334	330,212	2,782,826	2,982,002
Ry. oper'tng exp.	363,983,667	380,856,293	2,078,672,589	2,363,343,960
Net revenue from railway operations	109,801,627	80,728,997	532,452,446	312,837,310
Railway tax accruals	26,561,731	23,405,715	147,285,803	133,396,337
Uncollectible railway revenues	106,530	129,712	660,703	545,651
Ry oper'ting inc.	83,133,366	57,193,570	384,505,940	178,891,323
Equipment rents—Dr. balance	5,110,477	4,895,221	20,859,370	24,032,466
Joint facility rent—Dr. balance	1,428,883	1,231,234	8,553,675	9,373,837
Net railway operating inc.	76,594,006	51,067,115	349,092,945	145,485,019
Ratio of expenses to revenues (per cent)	76.82	82.51	79.61	88.31

[1]Includes $2,844,567, sleeping and parlor car surcharge.
[2]Includes $2,923,490, sleeping and parlor car surcharge.
[3]Includes $14,947,096, sleeping and parlor car surcharge.
[4]Includes $16,023,105, sleeping and parlor car surcharge.

Traffic News

The Tennessee, Alabama & Georgia resumed passenger service on July 20, after having been dormant since May 1. It has also been announced that within 90 days this road will run express trains between Chattanooga, Tenn., and Gadsden, Ala., with gasoline driven cars.

J. G. Thomas, a freight agent on the Cincinnati, Indianapolis & Western, was elected president of the American Association of Railway Agents, succeeding W. L. Heacox, of Chicago, who has resigned. The headquarters of the association are to be moved from Chicago to Indianapolis within the next few weeks.

G. Cummins, Davenport, Iowa, traffic commissioner of the Commercial Club of that city, has been elected president of the Iowa Traffic League. C. O. Dawson, traffic manager of the Jacob E. Decker packing plant, Mason City, was elected vice-president; L. M. O'Leary, Fort Dodge, Chamber of Commerce traffic manager, was elected secretary, and E. G. Wylie, Des Moines, was re-elected treasurer.

A rate of one fare for the round trip has been granted to the G. A. R. veterans to their national encampment which will be held in Des Moines, Iowa, from September 24-29. The rate applies to all members of the G. A. R., wives and dependents, widows of G. A. R. members, army nurses of the civil war, members of auxiliary organizations of the G. A. R., and dependent members of their families. Tickets will be on sale September 21 to 26, and will be honored until October 31. Stopovers will be allowed at all points within the final limit of the ticket.

The Southern Pacific has made reductions in rates on several commodities passing through San Francisco from the Far East and Hawaii to eastern points in the United States and Canada. The rate on canned pineapples originating in the Hawaiian Islands, or further west, was reduced from $1.42 to $1.15 per 100 lbs., in carloads of 40,000 lbs., and when destined to Montreal and Toronto from $1.22 to $1.05, in carloads of 60,000 lbs., and the rate of $1.50 on gall nuts has been reduced to $1.

Official List of Sailing Dates for Exporters

Dates of sailing of American-registered steamships going to foreign ports are now advertised by the Interstate Commerce Commission by means of a semi-monthly bulletin, the first number of which was dated July 20. By order of the Commission this bulletin is to be kept on file at principal freight stations throughout the country; that is to say, at all stations where, by the order of the Commission, issued last January, the railroads are required to issue through bills of lading for goods going to non-adjacent foreign countries. The list of stations printed in the January order covers the whole country, beginning with the Aberdeen & Rockfish (three stations) and ending with the Yreka Railroad. Thirty-two lines are represented in this first bulletin, and the schedules fill 25 pages, of which eleven are filled with sailings from New York. Some of the carriers give dates as far in the future as October and November. Prominent lines doing foreign business which are not represented in this bulletin are the Cunard-Anchor, the French Line, Lamport & Holt, Mallory Line, Pacific Mail and the Quebec Steamship Company.

Coal Production

The nineteenth week of the coal strike (August 7-12) opened with a decided increase in production, according to the weekly bulletin of the Geological Survey. Returns indicate an output of soft coal of about 4,800,000 net tons, or 500,000 tons more than the week before. The increase is said to be due to gradual improvement in traffic conditions on the railroads serving non-union fields and also, but only in a very small way, to increased production in fields hitherto throttled by the strike. Despite this increase in bituminous coal output the nineteenth week finds production still about 550,000 tons below the level reached before the shopmen's strike. The week, however, represents the third consecutive week of increase.

Production of anthracite in the nineteenth week will be less than 30,000 tons.

The trend of production is shown in the cars loaded daily by the railroads. Loadings on Monday, August 7, were 16,021 cars, an increase over the preceding Monday of 7 per cent. During the following days, the loadings dropped, but remained greater than on corresponding days of the preceding week.

The mine reports for the week ended July 29 indicate that traffic conditions improved in some fields, but grew worse in others. As a result of this improvement, working time increased in the Pocahontas, Tug River and Hazard districts. In Winding Gulf, New River and Western Kentucky greater congestion was responsible for increased losses. Service was resumed on the railroad in Colorado that had temporarily suspended operations.

For the season to date, the movement of cargo coal to regular Lake destinations now stands at 3,544,000 tons. This is in round numbers 9,160,000 tons below 1921, and 3,500,000 tons below even 1920, when as now the Lake movement was late in starting.

Shipments of Coal by Districts

In the Middle and Southern Appalachians, which have been the principal sources of supply, production has been curtailed by the shopmen's strike but has gradually increased during August. As indicated by this week's report, the unorganized districts of this territory gained, by relief from traffic congestion, about 200,000 tons over the output of last week. The non-union and partly organized fields of this region are now furnishing about 41 per cent of the total output in the United States, whereas they furnished 54 per cent in the week ended June 24. The districts in Pennsylvania and the Central Competitive field and those west of the Mississippi have been less affected by traffic congestion. Changes in shipments there measure better the direct influences of efforts to overcome the strike. In Pennsylvania the output since the last week of July has increased somewhat, returns this week indicating shipments larger than reported for any other week during the strike. Union districts in West Virginia also reported slight increases. On the other hand reports for this week indicate decreased production in the strongly organized districts of the Central States.

WEEKLY SHIPMENTS OF SOFT COAL FROM PRODUCING DISTRICTS, AS REPORTED BY THE RAILROADS

Net Tons, Assuming 50 Tons to the Car

District	First week April 8	Lowest week April 22	Highest week June 24	Last week Aug. 5	This week *Preliminary
Central Pennsylvania	132,900	94,150	164,700	158,150	170,520
Western Pa., inc. Freeport	118,550	64,800	138,900	136,850	146,902
Greensburg-Westmoreland	264,450	161,250	164,850	187,800	203,056
Connellsville and Somerset-Meyers	289,350	198,400	282,850	299,400	331,044
South Fork and Windber	61,050	2,650	17,000	23,450	25,382
Total Pennsylvania	866,300	521,250	768,300	815,650	876,904
Georges Creek, Upper Potomac and Cumberland-Piedmont	18,250	29,300	72,500	74,300	77,322
West Virginia Panhandle	29,300	39,700	46,150	37,500	38,906
Fairmont	7,150	13,700	50,150	72,050	80,164
Coal and Coke	27,850	35,100	50,900	53,400	55,763
Kanawha and Coal River	8,100	14,600	58,700	70,950	84,378
Logan	297,600	292,400	393,900	183,000	257,544
New River (C. & O. New River Div.)	61,850	61,900	188,550	100,700	136,220
Winding Gulf (Virginian)	103,650	103,400	145,150	113,450	46,158
Pocahontas and Tug River	445,400	478,150	565,000	378,800	458,150
Kenova-Thacker	129,250	146,000	199,900	120,200	158,270
Total W. Va. and Md.	1,128,400	1,214,250	1,770,900	1,204,350	1,392,874
Eastern Kentucky	407,600	540,750	687,400	320,700	429,730
Western Kentucky	88,850	143,450	394,600	345,500	380,926
Tennessee	28,850	44,350	90,750	74,950	93,590
Cumb. Valley and S.W. Va.	132,800	156,250	225,750	146,550	156,310
Alabama and Georgia	249,450	194,450	299,150	350,550	339,766
Ohio	34,250	49,600	110,150	109,700	109,956
Indiana-Illinois	6,000	2,200	17,150	11,400	10,682
Iowa, Mo., Kan., Okla., Ark. and Texas	25,250	33,600	80,650	78,550	75,754
Colorado	82,000	90,850	174,350	187,100	190,708
New Mexico	23,800	25,050	42,600	39,800	38,808
Utah	59,700	54,000	74,000	95,100	101,528
Wyo., Mont., and N. D.	7,000	7,500	8,800	16,550	19,012
Washington	18,500	19,700	20,700	22,250	21,952
Michigan	0	0	0	0	0
Grand total, bituminous shipped	3,158,750	3,097,250	4,764,650	3,818,700	4,238,500

*Total for Monday, Tuesday and Wednesday multiplied by 1.96.

Equipment and Supplies

Locomotives

THE ERIE has ordered 30 Mikado type locomotives from the Baldwin Locomotive Works.

MITSUI & COMPANY, New York, are inquiring for 2 light locomotives for export to Siam.

THE MIRANDA SUGAR COMPANY has ordered 2 Consolidation type locomotives from the Baldwin Locomotive Works.

THE MISSOURI, KANSAS & TEXAS is inquiring for 40 Mikado type locomotives and 10 eight-wheel switching locomotives. Also for 5 Pacific type locomotives.

THE UNION PACIFIC, reported in the *Railway Age* of July 29 as inquiring for 55 Mountain type and 15 Santa Fe type locomotives, and in the *Railway Age* of August 5 as inquiring for 10 Mallet type locomotives, has ordered the 55 Mountain type and 10 Mallet type locomotives from the American Locomotive Company. The Mountain type will have 29 by 28 in. cylinders and a total weight in working order of 345,000 lb. and the Mallet type will have 26 and 41 by 32 in. cylinders and a total weight in working order of 495,000 lb.

Freight Cars

THE ILLINOIS CENTRAL is inquiring for 75 caboose cars.

THE CENTRAL OF GEORGIA is inquiring for 100 flat cars of 40 tons' capacity.

THE CHICAGO, BURLINGTON & QUINCY is preparing to issue inquiries for 2,000 composite gondola cars.

THE ELGIN JOLIET & EASTERN has placed an order with the General American Car Company for 80 steel underframes.

THE UNITED ALLOY STEEL CORPORATION, Canton, Ohio, is inquiring for 17 hopper cars of 50 tons' capacity; also for 13 all-steel gondola cars.

THE KING CHEMICAL COMPANY, New York, has ordered from the General American Tank Car Corporation 1 tank car for carrying sulphur dioxide.

THE MATHIESON ALKALI WORKS, New York, has ordered from the General American Tank Car Corporation, 20 tank cars of 15 tons' capacity, for carrying liquid chlorine.

THE ELECTRO BLEACHING GAS COMPANY, New York, has ordered from the General American Tank Car Corporation 5 tank cars of 15 tons' capacity, for carrying liquid chlorine.

THE LEHIGH VALLEY has ordered repairs to 1,000 high side steel gondola cars. The order was equally divided between the American Car & Foundry Co., and the Buffalo Steel Car Company.

THE BANGOR & AROOSTOOK, reported in the *Railway Age* of May 13 as contemplating making repairs to 250 additional cars, is now making heavy repairs to 250 box cars in its shops at Derby, Maine.

THE INDIANA GAS & COKE COMPANY, reported in the *Railway Age* of August 5 as inquiring for repairs to 50 hopper cars has placed an order for this work with the General American Car Company.

THE CHICAGO & NORTH WESTERN, reported in the *Railway Age* of August 12 as about to place orders for the repair of 500 box cars, will have these cars repaired at the shops of the American Car & Foundry Co. A contract has also been given for the repair of 1,000 box cars to the Western Steel Car & Foundry Co.

THE CHICAGO, MILWAUKEE & ST. PAUL, reported in the *Railway Age* of July 15 as inquiring for repairs to 1,000 box cars and 250 gondola cars is reported to have placed an order with A. M. Castle & Company, Chicago, for 750 underframes for the box cars. This company has some material on hand and first contemplated doing its own repair work although strike conditions are said to have changed plans resulting in inquiry which is still pending with no definite move towards placing.

Iron and Steel

THE CHESAPEAKE & OHIO is inquiring for 300 tons of bridge steel.

THE BOSTON & MAINE has ordered from the Boston Bridge Works 500 tons of steel for a bridge at Biddeford, Maine.

THE CHICAGO UNION STATION is inquiring for 23 spans of structural steel to be used for the viaduct over its tracks at Roosevelt road.

THE ALASKAN ENGINEERING COMMISSION, Seattle, Wash., closed bids on August 16 for the furnishing of guard rails, switch stands, switches, frogs, cast iron and steel wheels, brake shoes, boiler tubes and repair materials for locomotives.

THE SOUTHERN PACIFIC LINES have placed an order with the Tennessee Coal, Iron & Railroad Company for 45,240 gross tons of first quality open hearth steel rails for delivery in the first half of 1923 and have also placed an order with the Lorain Steel Company for 670 gross tons of special girder rail, for delivery early in 1923. In the *Railway Age* of July 22, the order for 30,000 tons of the above rail was noted.

Track Specialties

THE WABASH is inquiring for 240,000 tie plates and 200 kegs of track bolts.

THE SOUTHERN PACIFIC has divided an order for 2,500 kegs of spikes between the Gary mill of the U. S. Steel Corporation and the Colorado Fuel & Iron Company.

THE LONG ISLAND will receive bids until 12 o'clock noon August 25 for 138 hard frogs and 12 hard frog points. Bids are also wanted on the same date for 148 open hearth frogs and separate bids for 108 hard switches, 115 open hearth switches, 65 open hearth switch points and 113 guard rails; separate bids for 2,300 twin tie plates and 1,592 intermediate guard rail tie plates, also separate bids for 638 kegs track bolts.

Machinery and Tools

THE TEXAS-MEXICAN has ordered a 79-in. driving wheel lathe from the Niles-Bement-Pond Company.

THE CHESAPEAKE & OHIO has ordered a 42-in. boring mill and a 1,100-lb. steam hammer, from the Niles-Bement-Pond Company.

THE UNION PACIFIC has placed an order with the Industrial Works, Bay City, Mich., for a 15-ton locomotive crane with 45 ft. boom.

Miscellaneous

THE CANADIAN PACIFIC has placed an order with the Industrial Works, Bay City, Mich., for a wrecking crane of 160-ton capacity.

THE NEW YORK CENTRAL has ordered a 60-in. horizontal boring machine from the Niles-Bement-Pond Company.

THE CHICAGO UNION STATION COMPANY has placed an order with the Webster Manufacturing Company for the coal and ash handling equipment to be installed in the boiler plant of the new station.

THE ILLINOIS CENTRAL has given an order to the Standard Stoker Company for 25 stokers to be installed on the 25 Santa Fe type locomotives ordered recently from the Lima Locomotive Works.

THE NEW YORK CENTRAL will receive bids until 12 o'clock noon August 21, for track spikes, fuel oil for locomotive service and metal superstructure for new passenger and baggage subway at Elyria, Ohio.

Supply Trade News

I. S. Kemp, formerly sales manager of the Vaughan & Bushnell Mfg Co., Chicago, has been elected vice-president of the Evansville Tool Works, Evansville, Ind.

G. E. A. Letourneau, manager of the Canadian Gold Car Heating and Lighting Company, Limited, 346 St. James street, Montreal, Canada, died suddenly at his home on August 5.

Frank S. Martin, senior member of **Frank S. Martin & Son**, 25 Broadway, New York City, died on July 27. **Francis A. Martin** will continue to conduct the business under the present name, and with the same staff.

At a meeting of the directors of the **Sharon Pressed Steel Company**, Sharon, Pa., on August 9, **L. B. LeBel, Edward O. Peck** and **Harold G. Mosier**, of Cleveland, and **A. E. Swan**, of Sharon, were elected directors to succeed W. L. Ulmer, W. H. Watkins, L. L. Knox and W. J. Parker, retired.

The Pressed Steel Car Company, Pittsburgh, Pa., has recently incorporated in Illinois the **Pressed Steel Car Company of Illinois**, capitalized at $5,000, and the **Koppel Industrial Car & Equipment Company**, also capitalized at $5,000. The parent company is a New Jersey corporation and the Koppel concern, a subsidiary of Pressed Steel Car, is incorporated in Pennsylvania.

Edward L. Lefler has been appointed manager of the recently organized railroad sales department of the **General Fireproofing Company**, Youngstown, Ohio, with headquarters at 325 West Madison street, Chicago, Ill. Mr. Lefler served as secretary to the vice-president of the New York Central at Boston, Mass., from April, 1907, to August, 1917. For the past five years he has devoted his entire time to selling office equipment and systems to railroads in Chicago.

American Locomotive Company

The American Locomotive Company reports for the six months ended June 30, 1922, a net loss of $966,780, as compared with a net profit of $3,901,043 in the corresponding period of 1921.

The condensed income account of the American Locomotive Company and subsidiaries for the six months ended June, 1922, compares as follows:

	June 30, 1922	June 30, 1921
Gross earnings	$7,399,934	$25,989,781
Expenses, depreciation, etc.	8,323,500	21,390,554
Gross profit	Def. 923,566	4,599,227
Interest on bonds of constituent companies, etc.	43,214	43,184
Net profit	Def. 966,780	4,556,043
Taxes	.....	655,000
Preferred dividends* (3½ per cent)	875,000	875,000
Common dividends* (3 per cent)	750,000	750,000
Surplus	Def. 2,591,780	2,276,043

* Paid from previously accumulated profits.

President Andrew Fletcher in his report to the stockholders says:

The gross earnings for the six months amounted to $7,399,934, and were the lowest of any six months' periods since the early part of 1915.

After allowing for cost of manufacturing, maintenance, administrative expenses, interest on bonds of constituent companies and $746,191 for depreciation on all classes of property there was a loss for the period ended June 30, 1922, of $966,780.

The strong cash position of the company, due to conservation of its net earnings during years of greater earnings, warranted the payment in the six months' period from previously accumulated profits of two quarterly dividends each of 1¾ per cent on its preferred stock, and two quarterly dividends each of 1½ per cent on its common stock, a total of dividends paid of $1,625,000 during the six months.

The inventory account of materials and supplies on hand and work in progress on June 30, 1922, amounted to $5,997,611, as compared with $4,751,900 on December 31, 1921.

The net current assets of the company on June 30, 1922, amounted to $39,113,392 after providing a reserve of $795,213 for shrinkage in value of notes and discount on Canadian funds, and a reserve of $868,917 for United States and Canadian income and profits taxes.

The company on June 30 had no loans payable and had in its treasury on that date in cash and marketable securities $24,448,304.

During the six months ended June 30, 1922, there was expended for additions and betterments to the plants $468,615, which has been charged to the reserves created from surplus of previous years.

The total unfilled orders on June 30, 1922, was $9,667,480, of which domestic business was 92.7 per cent and foreign business 7.3 per cent, compared with total unfilled orders on December 31, 1921, of $3,344,[illegible], of which 96.2 per cent was domestic and 3.8 per cent foreign business. The largest part of the unfilled orders on hand on June 30, 1922, was not received until the latter part of April and during June, and earnings on same will be included in the last half of this year.

There has been a very material increase in business since June 30, the amount of unfilled orders now on hand being about 100 per cent greater than on that date. We believe additional domestic business will be obtained but at present there is very little attractive foreign business offered.

Obituary

Coleman Sellers, Jr., president of William Sellers & Co., Inc., Philadelphia, Pa., died on August 15 at the home of his daughter in Bryn Mawr.

James Kennedy, president of the Angus Sinclair Company, New York City, and managing editor of Railway and Locomotive Engineering, died suddenly at his home in New York City, on August 14. Mr. Kennedy was born in Forfarshire, Scotland, in 1850. He served his apprenticeship as a railroad machinist in his native land, and came to this country in 1868, and was later foreman of the Singer Machine Company, New York. He studied at night, and graduated from the old Thirteenth street high school, New York, in 1875. He again entered railroad service with the Lackawanna & Bloomsburg, now a part of the Delaware, Lackawanna & Western at Kingston, and was later foreman at Scranton, Pa. From 1879 to 1902 he was foreman at the New York Elevated shops in New York City. For the following year Mr. Kennedy was chief cashier of the Water Department of the City of New York, and in 1904 was deputy superintendent of elections. He contributed for many years to the railroad press, and in 1905 joined the staff of Railway and Locomotive Engineering, and became managing editor in 1911. He was the author of a number of handbooks on locomotive subjects.

J. Kennedy

Trade Publications

SCHOOP METAL SPRAYING PROCESS.—The Metals Coating Company of America, Philadelphia, Pa., has recently issued a large size, 18-page, illustrated bulletin descriptive of the metal spraying process developed by that company. The bulletin discusses fully the details of the process and the equipment, showing both by text and by numerous illustrations the various forms and classes of structures, such as bridges, pipe, car frames, towers, etc., which can be treated by this process of spraying on a thin coating of such metals as zinc, lead, aluminum, tin, copper, etc., for protection against corrosion and other destructive agents.

ELECTRIC CAR LIGHTING FIXTURES.—A catalogue under the title of "Electric Lighting Fixtures" has recently been issued by the Safety Car Heating & Lighting Company, 2 Rector street, New York, which describes and illustrates electric car lighting fixtures made by that company. The catalogue is profusely illustrated in two colors and contains 85 pages. The fixtures illustrated do not cover the entire line of Safety designs. They do, however, include those which, by virtue of the demand for them, would seem to represent the majority preference of railway men and the approval of the traveling public.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company contemplates the extension of its line between El Segundo, Cal., and Wilmington Harbor.

BALTIMORE & OHIO.—This company has placed contract with the American Bridge Company for the erection of two bridges on its Parkersburg branch at Smithburg and West Union, W. Va. The new structures consist of plate girder spans, 80 and 112 ft. in length.

CANADIAN NATIONAL.—This company will replace a 2,400-ft. trestle over the Bird Tail Creek valley, 190 miles west of Winnipeg, Man., by an embankment and a 79-ft. deck plate girder span on concrete abutments 56 ft. high.

CARBON COUNTY.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a new line from a junction with the Denver & Rio Grande Western for a distance of 4½ miles in Carbon County, Utah.

CHICAGO, BURLINGTON & QUINCY.—This company will construct a low grade line from the Illinois river bottoms at Frederick, Ill., to Vermont, a distance of 15½ miles, to facilitate the handling of heavy northbound coal traffic.

KANSAS, OKLAHOMA & GULF.—The Interstate Commerce Commission has issued a certificate authorizing the construction of an extension from Baxter Springs to Military Junction, Kans., 6½ miles.

MISSOURI, KANSAS & TEXAS.—This company will accept bids until Sept. 1, for the construction of a brick and steel locomotive shop, 222 ft. by 475 ft., at Waco, Tex.

NASHVILLE & ATLANTIC.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension of about 12 miles from Campaign, Tenn.

OREGON-WASHINGTON RAILROAD & NAVIGATION.—This company, in conjunction with the Oregon State Highway Commission, will construct an undercrossing on the Shaniko branch at a point about two and a half miles south of Moro, Ore.

PHILADELPHIA & READING.—This company has awarded a contract to F. W. Van Loon, Philadelphia, Pa., for the construction of a building at Eighth and Master streets, Philadelphia, which will be leased to the American Railway Express Company for its use. The plans call for a one-story structure of steel frame covered with corrugated asbestos metal. The building will be 337 ft., 6 in. long and 86 ft., 10 in. wide, supported on a concrete foundation.

PHILADELPHIA & READING.—This company has started the reconstruction of bridges No. 7 and 8 on the New York division near Bethayres, Pa. Both bridges will be constructed of steel encased in concrete and resting on concrete piers. Their lengths will be 55 ft. and 200 ft. respectively.

RICHMOND, FREDERICKSBURG & POTOMAC.—This company has awarded a contract to the Roberts & Schaefer Co., Chicago, for the construction of two 1,000-ton coaling stations to be erected at Acca yard, Richmond, Va., and Potomac yard, Alexandria.

TENNESSEE, ALABAMA & GEORGIA.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension from Gadsden, Ala., to Odenville on the Seaboard Air Line and Margaret on the Central of Georgia, a total of 34 miles.

UTAH CENTRAL.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line through or near Huntington, Desert Lake and Cleveland, Utah, to Wellington on the Denver & Rio Grande Western, with a branch connecting with the Utah Railroad, a total of about 50 miles.

Railway Financial News

BOSTON & MAINE.—*Equipment Trusts Sold.*—The Equitable Trust Company of New York, Paine, Webber & Co., West & Co., and Edward Lowber Stokes & Co., have sold $3,926,000 6 per cent equipment trust gold notes, maturing January 15, 1923, to January 15, 1935, at prices to yield from 4.75 to 5.75 per cent, according to maturity.

CINCINNATI, INDIANAPOLIS & WESTERN.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $1,000,000 of first mortgage 5 per cent gold bonds to be sold at not less than 70 and the proceeds used for corporate purposes.

DENVER & SALT LAKE.—*Excepted in 10 Per Cent Rate Reduction.*—The commission has rendered a decision on a petition of the receivers of the Denver & Salt Lake to be excluded from the effect of its recent decision prescribing a general 10 per cent reduction in freight rates. The commission finds that the joint interstate rates on coal over this road will be unreasonable to the extent that they exceed the rates in effect on August 25, increased by 20 per cent; but as to the rates on other traffic no protest or objection was made and the petition was granted. The commission has also issued an order according increased divisions of joint rates to this road on bituminous coal in carloads from mines on its line in the Oak Hills (Colo.) district.

EUREKA SMELTING & MINING COMPANY.—*To Purchase Eureka Nevada Railway.*—This company, recently organized to engage in a mining and smelting business, has secured an option on the Eureka Nevada Railway with the intention of soon purchasing this property. The road is of narrow gage and extends between Eureka, Nev., and Palisade, a distance of 88 miles.

FONDA, JOHNSTOWN & GLOVERSVILLE.—*Authorized to Issue Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $550,000 of first consolidated general refunding mortgage bonds to be sold at not less than 75 or to be pledged from time to time as collateral security for notes.

GRAND TRUNK.—*Director Resigns.*—The resignation of Howard G. Kelley from the board of directors was accepted by the Canadian government on August 16. Pending the reorganization of the Canadian National board, the government appointed Major Graham Bell, deputy minister of railways, to succeed Mr. Kelley.

GULF, MOBILE & NORTHERN.—*Annual Report.*—The corporate income account for the year ended December 31, 1921, compares as follows:

	1921	1920*
Average miles of road operated	454	470
Operating revenues	$4,086,217	$4,147,960
Operating expenses	3,653,018	4,909,103
Net operating revenues	433,199	Def. 761,141
Railway tax accruals	234,057	179,718
Total operating income	98,870	Def. 1,034,097
Total non-operating income	55,721	922,541
Gross income	154,592	Def. 111,556
Total deductions from income	110,004	703,669
Surplus or deficit	44,588	Def. 815,224

*Excludes effects of federal compensation and guaranty.

KANSAS & OKLAHOMA SOUTHERN.—*Authorized to Issue Securities.*—The Interstate Commerce Commission has authorized this company to issue $310,000 of two-year, 7 per cent promissory notes, the proceeds to be used for construction, and to pledge $310,000 of its first mortgage bonds as collateral security.

LAKE ERIE & WESTERN.—*Control by Nickle Plate Authorized.*—The Interstate Commerce Commission has authorized the acquisition by the New York, Chicago & St. Louis of control of the property of the Lake Erie & Western by means of an operating contract.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Dividend Held Up.*—Federal Judge W. F. Booth, at Minneapolis, Minn., has issued a restraining order directing that the dividend of 2 per cent declared last March cannot be paid until the United States Circuit Court of Appeals passes on the legality of the issue.

This means no dividend will be paid at least until December 4, when the Circuit Court meets in St. Louis. Judge Booth issued his order following a notice of an appeal by the Continental Insurance Company, and the Fidelity Fire Insurance Company from his recent decision that the common stockholders were entitled to participate in the earnings.

Missouri-Kansas-Texas.—*Asks Authority to Issue Securities.*—The Missouri-Kansas-Texas Railroad Company has applied to the Interstate Commerce Commission for authorization of the issuance of its securities in accordance with the plan of reorganization which was announced last November. The new company proposes to issue the following securities: $52,942,752 of prior lien mortgage 5 per cent gold bonds; $27,230,000 prior lien mortgage 4 per cent gold bonds; $29,121,347 prior lien mortgage 6 per cent gold bonds; $57,500,000 convertible adjustment mortgage 5 per cent gold bonds; $30,000,000 of 7 per cent preferred stock, and 1,000,000 shares of common stock without par value. The company also asks authority to issue from time to time, upon surrender of the convertible adjustment mortgage bonds, such additional amount of preferred stock up to $57,500,000 as may be necessary to effect such conversion. A copy of the plan of reorganization as announced by J. & W. Seligman & Co., of New York, and Hallgarten & Co., of New York, reorganization managers, was filed with the application. The exchange of securities is to be handled by a syndicate including those two companies, Speyer & Co., and the Equitable Trust Company.

Nevada-California-Oregon.—*Increased Divisions Ordered.*—The Interstate Commerce Commission has issued an order finding that divisions of joint rates accorded the Nevada-California-Oregon by the Southern Pacific to be inequitable and directing that they be increased by 10 per cent of the divisions accruing to the Southern Pacific.

Northern Pacific.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority for an issue of $4,500,000 of 5 per cent 10-year equipment trust certificates to be used in the acquisition of cars to the amount of $6,195,000. Through an agreement with the North Western Improvement Company and the First National Bank of New York the certificates are to be purchased by the improvement company at 99.

Pennsylvania.—*The Stockholder and the Employee.*—In reply to an inquiry as to how the employees of the Pennsylvania Railroad have fared, as compared with its stockholders, by reason of the wage and dividend changes made since the pre-war period, A. J. County, vice-president in charge of accounting, has authorized the following:

In 1914 wages on our railroad averaged $850 a year per employee. Today, after all readjustments, including those effective July 1, 1922, they average $1,550. Our wages are therefore 82 per cent higher than in 1914, while the cost of living, according to government statistics, is 67 per cent higher. This means that each of our 200,000 employees, on the average, is able to buy considerably more of the desirable and needful things of life than his pre-war wages would obtain.

Our stockholders are in a different position. They number 140,000. Most of them own less than 50 shares each. The average ownership is 71 shares. Before the war 71 shares yielded an income of $213 per year. In 1921 our directors were forced to reduce the dividend on Pennsylvania Railroad stock from the rate of 6 per cent to 4 per cent per annum. This cut the return of the holder of the average number of shares to $142 per year. He is now getting one-third less dollars than in 1914, and in addition, like the employee, he has to meet the higher cost of living. This means that the actual buying power of his present income from dividends is much below that of his pre-war return.

Our management feels an obligation, which has been publicly stated, to restore the 6 per cent rate as soon as that step can be wisely taken, without risking deterioration of the property. Even then our stockholders' incomes will merely be restored as to the number of dollars, but not as to purchasing power, as long as the cost of living remains above normal.

As between the stockholder and the employee of the Pennsylvania Railroad, the burdens of the war have fallen entirely upon the former. The same condition, of course, is true of the railroads in general, and has undoubtedly been an important factor in accounting for the failure of the men, who are at present on strike against the recently authorized very moderate wage readjustments, to enlist the support of the public.

It is, and long has been, the declared policy of the Pennsylvania Railroad to pay its employees the best wages and offer them the most favorable working conditions in the country, or for that matter in the world. The stockholders of the company have consistently supported the management in this policy, in order that loyal, efficient and satisfied working forces might be maintained, and the public receive the best service possible. Most of our men are, and always have been, of this type.

In the present crisis, the great majority of our shop forces have remained loyal, wisely accepting a conservative wage readjustment which is fair to their interests, and necessary as a measure of justice both to the owners and the users of our railroad. Moreover, among our men there are doubtless [illegible] whose choice of action has been influenced by knowledge of the facts that the railroads have had to accept a reduction in freight rates, and that wages on our railroad, even in a depressed year like 1921, took over 70 cents out of every dollar paid by the public for service; whereas after paying these wages, taxes, material and supply bills, fixed charges, etc., less than two cents remained out of every dollar of revenue to pay dividends and maintain the credit of the Pennsylvania System.

Peoria Railway Terminal Company.—*Receivership.*—W. G. Bierd and H. I. Battles have been appointed co-receivers by the United States District Court for the Southern District of Illinois, Northern Division.

Seaboard Air Line.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $3,009,980 of equipment trust certificates to be issued by the Chase National Bank of New York, including $2,450,000 to be sold at not less than 97.02 and $559,980 of deferred certificates to be sold at par.

Southern Pacific.—*Authorized to Abandon Branch.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of its branch from Tulasco to Metropolis, Nev., 7.8 miles, which is owned by the Central Pacific.

Union Terminal.—*Authorized to Extend Notes.*—The Interstate Commerce Commission has authorized this company to enter into agreements with the holders of $550,001 of its 5 per cent unsecured notes for the extension of the maturity date from October 10, 1922, to October 10, 1923, and for the payment of interest at 6 per cent.

Virginian & Western.—*Acquisition of Control Authorized.*—The Interstate Commerce Commission has authorized the acquisition of control of the Virginian & Western by lease on the condition that the Virginian shall not dispose of the stock of the Virginian & Western now owned or controlled by it without the consent of the commission and that the amount to be paid by the Virginian under the terms of the lease for the purpose of maintaining the corporate organization of the Virginian & Western shall not exceed $1,000 a year.

Virginian.—*Asks Authority to Increase Dividend.*—This company has applied to the Interstate Commerce Commission for authority to change the dividend rate on $27,955,000 of preferred stock from 5 to 6 per cent, the dividend to be cumulative and calculated from August 1, 1922.

Revised Regulations Concerning Common Directors

The Commission has issued revised regulations relative to authorizations of common officers and directors under paragraph 12 of section 20a of the Interstate Commerce Act. The order supersedes the Commission's order of October 11, 1921, and revises the regulations thereby prescribed. The provisions of the former order permitting applications to be made by carriers have been eliminated and henceforth applications can be made only by the individuals concerned and each application must be confined to one person.

Dividends Declared

Canadian Pacific.—Common, 2½ per cent, quarterly; preferred, 2 per cent, semi-annually; both payable September 30 to holders of record September 1.

Chestnut Hill.—1¾ per cent, quarterly, payable September 5 to holders of record August 19.

Cincinnati, New Orleans & Texas Pacific.—Preferred, 1¾ per cent, quarterly payable September 1 to holders of record August 18.

Delaware & Bound Brook.—2 per cent, quarterly payable August 11 to holders of record August 1.

North Pennsylvania.—$1.00, quarterly, payable August 25 to holders of record August 10.

Pittsburgh, Youngstown & Ashtabula.—Preferred, 1¾ per cent, quarterly, payable September 1 to holders of record August 21.

Southern Pacific.—1½ per cent, quarterly; payable October 2 to holders of record August 31.

Union Pacific.—Common, 2½ per cent, quarterly; preferred, 2 per cent, semi-annually; both payable October 2 to holders of record September 1.

Trend of Railway Stock and Bond Prices

	Aug. 15	Last Week	Last Year
Average price of 20 representative railway stocks	70.61	70.72	55.35
Average price of 20 representative railway bonds	88.65	88.95	74.97

Railway Officers

Executive

D. Upthegrove, general solicitor of the St. Louis Southwestern with headquarters at St. Louis, Mo., has been appointed acting president to succeed J. M. Herbert, deceased.

W. F. Woodul has been elected temporary president of the re-organized International & Great Northern with headquarters at Houston, Texas. R. E. Williams has been elected temporary secretary.

P. E. Crowley, vice-president, and R. D. Starbuck, assistant vice-president, of the New York Central, have had their authority extended, effective August 7, over the Toledo & Ohio Central, the Kanawha & Michigan, the Kanawha & West Virginia and the Zanesville & Western of which properties the New York Central recently became lessee.

F. B. Sheldon, vice-president of the Toledo & Ohio Central, the Kanawha & Michigan, the Kanawha & West Virginia and the Zanesville & Western, which properties have recently been leased by the New York Central, has been given, effective August 7, the title of resident vice-president with duties to be assigned. His headquarters remain as heretofore, at Columbus, Ohio.

Traffic

I. W. Gent has been appointed general agent of the Minneapolis, Northfield & Southern with headquarters at Kansas City, Mo.

Harry L. Farrell has been appointed commercial freight agent of the Buffalo, Rochester & Pittsburgh with headquarters at New Castle, Pa.

J. M. Ball, general traveling agent, freight department, of the International & Great Northern with headquarters at Houston, Tex., has been promoted to general agent with the same headquarters.

J. A. Staus, commercial agent of the Duluth, Missabe & Northern with headquarters at Duluth, Minn., has been promoted to assistant general freight and passenger agent with the same headquarters, succeeding G. C. Ross, resigned. He will be succeeded by D. N. Jones.

L. F. Vosburgh, traffic manager of the New York Central, had his authority extended, effective August 7, over the Toledo & Ohio Central, the Kanawha & Michigan, the Kanawha & West Virginia and the Zanesville & Western of which properties the New York Central recently became lessee.

Operating

H. J. Humphrey, whose appointment as assistant general superintendent of the Ontario district of the Canadian Pacific was announced in the *Railway Age* of July 15, page 137, entered railway service in 1896 as a telegraph operator for the Intercolonial Railway. The following year he entered the service of the Boston & Maine in a similar capacity and remained until 1901 when he returned to the Intercolonial. In 1902 he went with the Canadian Pacific and a year later was promoted to train dispatcher. In 1911 he became chief dispatcher at McLeod, Alta., and the following year was promoted to car service and fuel agent of the Saskatchewan district with headquarters at Moose Jaw, Sask. In 1915 he was promoted to superintendent of car service, Western lines, with headquarters at Winnipeg, and the same year was transferred in a similar capacity to the Eastern lines with headquarters at Montreal. In 1916 he was promoted to superintendent at Farnham, P. Q., and from that time until his recent appointment served in a similar capacity at Montreal, Brownville Jct., Me., and Toronto, Ont.

R. B. Hoffman, whose promotion to superintendent of transportation of the Pacific Fruit Express with jurisdiction over car service matters east of Omaha and El Paso, Tex., with headquarters in Chicago, effective August 1, was reported in the *Railway Age* of August 5, was born on February 3, 1885, and entered railway service as an employee of the Chicago, Burlington & Quincy in June, 1900, from which time he served in the capacities of mileage and car record clerk, yard clerk, fireman and switchman on the Chicago, Burlington & Quincy and the Chicago & North Western until 1905. From 1905 to November, 1906, he was car service and transportation clerk for Armour & Company and Swift & Company and from November, 1906, to January, 1908, had charge of the car record department of the American Railway Clearing House. He entered the service of the Pacific Fruit Express on January, 1908, in charge of the car record, mileage, block diversion and block department of this company until April, 1912, when he became traffic manager of the E. L. Hasler Company. He re-entered the service of the Pacific Fruit Express in October, 1914, and from that time until his recent promotion had charge of the transportation department with headquarters at Chicago.

Obituary

G. E. Simpson, general supervisor of transportation of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, Ill., died August 16 from heart trouble.

John R. Schrader, general car foreman of the New York Central at Mott Haven, N. Y., died Friday, August 11. He was also second vice-president of the Central Railway Club.

George A. Cullen, who was passenger traffic manager of the Delaware, Lackawanna & Western until March 19, 1920, and who since that time had been vice-president of the North American Fruit Exchange, with headquarters at New York City, was found dead on August 14 in the room of a hotel at which he was staying in New York City. Mr. Cullen was compelled recently to leave his work for a rest, having been working night and day for months, causing a nervous breakdown. He was born in St. Louis and began railway work with the Wabash Railroad. He subsequently served as rate clerk on the Missouri Pacific. In 1895 he was chief rate clerk and rate sheet compiler of the Southern Passenger Association at Atlanta, Ga. He then was consecutively chief clerk in the passenger department of the Plant System, of the Western Passenger Association at Chicago, and (in 1898) general agent of the same association in charge of the immigration bureau at New York. In 1900 he went to the Delaware, Lackawanna & Western as general western agent at Chicago; six years later he was appointed general passenger agent with office at New York and in 1911 was promoted to passenger traffic manager. During the war Mr. Cullen served as the chief of a section of the United States Food Administration in Washington. As a United States Railroad Administration executive in charge of consolidated ticket offices he was credited with the successful preparation of the plan on which they are operated in the larger cities.

G. A. Cullen

Utah has joined with other Western states in requiring that motor vehicles engaged in the transportation of freight and passengers stop before crossing railroad tracks. The Public Utilities Commission of Utah recently issued an order that the stop must be made not less than 20 ft. and not more than 50 ft. from the track.

Railway Age

EDITORIAL

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The Growing Menace of the Highway Crossing

The wrecking of a Soo Line train at Annandale, Minn., with the death of ten persons and the injury of many more as the result of a collision with a motor truck at a highway crossing, is a shocking illustration of a new menace in the highway crossing accident, namely the hazard to the patrons and employees of the railroads. Accidents of a similar nature, but with less gruesome results, befell a Pennsylvania train at Allaire, N. J., on June 16, an Erie express train at Binghamton, N. Y., on June 6, and the "Black Diamond" express of the Lehigh Valley at North Leroy, N. Y., on May 13. Under this same classification is the collision of a passenger train in California with a road roller a month or two earlier. In the early days of railway transportation the onus of the grade crossing was placed upon the railroad. Except in the far west the highways were largely built first, so the coming of the railroads was the cause of the crossing, moreover the vehicles on the former moved at a speed that was very slow as compared with those prevailing on the latter. With the beginning of the new century, these conditions have changed rapidly. Traffic on the highways has changed in volume and character so that there are now many crossings where thousands of highway vehicles pass over the tracks daily at speeds in many cases approaching that of the railway trains. However, until recently the property damage and casualties resulting from collisions of railway and highway vehicles fell almost entirely upon the latter and their occupants, but now we find that the danger is not entirely to the automobile or motor truck. Not only does the driver risk his own life and that of his companions when he fails to exercise care in crossing a railroad track, but he endangers the lives of the several hundred passengers on the train that may be approaching the crossing at that moment. Railway traffic has increased in volume and density during the last two decades, but this increase is not of the same degree as the revolutionary change which has occurred simultaneously in the use of public highways. Consequently the increase in the hazard at highway crossings is a condition for which responsibility must be placed primarily on the users of the highways.

Railway Stocks Advance

Railroad stocks and bonds are again popular in Wall Street. They are participating in the general advancing movement in which all classes of stocks or bonds have participated but, on the whole, within the past week or two they seem to have been receiving more or less special favor. On Saturday, August 19, about 20 railroad stocks reached new high prices for the year. On Monday this advance in prices continued with the result that a large number of railroad stocks and bonds not only reached their highest prices so far this year, but also their highest prices for several years. New York Central common on Monday of this week passed par, this being the first time quotations for this stock have been above par since 1916. The closing price on Monday of Great Northern preferred, 94⅜, was 3⅛ above the closing price on Saturday, 12⅜ points above the price on July 7 and the highest it has been since 1919. Chicago & North Western common, closing at 91¾, was 3⅜ points above the closing price on Saturday, 11¾ points above the price on July 7 and also the highest it has been since 1919. Common stock of the Chesapeake & Ohio, closing at 78⅝, of the Southern Pacific, closing at 95½; of the Northern Pacific, 86⅜; Norfolk & Western 119½; Baltimore & Ohio, 60¼, were among other issues which on Monday reached higher prices than they had reached for a period of several years. The manner in which railway stock and bond quotations have advanced recently is unquestionably partly due to the favorable feeling in the financial district as to the progress which is being made towards winning the shopmen's strike. It is partly the result of the manner in which the railways have handled business in spite of the strike, to the recent improvements in railroad net earnings and to the expectation that a heavy coal and grain movement will greatly increase the favorable net of many of the roads which are already reporting good figures. Underlying the whole situation, however, is the very optimistic attitude that people in financial circles have as to the present condition of the country's industry. It is of extra interest to the railway man that railroad shares should be receiving special favor, it means much for future railway financing.

Are Modern Machine Methods Fully Utilized?

Some railroad shops undoubtedly have installed a few of the best modern machine tools available but these shops are the exception rather than the rule. In most cases modern equipment is conspicuous by its absence and there is apparently a tendency to believe that work once done in a certain way should always be done that way. At least, the attitude toward new ideas and new machines is not particularly receptive. As soon as the strike is settled, mechanical department officers and shop foremen should get away from their work long enough to note the immense strides in machining methods which have been made in recent years by industrial manufacturers. The railroads certainly ought to profit by the best of these modern methods. They are not doing so at the present time according to the testimony of both railroad and machine tool men. A prominent manufacturer of internal grinding machines says: "Our experience indicates that in the majority of cases the railroad repair shops are so far behind in the matter of up-to-date machine shop equipment that it is going to be a long, long time before they get educated up to the class of machinery, such as we are prepared to offer." It is unfortunate that such a statement can be made with any degree of truth. In the case of the particular machines referred to, internal grinders have been largely developed for the automotive field, but they also have a wide field of usefulness in railroad shop work. Space does not permit mentioning internal grinding operations in detail; suffice to say that internal grinders, already installed in a few of the more advanced shops, perform truing operations on many locomotive and car parts far more accurately and in a shorter time than could be accomplished by any other method. In addition, other operations (such as grinding the bores of case-hardened bushings) never possible before the advent of the internal

grinder, can now be performed with ease. The internal grinder is mentioned only as an example of many machines which have been developed in recent years, effecting remarkable economies in machining methods. The railroads, as well as industrial manufacturers, should profit by these economies.

C. & O. Preferred Stock

The Chesapeake & Ohio announced on Monday that it has decided to offer to its common stockholders the right to subscribe at par for new 6½ per cent cumulative convertible preferred stock, series A, to the extent of 20 per cent of their holdings. The issue will amount to about $12,558,500. Action is subject to approval by a stockholders' meeting to be held September 26 and, of course, by the Interstate Commerce Commission. The announcement of this proposal to issue preferred stock is of leading interest at this time because the step takes advantage of a much more favorable financial situation from the railroad point of view in that the financing can be done through an issue of preferred stock instead of bonds. It has been necessary in too great a degree in recent years for the railroads to finance through bonded indebtedness instead of stock. The recent increase in the value of railroad common and preferred stocks—which one trusts is only in its beginnings—now puts a better aspect on the situation. We are likely, therefore, to see during the coming year an increasing tendency for railroads to finance through stock issues. The Chesapeake & Ohio intends to use the proceeds of the proposed preferred stock issue for physical improvements during the next four years. The program, with a total cost given as $16,500,000, includes new roundhouses and shop facilities, additional running and passing tracks, grade reduction, and additional terminal facilities at Hanington Roads. As *Railway Age* readers know, the Chesapeake & Ohio already has an improvement program under way, this and the new plans being necessary because of the rapid expansion of C. & O. traffic in recent years, if anything beyond the ability of the physical plant to handle with desired economy. An additional feature of interest is the earnings of the property. Profiting from serving non-union mines, the Chesapeake & Ohio had a net railway operating income in the first six months of 1922 of $9,644,657 as compared with $5,041,318 in the first half of 1921.

The Railway's Part in Developing Labor Saving Equipment

THERE HAS NEVER been a time when railway officers have been more united or more outspoken than now in their opinion that the roads must install more labor saving equipment. While this feeling has grown with the greatly increased cost of labor the need for more labor saving equipment has been realized for a long time. It exists in all departments, although there is no branch of the service where the possibilities for economies are as great as in maintenance of way work.

Nearly half a million men are employed in these operations which are largely of a character which lend themselves to mechanical performance. Yet the development of machinery to replace men has lagged. One reason for this is the fact that the roads themselves have not set about to foster this development, but have left it to private enterprise and have assumed a more or less disinterested attitude.

It is common knowledge that the way of the inventor is hard. Experience has shown that the path of the promoter of equipment of this character is scarcely less arduous. Every new device must pass through a period of development. This must be carried on under actual service conditions. It is expensive in time and in money, and it requires the sympathetic co-operation of railroad officers interested in perfecting it if success is to be attained.

Many railway men maintain the attitude that the development of labor saving equipment is a commercial problem and that they are not interested until the equipment has reached the stage where its practicability can be demonstrated. This attitude has done more than any other single influence to discourage and to delay the development of the equipment for which these men have expressed a desire and a need, and until it is changed many experienced manufacturers hesitate to make the expenditure necessary to develop a new device.

To suggest that the roads enter more fully into the development of such equipment is not a plea for aid for the manufacturers, but for the roads themselves—for the manufacturers will profit ultimately only as the equipment is able to effect a saving for the roads. The rapidity with which this equipment will be developed will depend directly upon the extent to which the roads co-operate. Mere expressions of a need will not bring equipment—co-operation will.

Future Settlement of Railway Labor Disputes

PRESIDENT HARDING in his message to Congress on the coal and railway shop employees' strikes, said that legal safe-guarding against such menaces to the public as that presented by the shopmen's strike must be left for future consideration. The language used by him indicated, however, that he believes this strike and the developments in connection with it have shown the necessity for amendments of the Transportation Act which will strengthen its labor provisions.

One thing has been made only too clear. This is that the labor provisions as they now stand will not prevent strikes. The first nation-wide railway strike in history has occurred under them. It began almost two months ago, and in spite of all reports to the contrary, there is no prospect of an early settlement of it.

The labor provisions contemplate the submission of all important railway labor controversies to the Railroad Labor Board. They do not, however, fix any penalties for violation of the decisions of the board by either the railways or the employees having been predicated on the assumption that public sentiment would cause obedience to the board's decisions. This theory has been exploded. There have been retail violations of the decisions of the board by railway companies. The shop strike involves wholesale violations of one of its decisions by the employees. The influence of public sentiment has proved smaller than the authors of the law expected.

The question presented to the public, then, is whether—first, to repeal the labor provisions entirely, and leave the settlement of railroad labor controversies to the voluntary action of the parties or to strikes; or second, to leave the labor provisions as they now are; or third, to provide penalties for violation of decisions of the board by either the railway companies or the employees.

There cannot be the slightest question in the mind of any person familiar with the present relations between the railway companies and the railway labor unions as to what would be the result of mere repeal of the labor provisions, which of course would include abolition of the Labor Board. The differences between the companies and the labor unions are now, and promise for a long time in future to be so fundamental and irreconcilable that no important controversy between them could be settled by direct negotiations. Fur-

thermore, while the companies have favored voluntary arbitration, the labor unions are absolutely opposed to it. Therefore, mere repeal of the labor provisions and abolition of the Labor Board probably would result in a series of railroad strikes which would demoralize all business and shake the country's institutions to their foundations. The labor leaders advocate repeal of the labor provisions. They want to destroy private ownership and management and believe abolition of all forms of government intervention in labor disputes would make this easier to accomplish. They are probably right, but in the struggle there would be other things destroyed besides private ownership of railroads.

Experience during the last two and one-half years shows clearly what would be the result of leaving the labor provisions of the Transportation Act as they are. On the whole, it probably would be better to leave them as they are than merely to repeal them. There is some advantage in having an important labor dispute thoroughly investigated and its merits passed upon by a government body on which the public holds the balance of power before the railways and their employees decide upon the course they are going to take, if the decision does not satisfy them. There are also disadvantages, but on the whole they probably are outweighed by the benefit derived from having the issues passed upon and clearly defined before an open break comes. The best course to take might be to leave the labor provisions as they are, provided the local, state and national governments could be relied upon, in the case of strikes, to enforce the laws against violence to property and persons. But experience in the coal and railway shopmen's strikes shows that they cannot be relied upon to do this. Therefore, while it might be better to retain the present labor provisions than merely to repeal them, the facts should be frankly recognized that their retention would be of comparatively little benefit and that probably as time went on they would exercise less and less influence on the course of labor controversies, and finally become practically a nullity.

The only course left open which holds out any promise of comparative peace in the railroad industry is to maintain the Labor Board or establish some other kind of government body to pass on railway labor controversies and to fix, by new legislation, heavy penalties for violations of its decisions by either the railway companies or the railway employees. It may be said that if the laws against violence cannot be enforced, no law to prevent strikes and other violations of decisions of a government arbitration body could be enforced. But the enforcement of the ordinary laws against violence is largely in the hands of officials in local communities where strikers and their supporters are such a large part of the total population that public sentiment either does not make itself felt, or is actually with the strikers. On the other hand, the enforcement of federal legislation requiring obedience to decisions of a federal tribunal would be in the hands of federal officials whose course would be dictated by the sentiment of the country as a whole. Now, there is no question that sentiment in the country as a whole has been against the strike of the shop employees, although it has not been in many local communities where the population is composed largely of railway employees.

The *Railway Age* has never in the past advocated compulsory arbitration of railroad labor disputes. This paper has believed that public sentiment and government officials would be so antagonistic to any party that acted in disregard of a decision rendered by a government body in a railroad labor controversy that in practically all cases such decisions would be obeyed and that at least no wholesale and protracted violations of them would occur. Experience has shown, however, that this belief was without foundation. There may be differences of opinion as to whether compulsory arbitration would work, but everybody now knows, or ought to know, that no other means intended to secure peaceful settlement of railroad labor controversies will work.

Looking Ahead

THERE IS NO QUESTION but what something is seriously wrong in the relations between the men and the managements of most of our railroads. The shopmen's strike is only one evidence of this. Regardless of the causes of this friction and unrest, the responsibility for improving conditions is strictly up to the managements. The underlying causes or forces which are responsible for the present situation have been in process of development for a long time and are natural reactions from past conditions. To correct the difficulties it will be necessary, first, scientifically to study and survey the situation to determine the underlying causes of the trouble and then by removing these causes, one by one, to bring about an improvement.

Too little attention has been paid in the past to the handling of the human element in railway work. Too much stress, comparatively, has been placed upon methods and practices and the development of equipment and apparatus, and too little on the study of human nature and the supervision and control of the men. Meanwhile many of the other industries have gone ahead in studying the personnel of their organizations, with the result that greater and greater stress has been placed upon the necessity of improving the relations between the men and the managements and in educating the men to a larger realization of their responsibilities and possibilities.

The railway executives, for instance, may have looked into John Leitch's experiments in industrial democracy, or into the methods of the Dennison Manufacturing Company, or developments of a similar nature. They have largely failed to utilize the experiences of other industries, however, on the plea that methods which could be used successfully by companies which were engaged in manufacturing were not applicable to the railroad business, and that, moreover, while an industrial concern is concentrated in a few buildings or over a few acres, a railroad organization is spread thinly over a vast amount of territory. The latter fact, however, is all the more reason why railroad managements should give more attention to matters of this kind. As far as the first objection is concerned, it is well to remember that the exact methods or practices involved in a particular scheme of organization are largely incidental in securing results, and that the important factor, after all, is the spirit back of them. One company may secure remarkable results from a certain form of organization, while another under similar circumstances may absolutely fail because those in control use the methods or practices with the idea of taking advantage of the men, while the other organization is dealing fairly with the men in the knowledge that both sides will profit from the transaction if it is honestly carried out.

It is high time that railroad managements gave more serious consideration to the development of strong personnel departments with the highest ideals. Because the difficulties which confront them are far greater than in compact, concentrated industrial organizations, it is necessary that the personnel departments be made even stronger and that they be based upon the highest ideals of successful, modern practices of dealing with men and supervising them. Railroad managements have before them many examples of successful experiments of this kind which have been made by manufacturing companies, even though it is true that only a comparatively few of the industries have awakened to the possibilities in this direction. Because the problem on the railroads is so much greater and more complicated than it is in other industries, it is important that it be tackled fairly and squarely and without any delay. This, if it goes hand in hand with the educational methods mentioned in the comments last week, entitled "The Next Step," will be productive of real and permanent results and will place the railroads on a sound basis so far as the relations with their employees are concerned.

The Coal Strike "Settlement"

As the largest purchasers of coal in the country the railways are interested in the so-called "settlement" of the coal strike recently effected by the United Mine Workers of America with certain coal operators at Cleveland. The miners struck throughout the country, except in non-union territory, on April 1 because they could not reach an agreement with the mine operators regarding wages and certain other matters. The agreement reached Cleveland on August 15 was not really a settlement, but a complete surrender by the operators. They agreed to put the miners back to work until April 1, 1923, under the same working conditions and wages as those in effect prior to April 1, 1922. No provision for arbitration was made. A "fact finding" committee is to be appointed, but there is nothing in the arrangement which binds either party to abide by the facts found, whatever they may be.

The complete and abject surrender made by the operators involved, most of whose mines are in eastern Ohio, means that reduction in the wages of the miners, and therefore reductions in the price of coal to the public, are indefinitely postponed. Since no means has been adopted for settling future controversies, it seems almost certain, if this agreement becomes the basis for agreements to open up the mines generally, that another nation-wide coal strike will begin on April 1, 1923. The public must bear the results of one coal strike which has lasted almost five months, including a very serious shortage of fuel; it must in addition pay even higher prices for coal than it would have had to pay if the strike had not occurred; and it must face the prospect of a similar struggle and resulting shortage of coal next year.

There are many operators of coal mines in the country who have not been willing to make such a pitiful surrender as was made by those who signed the Cleveland agreement. The Illinois Coal Operators Association, for example, has held out for the adoption of some plan of arbitration as a condition of putting the miners back to work at the old wages. The miners' union continues, however, to reject all proposals for arbitration, and there is grave danger that sooner or later the miners throughout the country will be put back to work at the old wages, and without any agreement for arbitration of the question of what wages shall be paid in future. The operators in Illinois and some other states find themselves confronted with state laws of such a character that they practically give members of the miners' union a monopoly of the right to work in the mines.

President Harding in his message to Congress on the coal and railway strikes recommended the creation of a commission "to make searching investigation into the whole coal industry with provision for its lawful activities and the bestowal of authority to reveal every phase of coal production, sale and distribution." Doubtless it is desirable that such an investigation should be made. Some very important facts have, however, been made clear by the two great coal strikes of 1919 and 1921. One is that a single labor organization, the United Mine Workers of America, has acquired such vast power that it can stop the production of coal by most of the mines of the country for an indefinite period. Another is that this union, rather than arbitrate, is perfectly willing to put strikes into effect which will demoralize and even bring almost to a standstill the entire business of the country and cause disaster and suffering to all its people. It has been demonstrated by actual experience that the United Mine Workers of America can put into effect and carry out strikes which will do more harm than any kind of a strike on the railroads, except possibly one by the employees actually engaged in the operation of trains.

The national government and almost every state government have asserted and exercised the right to regulate or even destroy, for the protection of the public, combinations of capital which it has been feared, reasonably or otherwise, would be able to fix prices in disregard of supply and demand. But high prices may result from excessive costs of operation due to excessive wages and inefficiency of labor as well as to the exaction of excessive profits by the capitalists.

The prices of coal help to determine the expense of operating every business. The cost of coal is an especially large item in the expense of operating manufacturing plants and railways. Therefore, if the public allows the miners to maintain a nation-wide combination which can successfully demand excessive wages, the effect upon the cost of living will be exactly the same as if it allowed the coal operators, or any other large class of capitalists, to maintain a combination to extort excessive profits.

Some years ago when the government was engaged in a great struggle with combinations of capitalists, President Roosevelt said: "We must shackle greed as we have shackled force." The words of his statement should now be transposed so that it will read: "We must shackle force as we have shackled greed." The miners have relied upon force to win their strike. They have not only struck, which is the use of a negative form of force, but they have resorted to every form of violence, which is a positive form of force, to prevent others from working where they would not work. The same things have been true, of course, of the striking railway shop employees. Force has won the miners' strike. The success of its use in this instance will encourage its use in other cases.

What does the successful use of force in such a case mean? It means simply that the stronger impose their will on the weaker, regardless of the rights involved. That is what it always has meant, and always will mean. Force settles nothing except which of two combatants is the stronger. The outcome of the coal strike has demonstrated that the United Mine Workers of America are stronger than the coal operators. Experience has shown that there is no limit to what any body of men will seek to take by force as long as the use of force is successful. Therefore, the United Mine Workers of America may be relied upon to take more and more by force as long as their use of force is successful. But in the long run what they take from the mine operators will be taken from the public, because everything the miners take from the operators is necessarily taken by the operators, in turn, from the public.

It is only a matter of time until shortage and high prices of coal will bring this fact home to the public. There will then be a struggle which the public cannot fail to recognize as being between the miners and itself. What will be the outcome of that is uncertain. The miners' union may be able to get support from other labor organizations which will enable it to triumph over even the public. In that case, the sovereignty of the labor unions will be substituted for that of the people. Those who exercise the greatest power in a country are sovereign, no matter what its constitution and laws may say.

Since a struggle between the miners and the public is inevitable sooner or later, the sooner it is precipitated the better it will be for all concerned. The public, in self protection, would precipitate it between now and April 1, 1923, by the passage of a law providing for compulsory arbitration of labor disputes in coal mines. If the public cannot compel settlement of labor disputes in the coal mines by peaceable means, if it cannot prevent protracted strikes such as those of 1919 and 1921, if it cannot prevent and punish violence such as occurred in these strikes, then the people have lost their sovereignty in the United States to the labor unions.

Letters to the Editor

[The Railway Age welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

The Use of Operating Statistics

St. Louis, Mo.

To the Editor:

I have read with interest the material which has recently appeared in the *Railway Age* relative to the proposed revision of the I. C. C. operating expenses classifications and requirements for operating statistics.

The Interstate Commerce Commission can only exercise a general supervision through the accounts and statistics. The analysis of such returns must necessarily be entrusted to specialists, with no direct interference with the free initiative and responsibility of local management. Present classifications were prescribed by the commission only after full investigation, consideration and co-operation with railroad accounting officers, no doubt with the thought of designing something that would clearly reveal all of the operating conditions and at the same time create a base for such detailed statistics as the commission and railroads might from time to time require.

The suggestion has been made that our present classification is much too elaborate and calls for wholly unnecessary segregation. I say unnecessary because many of the classifications are not used, but I hardly see how the present classification can be simplified without a reduction in the number and this certainty ought to be done without reducing the amount of necessary data.

To analyze readily a statement or report with its voluminous information is difficult. I am, therefore, prompted to suggest a grouping of the related factors in separate statements or charts without including factors of minor importance. The prime factors must be developed as conditions and circumstances warrant. They should be prepared and presented in a form that will enable one, without studying a mass of figures, to determine tendencies. Should the tendencies be of a character requiring investigation, then, of course, one must go to the details. There must be a constant improvement of conditions and the problem is one of securing authoritative information concerning:

1. The effectiveness of the system in use.
2. The performance which can be expected of changed methods or the introduction of new devices.
3. The cost of the change.

Naturally, to obtain this sort of information, there must be a large amount of data, both accounting and statistical.

Statistics as now compiled show the sources of income and the channels of expenditures. An equal interest in both is paramount to a healthful situation. All statistics should be used to the greatest advantage looking toward greater sources of revenue and economies in operation. Many know the extent of the earnings but I dare say few realize the magnitude of the expenditures; that is, where the money goes after it is earned. These facts may be learned through operating statistics now compiled, if advantage is taken of them. Aside from this, they are valuable for the analysis of existing conditions but, in many cases, furnish little information as to what would happen under other and different conditions. Thus the predetermination of operating results, which is most important from the standpoint of orderly and improved operation, is largely dependent upon the researches of the individual and a co-ordinated organization. Vast numbers of both related and unrelated figures are compiled, but they are not a panacea to the solution of general problems. A statement of the expenses under fixed conditions will not ultimately suffice but the change of expenses under certain varying conditions is needed. If such data were available, the study and analysis of operating results would be more truly a diagnosis, rather than a postmortem.

A carefully thought out program and diligent research and investigation through the medium of statistics will bring out numerous aspects of the economies of operation that merit attention. It is, therefore, not logical to reduce the amount of information available for use by the operating officers, particularly at a time when the slight margin between revenues and expenses makes it absolutely essential that they be provided with all the data which can be furnished at a reasonable expense. This is particularly realized when an attempt is made to determine the cost of some particular class of traffic and this feature alone, to my mind, is quite important.

It has been suggested that reports as used do not give full information as to railroad operations, which statement may have been prompted by the thought that they are not in sufficient detail or properly assembled by classes to permit proper comparison, one road with another. In the first place, this is an impracticable suggestion. Second, considering the fact that greater efficiency is always uppermost in the mind of the operating manager, a complete segregation of the several items of operating costs into a number of composite units for publication uniformly would be of no value as a comparison with like units or factors of other roads, either as to determining the efficiency of operation or as to the value of the road's securities, when the physical characteristics of the property compared were unlike and the kind, density and proportions of tonnage, besides the speed, number and weight of trains, were different.

A comparison of the operating and maintenance costs of one railroad with another, of any one of the many factors which go to make up the aggregate, even though the physical and traffic conditions of both roads were somewhat analogous, would not reveal a difference sufficient in amount to enable one to form an intelligent judgment as to the respective efficiencies or as to the wisdom of investing in the securities. This could better be determined by a comparison with the aggregate amount expended by one road in relation to its gross earnings, for the same given period, or with that expended in previous years, or with the aggregate expenditure of any road having similar physical features, due consideration being given to the respective trend and volume of traffic, weight and speed of trains, and the prevailing weather conditions, etc. Of course, the expense of all of these several factors which make up the aggregate are carefully guarded and looked after in detail by the railroad manager and any further segregation for such comparative uses is liable to involve an expense far exceeding any value they might have.

Where a diversity exists in the physical and traffic conditions, a comparison of the operation of one road with that of another has very little value in determining the efficiency of management. Even on the same road, great differences in operating results may be shown from year to year, according to economic, rate or weather conditions, affecting the trend and volume of traffic and the facilitation of operation. The ratio of operating expenses to gross operating revenue is regarded as a criterion of the efficiency of the management and comparisons between different roads of this ratio are oftentimes made with the resultant impression that the road with the lowest ratio of expense is better managed. Such an impression might be altogether wrong as there may

have been different conditions in operation and traffic affecting the one road and not the other. One of the many factors that would affect this working ratio is the commodity traffic rate. There might be a predominating class of freight traffic on the road showing the low working ratio producing a rate per ton-mile much higher than that produced by the other. The rates in effect play a more important part in the results than any increased efficiency obtainable.

Statistics are quite necessary and must be of the kind and character to establish facts. The first and primary object of these facts is their use. No statistics, however, should be compiled unless they serve a useful purpose. Neither should it be assumed that the use of statistics alone will correct the evil and produce the desired results but, on the other hand, it is a question of adapting ourselves to the operating and economic conditions and then co-ordinating all facility units. Economy means the wise spending of money or time, good stewardship and careful administration. All agents and employees, including the officers and colaborers, must have a keen sense of duty and realize that each is just as important in the operation and success of the great institution as the locomotive. The last requirement is of great importance for, unless all the different operations work in harmony, the machine, as a whole, will not run smoothly. There should be personal interest not only in individual success but in the ultimate success of the railroad.

C. D. Hicks.
Executive Department, Missouri Pacific.

The Conservatives of 1851, and of 1922

Harriman, N. Y.

To the Editor:

Do you recognize this place? Few letters from summer resorts reach your desk, I presume; but that is no reason why the bracing country air should not stir *me*. The most notable structure in Harriman is the monument to Charles Minot, superintendent of the Erie Railroad, who in 1851 sent the first train order. (It was not a "31" nor a "19"; but it was a full-fledged meet order.) The dedication ceremonies of the monument were reported in the *Railway Age Gazette* of May 10, 1912. Minot, on a westbound passenger train which had lost its right to the road, telegraphed from here to the agent at Goshen, 13 miles west, to hold the superior eastbound train; and then ordered the westbound train to proceed. He was obliged, however, to mount the locomotive cab himself because the engineman refused to act on such an unheard of order.

You may, very likely, class me (with other summer-resort writers) as one who, when loafing in a quiet mountain resort, forgets the usual business perspective and writes sentimental stuff to fill up space; but if you do, you will be wrong; for I am intensely practical. We have still to learn a part of the lesson of the Minot incident.

When we realize that, to the experienced and skilful telegrapher, the words of the person at the other end of ten or a hundred miles of wire are as personal and human as they would be to you or to me if the means of communication were a telephone instead of a Morse relay or sounder, the slowness with which that Erie engineman grasped the idea that there had been a real and reliable conversation between Turner (now Harriman) and Goshen seems almost incredible, but *we of the twentieth century are retarding progress today* in just about the same way. And this Erie engineman was not the only rusty-minded conservative of the 19th century. The telegraph had been demonstrated in 1844, and Minot had, no doubt, scores of examples in his own experience assuring him that the miracle of instantaneous communication was a reality; but the average railroad officer of that time was so unprogressive that to us today he seems to have been absolutely fossilized. As late as 1871, the superintendent of the Eastern Railroad, of Massachusetts, said that he could not bother with such a cumbersome aid as the telegraph in directing train movements.

How very dull the railroads of this country were to the advantage of the telephone! I really believe England was in some respects ahead of us. C. A. Hammond used the telephone for transmitting train orders in Massachusetts about 1883, but it was 1898 before any big road got that far; and still ten years more before the objectors were fairly silenced.

But it is your editorial of August 19, on the collision at Sulphur Springs of August 5, 1922, which I have just been reading, that has brought this question to my mind just at this time. How very absurd to put up a separate signal to stop trains for orders when you already have a signal, of the right kind and in the right place, to be used for stopping them for all other purposes. Or, to put it in another way, if the train order signal was there first, how pig-headed to keep on using it just because you love it for its honorable and venerable reputation in the past. And yet Porter, Ind., and Riverside, Mo., are only two of hundreds of such examples of wasteful and complicated arrangements which are perpetuated simply for lack of a little reasonable enterprise.

The collision at Leeds, Mo., calls attention to similar lessons. Your little homily, in connection with that disaster, on the fundamentals of the block system (August 19, page 317) only brings out what was well known in England in 1860, before we boastful Americans had even thought of using the block system; yet "progressive" American railroad presidents, who furnish baseball news by radio for passengers in their palatial trains too impatient to wait until the train reaches the next station, continue today, 62 years afterward, to try to run trains safely without any block system at all.

Surely, the old fogies are not all dead!

And the Sulphur Springs collision conveys another lesson. Refer back to your issue of April 22, 1921, page 978, and read the clear and forceful argument for the audible signal presented by J. B. Latimer, signal engineer of the Chicago, Burlington & Quincy. No one could ask for a better demonstration of the usefulness of an audible signal (either at the side of the road on a post, or in the cab of the locomotive) than the circumstances of this Sulphur Springs collision. Thirty-three passengers were killed because an engineman went past one or more signals without seeing them; and all the consolation that the traveling public can get out of this fresh illustration of conditions which are at least 33 years old is that, after studying the problem of collision prevention for 33 months (counting from the time when the United States Railroad Administration committee wrote its report on the subject), the principal railroads of the country profess themselves to be still unable to decide what to do about it! That U. S. R. A. committee examined 37 automatic train stop devices, but remained silent as to what it thought of 37 years' experience, in considerable measure successful, on the Northern Railroad of France with an audible signal. And this French signal, in an improved form, is now being introduced on all of the larger railroads of that country.

The audible signal is not so comprehensively perfect, on paper, as are some of the automatic train-stops; but who can doubt that if the Missouri Pacific had heeded the lesson from France in 1912 it would have been saved this humiliating experience in 1922?

Who denies that an appeal to the engineman's eyes and ears more than doubles the factor of safety as compared with an appeal to eyes alone?

Irry.

Executives Reaffirm Position on Seniority

Possibility Opened for Separate Agreements—Situation Reverts Back to Roads for Individual Action

THE RAILWAY executives, assembled at the Yale Club, New York, on Wednesday for their third meeting called in connection with the railway shopmen's strike, reaffirmed by a practically unanimous vote their previous stand on the seniority issue and declared their belief that mediation with the committee of the brotherhood leaders would produce no favorable results "unless the representatives of the striking shop employees are prepared to accept that position."

On the understanding, however, that the shopmen might be willing to consider the possibility of settlements with individual roads a group of about 25 carriers said to be in a position to take back all of their striking shopmen, have continued conferences with the mediatory brotherhood leaders to see if it is possible to reach any favorable results.

The action of the meeting of the Association of Railway Executives in practical effect eliminates the possibility that the strikers may be able to bring the strike to a close by a country-wide agreement including all of the railroads. It accomplishes this result because it is hardly possible that the strikers will be willing to meet the conditions laid down by the executives in their stand on seniority. The effect of the meeting is also to act in the direction of reverting the matter of the strike back to the individual roads. It indicates without much question the belief of the executives that the strike has been won and that the problem now is for each road to continue building up its forces and in general to work out its own situation in the light of its particular conditions.

One of the developments of the meeting was the announcement that the conference between the committee of executives and the leaders of the brotherhoods, the latter of which have been acting as mediators for the shopmen, came to no definite conclusion as to proposals or plans at the sessions in New York on Thursday and Friday of the preceding week. It was expected that the Wednesday meeting might bring out considerable discussion and a division of opinion among the executives. This division of opinion failed of realization. The vote in favor of the resolution reaffirming the executives' stand on seniority was 254 to 4, the only executive voting against it being S. Davies Warfield, president of the Seaboard Air Line. Mr. Warfield is chairman also of the National Association of Owners of Railway Securities.

The meeting assembled at the Yale Club at 10 o'clock Wednesday morning. After discussing the results of the conference between the committee of executives and the train service leaders—to consider which the meeting was called—the resolution was adopted and its sense reported to the brotherhood heads. They, being invited to the meeting to give their views, accepted. In stating his views, L. E. Sheppard, president of the order of Railway Conductors submitted a memorandum which suggested the replacement of the striking shopmen with status as of June 30, the day before the strike became effective. He also intimated the possibility of separate settlements. The suggestions in the memorandum were, of course, rejected. Several of the roads, however, desiring to follow out the idea of the separate agreements remained after the meeting itself had adjourned. A committee of them, with Hale Holden, president of the Chicago, Burlington & Quincy, as chairman, reassembled in the evening and discussed further with the mediators the possibilities of the suggestion made. A statement authorized by T. DeWitt Cuyler gave a complete report of the main meeting as follows:

Official Report of the Meeting

The various suggestions made by the chairman of the train and engine service brotherhoods, as voluntary mediators, in respect to an adjustment of the pending strike of the shopcrafts, were fully considered, and the following preamble and resolutions were adopted by a vote of 254 to 4:

"The committee appointed at the meeting of the railroads on August 11 having been requested by the chief officers of the five train service organizations to meet them as mediators, reported to the meeting today that conferences in accordance with this invitation were held in Washington on August 12 and in New York on August 17 and 18.

"At these conferences the position of the railroads, as reflected in the action taken on August 11, was fully discussed, but the committee has reported that the officers of the train and engine service brotherhoods were unable to bring about an agreement on the part of the shopcrafts.

"At the conclusion of the conference on Friday, August 18, an adjournment was taken to enable the committee to report the result of the conferences to their associates, which report has been made today.

"After discussion, the following resolution was adopted:

> "RESOLVED, That the committee is authorized to meet the representatives of the train and engine service brotherhoods again and state to them that the railroads adhere to the position heretofore taken, namely, that 'the striking former employees cannot be given preference to employees at present in the service, without doing violence to every principle of right and justice involved in this matter and without the grossest breach of faith on the part of the railroads to the men at present in their service. Under these circumstances it becomes apparent that the railroads cannot consider any settlement of the present strike which does not provide protection in their present employment, both to the loyal employees who remained in the service and to the new employees entering it.'
>
> "RESOLVED FURTHER, That unless the representatives of the striking former shop employees are prepared to accept that position, the railroads are unable to see wherein the efforts at mediation by the chief officers of the brotherhoods can harmonize these fundamental differences.
>
> "RESOLVED, That the railroads express their appreciation of the friendly intent and the earnest efforts that have been made by the chief officers of the train and engine service brotherhoods to compose the present situation, and express their sincere regrets that the situation has not permitted a successful termination of these efforts."

These resolutions were at once communicated to the mediators by a committee appointed for the purpose. Upon delivering and reading the resolutions to the mediators they requested that they might appear personally before the member-roads, which request was, of course, granted. The mediators thereupon joined the executives assembled at the Yale Club, and made statements embodying their views of the situation.

In the course of Mr. Sheppard's remarks, he, on behalf of the mediators, submitted a suggestion in the form of a memorandum which is fully quoted in my letter given below.

They disclaimed any knowledge as to whether this suggestion would be accepted by the striking shopmen, but requested that it be considered by the association, and also that it be presented to any individual road that might be inclined to make a separate settlement. To this communication the association directed the following answer to be made today to the chairman of the five train service organizations, which was accordingly done:

"Gentlemen:

"The carriers have carefully considered the tentative suggestion you have today made reading as follows:

> "First: All men to be reinstated in the position of the class they originally held on June 30, 1922, and as many of such men as possible are to be put to work September 1, at present rates of pay, and all employees who have

been on strike to be put to work or under pay, not later than October 1, next, except such men as have been proven guilty of destruction of railroad property or convicted of crime; ordinary cases of assault and battery the result of personal encounter are to be disregarded.

"Second: If a dispute arises as to the relative standing of an employee or employees that cannot be otherwise adjusted by the carrier and said employee or employees, the matter shall be referred to the United States Railroad Labor Board in accordance with the Transportation Act of 1920 by the organization, the employees or the carrier in the interest of any employee who may be aggrieved.

"Third: No intimidation nor oppression shall be practiced or permitted as against any of the employees who have remained or have taken service or as against those who resume service under this understanding.

"Fourth: All suits at law now pending as the result of this strike to be withdrawn and cancelled by both parties.

"The use by you in this suggestion of the term 'reinstated' goes to the root of the differences between us.

"You have repeatedly explained to our committee that this means an acknowledgment on the part of the carriers that the men returning to work under your proposition above quoted will be senior to the new men employed since July 1, 1922, and senior to the old men who remained in the service to the extent that the returning strikers were senior on June 30, 1922.

"As this acknowledgment would doubtless control the decision of the Labor Board on a dispute submitted under your second paragraph as to seniority, and oblige it to render a decision against the old men who remained and the new men who entered the service, we cannot accept it.

"THOMAS DE WITT CUYLER, Chairman."

It may be, from the suggestion above mentioned of the mediators, that they will recommend to the leaders of the striking shopmen to permit settlements with individual roads, authority to make which has hitherto been declined by these leaders.

While the basis suggested by the train and engine service brotherhood leaders interpreted as it is understood the brotherhood leaders interpret it, was not acceptable as submitted, a group of roads have determined to ascertain whether or not such modifications of it may be obtained by further negotiations between this group of roads and the mediators, as will make the proposal acceptable to at least some of the roads under their special conditions, which, in that event, would consider the making of separate and individual settlements.

Statement by Bert M. Jewell

The vote and action of the executives received the condemnation of Bert M. Jewell, president of the Railway Employees' Department of the American Federation of Labor, in the following statement:

The Association of Railway Executives have "closed the door." The unions have offered every concession within reason to end the strike and to save the public from a breakdown of transportation; but the executives have made none. On the contrary, they have since the strike began raised an entirely new and irrelevant issue of their own—seniority; and by their refusal to recede from their position have made a settlement impossible at this time. The responsibility for what will happen now rests wholly upon them.

The shopcraft's employees voted in June for a strike to establish a living wage and decent working conditions. The Association of Railway Executives have now voted for a lockout to smash unionism on the railroads and to eliminate collective bargaining from the industry.

The men have been ready at all times to meet the executives to bring about an honorable settlement. We expressed our willingness to do so to the Labor Board in Chicago. We accepted President Harding's terms of settlement of July 31. The executives, however, have consistently and arrogantly blocked every move to end the strike. They have done so with the plain intent of eliminating unionism from the railroad shops as the first step in the elimination of unionism from the industry as a whole. They refuse, even at the President's direct request, to take back striking employees with seniority rights unimpaired, in order that they might separate free and courageous men from their jobs and thus disintegrate the employees' organization. They even try to justify their refusal on the ground of promises of permanent employment to strikebreakers which they have not made.

The shopcraft employees are now fighting for their very existence and the existence of the other railroad employees, as well as for justice and right. This last misguided action of the executives makes our victory secure. The executives today have not a leg to stand on before the people.

The 400,000 striking employees accept the challenge of the railroads. We will redouble our efforts, confident of success.

Roads Discuss Separate Agreements

Hale Holden, president of the Chicago, Burlington & Quincy, spokesman of the approximately 25 roads which continued negotiations with the brotherhood leaders acting as mediators issued a statement in the afternoon in which he said: "At the conclusion of the general meeting of the Association of Railway Executives, the officers of a considerable number of individual railroads remained in further conference over the proposition submitted by the brotherhood leaders. There was no dissent from the action taken at the main meeting."

A committee of these roads headed by Mr. Holden as chairman reassembled in the evening to go over the matter with the brotherhood mediators. Up to the time of going to press announcement of what may have taken place at this meeting was not forthcoming. After the break up of the meeting Warren S. Stone, president of the Brotherhood of Locomotive Engineers contented himself with the statement that "Mediators don't talk." Daniel Willard, president of the Baltimore & Ohio, speaking for the group, said that there would be another conference Thursday. He is quoted as adding "If you want to see us settle the strike, just give us a chance."

Until the official report of the conferences is made public it is useless to conjecture concerning the matters discussed. This is made difficult in any event because Bert M. Jewell on Wednesday evening denied that the shop leaders had authorized the brotherhood leaders to make any suggestions as to possible separate agreements. Mr. Jewell reiterated the policy of the shop leaders as being opposed to any settlement except on a national basis—thus continuing the policy followed out in the fruitless negotiations with the Baltimore & Ohio, the Southern and other roads which have offered to negotiate separately.

The roads involved in the discussion were understood to be those that are in a position to take back all of their striking shopmen. It was plainly indicated, however, that any agreement they might make would be in strict accord with the sentiments adopted by the general meeting on matters of seniority. The roads included the Chicago & North Western, the Chicago, Milwaukee & St. Paul, the Chicago, Burlington & Quincy, the Northern Pacific, the New York Central Lines, the Erie, the New York, Chicago & St. Louis and Lake Erie & Western, the Chesapeake & Ohio, the Norfolk & Western, the Buffalo, Rochester & Pittsburgh, the Norfolk Southern, the Wheeling & Lake Erie, the Lehigh & New England, the Chicago, Rock Island & Pacific, the Minneapolis & St. Louis, the Louisiana & Arkansas and the Alabama & Vicksburg and Vicksburg, Shreveport & Pacific, etc.

Conference with Train Service Leaders

On Thursday, a week ago, as briefly reported in last week's issue of the *Railway Age*, a committee of the Association of Railway Executives met at the offices of that organization the five leaders of the train service brotherhoods who had offered their services as mediators. The conference did not conclude its discussion on Thursday and reassembled Friday morning.

There were in attendance representing the railroads: T. De Witt Cuyler, chairman of the Association of Railway Executives; W. W. Atterbury, vice-president of the Pennsylvania; Howard Elliott, chairman of the Northern Pacific; Hale Holden, president of the Chicago, Burlington & Quincy; Julius Kruttschnitt, chairman of the Southern Pacific; W. L. Mapother, president of the Louisville & Nashville; C. H. Markham, president of the Illinois Central; A. H. Smith, president of the New York Central; Carl Gray, president of

the Union Pacific, and A. P. Thom, vice-chairman and general counsel of the Association of Railway Executives.

The five brotherhood leaders were Warren S. Stone, president of the Brotherhood of Locomotive Engineers; L. E. Sheppard, president of the Order of Railway Conductors; W. N. Doak, vice-president of the Brotherhood of Railway Trainmen; E. H. Robertson, president of the Brotherhood of Locomotive Firemen and Enginemen, and T. C. Cashen, president of the Switchmen's Union.

B. M. Jewell, president of the Railway Employees Department of the American Federation of Labor, and other of the labor leaders, were in town but were not called into the conference.

Like the session on Thursday the activities of the following day were shrouded in secrecy. Following the close of the conference on Friday afternoon, the following announcement was authorized by T. De Witt Cuyler, chairman of the Association of Railway Executives:

"The conference between the leaders of the five train service organizations, acting as mediators, and a committee of railway executives, has been adjourned until some day next week not yet designated. Prior to further conferences the committee of railway executives will consider further the suggestions made and consult with their associates. The discussions which have taken place have been marked by commendable public spirit and frankness on both sides, and this recess is taken without any diminution of this attitude."

The non-committal character of this statement, combined with the fact that the mediators on both sides were sworn to secrecy, gave little inkling as to what had taken place at the conference and still less as to what the next step in the mediations would be. It was made known, however, that the plan was to refer the matter back to interested parties. This information for the moment seemed somewhat inconclusive until it was found out that the procedure would be to call a general meeting of the member roads of the Association of Railway Executives; that the committee of railway heads was to report its action to the meeting for the latter's decision, and that then the matter would again be taken up with the train service leaders in further conferences. Confirmation that this would be the plan of action was forthcoming when announcement was later made that the executives' meeting had been called for Wednesday of this week.

Labor Leaders' Publicity

Practically no information whatever was forthcoming from any of those in attendance at the conference as to what matters had been discussed, as to what line the discussion had followed, or as to what decisions may have been made. Authoritative statement was made that the conference had been characterized by an attitude of friendliness and that each side had been given an opportunity to receive the views of the other and enabled to understand how far each side was ready and willing to go to bring about a settlement. Beyond this, no other information was available. The labor leaders to whom the information had been imparted by the mediators did not, however, prove so reticent. At any rate, certain of the labor representatives, who refused to permit their names to be quoted, did give the press an idea as to what had been done. Naturally, under the circumstances, they took advantage of the situation, purposely or otherwise, and painted the situation so that it would look most favorable from their own point of view. The story they gave later proved incorrect but it was the story that appeared in Saturday's papers.

Briefly the story was to the effect that the conferees for the executives had agreed to propose a settlement embodying some kind of a gentlemen's agreement whereby the strikers would be taken back with their seniority rights to be adjusted ultimately to the satisfaction of all. The details of the manner in which this is to be done were, however, lacking. Under the circumstances any guess might be in order. It was, however, pointed out that there was no idea of any 1, 2, 3 plan of seniority arrangement such, for instance, as was embodied in previous proposals that (1) the shopmen who remained on the job should outrank (2) those who struck, to be followed in ranking by (3) the new men. The plans evidently called for the returning to work of all the strikers and the retaining of the new men as well, it being felt that there would be work enough for all as a result of the recent expansion of traffic and the delayed repair work. It was also pointed out that any 1, 2, 3 plan might be impractical, particularly if all the strikers returned in a body and were given the same seniority. The idea was further amplified with the information that the plan was such that neither side could claim a victory nor would have to admit defeat on the seniority issue. The labor leaders, naturally, put the situation in the best light from their own point of view by saying that it would permit the railways to get out of a difficult position but in a manner which would permit the railway executives to save their faces.

"P. & A. Photo"

Railway Executives and Labor Leaders at Peace Parley

A Labor View

Carrying the idea further, the labor leaders gave out the impression that there was involved some kind of a concession on the part of the railway executive conferees. It was stated that the executive conferees had agreed to these concessions on Thursday but that when they returned to the meeting on Friday morning they had thought it better not to act on their own responsibility but rather to refer the matter back to their fellow executives for the opinion and action of the latter.

Naturally the foregoing was a close approach to speculation. It proved to be entirely in error but that does not

avoid the fact that it formed railroad history for one week at least.

President Harding's address, which was delivered to Congress on Friday, after a day's delay waiting for possible results from the New York mediation conference, was not, insofar as can be learned, a subject of discussion at the conference. Neither was it discussed openly by the labor leaders assembled in New York at the time. Mr. Gompers in Washington, however, took the opportunity to express his opinions—adverse to the address—to the newspaper men. A further element of interest in connection with the New York conference was the fact that but little opinion was in evidence regarded the Labor Board. Although it was a statement by Chairman Hooper and a resolution of the Labor Board which largely brought up the question of seniority, this factor seems for the moment to have been forgotten. Similarly, but little comment was made outside the conference, at least, concerning President Harding's suggestion that the seniority issue should be decided by the Labor Board.

Gompers Denounces President's Address

President Gompers had sent for the newspaper men on Saturday and denounced the President's address item by item. He said that to make the decisions of the Labor Board enforceable would amount to making slaves of the employees, and he referred to the public members of the Labor Board as representatives of the employer type of mind. When reminded that two of the three public members had voted with the labor members for the wage increase of 1920, he said it was the fashion to raise wages then but that the board had reduced wages twice since then. He referred to the 23 cent an hour rate for trackmen in some parts of the southwest as a "basic" rate, and when reminded that this applied to less than 7,000 men, he said that it showed the strikers what they might expect next. He declared that the President's address should have been deferred, because the railroad executives in New York meeting with the brotherhood committee assumed a very different attitude after they had learned its nature.

Executives Majority Vote Does Not Bind All Roads

On Monday and Tuesday of this week, prior to the meeting at the Yale Club on Wednesday, there was a more or less general impression that there would again be a sharp division of opinion among the executives. A number of the roads, particularly in the east, which have been more fortunate in meeting the shopmen's strike situation, were understood to be prepared to oppose any concessions of any kind to the strikers. What was considered as practically official announcement to this effect was contained in reports of the meeting of the Eastern Presidents' Conference in New York on Monday. The expected division of opinion, however, failed to materialize. As has been noted above, the resolution expressing the position of the executives was adopted with a dissenting vote by only one executive.

One notes more and more of a tendency to emphasize that a majority vote of the member roads of the Association of Railway Executives is not necessarily binding upon all the roads. As one authority has expressed it, it must be borne in mind that a majority vote of the executives is, insofar as concerns the particular railroad, entirely secondary to the wishes of the road's board of directors or its stockholders. This point is gradually given more significance as the difficulty is realized of trying to settle the strike in the same manner for roads which have practically won the strike as for those which have had considerably less success in this direction. This thought may also be expressed in other words by saying that there is a growing feeling on the part of many observers that a national settlement with the striking shopmen would be a mistake. It is not difficult to read an increasing adherence to this opinion in the action which was taken at the Wednesday meeting.

It would probably be putting the matter somewhat too strong to say that the question of seniority has lately been somewhat subordinate to the question of whether there should be a national settlement or not. There are many observers, however, who feel free to express such an opinion. They add that the strike has been lost as far as the men are concerned and that the issue now from the strikers' point of view is to get back to work on the best terms they can. The issue is made possible, these observers say, because of the knowledge that the railroads will need all their equipment to handle a record-breaking fall movement of grain and other commodities combined with the delayed movement of coal. It is similarly pointed out that the strikers have been somewhat encouraged or, at any rate, held back from going to work, by the continued negotiations on the part of President Harding, the brotherhood leaders, etc.

Bombing Features Western Strike Developments

The bombing of railroad property and the attempted destruction of trains and other transportation facilities featured the past week's developments in the strike situation in western territory.

Many of these instances have involved freight and passenger trains, roundhouses and other property on which members of the train service brotherhoods are employed, clearly pointing to the conclusion that they represent efforts of individuals to create conditions which will induce the train service men to follow the instructions of some of their national leaders to the effect that where their work involves extra hazards brought about by conditions resulting from the strike of shopmen they may exercise their own judgment and refuse to continue in service until these conditions have been remedied.

The most successful attempt of this kind occurred at Gary, Ind., where two train service employees were killed in a wreck, described elsewhere in this issue. Attempted wrecks were also reported at Kings Bridge, Tenn., on August 15, and at Neshota, Ala., on August 16.

The press reports during the past week have been replete with instances of the attempted destruction of railroad property through the use of bombs, dynamite or torches, instances of this character being reported at St. Louis, Mo., and Evansville, Ind., on August 15; at Birmingham, Ala., on August 16; El Reno, Okla., on August 17, and Dallas, Tex., and Grace, Ala., on August 18. In addition strikers or strike sympathizers at San Bernardino, Cal., have displayed a particular fondness for bombing the railroad property at that point, the reports of instances of this character being frequent and more or less regular.

Accompanying this wave of violence, directed both at the railroads, at the intimidation of loyal and new shopmen and at the coercion of the members of the train service brotherhoods, there has been the usual quota of slugging, rioting and similar outbreaks, although the property and personal damage has been less than in previous weeks. Since August 15 trouble of this character has been reported at San Bernardino, Cal., Cedar Rapids, Ia., Superior and Janesville, Wis., Birmingham, Mobile and Albany, Ala., Kansas City, Mo., Cincinnati, Ohio, Topeka, Kan., Colton, Cal., Pueblo, Colo., Van Buren and Little Rock, Ark., Joliet, Ill., Tacoma, Wash., Milwaukee, Wis., Gary, Ind., and Channing, Mich.

The difficulties created in the far west by the sporadic walkouts of train service employees on several of the larger trans-continental roads were rapidly overcome during the

past week, train operation through all of the districts affected by the strike being normal by the night of August 17

Effect of Sporadic Strikes of Train Service Employees Overcome

On August 16 embargoes were lifted and trains were moved again over the Atchison, Topeka & Santa Fe, the Southern Pacific and the Union Pacific, the roads chiefly affected by the walkouts of the "big four" transportation brotherhoods.

Refusal of brotherhood leaders to sanction the walkouts when the Santa Fe issued ultimatums demanding immediate explanations of the attitude of national officials of the train service unions were followed by speedy developments in untying the traffic knots in California and other western states.

Furthermore at practically all points where similar strikes have been called or threatened, negotiations have been started to settle the difficulties. Nevertheless reports continue to come in of sporadic walkouts or threatened walkouts at other points, but so far no serious inconvenience has been caused by these outbreaks.

On August 20, Warren S. Stone, president of the Brotherhood of Locomotive Engineers, and D. B. Robertson, president of the Brotherhood of Locomotive Firemen and Enginemen, declared that there was no danger of the train service brotherhoods being drawn into a sympathetic strike, even if the negotiations to end the shopcrafts' walkout resulted in failure.

"There never has been any sympathetic strike nor has any been considered," Mr. Stone said. "There are safety laws to take care of the defective equipment which would endanger the lives of the brotherhood members, and it will only be necessary to enforce these laws."

Eastern Railroads Have 71.5 Per Cent Normal Forces

The railroads in the east on August 18 had 71.5 per cent of their normal shop forces. This information was contained in a statement issued by L. F. Loree, president of the Delaware & Hudson, following a meeting on Monday of the Eastern Presidents' Conference of which Mr. Loree is chairman. The statement said:

"The normal number of railway shopmen employed by the railroads in the Eastern region is 161,339. The percentage of this number at work during the past four weeks, together with the weekly increase, was as follows:

	Number	Per Cent	Weekly Increase
July 28	97,724	62.0	....
August 4	103,528	64.7	5,804
August 11	111,324	69.0	7,796
August 18	115,745	71.5	4,421

"It was expected that the ratio of increase of August 11 would be continued on the 18th, but the occurrences of last week put a damper on recruiting. Nothing can be more destructive than to introduce a feeling of uncertainty into a situation such as this."

Pennsylvania Forces Reach 50,000

For the first time since the shopmen's strike began, the shop forces of the Pennsylvania System have risen above the 50,000 mark. Reports on August 22 from all four regions and the Altoona works show 50,022 men reporting for duty and actually working. This represents 91 per cent of a full normal week-day force. In the last week the Pennsylvania System, the announcement giving this information continues, has made a net gain of 1,733 men in its shop forces. As compared with conditions at the low point of the strike which was reached on July 5, there are now 11,737 more men on duty and actually at work.

In order to avoid any possibility of a misunderstanding between the officers of the Pennsylvania System and employees in its engine and train service, in connection with conditions which may arise through the continuance of the miners' and shopmen's strike, a conference between the representatives of the employees and the management was held in Broad Street Station, Philadelphia, on August 19. At this conference an agreement was entered into whereby any question affecting the working conditions of employees in the engine and train service must be taken up through the proper channel, with the strict injunction that "no departure from the terms of the agreement between the management and the men will be tolerated." It was also agreed that no individual employee in engine and train service shall, at any time, take it into their own hands, to deviate from the course outlined in detail in the agreement.

Copies of the agreement are now being distributed to all employees in the engine and train service on the Pennsylvania System, as well as to all officers who deal directly or indirectly with these employees. The agreement or "Memorandum of Understanding" follows in part:

"Memorandum of Understanding"

If engineers or firemen find the engine to which they are assigned is in what they believe to be a defective condition they should at once report such condition to the proper officer. If they are in the enginehouse at the time the defect is discovered they should at once call the enginehouse foreman's attention to same. If train crews find equipment in a defective condition they should at once notify the proper officers.

When employes report motive power or equipment in a defective condition the proper supervising officer will, as promptly as possible, have an investigation made of the defect. If the defect is such as to render the locomotive or car unsafe to work on, employes will not be required to perform service thereon.

If an employe reports a locomotive or car in such a defective condition that he believes it unsafe to perform service thereon, and the proper officer to whom the defect has been reported decides after investigation that the defect is such as will not render its use on the part of the employe unsafe, and so reports to the employe with instructions to the employe that he shall use the defective equipment, the employe will then perform his usual service with such equipment. The employe so using equipment which he considers is in an unsafe condition may report the matter to his local representative who should as promptly as possible take the matter up with the superintendent. The superintendent will discuss such a question with the local representative with as little delay as possible.

Where employes find motive power or equipment in a defective condition which renders its use unusually dangerous or burdensome on the employe, they should report such a condition to their local representative who should at once take the matter up with the superintendent under the "Memorandum of Understanding." The superintendent will handle such matters promptly without requiring the usual five days' previous notice.

If an employe is called for mine service and he believes conditions resulting from the strike of the miners will render the performance of such service dangerous to his personal safety, he should at once report such situation to the proper officer, who will at once investigate the complaint. Where investigation shows that the performance of such service may endanger the safety of the employe, the supervising officer will either not require such service of the employes or if the service is required of the employes, adequate protection will be furnished them.

Where it is necessary to perform mine service in known dangerous territory, performance of such service will only be required of employes during daylight hours. If an employe has reported that he believes the performance of such mine run service would endanger his personal safety and the proper officer after investigation has insisted upon the employe performing such service, such employe, if he desires further consideration of his complaint should present the matter to his local representative who should at once take the question up with the superintendent under the "Memorandum of Understanding." Questions so referred to the superintendent will be discussed by him as promptly as possible without the usual five day's previous notice.

If it becomes necessary to handle any of these complaints beyond the superintendent, the general officer to whom the complaint is referred by the general chairman handling same will, as promptly

as possible, meet and discuss the same without requiring the usual five days' previous notice.

Officers will not require train and engine service employes to do anything outside of their regular duties. . . .

New Shop Crafts Organizations

Various railroads have begun to report the formation on their lines of new shop crafts organizations in accordance with the Labor Board's resolution of July 3. The New Haven's new organization has received the name of Association of Mechanical Department Employees—New Haven system.

The Southern Pacific's organization is the Pacific System Shop Crafts Protective League.

President Pearson of the New Haven in his announcement of the new organization, includes the significant statement that the agreement between the road and the new union covers "the handling without outside dictation of all matters of mutual interest." The announcement further says that

"The rates of pay agreed upon are both higher and lower than the former flat scale of the Labor Board, providing more liberally for work requiring the greater skill or effort."

The road in its advertisements for new men gives the new rates of pay as follows: Machinists, 66 to 76 cents an hour; boiler makers, 67 to 75 cents an hour; blacksmiths, 66 to 75 cents an hour; electrical workers, 65 to 75 cents an hour; car inspectors and repairmen, 63 cents an hour; helpers, first year, 45 cents an hour.

Further details concerning the New Haven's new shopmen's organization were given out in a statement issued by the New Haven on Wednesday. The statement said that the preamble of the by-laws of the new organization reads:

"We believe that with unity, guided by intelligence, and with an intelligent association we can acquire discipline necessary to enable us to act together, concentrate our strength, and direct our efforts toward a common purpose."

The object of the association is declared to be "to promote the welfare and protect the interests of its members; to promote good feeling and constructive co-operation between its members and the officers of the company, and, by joint action, protect and promote the interests of the public."

All mechanics, helpers, and apprentices who are actively engaged in the maintenance of equipment and machinery in the motive power department of the New Haven and who are not acting in a supervisory capacity, are entitled to membership in the association. Furthermore, employees who are entitled to participate in this association and who are American citizens, 21 years old or over, shall be eligible to office in the association. One of the rules of the new association declares:

"Elections shall be by secret ballot, and so conducted as to avoid undue influence or interference with voters in any manner whatsoever, and to prevent any fraud in the counting of ballots."

The officers of the association are to serve until the next annual meeting in July, or until their successors have been elected and qualified.

There is a general board whose jurisdiction includes the New York, New Haven, Hartford, Providence, and Boston divisions, the Midland, Old Colony, Waterbury, Danbury and Central New England divisions, the Van Nest shops, and "three members from the locomotive, five members from the passenger car, and two from the freight car department at Readville." The general board is to look after the interests of the association on their respective divisions, reporting to the association as a body matters of interest in their respective jurisdictions. There is a system adjustment board which is to place before the officers of the company all matters submitted to it by a local adjustment board or the general board and report to the general board the results. This system adjustment board has authority to deal with system officers upon all unsettled disputes or grievances originating from the divisions or in the shops, and upon all matters relating to interpretations of rules, rates of pay, working conditions, and of general interest to the membership. Any agreement, it is declared, reached between the system adjustment board and officers of the company with respect to these matters, shall, upon approval by the general board, be binding upon the membership as a whole; furthermore, any disputes which cannot be settled in conference between the system adjustment board and officers of the company will be handled in accordance with the provisions of the Transportation Act.

Massachusetts Governor Offers Reward

The Governor of Massachusetts on Friday, August 18, announced that the State would pay a reward of $1,000 for the detection and conviction of persons guilty of violence towards railroad employees or of destruction of railroad property. The Governor acted on a report of the Commissioner of Public Safety who enumerated 27 or more instances of attacks on railroad employees, cutting of air hose, stone throwing and intimidation of employees' families. These acts were committed at West Springfield, Worcester, Westboro, Framingham, Lowell, Clinton, Greenfield and other places. There were seven or more instances of cutting of air hose, 18 cars in one train being thus disabled on one occasion.

In behalf of the Boston & Albany, the Superior Court, at Boston, on August 18 issued a temporary order, warning against picketing and committing acts of violence. A similar injunction was secured by the New York, New Haven & Hartford in the United States District Court at Norwalk, Conn., on August 17.

Dispatches of August 17 reported cutting of hose and other acts of vandalism at Portsmouth, N. H., and other points on the Boston & Maine.

Southern Calls for Volunteers

Fairfax Harrison, president of the Southern Railway, has issued a statement calling on the people of the South, who want justice done and to that end demand that the strike be fought out, to volunteer their active aid.

"Normal transportation will be restored when public opinion asserts itself," he said. "If that public opinion supports the determination of the striking shopmen to disregard the judgments of the tribunal set up by Congress to do them justice and agrees that they may write their own pay checks, then there may be a resumption of work on that basis, but freight rates must be again increased.

"On the other hand, the responses received to my public statement on Monday last show that the people all over the South, who pay the freight, want justice done—no more, no less—and to that end now demand that this strike be fought out.

"It remains for those who feel that way about it to volunteer their active aid in the shops and roundhouses during the crisis. The Southern will afford an opportunity to all citizens to assert themselves, and under protection, to give practical effect to their opinions in the present situation."

Mr. Harrison later announced that a large number of skilled mechanics have been imported and that others were applying for work in a steady stream. "It is apparent," he said, "that there are many men in the North and East who want to work for us and who give every evidence of large experience in railroad shops."

The governor of North Carolina sent 500 national guards on Saturday to camp in the neighborhood of its Spencer shops, where there had been threats of disorder upon the arrival of new shop workers.

After the state troops had taken over the patrol of the yards a number of the enginemen refused to work and an

agreement was reached which resulted in the withdrawal of the troops.

The company has also obtained injunctions covering the principal points on its system.

Chamber of Commerce Analyzes Effect of Strike

The Chamber of Commerce of the United States is distributing to its members a statement prepared by the Railroad Bureau of the Department of Transportation and Communication of the chamber for the guidance of the members in reaching their own conclusions regarding the railroad strike. The statement first outlines the proposals made by the President and the replies of the railroad and the unions, together with various quotations, then gives a series of statistics reflecting the effects of the strike. From an examination of reports of the American Railway Association it is shown that during the four weeks in June preceding the strike there was loaded a weekly average of 92,636 cars of coal and 843,814 cars of all commodities. For five weeks in July there was an average weekly decrease of 13,940 cars, or 15 per cent, in the number of cars loaded with coal and an average weekly decrease of 8,418 cars, or 1 per cent, in the number of cars loaded with all commodities. Similar comparisons are made of the freight car surplus, the condition of locomotives and cars on July 1 and on July 15, the percentage of cars furnished to cars required. There is also a summary taken from telegraph reports to the I. C. C. of accidents for June, July and August.

An examination of these telegraphic reports for June, July, and August, 1922, shows killed and injured as follows:

	Employees	Passengers	Both
June, 1922 (immediately prior to the strike)	86	127	213
July, 1922 (immediately following the strike)	63	30	93
First 16 days in August, 1922	64	79	143

The monthly average for this class of accidents for six months ended June 30, 1922, shows employees 88, passengers 52, both 140.

The telegraphic reports for June, July, and August, 1921, showed:

	Employees	Passengers	Both
June, 1921	154	112	266
July, 1921	111	14	125
August, 1921	111	19	130

The statement says the available statistics do not permit segregation of figures into casualties in accidents resulting from defective equipment and casualties in accidents due to other causes. For example, it is well known that the figures for the first 16 days of August, 1922, include two disastrous accidents neither of which was related in any way to defective equipment and in which more than 50 per cent of the casualties for the period occurred.

In a Recent Issue of the Pullman News, a new magazine which is being published by the Pullman Company, and distributed among its employees and patrons, a story is told of the initial trips of the first Pullman car. J. L. Barnes, the first conductor, was later a division superintendent of the Atchison, Topeka & Santa Fe, and is now retired. The car, No. 9, was a remodeled Chicago & Alton passenger coach, and the run was from Bloomington, Ill., to Chicago, over the Chicago & Alton, on September 1, 1859. George M. Pullman, its inventor, was the most observant of four passengers. In connection with this story Mr. Barnes is quoted as saying:

"I remember that on that first night I had to compel the passengers to take off their boots before they got into their berths. They wanted to keep them on—seemed afraid to take them off. I wore no uniform and was in citizen's clothes, although I had a badge. The pay was $4 a round trip or $2 a night. The three cash passengers, all men, were from Bloomington. The first month's business was poor. People had been in the habit of sitting up all night in the straight back seats, and they did not think much of going to bed while traveling."

Coal Distribution

Washington, D. C.

In order to meet the pressing need for immediate despatch of large tonnages of coal to the upper Great Lakes region from Southern Appalachian districts, the Federal Fuel Distribution Committee has put into effect a plan whereby all coal produced on Monday, Wednesday and Saturday of this week in a number of districts in Kentucky and West Virginia will be shipped to lake ports for forwarding to the Northwest and other lake territory. It is estimated that this movement should approximate 400,000 tons of coal. The districts from which these fuel supplies are to come are the Logan, Kanawha, Coal River, Big Sandy, Sandy Valley and Elkhorn, and Long Fork districts on the Chesapeake & Ohio, the Thacker-Kenova district on the Norfolk & Western; and the Eastern Kentucky and Cumberland Valley divisions of the Louisville & Nashville, excluding mines on the Cumberland Valley division at Middlesboro, Ky., and east thereof.

The Fuel Distribution Committee has received numerous requests that the movement of coal to the upper lakes be expedited. These inquirers were informed that, while, under the committee's program of movement, coal dumpings at lake ports have not yet reached considerable proportions, the lake movement is believed now to be attaining a real momentum which must be felt very shortly. As the program has had but a few days in which to operate, naturally the advanced tide of the movement has not yet been especially perceptible north of the Ohio river. An important factor in handling lake tonnages is the coal-handling capacity of the ports of Toledo and Sandusky, the natural outlets of the coal-carrying roads engaged in this movement.

The committee was informed that loadings of coal for lake movement from West Virginia and eastern Kentucky districts amounted to 2,558 cars on Monday, the first day of the new program. Indications were that the anticipated tonnage of 400,000 tons of lake coal would be reached during the week.

Reports received by Fuel Distributor Spencer from Pennsylvania indicate that production of coal in that state may be materially increased by the latter part of the week. Conferences of operators in the various Pennsylvania districts were reported as giving consideration to the matter of reopening their mines.

A plan has been devised by the Fuel Distribution Committee for certification by the state fuel administrations of the status of coal of priority No. 2 classification or below, loaded by mines for shipment to public utilities or other concerns with whom contracts for coal already exist. Some complications have arisen due to the reluctance of railroads to move such coal without definite assurance as to its classification. Under the new plan, the state fuel administrator, after the receipt of a proper affidavit from the consumer, will furnish a certificate to the effect that the coal contracted for is to be used for certain approved purposes. This certificate will be delivered by the consumer to the shipper, who must be prepared to exhibit the certificate upon request of the railroad serving his mine.

A number of authorizations for movement of coal in priority class No. 1 just issued by the fuel distributor cover the movement of coal to various railroads in Illinois, Michigan, Iowa and Indiana. The needs of quite a number of public utilities in Indiana, Michigan and Iowa have also been provided for. The problem of keeping the public utilities of the middle west going is one which has to be given very careful attention. The committtee is endeavoring for the present to keep these utilities provided with 10 to 20 days' supply of coal.

The Missouri and Kansas state fuel administrations reported that they were arranging to obtain emergency fuel

supplies as far as possible from producing coal mines in southwestern Missouri and southeastern Kansas.

The matter of the consumption of pea coal as locomotive fuel by certain eastern railroads has been brought to the attention of the fuel committee. It is the general policy of the committee to discourage the use of the smaller sizes of anthracite for steam-raising and industrial purposes at this time, as available supplies of such coal are urgently needed for domestic heating purposes.

Inquiries as to whether the forwarding from Washington to district fuel committees of authorizations for the movement of coal under Class 2 priority establishes precedence over general orders of this classification are being answered by the information that all Class 2 business should have equal attention irrespective of whether the authorization comes from the Federal Fuel Distributor. The forwarding of authorizations from Washington for the movement of coal to a consignee under Class 2 priority is merely a method of designation of the particular mine from which the coal can most practically be shipped under prevailing conditions. It is the general policy of the committee that all orders within a certain classification be given equal consideration.

The Fuel Distribution Committee has received applications for the shipment of tidewater coal under Class 2 priority to the West Indies for bunkering purposes on those islands. These applications are being denied such classification as shipments of this nature are considered by the Interstate Commerce Commission as being cargo coal rather than bunker coal.

Following the recent dispatch of telegrams to railroad officials in the eastern part of the country, calling their attention to complications in the distribution of railway fuel occasioned by competitive bidding which was causing a tendency toward price inflation, the fuel distributor has been assured by railroads that generally he may count on their full co-operation in the matter. The committee is informed that shipments of railway fuel are now proceeding to southwestern lines from Alabama, in which state some complications had arisen.

Authorizations for the movements of approximately one million tons of coal were issued on August 17 by the central fuel committee. Provision was made for large tonnages of railway fuel for railroads of the middle west, and for the fuel supplies of a number of public utilities operating in Indiana, Michigan, Illinois, and Ohio cities.

The more urgent fuel needs of a number of Canadian railroads have been presented to the Federal Fuel Distribution Committee by the Federal Advisory Fuel Committee of Canada, in session at Ottawa. The Canadian committee has asked for 125,000 tons for railway fuel for both lake and rail movement, and has given assurance that the necessary financial guarantees will be arranged. The fuel requirements of these railroads have in the past largely been supplied from Ohio and Pennsylvania, and it is the belief of the Fuel Distribution Committee that new coal production in Ohio will tend to relieve the Canadian situation materially. Some Canadian railroads own their own mines in Ohio.

The state fuel administrations of Missouri and Kansas, in a joint communication to the Federal Fuel Distributor, have called attention to the raising of prices of coal in those states, due, it is claimed, to competitive bidding for coal on the part of railroads. To meet the situation, it was requested that the provisions of Service Order No. 23 of the Interstate Commerce Commission be extended to trans-Mississippi territory. It is hoped by the central fuel committee that this situation may be corrected through the co-operation of railroads operating in these states.

The fuel situation of a number of middle western railways centering in Chicago was said to be rather acute. From Chicago came also urgent requests for coal for the use of various hospitals, schools and other public institutions. The shipment of blacksmithing coal is a matter of considerable concern in the trans-Mississippi region. An effort is being made by the committee to obtain Pennsylvania coal to meet the urgent demands of public utilities in Buffalo, N. Y.

District fuel committees were informed on Monday by the Federal Fuel Distribution Committee that the recommended fair price for coal produced in the states of Tennessee and Virginia has been raised to $4.50 per net ton f. o. b. mines. The adjustment of the price for Tennessee coal was made upon the recommendation of Governor Taylor of that state. Inasmuch as the $4.50 price had been granted in West Virginia, Kentucky and Tennessee at the request of the governors of these three states, it was thought only just that the increased price be allowed also in Virginia. The action taken sets up a uniform maximum fair price of $4.50 per ton in the four states. The previous price prevailing in the larger part of the territory was $3.50, the raise in price generally averaging a dollar per ton.

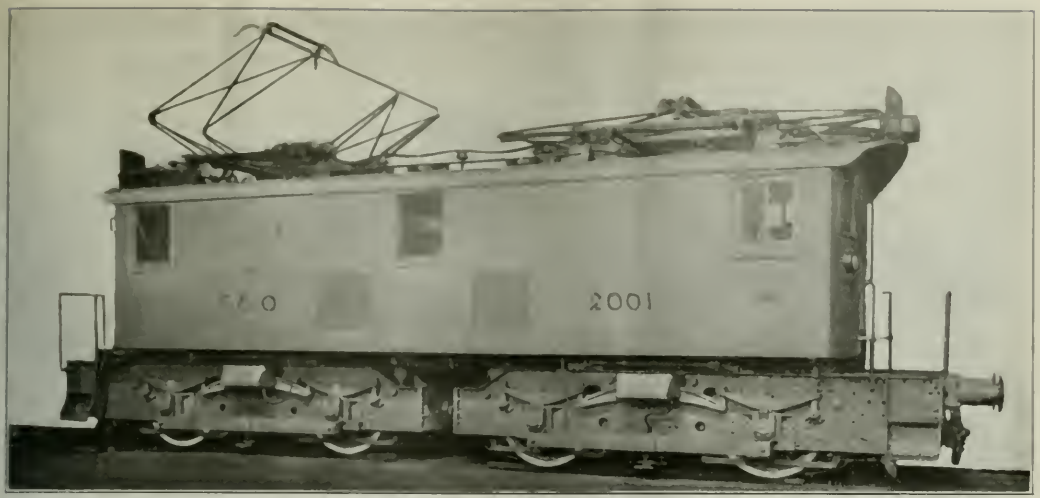
The outlook for coal production the present week is for nearly 6,000,000 tons, based on an estimated production of 1,500,000 tons from fields just being reopened.

A total movement of 600,000 tons of coal to the Great Lake region is the program of the Federal Distribution Committee for the week beginning Monday, August 28. While the details have not yet been fully arranged, it is probable that a considerable proportion of this tonnage will come from mines recently reopened in Ohio, Pennsylvania, Michigan and northern West Virginia. The fuel distributor considers that, regardless of strike settlements in the various bituminous fields, the supplying of the necessary tonnage to the lake country before the close of navigation is a serious problem. By utilizing for this movement new production from the states named, the committee hopes to relieve considerably the strain on the producers and railroads of the Southern Appalachian field. It is estimated that about 85,000 tons of coal available for lake movement is now being mined in Pennsylvania and 50,000 tons per day in the northern West Virginia field. Coal was being produced in Ohio Saturday, August 19, at the rate of 250,000 tons per week. It is expected that production in that state for this week will amount to approximately 350,000 tons.

The Geological Survey estimates that, if production is re-established in Indiana immediately, as seems probable, a maximum production of 6,300,000 tons may be expected this week. The outlook for next week is for a production of from 7,500,000 to 8,000,000 tons. These figures may, however, be considerably increased if strike settlements are made in still other fields.

On Monday, August 21, 19,043 cars were loaded with coal. This was the largest number loaded on any one day since the miners' strike began on April 1 last. Monday loadings would be at the annual rate of production of approximately 6,250,000 tons per week. This was an increase of 3,321 cars over the previous Monday. During the week ended on August 21, 85,161 cars were loaded with coal, an increase of 4,030 cars over the preceding week. The increase was due principally to new production resulting from the agreement recently reached by the miners and the operators at Cleveland.

The urgency of the railway fuel situation promises to be considerably relieved by production from coal fields now being reopened. The presence of this new coal in the market, rendering available those supplies of fuel which the railroads have normally been accustomed to obtain, naturally tends to relieve the strain on the railway fuel situation in the Southern Appalachian districts, which have for some months been the chief sources of provision of railway fuel.



Seventy-three Ton Freight Locomotive for Yard and Main Line Service, Buenos Aires & Western

Steam Road Electrifications in the Argentine

South American Republic Finds Electric Operation Profitable and Will Extend Lines to Meet Traffic Needs

By Lynn G. Riley
Control Engineer, Westinghouse Electric & Mfg. Co.

THE RECENT inauguration of freight service on the electrified section of the Buenos Aires & Western Railroad (Ferro Carril Oeste) calls attention to a field for electrification of steam roads which has great possibilities. One of the most important factors in the phenomenal development of the Argentine Republic is the extensive system of railways and their excellent condition. Many roads radiate from the capital to the inland cities and across the far-reaching pampas, and a net-work of inter-connecting lines brings good transportation facilities to the agricultural and cattle raising provinces, extending back to the Andean foothills.

Buenos Aires being the "Capital Federal" and the center of import and export activity, the city is rapidly out-growing its transportation systems and at some points the congestion in both passenger and freight traffic is reaching the limit of existing facilities.

There are present all of the conditions tending to make electrification desirable and profitable: scarcity of fuel, congestion in terminals, high cost of additional trackage, and the very probable rapid growth in traffic in the near future. While the two electrifications in this district, the Argentine Central and the Buenos Aires & Western, were both undertaken prior to those of the Paulista Railways in Brazil, and the Chilean Railways on the west coast, neither so far has been extended beyond the suburban districts.

Broad Gage Roads in Buenos Aires

There are four important broad gage railroads entering the city, which handle the greater portion of the traffic. There are also several smaller roads of varying gages and prominence.

1.—The Buenos Aires & Pacific Railroad has its station near the river front and is in direct contact with the extensive system of docks. The lines extend westward as far as Mendoza, where they connect with the Transandean railway and furnish through service to the Chilean coast.

2.—The Argentine Central Railroad has a large terminal, also near the river front, with six local tracks electrified. These lines extend west and northwest along the Rio de la Plata and to the cities of Cordoba and Tucaman.

3.—The Buenos Aires & Western terminal is located in the center of the city. The local tracks are electrified for 20 miles. These lines form an extensive net-work westward and south, extending as far as the southern borders of the province of Mendoza.

4.—The Great Southern Railroad has terminal facilities toward the east of the center of the city and in the city of La Plata where there are also extensive docks. This will probably be the next electrification in Buenos Aires. The Southern Railway system covers a large area of prosperous territory as far south as Bahia Blanca, from which place a second transcontinental line is projected.

Rolling stock, equipment and operation of all of these roads are of a high class, including every facility for comfortable express passenger service.

Electrification of Argentine Central

Suburban passenger service on the Argentine Central is of great importance inasmuch as the lines connect from the main passenger terminal, Retiro, to several residential suburbs and pass through an elaborate system of parks where large crowds congregate. In 1916 the electrification was completed from Retiro to Tigra, a distance of 16 miles,

with six tracks electrified in the terminal, four tracks through some of the parks and two tracks for the complete distance.

Normal service is handled with six-car trains and there are 90 trains per day in each direction. There are 67 motor cars and 50 trailers in service, weighing 52 tons each, and having an over-all length of 62 ft. The system is third rail at 800 volts d.c., and trains are made up of one-half motor cars and one-half trailers, motor cars being equipped with two 250 h.p. motors and automatic control. The entire electrification, the roadbed and shops have a very substantial appearance and the system is not yet being worked to its full capacity. It is probable that another branch which parellels the present electrified division, but touches several other important suburbs, will be electrified as soon as conditions warrant.

Electrification of Buenos Aires & Western

The electrification of the Buenos Aires & Western Railroad followed closely that of the Argentine Central and is quite similar in the adoption of 800 volts d.c. third rail. The terminal is at Plaza Once where the multiple-unit trains transfer passengers direct to the subway system of the Anglo-Argentine Tramways. These trains are also made of approximately one-half motor cars and one-half trailers and the cars are equipped with four 200 h.p. motors. There are a total of 47 motor cars and 45 trailers under construction. These cars weigh approximately 50 tons and are 58 feet over-all, with two side doors, and all station platforms will eventually be on a level with the car floor.

The electrified zone extends for a distance of 20 miles from Estacion Once to Moreno. In addition there is a single-track freight tunnel from the passenger terminal, connecting directly to the port and the system of dock tracks laid out in connection with the warehouses. This tunnel, as well as the dock track, is fitted with overhead wire instead of third rail, and the freight trains are handled by two Baldwin-Westinghouse locomotives.

A new power house of 18,600 kilowatts capacity, 25-cycle, in turbo-generators is located at the port. Transmission is at 20,000 volts from the main plant to the motor-generator set sub-stations.

Terminal Building of the Buenos Aires & Western at Plaza Once. Electric Suburban Trains Connect Direct With the Subways of the Argentine Tramways at This Point

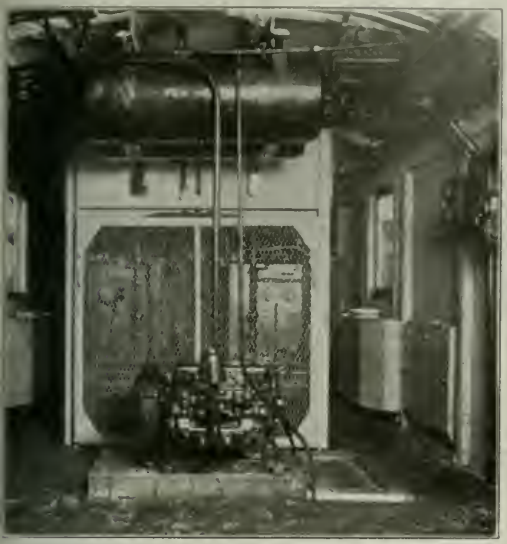
A large amount of freight is moved to and from the docks through the 2.5 miles of single track tunnel under the center of the city to the terminal at Plaza Once, and from there over the main line for a distance of 11 miles to the freight yards at Haedo. The maximum load is 600 tons and it is necessary at times to start this train on 1.4 per cent grades. On level tracks a single locomotive makes 28 m.p.h. with

Map of Buenos Aires Showing the Principal Broad Gage Railroads and Their Terminals. Buenos Aires & Pacific Railroad (Ferro Carril Buenos Aires al Pacifico); Argentine Central Railroad (Ferro Carril Central Argentino); Buenos Aires & Western Railroad (Ferro Carril Oeste); Great Southern Railroad (Ferro Carril Sud)

such a train, and 45 m.p.h. is considered the maximum speed to be attained on down grades.

Service Conditions

Two Baldwin-Westinghouse locomotives of 73 tons each are operating in this service. As shown in the illustrations,



Interior of Locomotive, Buenos Aires & Western, Showing Control Apparatus Compartment and Air Compressor

they are of the articulated truck, box cab type, with 9 ft. rigid wheelbase, and a total wheelbase of 27 ft. 6 in. The wheel arrangement is 0-4-0 with all weight on the driving axles. The over-all length is 43 ft. 2 in., the couplers are of the continental type.

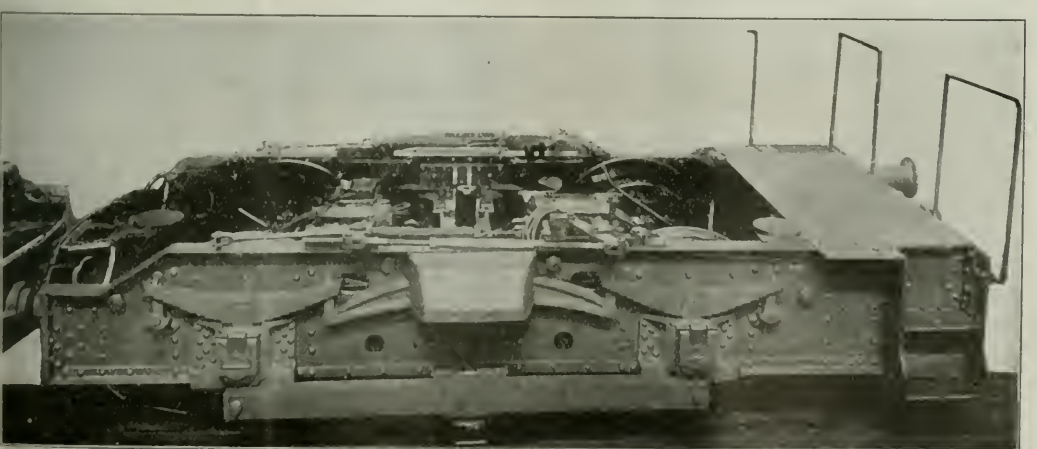
The truck side frames are of structural steel and the bolster and bumpers of cast steel. For operation on the main line each truck is equipped with third-rail shoes and fuses. Two pantagraph trolleys are provided for use in the tunnel and around the docks, for operating from the overhead wire.

Four Westinghouse motors of 230 h.p. each at 800 volts are geared at an 18:70 ratio to 48 in. wheels. The maximum tractive effort available for starting is about 36,000 lb. With forced ventilation the one-hour rating permits a tractive effort of 19,000 lb. at 18 m.p.h. and a continuous rating of 9,600 lb. at 23 m.p.h.

The next step in the extension of electric service will

Interior of Operating Cab, Buenos Aires & Western Locomotive, Showing Master Controller, Brake Valve and Instrument Panel

probably be the handling of through passenger trains with electric locomotives from the terminal to the end of the third-rail section. These trains are of 500 tons instead of 600



Detail View of Locomotive Truck, Showing Motors, Spring Equalizing System and Third-Rail Shoes

tons, but must operate at somewhat higher speed than the freight trains. The multiple-unit trains over this section have a balancing speed of 50 m.p.h.

When plans were first made for this electrification there was provision in all electrical equipment for a possible change to 1,600-volt operation. There seems to be no immediate prospect of such a change being made. A third rail in the form of an inverted L combines the advantages of under running contact shoes, with the mounting on the top of insulators, without the need for an overhung bracket. All rails are well covered with a substantial wood box-construction.

Locomotive Equipment

The main circuit apparatus for the locomotive consists of the following items:

4 230 hp. motors with forced ventilation.
2 air-operated pantagraph trolleys.
4 third-rail shoes with individual fuses.
2 main circuit disconnecting knife switches for separating the pantagraph trolleys and the third-rail circuit.
1 main fuse box mounted on the roof.

A Buenos Aires & Western Freight Locomotive in Service at the Docks of Buenos Aires. A Tunnel 2.5 Miles Long Connects from This Point to the Main Terminal

2 nine-switch electric pneumatic switch groups containing the unit switches for speed combinations and acceleration.
1 set of grid resistance.
2 drum type pneumatic reversers.
2 main motor cut-out switches.

The control circuit apparatus consists of:

2 Master controllers.
2 sets of control switches and push buttons
1 control resistor for reducing line voltage for the low voltage control.
4 12-point train line receptacles with jumpers for tandem operation of locomotives.
Miscellaneous junction boxes, lighting switches and other details.

The auxiliary apparatus consists of:

1 set airbrake apparatus, complete, with clasp brakes.
1 air compressor for brakes and control
1 blower motor for forced ventilation of the main motors.

The control is type HL Westinghouse electro-pneumatic which is the Westinghouse standard for locomotive application. All changes in circuits for applying power to and accelerating the motors are made by unit switches which are closed by air pressure and opened by a spring. The air is admitted to the switch cylinders and released by a magnet valve, controlled electrically by the master controller in the operating cab. Current for the controlling circuits is drawn from the line through a resistance which reduces the voltage to less than 100 volts for the operation of the magnet coils.

The drum type reversers, one for each pair of motors, are also electro-pneumatically controlled.

For freight service and frequent starting a large number of control notches are desirable; therefore, this control is arranged with a total of ten notches with the four motors in series parallel connection and nine notches with the motors in parallel connection. The bridge type of transition is employed in changing from the series parallel to the parallel connections. By this means full tractive effort is maintained with all motors during the transition period and there is neither slackening of speed nor surging in the train while passing over this position. Full overload protection is secured by the use of overload trip relays in the circuit for each pair of motors. A large factor of safety is provided in the capacity of the main grid resistors to take care of unusual starting conditions.

A cable reel is mounted inside the cab and carries sufficient cable with contact devices at each end to connect from the third-rail to the blade of the main knife switch for emergency operation on gaps in the third rail.

All features of the electrical equipment conform to the most modern practice in locomotive design and establish a permanent basis for extensions of the electrification. The two electrifications now in operation in Buenos Aires are looked upon as having been very well planned and executed, and frequent extensions may be expected as a part of the normal growth of the country.

The Interstate Commerce Commission has issued a modification of its order defining the limits of United States Standard, Eastern and Central time zones so as to include the territory embraced within the corporate limits of the city of Detroit, Mich., in the first zone. This was done on petition of the city of Detroit.

Flies and Rodents, constant enemies, demand a share of the attention of the purchasing agent of the Southern Pacific. During 1921, the company purchased 163 rat traps, 255 mouse traps, 30 fly traps and 16 gopher traps. The rat and mouse traps were used in storehouses, warehouses, commissaries, etc., and the fly traps in restaurants and commissary supply houses.

"P. & A. Photo"

Effects of Bomb Explosion Near Weehawken, N. J., August 13

President Harding Addresses Congress. "P & A Photo"

The President Says the Law Must Prevail

To Use All Power of Government to Maintain Transportation and Sustain Right of Men to Work

WASHINGTON, D. C.

IN AN ADDRESS before a joint session of the Senate and the House of Representatives on Friday, August 18, President Harding gave to Congress and the country an account of his efforts to settle the coal and railroad strikes and the motives which had inspired his endeavors, announcing in vigorous but somewhat general language that he was "resolved to use all the power of the government to maintain transportation, and sustain the right of men to work." The address had been postponed one day in order not to embarrass the conference between the brotherhood leaders and a committee of railroad executives in New York but when it appeared that the first day of the conference had brought forth no results he determined to delay no longer in carrying out his announced intention of laying the entire situation before the public as he saw it after several weeks of conference and correspondence in the endeavor to bring about a voluntary adjustment. The speech had been sent to the printer on Thursday and some last revisions were made in it only an hour or two before the President went to the Capitol.

Contrary to the many predictions which had been published, the President did nothing which could be construed as "passing the buck to Congress" and as far as the railroad situation is concerned he made no proposals for legislation, saying it was not his thought to ask Congress to deal with the problem at this time and that no hasty action would contribute to the solution of the critical situation. While he declared that the decisions of the Labor Board must be made enforceable and effective against carriers and employees alike, and while it is understood that members of the Senate committee on interstate commerce who have been in consultation with the President recently have made plans for amending the Transportation Act for the future along that line at the next session of Congress, the President pointed out that the law is new and said that no perfection of it now "could be helpful in the present threatened paralysis of transportation."

That part of the President's address relating to the railroad strike is as follows:

Text of President's Address Relating to Railroad Strike

"The public menace in the coal situation was made more acute and more serious at the beginning of July by the strike of the Federated Shop Crafts in the railroad service—a strike against a wage decision made by the Railroad Labor Board, directly affecting approximately 400,000 men. The justice of the decision is not for discussion here. The decision has been lost sight of in subsequent developments. In any event, it was always possible to appeal for rehearing and the submission of new evidence, and it is always a safe assumption that a Government agency of adjustment deciding unjustly will be quick to make right any wrong.

"The Railroad Labor Board was created by Congress for the express purpose of hearing and deciding disputes between the carriers and their employees, so that no controversy need lead to an interruption in interstate transportation.

"It was inevitable that many wage disputes should arise. Wages had mounted upward, necessarily and justly, during the war upheaval, likewise the cost of transportation, so that the higher wages might be paid. It was inevitable that some readjustments should follow. Naturally these readjustments were resisted. The administrative Government neither advocated nor opposed. It only held that the Labor Board was the lawful agency of the Government to hear and decide disputes, and its authority must be sustained, as the law contemplates. This must be so, whether the carriers or the employees ignore its decisions.

"Unhappily a number of decisions of this board had been ignored by the carriers. In only one instance, however, had a decision, challenged by a carrier, been brought to the attention of the Department of Justice, and this decision was promptly carried to the courts and has recently been sustained in the Federal Court of Appeals. The public or the Executive had no knowledge of the ignored decisions in other cases, because they did not hinder transportation. When these failures of many of the carriers to abide by decisions of the board were brought to my attention, I could more fairly appraise the feelings of the strikers, though they had a remedy without seeking to paralyze interstate commerce.

"The law creating the Railroad Labor Board is inadequate. Contrary to popular impression, it has little or no power to enforce its decisions. It can impose no penalties on either party disregarding its decisions. It cannot halt a strike, and manifestly Congress

deliberately omitted the enactment of compulsory arbitration. The decisions of the board must be made enforceable and effective against carriers and employees alike. But the law is new, and no perfection of it by Congress at this moment could be helpful in the present threatened paralysis of transportation.

"Happily it is always lawful and ofttimes possible to settle disputes outside of court, so, in a desire to serve public welfare, I ventured upon an attempt at mediation. Those who had preceded me in attempted settlements had made some progress. I submitted to the officials of the striking employees and the chairman of the Association of Railway Executives, in writing, on the same day, a tentative proposal for settlement. Knowing that some of the carriers had offended by ignoring the decisions of the board and the employees had struck when they had a remedy without the strike, I felt it was best to start all over again, resume work, all to agree to abide faithfully by the board's decisions, make it a real tribunal of peace in transportation, and everybody serve the public. The barrier to be surmounted was the question of seniority. By the workmen these rights are held to be sacred, and unsurrendered by a strike. By the carriers the preservation of seniority is the weapon of discipline on the one hand and the reward of faithful employees on the other. It has been an almost invariable rule that when strikes have been lost seniority and its advantages have been surrendered; when strikes have been settled seniority has been restored.

"In the tentative proposal which I sponsored it was provided that everybody should go to work; with seniority rights unimpaired, that there should be no discrimination by either workmen or carriers against workmen who did or did not strike. I realized that the proposal must carry a disappointment to employees who had inherited promotion by staying loyally on the job, and to such new men as had sought jobs looking to permanent employment, but I wanted the fresh start and maintained transportation service, and I appraised the disappointment of the few to be less important than the impending misfortune to the Nation. It was not what I would ask ordinarily to be considered or conceded, but at that moment of deep anxiety, with the coal shortage gravely menacing, I was thinking of the pressing demands of the welfare of the whole people. I believed the sacrifice brought to the men involved could be amply compensated for by the carriers in practical ways. I believed that the matter of transcendent importance was the acceptance of the proposal to respect the Labor Board's decisions on the questions which formed the issue at the time of the strike. The public compensation would be complete in guarding by law against recurrence.

"The proposal was rejected by the carriers. Though the rejection did not end all negotiation, it left the Government only one course—to call the striking workmen to return to work, to call the carriers to assign them to work, and leave the dispute about seniority to the Labor Board for decision. When negotiation or mediation fails, this is the course contemplated by the law and the Government can have no chart for its course except the law.

"To this call a majority of the carriers responded favorably, proposing to re-employ all strikers except those guilty of violence against workmen or property, to restore the striking workmen to their old positions where vacant, or to like positions where vacancies are filled; questions of seniority which cannot be settled between the employer and employees to go to the Labor Board for decision. The minority of the carriers proposed to assign jobs to workmen on strike only where the positions were vacant. Neither proposal has been accepted.

"Thus the narrative brings us to the present moment, but it has not included the developments which have heightened the Government's concern. Sympathetic strikes have developed here and there, seriously impairing interstate commerce. Deserted transcontinental trains in the desert regions of the Southwest have revealed the cruelty and contempt for law on the part of some railway employees, who have conspired to paralyze transportation, and lawlessness and violence in a hundred places have revealed the failure of the striking unions to hold their forces to law observance. Men who refused to strike and who have brayed insult and assault and risked their lives to serve a public need have been cruelly attacked and wounded or killed. Men seeking work and guards attempting to protect lives and property, even officers of the Federal Government, have been assaulted, humiliated, and hindered in their duties. Strikers have armed themselves and gathered in mobs about railroad shops to offer armed violence to any man attempting to go to work. There is a state of lawlessness shocking to every conception of American law and order and violating the cherished guaranties of American freedom. At no time has the Federal Government been unready or unwilling to give its support to maintain law and order and restrain violence, but in no case has State authority confessed its inability to cope with the situation and asked for Federal assistance.

"Under these conditions of hindrance and intimidation there has been such a lack of care of motive power that the deterioration of locomotives and the noncompliance with the safety requirements of the law are threatening the breakdown of transportation. This very serious menace is magnified by the millions of losses to fruit growers and other producers of perishable foodstuffs, and comparable losses to farmers who depend on transportation to market their grains at harvest time. Even worse, it is hindering the transport of available coal when industry is on the verge of paralysis because of coal shortage, and life and health are menaced by coal famine in the great centers of population. Surely the threatening conditions must impress the Congress and the country that no body of men, whether limited in numbers and responsible for railway management or powerful in numbers and the necessary forces in railroad operation, shall be permitted to choose a course which so imperils public welfare. Neither organizations of employers nor workingmen's unions may escape responsibility. When related to a public service the mere fact of organization magnifies that responsibility and public interest transcends that of either grouped capital or organized labor.

"Another development is so significant that the hardships of the moment may well be endured to rivet popular attention to necessary settlement. It is fundamental to all freedom that all men have unquestioned rights to lawful pursuits, to work and to live and choose their own lawful ways to happiness. In these strikes these rights have been denied by assault and violence, by armed lawlessness. In many communities the municipal authorities have winked at these violations, until liberty is a mockery and the law a matter of community contempt. It is fair to say that the great mass of organized workmen do not approve, but they seem helpless to hinder. These conditions cannot remain in free America. If free men cannot toil according to their own lawful choosing, all our constitutional guaranties born of democracy are surrendered to mobocracy and the freedom of a hundred millions is surrendered to the small minority which would have no law.

"It is not my thought to ask Congress to deal with these fundamental problems at this time. No hasty action would contribute to the solution of the present critical situation. There is existing law by which to settle the prevailing disputes. There are statutes forbidding conspiracy to hinder interstate commerce. There are laws to assure the highest possible safety in railway service. It is my purpose to invoke these laws, civil and criminal, against all offenders alike.

"The legal safeguarding against like menaces in the future must be worked out when no passion sways, when no prejudice influences, when the whole problem may be appraised, and the public welfare may be asserted against any and every interest which assumes authority beyond that of the Government itself.

"In the weeks of patient conference and attempts at settlement I have come to appraise another element in the engrossing industrial dispute of which it is only fair to take cognizance. It is in some degree responsible for the strikes and has hindered attempts at adjustment. I refer to the warfare on the unions of labor. The government has no sympathy or approval for this element of discord in the ranks of industry. Any legislation in the future must be as free from this element of trouble making as it is from labor extremists who strive for class domination. We recognize these organizations in the law, and we must accredit them with incalculable contribution to labor's uplift. It is of public interest to preserve them and profit by the good that is in them, but we must check the abuses and the excesses which conflict with public interest, precisely as we have been progressively legislating to prevent capitalistic, corporate, or managerial domination which is contrary to public welfare. We also recognize the right of employers and employees alike, within the law, to establish their methods of conducting business, to choose their employment and to determine their relations with each other. We must reassert the doctrine that in this Republic the first obligation and the first allegiance of every citizen, high or low, is to his government, and to hold that government to be the just and unchallenged sponsor for public welfare, and the liberty, security, and rights of all its citizens. No matter what clouds may gather, no matter what storms may ensue, no matter what hardships may attend or what sacrifice my be necessary, government by law must and will be sustained.

"Wherefore I am resolved to use all the power of the government to maintain transportation, and sustain the right of men to work."

Legislation as to Coal Recommended

As to the coal situation, the President asked at the hands of Congress the authority to create a government commission independent of the industry to make a searching investigation into the whole coal industry, with provision for its lawful activities and the bestowal of authority to reveal every phase of coal production, sale and distribution, "to advise as to fair wages and as to conditions of labor and to bring protection to all and point the way to continuity of production and the better economic functioning of the industry in the future." Unless a cure is found for the

economic ills which affect the industry, he said, "we shall be faced with a like menacing situation on next April 1 on the expiration of the wage contracts which are now being made."

To deal with the conditions resulting from the coal strike he recommended immediate provision for a form of temporary control of distribution and prices through "a temporary national coal agency, with needed capital, to purchase, sell and distribute coal which is carried in interstate shipment." The purpose is to give the necessary legal authority to the present emergency coal distribution organization created by Secretary Hoover and functioning under the direction of Henry B. Spencer subject to a committee appointed by the President. President Harding said in his message that he did not mean that all interstate coal shall be handled by such a federal organization; perhaps none will be necessary, but "it will restore its capital to the public treasury and will be the instrumentality of guarding the public interest where private conscience is insensible to a public need."

This proposal does not relate to any possible employment of the national agency in relation to intrastate transactions, the President made clear. "Price restraint and equitable distribution in intrastate shipments," he said, "is a responsibility of the state's own government" and "in such voluntary activities as have been carried on thus far the federal government has endeavored to re-establish the authority and responsibility in the states which was undermined in the necessary centralization of authority during the World War."

"The almost total exhaustion of stocks of coal, the crippled condition of the railways, the distressed situation that has arisen and might grow worse in our great cities due to the shortage of anthracite, the suffering which might arise in the Northwest through failure to meet winter needs by lake transportation, all these added to the possibility of outrageous price demands, in spite of the most zealous voluntary efforts of the government to restrain them, make it necessary to ask you to consider at once some form of temporary control of distribution and prices."

President Replying to Critics

The President was plainly giving his answer to many criticisms of the course he has adopted in dealing with the two strike situations. One class of criticism which he attempted to meet was that arising from impatience because he had not taken more positive and direct action to bring about some kind of a settlement by "big stick" methods. Another class was that which blamed the President for having interfered at all and by continually holding forth the expectation of a settlement lending encouragement to the strikers to hold on a little longer.

To the first class of critics the reply is in effect that there is no big stick among the present furniture of the White House.

The idea of taking over the railroads was not mentioned, perhaps because it represents a stick rather too heavy to swing for such a situation as we have so far. The President pointed out that the Labor Board has no power to halt a strike, that Congress deliberately omitted the enactment of compulsory arbitration and that, therefore, the federal government had no direct power to require a settlement.

To the second class of criticism his answer is found in his statements regarding the seriousness of the situation and that in a desire to serve the public welfare he had ventured upon an attempt at mediation. He made no attempt to defend on its merits his original proposal that the strikers be returned to work with seniority unimpaired, referring to it as a "tentative proposal," not what he would ask ordinarily to be considered or conceded, but as one that would represent a "fresh start" by restoring the status that existed before the strike and that would have demanded a sacrifice of some of the men involved, less important than the "impending misfortune to the nation."

There is also a third type of criticism, voiced by those who condemn the President for not having followed up more actively his proclamation of July 11 in which he said that those who are not satisfied with the wages fixed by the Labor Board must not be allowed to interfere with those who are willing to accept them, instead of holding conferences with the strike leaders in an effort to compromise. To this class of critics the President replies that the duty of preserving law and order and restraining violence is primarily the function of the state and local authorities, who had not yet confessed inability to cope with the situation nor asked for federal assistance. He also attempted to distribute to some extent the responsibility for the conditions resulting from the strike, among both the companies and the unions, although he had pointed out that the strike was called by the unions against a decision of the Labor Board.

However, whereas for a time he had attempted to remain completely neutral and act solely as a mediator, recent events and a clearer understanding had led him to a point where "the simple but significant truth was revealed that, except for such coal as comes from the districts worked by unorganized miners, the country is at the mercy of the United Mine Workers."

There was no mincing of words when he referred to the "sympathetic strikes" that have developed here and there, "the cruelty and contempt of law" on the part of some railway employees, who he said have "conspired to paralyze transportation," and "lawlessness and violence in a hundred places" that have revealed the "failure of the striking unions to hold their forces to law observance," but the President endeavored to retain a neutral attitude when he said that "neither organizations of employers nor workingmen's unions may escape responsibility," and that the government has no sympathy for the "warfare on the unions," without commenting on the war against private ownership of railroads and coal mines. He referred to the ignoring of a number of decisions of the Labor Board by many of the carriers, although he pointed out that they did not hinder transportation and that the strikers had a remedy without seeking to paralyze interstate commerce. While admitting the incalculable contribution to labor's uplift made by the labor unions, however, and the public interest that the good in them be preserved, he declared that the abuses and the excesses which conflict with public interest must be checked in the same way that forms of regulation have been devised to deal with the abuses charged to the corporations.

He also referred to "the deterioration of locomotives and the non-compliance with the safety requirements of the law" as "threatening the break-down of transportation," although Chairman McChord of the Interstate Commerce Commission, who furnished his information on this subject, had qualified the statement by the words "on certain roads."

Having reached the point of calling some things by their right names, the President found a considerable body of existing law available, although there is no law against strikes. "There is existing law by which to settle prevailing disputes"—the law setting up the Labor Board as an arbiter; "there are statutes forbidding conspiracy to hinder interstate commerce"—notably the Sherman law; "there are laws to assure the highest possible safety in railway service"—the locomotive inspection and safety appliance laws. It was his purpose, the President said, to invoke these laws, civil and criminal, against all offenders alike.

The tone of the President's address undoubtedly strengthened to some extent the position of the railroad executives meeting in New York with a committee of labor leaders, who were endeavoring to induce or threaten them into a compromise. They have repeatedly told the President that if assured of adequate protection for the men who are willing

to work, and whose right to protection has been repeatedly proclaimed by the President, the strike would take care of itself and there would be no need of sacrificing the employees who had "inherited promotion by staying loyally on the job" and "such new men as had sought jobs looking to permanent employment."

Means to Maintain Full Force of Law and Order

Although it was not given out at the White House, the President has given one of the reasons why he has not ordered the use of federal troops to furnish protection to the working shopmen in a letter in reply to one from W. H. Chandler, president of the National Industrial Traffic League. "If I faced only such a condition as Mr. Cleveland had to deal with," he said, "it would be a very simple matter to handle it. I think you ought to appreciate the difference between meeting a disturbed situation in one center of population and having to deal with a like situation in perhaps a thousand localities throughout the United States. It is useless to talk about weakening. This government means to maintain the full force of law and order and such majesty of power as it possesses. Its purpose does not in any way seem inconsistent with every reasonable effort to avoid conflict."

Administration Hopeful of Settlement

After the address the Administration apparently "marked time," as far as the railroad situation is concerned, awaiting the results of the meeting in New York on Wednesday, as to which the government officers professed to be optimistic in spite of statements from New York holding forth little hope of a settlement. Alfred P. Thom, counsel for the Association of Railway Executives, called on the President on Saturday and is understood to have reported on the conferences of Thursday and Friday. On Tuesday it was stated at the White House that the President had hopes of a settlement as a result of the New York conference.

Congress Begins Work on Legislation Asked by President

Congressional leaders at once began preparations for the enactment of the legislation asked by the President providing for the creation of a coal commission and bills for that purpose have been introduced by Senator Borah and Representative Winslow, but opposition at once developed to the idea of empowering a committee to purchase and sell coal. No action is expected at this session on amendments to the Transportation Act. The President is insistent that the coal commission shall be composed only of members representing the public, inasmuch as the operators and miners have arranged for the formation of a partisan commission.

The House committee on interstate and foreign commerce held a meeting on Monday on the Winslow bill, which provides for the creation of the United States Coal Commission, composed of not more than nine members, to be appointed by the President, to submit its first report not later than January 1. Plans were made for rushing this bill through the House. Senator Borah also called a meeting of the Senate committee on labor for Tuesday to consider his bill.

Bills to carry out the President's plan for temporary price control were being drafted by the Department of Justice and were to be submitted to the President's coal committee.

A bill requiring the Interstate Commerce Commission to regulate the compensation of all railroad employees and officers and to place in the hands of the commission the functions now exercised by the Railroad Labor Board has been introduced in the House of Representatives by Representative Ward of North Carolina.

Representative Dickinson of Iowa introduced a bill providing that decisions of the Railroad Labor Board shall not become effective for 150 days.

In spite of the peace talk which had pervaded Washington for several days, on the strength of the reports that a plan would be agreed upon to take back the strikers now and postpone the seniority question until it came time to lay off some of the men several months later, the executive counsel of the American Federation of Labor on Monday addressed an appeal to all organized labor urging the moral and financial support in behalf of the organization in its railway employees department now on strike to "resist the imposition of unfair terms and conditions of employment."

Federation of Labor Appeals for Support of Strikers

"The struggle in which these workers are involved is one which is important, not only to themselves and to their organizations, but to all organized workers and to all Americans who love justice and fair dealing," the appeal said in part.

"It is essential to the well-being of the men on strike, to the well-being of all workers and to the well-being of our national industrial organization that justice shall prevail in the struggle now going on in the railroad industry.

"It must be clear that the policy which has been pursued by the railroads has been entirely in harmony with the policies of all organizations of employers, which, since the armistice, have been seeking to weaken and destroy the voluntary organizations of the workers. The railroads have been engaged in this effort from the moment government control was relinquished on March 1, 1920.

"Finally, the decisions of the board compelled resistance on the part of the workers through suspension of work. A wage of 23 cents per hour was established for section men, and this wage is the basis upon which all other wages are calculated.

"In addition to this the board ordered the abolition of the payment of time and a half for work done on Sundays and holidays. It was sought to impose grave injustice upon the workers through rulings of the Labor Board, while the railroads had consistently violated and repudiated rulings of that board from the beginning.

"The railroad shop workers are on strike in an endeavor to secure a living wage for the maintenance of the American standard of living. They are on strike for the maintenance of reasonable working conditions and for the maintenance of the right of organization.

"It goes without saying that financial assistance is needed, especially when it is recalled that most, if not all, of the organizations of employees now on strike have thousands of members engaged in other industries who have been, or who are now, also on strike. Therefore, their financial condition is at present incapable of meeting the barest wants of their needy, struggling men and their families.

"It is to be hoped that every union and its membership, individually and collectively, again will demonstrate its solidarity by coming generously and immediately to the assistance of the striking railway shop craft organizations. They are fighting the fight of all workers. They should have all of the moral and financial assistance which our movement can give, and your Executive Council earnestly hopes that your action will be as prompt and as generous as the circumstances warrant."

Secretary Weeks of the War Department has received an opinion from the acting Judge Advocate General of the Army that existing labor troubles on railroads and in mines do not constitute an emergency authorizing recruiting the regular army to war strength and that there is no authority vested in the Executive branch of the government to draft men for military and other service in time of peace. Secretary Weeks said he had asked for an opinion on these points not because the government contemplated any such action, but to clear up any uncertainty that might exist in the minds of federal officials and to put the public mind at ease on the subject.

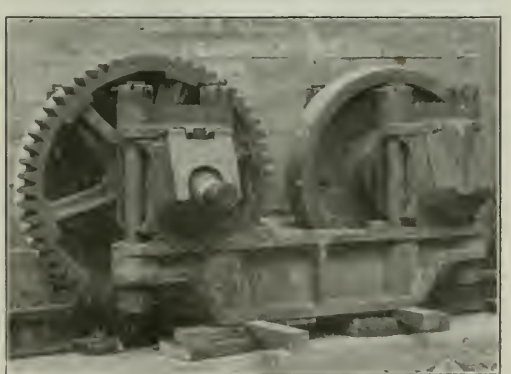
Each Half of the Table Is Virtually an Independent Unit

Twin Span Turntable Reduces Load on Center

Innovation in the Design of this Roundhouse Facility Embodies Many Novel Features

SINCE THEIR EARLIEST development turntables have been almost entirely of the center bearing type. As the weight of locomotives has grown heavier and they have assumed greatly increased lengths, the problem of the turntable has become an increasingly difficult one. It has been necessary to provide a center capable of sustaining ever-increasing loads and higher bearing pressures while the girders or trusses have had to be increased enormously in order that they could serve as double cantilevers to balance the long, heavy locomotives on a single support. Various schemes have been undertaken to overcome these difficulties, among which was a table built about three years ago by the Pennsylvania which was designed to take bearing on the circular rail as well as the center during the turning operation. In other words, the turntable was designed as a continuous girder supported at the ends as well as the center under all conditions of loading. This required that the center bearing be equipped with a means of adjustment so as to take care of any possible settlement of the center which would tend to increase the proportion of the load carried by the circle rail.

More recently a new table has been brought forth embodying a still greater departure from conventional methods. Instead of building the girder continuous across the center, two separate girder spans are provided with simple bearings at the center, thus affording a type of turntable construction in which the load carried on the center is reduced appreciably, and in which the operation of the turntable becomes largely independent of ordinary settlement of the center or variations in the level of the circular rail. Several of these tables have been built and are in operation, so that the construction may be treated as a thoroughly practical development. The construction of a turntable along lines involving such a marked departure from usual practice has imposed a great many new problems on the designer, and these have resulted in the development of many original details. These may be listed briefly as an articulate connection of the girders over the center, an original type of flat disc center bearing, heavy end trucks capable of carrying the imposed live load, turning machinery connected direct to one of the truck wheels at each end and a heavy, rigid circle rail construction insuring a circle rail of uniform elevation and alinement that will insure smooth operation of the table.



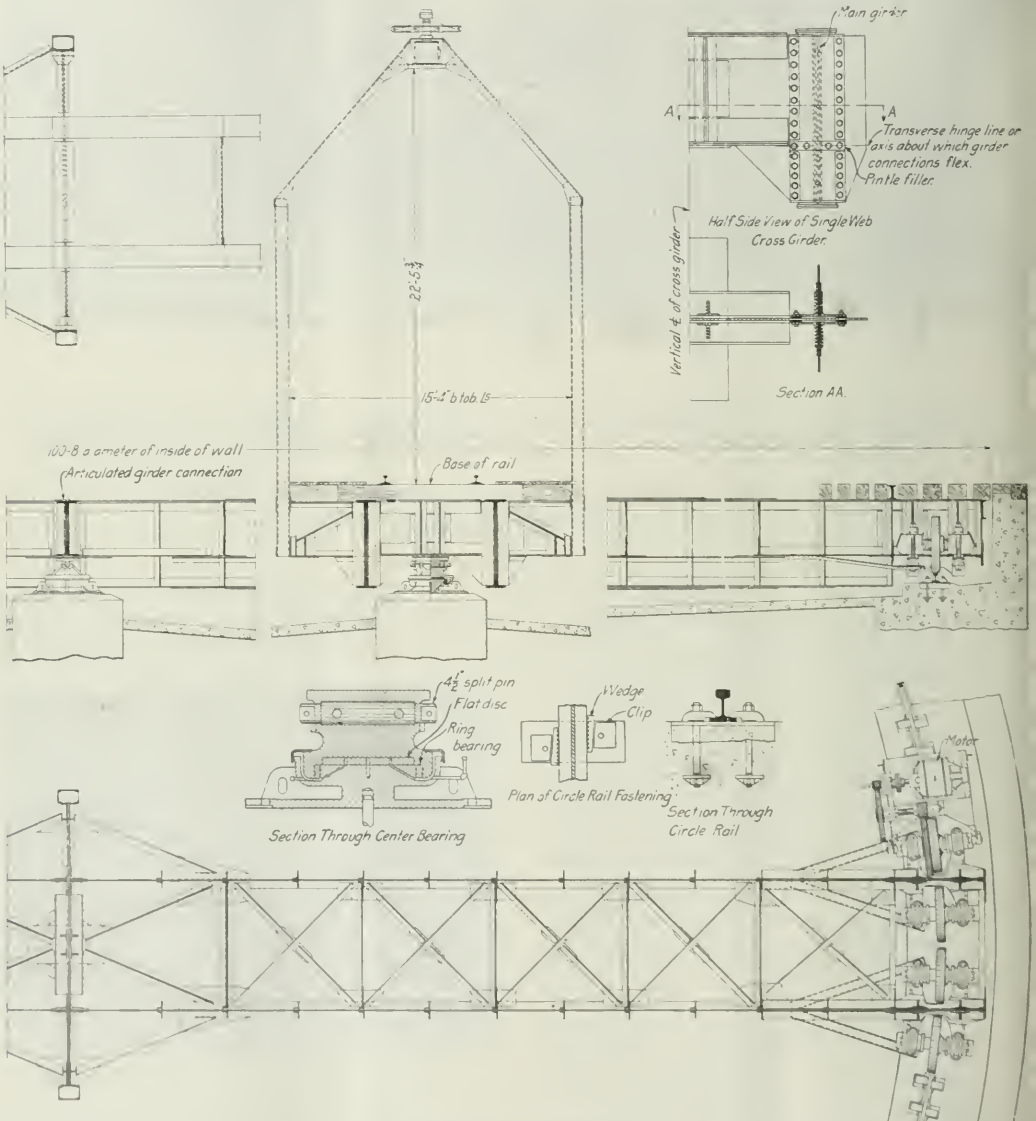
There Are Two End Trucks at Each End of the Table

The main girders of the table are framed into a cross or loading girder, in turn supported on the center bearing. The connection of the main girder to the cross girder is accomplished by means of connection angles with the addition of filler plates. This affords ample opportunity for a hinge action of the connection of the main girder to the cross girder

through the flexibility of the connection angles. As a result of this arrangement each span of the turntable is virtually provided with three points of support, one at the center, and one at each of the trucks.

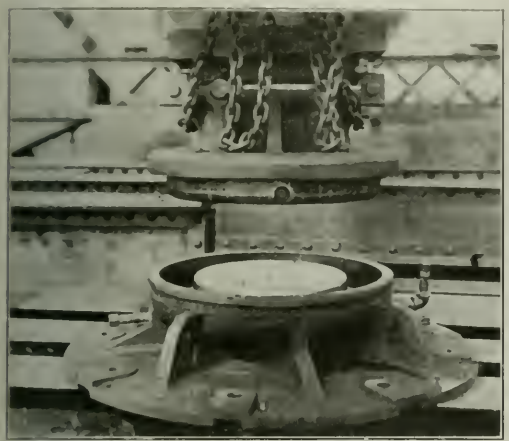
The center is bolted beneath the junction of the lateral system and the cross girder and consists of the usual bridge shoe unit of upper shoe, horizontal pin and lower shoe, set on a flat phosphor bronze disc, which in turn rests on an anchored base or distributing casting. A second phosphor bronze bearing is provided in the form of a ring surrounding a vertical point forming a part of the base casting for the purpose of transmitting the lateral and longitudinal forces to the base. The center bearing is designed to be immersed in oil and trapped so that it can run in flood waters without damage. The bearing is also arranged so that the raising of the table not more than 1/16 in. will permit the removal of the shoe and disc for inspection, replacement or repairs.

With a considerable portion of the load of the table and locomotive carried on the circle rail during the turning of the table it is obviously necessary to give careful attention to the design of the end trucks. These are of a heavy construction. The two girders of the table are supported directly on heavy cast steel truck frames of H section by



Details of the Twin Span Turntable

means of a bearing plate that provides for the radial position of the frames. This arrangement provides for thorough equalization of the girder load on the two wheels of each truck. From the truck frames the load is transmitted to the journal boxes of the wheel by means of three-inch cold rolled bolts secured through a loading cap resting on top of the journal boxes. The wheels are standard forged, pressed or rolled steel car wheels, except that the flanges have been removed and the treads have been coned to the center of the table. The journal boxes, of which there are eight for each end of the table, are standard M. C. B. journals with



The Upper and Lower Sections of the Center Bearing

standard boxes, wedges, brasses, lids, guards, waste and lubricants. In other words, the truck mechanism conforms strictly to established railroad practice.

The power for turning the table is applied directly to one of the truck wheels by a train of gears from an electric motor which is suspended in a frame attached to the end of the table. Ordinarily, two motors are provided, one at each end of the table, but the manufacturers recommend that one of these motors be held in reserve, as the table is turned readily by one motor. Each of the turning units is normally equipped with a hand power device for use in emergency. A foot brake is also provided; this and other controlling devices being placed in an operator's cab located directly above one of the motors. The current take-off is readily provided by means of a structural steel current collector arch mounted over the cross girder.

Circle Rail of Heavy Construction

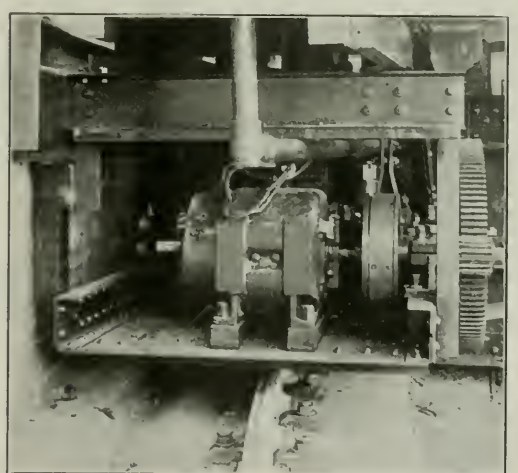
To insure a circle rail of uniform surface and alinement subject to very little deflection under load, a 130-lb. rail of P. S. section is provided with a special fastening to insure thorough anchorage and adjustment. The support for the rail consists of special steel T-ties of Bethlehem H-section imbedded in a concrete foundation. The rail is securely fastened to the ties by means of heavy clips with bolts and nuts and serrated wedges driven between the flanges of the rail and the wedge seats in each clip. This affords ready adjustment of the rail for alinement to a true circle and when the alinement has been secured perfectly, molten spelter is poured over the fastenings to hold them in position.

Advantages

Some of the advantages to which attention has been called by the manufacturer are among the following:

The table is cheaper in first cost, particularly where it is installed to replace a center bearing table designed to take shorter and lighter engines. Owing to the distribution of the load on the center and end trucks of the twin span turntable, the existing center foundation will usually be sufficient as it had to take the entire load of the old table. The girders of the twin span table are relatively shallow and it is unlikely that the pit will have to be deepened. Finally, as there is no necessity of balancing the load the twin span table will turn an engine having a wheel base practically as long as the table, so that it may be possible to use the same length of table. In short, a twin span table could be placed in the existing pit that would handle locomotives 90 per cent heavier and 20 per cent longer than the maximum capacity of the center bearing table it replaced. It is obvious that the same saving in size of table and pit occur in new installations. The twin span table is efficient in operation, as no time is lost in balancing the engine and the table can be started as soon as the engine is completely on. The friction of the journals is sufficient to hold the table stationary, so end locks are unnecessary. Because the ends of the table are supported on a very solidly constructed circular rail and are accurately level with the approach rails the usual hammer in running engines on or off the table is avoided. The flexible connection of the girders at the center makes settlement of an inch or so in the center foundation of little or no consequence.

The twin span turntable requires more power than the



The Motor and Housing. Note Also the Circle Rail Construction

balanced type but the additional cost is said to be negligible, considering the saving of time in handling engines, lesser likelihood of damaging the engines and the longer life of the table.

Patents on this type of articulated turntable are owned by the Bethlehem Steel Bridge Corporation, Bethlehem, Pa., which has developed detail plans for this table to fit various requirements. A number of tables of this type have been built for the Chesapeake & Ohio, the Atlantic Coast Lines and the New York Central and a table is now being installed on the Richmond, Fredericksburg & Potomac.

CANNED SALMON, by the shipload is now said to be moving from Japan to Europe by way of the Panama Canal. The Japanese steamer Taketoio Maru, thus loaded, recently stopped at Nanaimo, B. C., for coal.

British Revise Rail Specifications

The British Engineering Standards Association, which is an organization of the Institution of Civil Engineers, the Institution of Mechanical Engineers, the Institution of Naval Architects, the Iron and Steel Institute and the Institution of Electrical Engineers of Great Britain, has just issued a revision of its standard specifications for bull head rails, with revised standard sections for rails weighing from 60 lb. to 100 lb. per yard inclusive. The present specification is a revision of one first issued in 1904 and revised in 1909.

Among the more important modifications are the following:

(1) Two classes of rails are now included, namely, ordinary carbon and higher carbon rails, and separate chemical analyses are specified for the Bessemer and open hearth processes.

(2) The position in the head of the rail from which the drillings and the test pieces for the chemical analyses and tensile tests are to be taken is now defined.

(3) In the drop test the height of the drop for B.S. Section No. 90 has been reduced to 18 ft.; the use of crop ends is allowed and the measurement of permanent set after the first blow has been omitted. The test is required to be carried out upon the British standard falling weight testing machine.

(4) The range of tensile breaking strengths for ordinary carbon rails has been increased from 40 to 48 tons per square inch, to 42 to 53 tons per square inch, and a range of tensile strengths for higher carbon rails inserted.

(5) The testing procedure before rejection has been set out in detail.

(6) Provision is made for ascertaining the weight of the rails during rolling.

(7) The brand or mark of the Association is now only intended to indicate that the rail is of British Standard section.

(8) An arbitration clause has been included.

The sections have also been modified, the depth of the head of the 85, 90 and 95 lb. rails having been increased by 1/16 in., 5/64 in., and 1/32 in. respectively with the object of securing a longer life. A corresponding amount being taken off the foot in each case to preserve the same weight and depth of the rail.

Freight Car Loading

Washington, D. C.

Car loading showed a slight increase during the week of August 12 to 852,480 as compared with 851,351 the week before. This was an increase as compared with the corresponding week of 1921 of 44,311 cars and a decrease as compared with 1920 of 118,689. As compared with the previous week there was an increase in coal loading of 5,313, to 84,559. There were also increases in livestock, forest products, ore and merchandise, but decreases in grain and grain products, coke and miscellaneous. As compared with last year there was a decrease in grain and grain products and coal and in the Southwestern district. All other districts showed increases. The loading of all commodities except coal was 768,021, which was greater than the corresponding figure for 1920.

The freight car surplus during the period from August 1 to 8 was reduced to 153,880, while the shortages increased to 32,314. The surpluses included only 15,873 box cars while there were shortages amounting to 23,032 box cars, and there were 118,044 surplus coal cars while shortages were also reported amounting to 5,964.

The percentage of cars placed to cars required for bituminous coal loading during the week of August 5 increased to 85, as compared with 71 the week before. Only the Pocahontas and Southern regions placed less than 100 per cent, 66 and 55 per cent respectively. The percentage of orders filled for open-top cars in general also increased, from 86 in the week of July 29 to 87 in the week of August 5.

REVENUE FREIGHT LOADED

Summary—All Districts, Comparison of Totals This Year, Last Year, Two Years Ago. Week Ended Saturday, August 12, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Misc. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	11,006	2,807	8,597	1,494	5,388	6,517	67,164	94,872	197,845	.....	.....
	1921	10,035	2,561	42,206	973	4,470	2,333	56,548	77,427	.....	196,553	237,824
Allegheny	1922	3,896	2,749	20,511	4,183	3,199	12,645	48,904	77,785	173,872	.....	.....
	1921	3,302	2,640	45,019	2,283	2,477	7,119	44,470	52,029	.....	159,339	199,378
Pocahontas	1922	236	204	22,297	237	1,022	33	3,720	2,637	30,386	.....	.....
	1921	173	228	19,340	88	1,137	72	4,783	3,351	.....	29,142	37,201
Southern	1922	4,240	2,152	17,981	965	17,027	1,228	34,713	32,607	110,913	.....	.....
	1921	3,813	1,966	20,721	272	14,272	187	36,222	31,528	.....	108,981	130,986
Northwestern	1922	13,802	6,622	5,995	968	14,799	46,336	29,087	33,889	151,498	.....	.....
	1921	16,043	6,407	8,328	431	10,714	21,822	27,993	33,756	.....	125,494	163,733
Central Western	1922	18,165	10,596	5,918	378	7,382	1,956	32,449	51,575	128,419	.....	.....
	1921	21,438	9,518	17,046	136	5,865	741	30,613	41,540	.....	126,897	135,858
Southwestern	1922	6,222	3,240	3,260	195	7,346	482	14,615	24,287	59,647	.....	.....
	1921	6,522	2,987	4,231	172	6,058	675	15,582	25,636	.....	61,863	66,287
Total Western districts	1922	38,189	20,458	15,173	1,541	29,527	48,774	76,151	109,751	339,564	.....	.....
	1921	44,003	18,912	29,605	739	22,637	23,238	74,188	100,932	.....	314,254	365,878
Total, all roads	1922	57,567	28,370	84,559	8,420	56,163	69,197	230,652	317,652	852,580	.....	.....
	1921	61,326	26,307	156,891	4,355	44,963	32,949	216,211	265,267	.....	808,269	.....
	1920	38,708	26,574	221,844	13,933	65,514	77,591	200,459	326,646	.....	.....	971,269
Increase compared	1921	.....	2,063	.....	4,065	11,200	36,248	14,441	52,385	44,311	.....	.....
Decrease compared	1921	3,759	.....	72,332	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1920	18,859	1,796	.....	.....	.....	.....	30,193	.....	.....	.....	.....
Decrease compared	1920	.....	.....	137,285	5,513	9,351	8,394	.....	8,994	118,689	.....	.....
August 12	1922	57,567	28,370	84,559	8,420	56,163	69,197	230,652	317,652	852,580	808,269	971,269
August 5	1922	58,512	26,507	79,246	8,442	55,898	66,218	229,287	327,241	851,351	786,178	935,730
July 29	1922	59,170	27,104	76,374	9,112	58,197	64,147	234,567	331,062	859,733	795,432	936,366
July 22	1922	57,566	27,455	76,060	9,949	58,512	64,417	239,510	327,655	861,124	788,034	928,418
July 15	1922	48,911	30,216	77,334	9,698	58,111	69,162	241,180	326,285	860,907	774,884	942,851

Compiled by Car Service Division, American Railway Association

Locomotive Fuel, the Life Blood of Transportation*

How Officers in All Departments Can Help to Save Fuel —Need for Refined Locomotives

By G. M. Basford
Consulting Engineer, Lima Locomotive Works

Fuel is the very life blood of transportation. We must use it as if we thought so. We must not treat it as we are tempted to treat water in the rainy season. We must not burn it as if there were a lot more where this came from.

Before those who direct and control the use of fuel on railroads lies a wonderful opportunity for money making, money saving. Wonderful improvements have already been made. More and even greater possibilities are available.

A fortunate fact about every feature in fuel conservation is that it helps railroad operation in ways that fuel does not directly touch. No one ever does anything to make more effective use of fuel without helping the road in other ways. Therefore, to co-ordinate all these possibilities and to organize the road into a Committee of the Whole to conserve fuel, fuel officers need to be very big, broad, influential men. They need to grasp and improve to the utmost the opportunity that lies before them. It is fortunate that they now have this opportunity and this organization back of them.

Fuel must take a new place in your hands. The fuel officer who is to bring fuel to its proper eminence has many strings to his bow. The fuel officer has back of him the locomotive builders with their extraordinary experience. He has many other supporters who have spent lifetimes in developing safe, sound and sane vitalizing factors that have never yet been employed to the limit of their capacity for improving the real efficiency of locomotives. He must also have the entire railroad back of him.

When business comes on again, look out! You have less railroad today than you had five years ago. You are short about 5,000 locomotives to keep the equipment curve anywhere near the curve of growth of the nation. C. B. Peck and V. Z. Caracristi show that locomotives are not used as efficiently now as they were 20 years ago, because of lack of maintenance facilities, but we know that as machines they are vastly more efficient. It is also clear that lack of adequate shop facilities is a great factor obstructing the application of fuel saving, capacity increasing improvements to locomotives now in service, each of which should, if run at all, run as economically and as efficiently, weight for weight, as the latest new power. These unmodernized engines are wicked wasters of fuel. To fix this situation right, new shop machinery is needed. This illustrates the breadth of the opportunity of the fuel officer. Adequacy of the equipment of shops affects his fuel record in several ways. It materially affects the number of new engines needed and controls the improvement of old ones. It also controls the condition of the power that is burning up his fuel.

As a railroad officer, acquire all the knowledge of the latest locomotive progress, learn of the perfectly sane and safe possibilities of power and its use, never yet put into general practice, and knowing to your own satisfaction that big improvements may be made, you may say, "As a railroad officer I cannot afford not to see this done." To the public the new locomotive and upkeep of present locomotives are more important than the question of rates and will continue to mean more to the public as to their own pockets, but the public does not know it.

*Abstract of a paper presented before the International Railway Fuel Association, May 23, 1922.

Purchasing Agent

Why not help him by showing him what coal to buy and why let him supply unimproved real estate? Thirty-two years ago a big western road, then poor, now very prosperous, tested seven coals for main line service. Differentials in price were established. Poor local coals were discarded and truly economical coals provided. Operation of the road instantly reflected the value of the right fuel. Nothing means more than this in making long locomotive runs. Careful roads buy the coal that is cheapest in the end. They pay more to get clean coal and save by doing it. Then the coal should be uniform or locomotives cannot be kept right as to drafting. Drafting has been a difficult problem on many roads. Changing coal discourages efforts to keep front ends "right."

Yardmaster

Give this very efficient officer the kind of switch engines he needs; powerful, efficient, economical, snappy ones. Give him road engines that will clear the ladder tracks quickly. He knows, better than anyone else, the value of locomotive improvements that make for better acceleration of trains over the tracks that tie up the yard until they get away. Then watch him make up trains for an even load on the road, avoiding fleeting. Bunching trains raises havoc with fuel performance. Watch him send road engines back to the roundhouse singly, again avoiding the fleeting that clogs facilities of all kinds, particularly locomotive terminals, and piles up stand-by losses.

Do you not think that you can classify trains at terminals so as to main track some of them through other terminals? One road does this with 10 to 15 per cent of its freight trains. Avoid switching trains at terminals whenever possible. This makes for long runs.

Dispatcher

No one can do more for fuel than this officer when he has the tools to work with. Everything he does for fuel does even more for himself. He does not want to fleet trains. He wants them to get away and run. He needs efficient power, first in the yards and then on the road. He needs such tonnage rating and careful loading for all engines as will enable him to give a track for the big powerful ones to use without being checked and harassed by old unmodernized ones. He knows that it costs from 500 to 1,000 lb. of coal to stop a train and start it again, depending on how long it stands, but often he cannot help it. Take the dispatcher into the family and give him the best tools to work with. Then get him to use his engines with the realization that they are very costly and very scarce and that every lump of coal is precious.

Scheduling freights is a great improvement. Send them out at specific times worked out to suit conditions and to keep the wheels turning, avoiding delays of all trains as much as possible.

Superintendent

Knowledge and thorough knowledge of his locomotives means more to this officer than to any other on the road, even those who are responsible for locomotives themselves. Under

his command are all those who use the power. When he has the traveling engineers he controls, and is in position to revolutionize locomotive handling and operation. He can control dispatching, control condition of power, direct firing and the use of locomotive cut-off. He more than any other officer can aid in making long locomotive runs and in providing equipment, men and supervision for locomotive maintenance and terminal attention. Superintendents also control the time lost at stations that must be made up by fast running that uses so much fuel. They are charged with fuel cost. They can do more than anyone else to save it.

In the superintendent the success of the divisional organization lies. Help him. Show him how the locomotive may help him.

Track Officers

Limitations of locomotive weight are sometimes arbitrary, but the tendency toward reducing dynamic augment, through lighter reciprocating parts, renders it possible to build even more powerful, more economical locomotives without requiring heavier rail and stronger bridges. Weight limits often prevent application of fuel saving improvements. The limit to locomotive capacity has not nearly been reached, but cooperation and understanding of this problem on the part of track people will be necessary. It will pay to relocate some water plugs, to change positions of some sidings for the sake of fuel. Improved acceleration of trains with a recent locomotive improvement has already affected these matters materially on a number of roads and will affect them much more. Track officers will find that locomotive improvements, other than light parts, will help them by avoiding the necessity for heavier rail and bridges. On the other hand they will find that they may do many things with track that affect fuel. They should interest themselves in what is happening to the locomotive, particularly as to application of the booster and reducing dynamic augment.

Signal Officers

These men know the cost of stopping trains. They are helping fuel by keeping trains moving. A new and vital problem lies before them. It will be up to them to secure the necessary safety from automatic train control without unnecessary stopping of trains. Get them into the fuel family as to the effect of this new development on the operation of trains of 60 to 100 cars and also as to the possible improvement of an occasional signal location. The possibility of increased acceleration of trains will affect these locations materially.

Mechanical Officers

When everybody else thinks of fuel, when the "business of owning locomotives" is understood and appreciated, when ultimate cost replaces "first cost" in the official mind, and when necessary improvements in accounting are made, mechanical officers will surprise everybody with the savings they will render possible. They will do it with modernized existing locomotives, with new and greatly improved locomotives, with competent maintenance, with tonnage ratings that mean maximum earnings. Their problem must be understood. They must have facilities, help, encouragement and support. They are ready, but they and their problems are not understood.

Condition of Power

A well known locomotive superintendent 15 years ago did a great thing to improve condition of power. He put several men in charge of matters that make or break fuel records.

1. Front ends, drafting engines for economy as well as for steam, air leaks into front ends and condition of superheaters. One man had charge of these.

2. Valve motion, best setting of valves for every class of engine and for every service was determined and it was this man's job to see that every engine on the road had economical and effective valve setting and that it was kept that way.

3. Boilers, this man was responsible for tight boilers, for clean flues and arch tubes, for grates, arches and ash pans.

4. Running gear, every box, pin, journal, shoe and wedge, was the responsibility of this expert. He supervised the shop and roundhouse work all over the road and had lubrication in charge.

These men had authority. At times they annoyed the master mechanics, but that was the reason for their appointment. Remarkable results were reported. Any road may do this. It means little in cost, but much in fuel. This is a good way to avoid fuel loss by leaky front ends, nozzles too small, leaky superheaters, fallen arches, leaky flues, hot boxes, knocking driving boxes and other things that defeat the best fuel efforts. Today, stokers, feed water heaters, grate shakers and power reverse gear would be added to the list, making it somebody's particular business to look after every one of them systematically.

Existing engines require this. As soon as the "bloom is off the peach" new ones need it also. Large capital expenditure is needed for the necessary maintenance facilities. The public has made it difficult for poor roads to raise the money, but a great deal may be accomplished by a gradual and relatively slow process, each step of which will make the next one easier. Get rid of the fatal monthly budget. Get to an annual basis. Consider annual cycles instead of straight line oversight. Do a little this year and invest the savings of this year for the time to come.

If our shops and roundhouses had adequate machinery and facilities for handling big work quickly, if they had enough to modernize all existing engines and to keep all engines up to condition there would be a surplus of power today for any load the roads have ever had to carry. This, however, will not provide for the load that is coming. New engines will be needed before they can be designed carefully to take advantage of available improvements, and before they can be built. But remember that the new ones will soon add to the shop load. There is no time to lose in this machinery matter or the loss to the public will bring the severest charges railroads ever faced. A new way for financing machinery additions must be found. This is now receiving attention with promise of success. Last February Secretary Hoover suggested government guarantees for improvements and equipment.

Engine Failures

Records for nine years on a well known road show 84 per cent reduction in the number of engine failures per month that cause a delay of five minutes, whether made up or not. Remember that time made up on the road is mighty costly in fuel and it should count against any failure that causes it. In the nine years referred to the number of engines dispatched per engine failure increased 251 per cent. Figuring on $250 as the average cost of an engine failure, and the cost may often reach five times that amount, this road estimates a saving of a quarter million dollars per year, and relatively it is a small road. An engine failure may cost $1,200 if it delays four or more trains. The particular failure that showed this figure could have been prevented by an expenditure of $25.

Long Locomotive Runs

Stand-by losses murder fuel records. Is yours as high as 30 per cent as it was recently stated to be on one big road? Popular demand for economies and growing public sentiment in favor of the operating economies of electrification have some foundation in view of the possible continuous service of electric locomotives eliminating stand-by losses. Eight hours a day or perhaps half that, ought to be enough to condition a locomotive, leaving 16 or more, for service. It is not the fault of the engine that it does not work more

than 16 hours or that it spends more than half its life at rest. After 150 miles the engine is well warmed up for another 500 miles

Individual Fuel Records

Without individual performance records it is impossible to check tonnage performance of engines, to check up the value of vitalizing factors and to know whether the power improvements and economy they should give is really produced. A combination of four vitalizing factors should give the light government Mikado 50 per cent additional pull at 30 miles per hour for the same coal as a plain engine of the same size would use. Do we get this power? Only individual records of fuel and tonnage will show. J. N. Clark covered this question admirably before the Pacific Railway Club last year. He asks how the traveling engineer is to know what to say to 125 engineers and 140 firemen unless he knows what each one is doing?

He also asks: "How long would a large industrial plant remain a going concern if they had one item of expense amounting to 40 per cent of their operating expenses and had no idea as to whether it was sustaining a loss each month due to lack of supervision over details?" W. L. Robinson covered this subject in his paper before the New England Railroad Club in December, 1917.

By a few simple figures every run may be made a test run. We do this with automobiles. Any deficiency in miles per gallon leads to a prompt investigation because it touches our own pocketbooks. Some tests made three years ago proved 20 per cent in fuel saving by an improvement on a big engine, but it did not show on any record except that of the test. When a new type of engine goes to work it is most important to know its operating and fuel standing as compared with those that it replaced. This would help in ordering the next new ones. Those who do not know cannot wonder why new engines are ordered without consultation with them. Some general office buildings have four and five floors of accountants. Is it not possible to divert a few accountants to the vital statistics needed for locomotive operation, to make every run a test run, even if it is a rough test?

Co-operation of Engine Men

The major number of engine men take pride in their work. Their co-operation is a vital matter. They are intelligent, able men, but don't ask them to save fuel while someone else who directs their work wastes it faster than they can save it. Give them a chance to run. Give them a railroad to run on, give them track, give them signals and water plugs where they ought to be. Then show them films such as the "Fuel Conservation," films of the Southern Pacific. They would co-operate and turn their daily routine to the advantage of the company. Are your engine men with you as to fuel? Have you a right to expect them to be? Do you keep records of individual tonnage and fuel so that the good men can make a showing and so that the others will be encouraged to try?

Stationary Power Plants

Over 1,200 railway power plants offer opportunities for a lot of fuel saving. Heat losses alone account for 25 per cent of the fuel in the average steam plant without referring specially to railroad plants. Do we give careful attention to the operation of shop power plants to see what the firemen are doing? Do we train and do we check up power plant engineers and firemen? Do we keep brickwork tight? Do we apply superheaters and do we cover piping and stop the leaks of steam, water and heat? A few years ago a large manufacturing company saved ten per cent of its fuel in a large plant by merely stopping leaks. What could railroads save by covering pipes, stopping leaks and by replacing old locomotive boilers by proper boilers with superheaters for stationary plants?

Boiler Water Treatment

A very costly encumbrance is boiler scale. Many a railroad is regularly using waters not fit to be put into boilers, locomotive boilers least of all. It costs little to "doctor" those bad waters, little compared with the cost of driving heat through boiler scale which is the most effective heat resister known. For the benefit of your fuel records "medicine" these bad waters.

Personnel

It's the personnel of an organization and the skill and spirit of its members, the team work, that gets the results, good or otherwise, out of any equipment—army, navy, manufacturing or railroad. Hand in hand must go improved men, improved supervision and improvements in material. To be ready for better locomotives it is necessary to lead men to bring the present equipment and its use to a point of high efficiency. Improve the men and when they get the best work out of present machinery they will be ready for better machinery. A suitable plan for recruiting, training and promotion of men—real apprenticeship—is the thing railroads need more than any other one thing today. What are you doing about this? Ask the roads that have systematically provided apprenticeship whether it pays. Ask the Santa Fe people. Only one road has applied this year to a certain famous technical school for some of its graduates. Was it your road?

Morale

Morale is the first thing to fix. Perhaps by inspired leadership this may be accomplished. Leaders always know what they want and how to get it. Everybody sees coal come in quantities by train loads. Is it not possible by leadership to induce everybody to use it as if it were their own?

Those Next New Locomotives

To order new engines now is a big responsible job which should be approached with full knowledge of the business possibilities of locomotives reinforced by experience and willingness to take advantage of everything that will produce efficient engines that will save money. There is little danger of going too far in refinement. There is great danger of perpetuating the brutal in present locomotive practice.

Unnecessary Weight

This is the first big thing to tackle. Many big engines today are doomed to carry literally tons of unnecessary weight, and to carry them for 20 or 30 years. Think of the fuel required to drag the heavier engine around. Many engines have been built recently that were too heavy to take important fuel saving factors. Here is where the fuel officer comes in on refinement of present brutal weights. He comes in again in saving of fuel by long locomotive runs to which refinement of design and better steels will contribute. One railroad has gotten down to less than 100 lb. of weight per horsepower. Is it your road? There must be a definite weight limit or your fuel records suffer.

Undoubtedly the new engines will have trailing wheels. Boosters add to capacity, produce quicker acceleration to speed, help over critical points on grades, clear yard ladder tracks in shorter time and really put a trailer type of engine into the next class above it in starting power. It saves fuel by avoiding doubling and by putting a light engine in position to do the work of a heavier one. You should consider building Atlantics today with boosters for suburban and frequent stop service, releasing heavier engines and make a little money on such trains.

Stokers should be considered for new engines in a new way—as fuel savers. They are generally advocated to throw more coal than a man can fire. They should be used as fuel savers, enabling the fireman to use his head when he is re-

lieved from the heavy work of firing. Power grate shakers reduce the starving of a fire for air. They are needed to make long runs and to facilitate cleaning fires. New engines call for most careful attention as to lubrication. Long runs already made prove this necessity. Heat conservation by feed water heaters will add to the power of the new engine or save fuel for the same power. Feed water heaters have been demonstrated to be a success and should be considered on every new engine.

All new engines have arches, but a new and double arch is available. Through its supporting tubes water equivalent to the entire contents of the boiler will circulate every seven or eight minutes when the engine is working hard. So also the thermic syphon is available. Their effect on combustion and also their influence on improved circulation must be considered. Boiler circulation may be accelerated in several ways. New engines with necessarily big boilers should have the fuel saving advantage provided by them. With improvements of this class circulation may be so rapid as to require steam separators to prevent the superheater from being compelled to evaporate water. This question will be answered soon. To help boiler circulation, reduce boiler repairs and reduce engine failures why not use ten or 12 inch mud rings?

No engines are built in these days without superheaters, but new ones should have the advantage of higher superheat and superheated steam for the auxiliaries which altogether use a lot of steam. This should save many a ton of fuel. This is now being worked out with promise of success.

Improved valve gears and power reverse gears are necessary on big engines. Cut-off control is only now becoming appreciated as a fuel saver and power increaser. The power

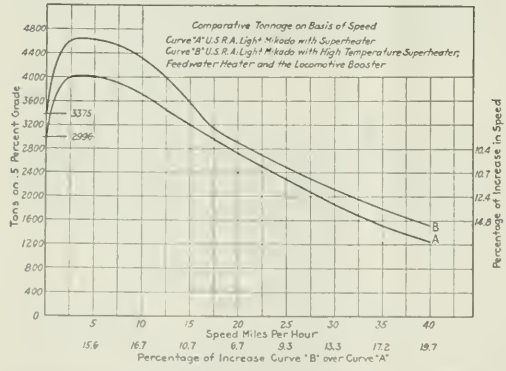


Fig. 1—Effect of Fuel-Saving Appliances on Tonnage and Speed

Curve A indicates the maximum tonnage which can be moved on a 0.5 per cent grade by the U. S. R. A. light Mikado at various speeds; while Curve B represents the possible increase in tonnage which may be obtained by equipping this locomotive with a feedwater heater, high temperature superheater and the locomotive booster.

The increased capacity, as shown by curve B, may be utilized in increased speed of operation, as indicated on the right margin of the diagram; for instance, the speed of a 1,600-ton train may be increased 14.8 per cent.

reverse gear that is to do the work on future big engines must be able to run for long periods without attention and without creeping. Such a gear is now available. For very powerful freight engines the 50 per cent maximum cut-off which has been so successful on the Pennsylvania should be taken into consideration, and after that comes the three cylinder engine to bring bearing pressures down.

This is not by any means a complete list. Skillful combination of design using these factors and others will produce locomotives that will surprise everybody. Up to the time this is written the locomotive that uses all of these, combined with skillful detail design, unrestricted as to first cost, but constructed for ultimate cost and operating economy, has not been built.

A Prediction

We think we know the locomotive. We do not. We will not until a certain thing is done that has never yet been done. Put this up right and you will get it.

Give an order to one of the three locomotive builders, or better give one to each of them, such an order as you give to electric locomotive builders. Give an order for a new locomotive for certain traffic on your road. Make no limit on price, but order the most economical engine that can be built for that work, all things considered, ton-miles per hour, per ton of locomotive metal, per dollar of locomotive maintenance and per dollar of track maintenance cost. Enlist the leaders and best engineering talent of the solid, reliable, reputable companies producing the vitalizing, capacity increasing and fuel saving factors that render the modern locomotive possible. Tell all hands, without exception, to cut out every pound of unnecessary weight and make every one of them do it. They will do wonders in this direction when they must. They have never yet been made to do it. But the builders can do more than all the rest. In all things insist on efficiency. Use alloy steels whenever possible, but do not take a chance on anything that has not abundantly made good. Above all things insist on quality material everywhere and get it, as you do when ordering electric locomotives.

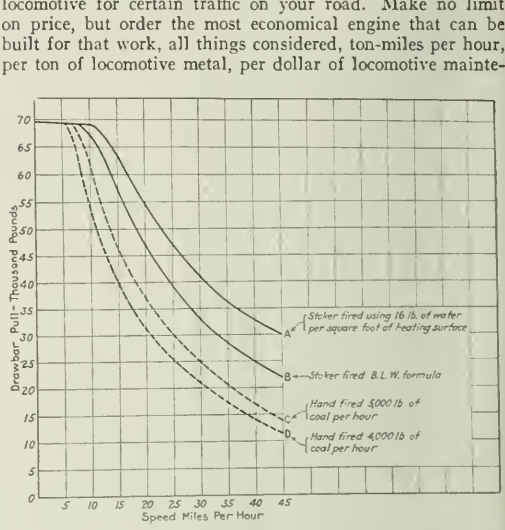


Fig. 2—How Stokers Increase Tractive Effort of Large Locomotives

The capacity of a fireman is limited to about 4,000 lb. of coal per hour over considerable periods; for short periods a man can fire at the rate of from 5,000 to 6,000 lb. per hour.

Curves D and C indicate the drawbar pull on level straight track that can be expected from the U. S. R. A. heavy Santa Fe type locomotive with hand-firing at the rate of 4,000 and 5,000 lb. per hour, respectively.

Curve B illustrates the normal output in drawbar pull of this locomotive as rated by the builders when it is equipped with a mechanical stoker; this involves an evaporation of from 12 to 13 lb. of water per square foot of heating surface and fuel consumption of about 120 lb. per square foot of grate per hour.

Curve A indicates the increase in drawbar pull over the normal capacity which may be expected when the boiler is forced to about 20 per cent beyond its normal capacity.

It will thus be seen that in emergency the stoker can be used to increase the locomotive capacity, although it should be borne in mind that such increase is obtained at a loss in efficiency.

When this engine is delivered take good care of it, but make it work every possible minute as every machine should work. Put an experienced man on the job of following the engine to see that it has a "show," as the electrical people do when they install electric locomotives. Then see to it that operation is made to fit the locomotives *as the electric loco-*

motive people do and thereby correct a lot of faults that steam locomotives have always had to endure. Keep track of the tons of freight, fuel, water and the time. Get the dispatcher to give the locomotive the rails to run on, show the men how to run it and then give the right amount of thought to its maintenance.

Then tell the chief executive the results in money saved. He will tell the "Board" the same day. That day will begin a new kind of money making railroading.

Some new, quick, deep, intensive thinking on the locomotive is needed and needed now.

This is an effort to interest real railroad men in some things they are overlooking. It is a challenge for the short-sighted gentry who refer to important locomotive improvements slightingly.

Look, think, act. When you build new engines build ten that will do the work of 20 old ones and cost less to keep up.

Who orders new engines on your road? When he orders two million dollars' worth of engines get him to see how much efficiency he can buy instead of how many engines he can get for his money without regard to their efficiency.

[Accompanying Mr. Basford's paper were numerous charts showing the effect of fuel-saving devices on tractive effort, tonnage, speed, fuel and water rates and acceleration. Two of these charts are reproduced in this abstract.—EDITOR.]

Discussion

H. C. Woodridge (Locomotive Stoker Company), said that fuel economy must be considered in connection with other operating costs as well as with considerations of revenue, calling attention to the fact that while stokers have not generally shown as good an evaporate efficiency as hand firing, they have actually reduced ton-mile fuel costs. Recent tests, however, have demonstrated that the stoker can actually increase the evaporation per pound of coal over that obtainable under comparable conditions by hand firing.

Statistics Show Increase in Timber Preservation

ALMOST HALF of the crossties now purchased by the railroads of the United States are subjected to preservative treatment before insertion in the track. This is the most important fact to be gleaned from the statistics on timber preservation in the United States for 1921, prepared by the United States Forest Products Service in co-operation with the American Wood Preservers' Association. The number of crossties treated in 1921 was 55,383,515 ties as compared with 44,987,532 in 1920, the previous maximum record. It is interesting to note that in spite of this marked increase in the treatment of railroad ties there was a decrease in the treatment of timber used for other purposes. Thus, expressed in cubic feet, there was an increase in the treatment of ties to the extent of 31,188,000 cu. ft., whereas the increase in the treatment of all timber was only 28,334,000 cu. ft.

Excluding ties there were only two classes of material in which there was any increase in the volume of timber treated,

CUBIC FEET OF TIMBERS OF VARIOUS CLASSES TREATED IN 1920 AND 1921

Classes	1920	1921
Crossties	134,962,596	166,150,545
Piles	8,092,546	5,581,999
Poles	10,309,746	10,959,256
Wood blocks	6,741,410	6,202,904
Crossarms	318,707	108,715
Construction timber	11,645,811	11,826,708
Miscellaneous lumber	1,238,689	753,101
Total material treated	173,309,505	201,643,228

namely, poles and construction timbers, and in each of these cases the increase was nominal. This comparison can be checked rapidly from an examination of the table showing the quantities of timbers subjected to treatment in 1920 and 1921, subdivided between crossties, piles, poles, wood blocks, crossarms, construction timber and miscellaneous lumber. A broader view of the growth of timber preservation is to be had from the larger table showing the quantities of timber treated and the consumption of the two principal preservative materials from 1909 to 1921, inclusive. Further evidence of the growth of the industry is to be had from the fact that 122 plants were in active operation during 1921, or 10 more than in the previous year.

In the preservation of wood in the United States in 1921 the treating plants consumed 76,513,279 gal. of creosote, 1,060,753 gal. of paving oil, 1,810,294 gal. of miscellaneous preservatives and 51,375,360 lb. of fused zinc chloride. The zinc chloride consumption in 1921 was the largest so far reported by the industry and represents an increase of 1,657,431 lb. over the quantity used the year before.

The quantity of creosote used during the year constitutes an increase of 7,755,771 gal. over that consumed in 1920, while the 1,060,753 gal. of paving oil reported was less by 788,158 gal. than the 1920 consumption. The quantity of miscellaneous preservatives used in 1921 was greater by 38,210 gal. than in the year previous. The restoration of the foreign creosote industry to its pre-war status is indicated by the large increase in the consumption of foreign oil, which amounted to 28,242,307 gal. in 1921 as compared with 9,575,680 gal. in 1920. However, although the quantity of domestic oil used in 1921 was less than in 1920, it is still considerably larger than the volume of imported oil.

WOOD PRESERVATION 1909-1921, TOGETHER WITH CONSUMPTION OF CREOSOTE AND ZINC CHLORIDE

Year	Total Material treated, cubic feet	Number of crossties treated	Creosote used, gallons	Zinc chloride used, pounds
1909	75,946,419	20,693,012	51,426,212	16,215,107
1910	100,074,144	26,155,677	63,266,271	16,802,532
1911	111,524,563	28,394,140	73,027,335	16,359,797
1912	125,931,056	32,394,336	83,666,490	20,751,711
1913	133,613,888	40,260,416	108,378,359	26,466,803
1914	159,582,639	43,846,987	79,334,606	27,212,259
1915	140,858,963	37,085,585	80,859,442	33,269,604
1916	150,522,982	37,469,368	90,404,749	26,746,577
1917	137,338,586	33,459,470	75,541,737	26,444,689
1918	122,612,890	30,609,209	52,776,386	31,101,111
1919	146,056,994	37,567,927	65,556,247	43,483,134
1920	173,309,505	44,987,532	68,757,508	49,717,929
1921	201,643,228	55,383,515	76,513,279	51,375,360

The consumption of domestic creosote aggregated 48,270,972 gal. in 1921, a decrease from quantities slightly in excess of 59 million gal. each for 1919 and 1920.

Of the total number of crossties treated during 1921, 35,819,931 were hewed and 19,563,584 were sawed. The crossties treated in the largest quantity were yellow pine, the total number reported being 21,511,719. Oak ties ranked second with 12,838,157 and Douglas fir ties were third with 4,960,115. Other ties treated in any quantity were western pine, beech, gum, tamarack, maple, birch, elm and hemlock.

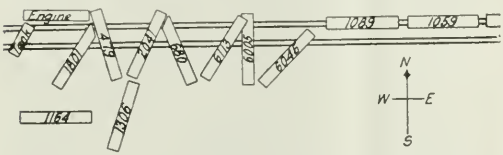
A total of 22,046,466 crossties were treated with creosote in 1921 and 30,265,947 with zinc chloride. The number of ties impregnated with the zinc-creosote emulsion was 3,061,234, while 9,868 were subjected to treatment with miscellaneous preservatives. In treating ties with creosote an average absorption of 7.21 lb. per cu. ft. was obtained. Where zinc chloride was used the average quantity of preservative that was forced into the wood was 0.48 lb. per cu. ft. With the use of the zinc-creosote emulsion the injection amounted to 0.49 lb. of zinc and 2.75 lb. of creosote. Practically all of the wood-preserving processes used commercially were employed in the treatment of crossties.

THE ANNUAL CONVENTION of the Chief Interchange Car Inspectors' and Car Foremen's Association which was to have taken place at Chicago, August 22-24, has been postponed and will be held at the Hotel Sherman, Chicago, November 6-8.

Michigan Central Express Wrecked by Removal of Track Spikes

MICHIGAN CENTRAL westbound train No. 39, a New York-Chicago express due to arrive at Chicago at 9:45 p. m. Saturday, August 19, consisting of 22 express cars and a coach, was derailed and wrecked 1¼ miles east of Gary, Ind., at 2:18 a. m. Sunday, August 20. The accident was caused by some unknown person or persons maliciously pulling 27 or more spikes from the outside of the south rail on the westbound main track. The engineman and fireman were buried under the engine and killed and two express messengers were injured.

The train was running approximately 45 miles an hour



Approximate Location of Engine and First Eleven Cars

at the time of the accident, and when it left the rails about 395 ft. of track was torn up and the locomotive half buried itself in the sand. After the engine turned over, the first car went nearly 200 ft. beyond it before going into the ditch. Four additional cars were derailed. The line, which is double track, passes through the sand dunes of Indiana and is tangent within the range of vision from the point of the accident.

Soon after the accident, James H. Connelly acting captain

International Newsreel Photo

View from the South East

of police of Gary and P. E. Pfeifer division superintendent of the Michigan Central, in investigating the cause of the accident, found that at least 27 spikes had been removed from the ties, the track being so badly torn up that it was impossible to determine how many more had been taken out.

The marks of the claw bar were plainly visible on the spikes and its impression on the ties was very clearly indicated. The first two cars which remained upright (the trucks only being derailed), stood at the point where the spikes had first been removed, and three ties were found to have spikes in them, although from their appearance, attempts had been made to remove them, as they were raised slightly.

The last passenger train westbound prior to the accident was No. 23 from Buffalo, N. Y., which was due at Gary at 8:00 p. m. Saturday. Westbound freight extra 7878 passed Garry at 12:38 a. m. No. 45, another passenger train from Buffalo, was due at Gary at 5:22 a. m. while No. 47, a train from Grand Rapids Mich., was due at 6:10 a. m. From the fact that extra 7878 passed the point of the accident at 12:38 a. m. and the accident occurred at 2:18 a. m., it appears that the spikes were removed some time during the one hour and forty minutes intervening between the time the extra left Gary and the time No. 39 arrived. From the investigation it appeared that after the spikes were removed the rail had been thrown out slightly to spread the gage.

At the inquest, which was held at Gary on August 21, the coroner stated that the wreck was the result of a deliberate

"P. & A. Photo"

Overturned Engine; the Tender Has Been Removed

plot, recording the deaths of the engineman and fireman as homicide. The verdict of the coroner's jury was that "The wreck was deliberately planned by a person or persons unknown and therefore the deaths were homicide." This verdict was reached after several witnesses had testified that a number of spikes had been pulled from the outside of the rail, which resulted in their spreading as the express train passed. The coroner's investigation developed the fact that no engine trouble had been experienced although such reports had been circulated.

J. P. Rooney, head of the bureau of investigation of the Department of Justice in Chicago, acting under instructions from Attorney General Daugherty at Washington, began a federal investigation of the causes of the wreck. In addition, Indiana state officials, railroad officers and other agencies are carrying on investigations. Operatives of states attorney Crowe of Illinois, raided the offices of William Z. Foster of the Trades Union Educational League after the accident to determine whether he was implicated directly or indirectly with the accident as he has been reported as being active in disseminating "red" propaganda among striking railway workers. However, the states attorney dropped his investigation after he learned that W. Z. Foster had been under such close surveillance by government agents during the rail strike and that it was almost impossible for him to have had any direct part in this occurrence.

Guard Against Physically Unsound Employees

Greatly Increased Liability of Railroads Under Present Laws Demands More Perfect Health Control

By John Leeming, M. D.
Medical Counsel, Chicago Surface Lines, and Consulting Physician, Chicago, Burlington & Quincy, Chicago

DO RAILROAD COMPANIES fully realize the risk they assume in the employment of their help? My experience leads me to believe that in the light of recent legislation this subject has not been sufficiently studied, nor its far-reaching effects fully comprehended. I submit the broad general statement that a railroad company should employ men only who are physically and mentally 100 per cent sound. No employer of labor will deny that efficiency depends largely upon a sound mind and a sound body, but desirable as efficiency may be, there are other reasons why perfect health is necessary in the workmen from the track worker to the locomotive engineer. A man in perfect health is more valuable to himself and his family and better able to render efficient service to his employer. Good health favors contentment, both individually and collectively, but when the subject is considered in the light of the various workmen's compensation acts, physical soundness is not only desirable, but as a matter of protection to the employer, a necessity.

Previous Health of Employee No Defense to Employer

The principle which underlies legislation of this character is that the employment in which the workman has been disabled owes him a living if the disability is due to an injury arising out of and in the course of the employment. A large number of cases which have caused endless trouble, litigation and great expense to the employer have proven to be cases where prior conditions of health had a serious bearing upon the question of compensation. There are any number of illustrations of a workman being employed with certain defects which are not absolutely disqualifying for service, but which, under the influence of an accident, may develop into a total and permanent disability. It appears to be well established in most jurisdictions that if a man is employed with certain latent or minor defects which are not in themselves disabling, and he suffers an accident "arising out of and in the course of his employment" and this accident so aggravates his prior condition that he is disabled, he is entitled to compensation notwithstanding the previous defect.

In Illinois it seems to be settled that so far as pre-existing disease is concerned, if the disease is aggravated or accelerated by an accidental injury in the course of the employment, an award will be predicated upon the effect of the injury upon the particular employee in his condition of health as it existed at the time of the injury (279 Ill., 235). The presence of a pre-existing disease is not of itself the basis of an award. "It is because of the injury acting as a cause of disability or aggravation of the disease, rendering the disability greater that makes compensation payable for the condition as it exists by reason of the injury." (Centralia Coal Co. vs. Industrial Commission, 301 Ill. 318).

The practical and important question which, therefore, presents itself to all employers of labor who are operating under the terms of workmen's compensation acts is: What latent or other defects are disqualifying, first, for competent and efficient service, and second, in anticipation of possible accidents occurring during and growing out of the employment. There should be no grading in selecting employees so far as physical health is concerned. All workmen should be 100 per cent sound, as determined by a competent medical examiner. A life insurance company will not accept a risk on any other basis and as railway companies, under the industrial laws, have to assume important risks, they should in self protection act on the same basis.

Railroad Protection Lies in More Thorough Examination

The important question which, therefore, presents itself, as indicated above, is to determine first by physical examination the positively disqualifying defects which will interfere with the worker's efficiency. This phase of the subject requires very little comment because the employment man in any large organization if instructed to do so could easily determine objectively the existence of the well recognized defects, such as, color blindness and other visual defects, impaired hearing, structural heart disease, pulmonary or bone tuberculosis, palpable deformity, organic diseases of the nervous system, over-weight, under-size and weight, etc.

The second phase of the subject, however, is one upon which I desire to direct special attention for the reason that it is one which in my experience and observation has been very much neglected in the past, and also because the disqualifications are of a character that are much more difficult to detect. I refer to what I have termed latent defects and the existence of certain blood diseases which do not manifest themselves to an ordinary or casual medical examination. Such underlying conditions, by a comparatively slight injury, may be so aggravated or roused up as to constitute a prolonged or even permanent disability. This opens up a big field and to go into the subject in any sort of detail, would carry one entirely beyond the permissible space of this article. A few suggestions will indicate the writer's trend of thought and should be entirely sufficient to lead an interested reader along the lines of study suggested.

Look for Latent as Well as Obvious Defects

What defects, inherited weaknesses, predispositions, constitutional states, etc., should be looked for in the thorough medical examination I am advocating? What underlying conditions might exist without exhibiting marked objective or apparent evidence that could be roused up by injury into a serious trouble resulting in prolonged disability, or possibly a fatal termination? Constituting one such condition, there is hernia. Many men are ruptured. Authorities are sponsors for the statement that one in every 25 male adults is affected in this way. Such ruptures are usually of long-standing and in most cases when properly supported are not disabling. Wherever located, an accident accompanied by an involuntary muscular movement in an effort to save one's self from falling, may so operate to bring about an acute and complete hernia, with possible disastrous results and prolonged incapacity for work.

As a second consideration there are the varicose veins of the legs, a condition which is not unusual in men. Neither is it disqualifying for work if the affected limb is properly supported. But if a workman with this defect sustains an abrasion or bruise in the region of his diseased veins they are very likely to become ruptured and a condition arise which results in a prolonged if not a permanent disability.

The condition indicated by high blood pressure is a third defect to be considered among these latent defects. In the physical examination of every applicant for service, the blood pressure should be taken and if it is more than "100 plus the man's age," a close investigation should be made to ascertain its cause and if the cause cannot be discovered and the condition remedied, the employment of such an applicant is a dangerous risk for the employer to assume.

There is a fourth class of defects to be considered in those disorders known as "Focal Infections." It refers to the presence in certain cavities of the body, of infectious or poisonous material which, not readily remedied by natural processes, is absorbed into the circulation, with the result frequently, of setting up inflammatory action in the muscles, joints, bones and other important structures. The follicles of the tonsils, root cavities of the teeth and the sinuses connected with the upper air passages are the most common sites of such infection and thousands of cases of chronic rheumatism, persistent neuralgia and other painful and disabling troubles have been permanently cured by the discovery and removal of such real underlying causes. Many apparently able-bodied men are, without their knowledge, carrying about with them some of these undiscovered foci of infection. Their general good health has enabled their systems to develop an immunity against this poison, but let such an individual sustain an injury to a joint, a sprain of his back, a bruise over some nerve, and the lowered resistance thus induced by the injury favors the development of a condition which will persist and disable until the real cause of the trouble is removed.

Venereal disease is another of these latent defects which invite serious consideration by railroads. The public would be appalled if it knew the prevalence of certain forms of such disease that prevail in many apparently healthy individuals. In fact, many such individuals do not know it themselves, and in such cases an injury, especially to bones, or joints, or the covering of bones where this underlying taint is present, proves to be disabling in the form of inflammation of the bone covering, etc., until a course of specific "blood treatment" is used.

Tubercular tendency is a sixth of the conditions to which I refer, a condition which is common but difficult to detect. It requires careful investigation. Many cases of tuberculosis of the knee joint, hip joint, spinal column and other parts of the body have been attributed to comparatively slight injuries to the parts involved which, owing to the underlying predisposition, were unable to survive the effects of the injury and a permanent disability has thereby ensued.

Finally there should be considered functional heart affections and functional nervous states. A rapid pulse, the evidence of an irritable heart, is very common in many otherwise healthy individuals from a variety of causes such as excessive use of tobacco, disturbances of gland secretion, prolonged indiscretion in diet, etc., in the presence of which the power of resistance against injury and the ability to recuperate following injury is materially impaired. Functional nervous state is a condition, which is either inherited or acquired and calls for careful attention. A plaintiff's expert once said, in reference to a case of this type: "Such an individual is a very bad one to receive an injury." These are the cases which fill our court calendars with the so-called traumatic neurasthenias and traumatic hysterias and in which employees after a trivial injury develop persistent, disabling and long continued neuroses, for which the employer is held liable under compensation acts.

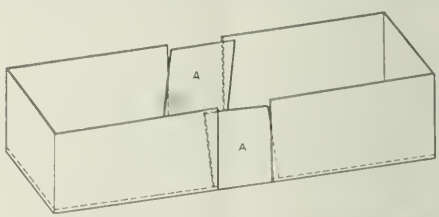
Life Insurance Methods None Too Complete

These suggestions show the position in which the employer of labor finds himself if he has men working for him who have these and other quiescent or latent defects. Failing to take the necessary steps to ascertain the fitness and capacity of the employee, he therefore assumes the increased risk under the compensation acts of employing or retaining men, who under the influence of a trivial accident may be disabled for months or years. Such men are undoubtedly bad cases to suffer from accidental injury "arising out of and in the course of" their employment, and while the suggestions indicated could be greatly elaborated and much of a similar character added in reference to other underlying defects, enough has been said to justify the statement made at the outset that in the employment of men in all branches of labor connected with railroad work, a thorough, complete and exhaustive examination is requisite—just as complete and thorough as that required by a life insurance company. The employment man of a railroad company would do well to have printed in large type for his guidance the recent opinion of an arbitrator that "This man's prior trouble was no doubt aggravated by the accident in question and his disability is no doubt due to such aggravation—the employer either knew of the pre-existing condition when the man was hired or it was his business to have discovered it."

A New Design of Liner for Grain Cars

LEAKAGE OF GRAIN from defective cars is a serious source of loss to the railroads. All roads endeavor to make equipment offered for grain loading as tight as possible, and a considerable proportion of the cars are lined with paper or burlap. Formerly, paper for lining cars was furnished in rolls, but this method of coopering is slow and expensive and prepared linings shaped to fit the floors, sides and ends of the cars have come into use in recent years.

An improved car liner of this type has recently been placed on the market by E. C. Unser, River Edge, N. J. The principal features of this liner are the one-piece construction and the simplicity of application. The complete liner is made in two sizes, 40 and 50 ft. long, which will fit any length of car. It is furnished so that it can be



The Liner Is Made in One Piece with Overlaping Flaps at the Doors

placed on the floor of the car and rolled out lengthwise, the sides being then lifted and fastened against the walls of the car. The operation of lining a car can be completed in a few minutes.

The two standard sizes of liners are adapted to the varying widths and lengths of cars by folding either longitudinally or transversely to fit the inside dimensions of the body. Special provisions are made in this liner for loading and unloading. Two separate sections, AA, at each doorway overlap the sides. When loading the ends of the car one doorway can be closed while the door covering on the side from which the car is loaded is folded out of the way and gradually raised as the level of the load rises and the grain doors are put in place.

These liners are made of heavy kraft paper and are suitable for protecting loads of sugar, salt, lime, paper, flour and other mill products as well as grain.

General News Department

The Central Railway Club, announces that the September meeting of the club has been postponed until further notice.

W. R. Rowe has been appointed general traffic manager of the Automotive Equipment Association, with headquarters at Chicago.

The Southern Hardwood Traffic Association has opened district offices in the Conway building, Chicago, in charge of W. E. Wherity, district manager.

The Atchison, Topeka & Santa Fe loaded 6,831 cars of revenue freight on August 22, an increase of 239 cars over the best previous record on October 25, 1921.

H. R. Gillespie has been appointed traffic manager of the Moore Refining Company, with headquarters in Chicago. This company has bought the properties of the Milliken Refining Company at Arkansas City, Kan.

The bill authorizing the Interstate Commerce Commission to require railroads to issue interchangeable mileage book tickets and scrip books and to fix the rate per mile and the denomination, became a law on August 18 by the signature of President Harding.

Arthur S. Tuttle has been appointed chief engineer of the Brooklyn-Richmond freight and passenger submarine tunnel to be built by the City of New York. H. H. Smith has been appointed deputy chief engineer on the same project. Some of the other engineering appointees are D. W. Coe, W. J. Shea, F. H. Phipps, J. B. Snow, C. D. Drew, W. M. Griffin, C. K. Conard, W. C. Lancaster and J. H. Quimby.

The Traffic Club of Atlanta, Ga., has re-elected the following officers: president, G. E. Boulineau, general freight agent, Georgia, and Atlanta & West Point; vice-president, J. W. White, traffic manager International Agricultural Chemical Corporation; second vice-president, S. Linthincum, traffic manager, Empire Cotton Oil Company; and secretary-treasurer, S. W. Willson, southern freight agent, Philadelphia & Reading.

The Chicago Chapter of the American Association of Engineers will start a class in railroad management on September 11. This course is designed to inform the student regarding the work of the station agent, yardmaster, trainmaster, superintendent, section foreman, master carpenter, roadmaster and division engineer. This is a repetition of a course which was conducted last year in which about 20 members of the association were enrolled.

Coal Loaded on Monday last, August 21, amounted to 19,043 cars. This statement, supplementing that of the Geological Survey, printed elsewhere, comes from the Association of Railway Executives. This total is 3,321 cars more than on Monday the 14th. Reports received by the Car Service Division show that the increase in loadings was due principally to a resumption of mining in the Ohio bituminous fields resulting from the agreement recently reached at Cleveland.

The Pennsylvania Railroad reports that between August 5 and August 9 it transferred 75,000 bushels of wheat from an elevator in Buffalo to a ship in the Delaware River within 72 hours. On Saturday afternoon the wheat was in the elevator at Buffalo. That evening it was loaded into 47 freight cars (48 tons to the car), which were made up into a solid train (about 3,500 tons). The train left Buffalo Sunday morning, and reached the Girard Point elevator, Philadelphia, late Monday afternoon. The grain inspectors worked all night, and at 7 o'clock Tuesday morning the work of loading the grain into barges, to be floated up to the I. M. M. steamer Maryland, at Pier No. 53, was started. The first barge left at 10 a. m. By Tuesday evening—exactly 72 hours after the loading of the cars in Buffalo—the entire cargo was aboard ship, ready for sailing. In that time the grain had been handled through four elevator operations and had made a journey of 416 miles by rail.

International Railway Congress

The Permanent Commission of the International Railway Association has announced that the next congress will be held in London during the latter half of 1925. This time is selected in order to participate in the centenary of the first English railway. The questions to be discussed will be limited to three for each of the five sections; way and works, locomotives and rolling stock operation, general, and light railways.

A. S. C. E. Fall Meeting at San Francisco

The American Society of Civil Engineers will hold its fall meeting at San Francisco, Cal., on October 4 to 9, inclusive, with headquarters at the Palace hotel. The program will be devoted to the consideration of the water power problem with technical meetings on Wednesday and Thursday, October 4 and 5 and with an excursion to Don Pedro, Hetch Hetchy, and the Yosemite Valley on October 6-9. Arrangements have been made for special cars to leave Chicago on the Overland Limited of the Chicago & North Western on Saturday evening, September 30.

Coal Production

Coal production during the week of August 14-19 from the mines that were already working is estimated by the Geological Survey about 4,300,000 tons. It was said to be unlikely that the union mines reopening in Ohio and elsewhere will raise the total output for the week much above the 4,576,000 tons produced the week before. For while mines long closed by the strike are reopening there was a recurrence of acute railroad disability in certain of the non-union and open shop fields. Loadings on Monday, August 14, according to the railroads, were 15,722 cars, a decrease of 3 per cent as compared with the week preceding. Thereafter they declined steadily to 12,530 cars on Wednesday. The loadings on Thursday, 13,463 cars, gave the first indication of shipments from mines reopened under the Cleveland agreement.

Car supply improved in certain districts of Southern West Virginia and Kentucky, but in Harlan County and adjacent fields of Southeastern Kentucky and Tennessee, transportation was for a time almost completely blocked. Western Kentucky also reported acute transportation loss.

There was no compensating increase in shipments from the non-union fields of Pennsylvania.

Final returns show production of all coal in the nineteenth week of the strike as 4,605,000 tons including 29,000 tons of anthracite. In the corresponding week of 1921 the output of bituminous was 7,770,000 tons and of anthracite, 1,770,000 tons, a total for all coal raised of 9,540,000 tons; the year before that the total was 12,280,000 tons. Considering anthracite and bituminous coal as a common source of supply, the present weekly output is five or six million tons below normal.

The mine reports confirm previous statements that the increase in production in the week ended August 5 was due largely to improvement in transportation. Losses in Colorado ascribed to transportation were practically confined to the railroad that recently resumed service after a suspension of several weeks.

The mine operators' statements show conclusively that the gradual increase in production was not due to the opening of mines in the strongly unionized districts, but rather to improved car and labor supply in the non-union and partly organized fields.

Operating Statistics of Large Steam Roads—Selected Items for the Month of June, 1922,

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross. Excluding locomotive and tender	Ton-miles (thousands): Net. Revenue and non-revenue	Average number of locomotives on line daily: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany.........1922	394	229,134	245,001	24,951	4,897	69.0	235,136	83,705	113	29	20.6	...
1921	394	243,687	262,603	29,513	4,366	63.6	235,293	91,918	122	29	19.1	...
Boston & Maine..........1922	2,455	487,160	543,358	44,164	11,484	73.4	536,459	208,655	323	122	27.5	47
1921	2,469	507,466	560,399	46,723	10,703	68.8	560,236	231,969	343	118	25.6	73
N. Y., N. H. & H........1922	1,959	430,932	471,156	28,811	11,623	71.7	536,951	205,110	284	73	20.4	39
1921	1,959	450,721	489,181	32,891	10,549	66.1	554,936	234,691	303	85	22.0	39
Great Lakes Region:												
Delaware & Hudson.......1922	887	231,699	313,571	30,428	6,500	69.0	358,335	160,964	287	29	9.3	178
1921	880	337,717	432,930	41,002	8,222	59.4	560,818	273,600	295	20	6.3	136
Del. Lack. & Western....1922	994	432,729	520,779	88,251	13,738	70.7	672,889	269,911	305	56	15.6	67
1921	995	493,782	600,315	111,451	14,851	67.0	839,641	390,098	362	57	15.9	47
Erie (inc. Chic. & Erie)...1922	2,309	776,112	855,677	57,602	25,813	64.9	1,445,047	602,624	534	227	29.8	98
1921	2,259	798,111	896,281	44,677	25,844	66.2	1,519,271	687,324	547	150	21.6	122
Lehigh Valley 1922	1,316	485,582	543,571	81,178	14,677	67.8	803,161	352,103	460	102	18.2	201
1921	1,316	519,626	576,703	58,448	14,733	62.6	913,309	428,826	420	121	22.4	135
Michigan Central 1922	1,827	491,998	501,469	19,060	16,251	66.9	833,704	321,978	315	89	22.1	91
1921	1,829	424,612	435,499	16,667	12,563	61.5	696,981	262,361	331	87	20.8	87
New York Central 1922	5,675	1,551,849	1,719,323	97,899	58,602	67.9	3,084,911	1,241,762	1,043	552	34.6	368
1921	5,655	1,566,482	1,720,706	116,663	52,824	61.3	3,139,553	1,323,307	1,005	618	38.1	306
N. Y., Chic. & St. L.......1922	510	344,281	345,011	1,120	11,301	68.4	560,571	212,044	106	34	24.0	30
1921	510	308,558	309,634	364	9,506	65.3	490,385	183,133	113	52	31.4	41
Pere Marquette 1922	2,812	306,848	316,112	5,718	7,884	68.5	414,459	181,264	172	38	18.2	20
1921	2,196	293,815	301,167	6,256	6,954	65.3	380,686	171,777	166	40	19.4	21
Pitts. & Lake Erie........1922	228	87,331	90,090	597	2,669	66.7	172,918	97,474	64	20	23.6	19
1921	225	70,171	79,810	392	2,288	64.2	159,505	93,159	62	23	26.8	20
Wabash 1922	2,418	564,580	596,425	4,875	16,562	72.2	824,103	340,888	281	59	17.4	41
1921	2,418	471,334	499,738	6,769	13,764	68.8	720,151	301,129	279	69	19.8	53
Ohio-Indiana-Allegheny Region:												
Baltimore & Ohio..........1922	5,235	1,687,025	1,944,047	153,234	44,069	67.0	2,607,250	1,283,087	967	353	26.7	175
1921	5,185	1,654,036	1,911,405	134,123	39,828	59.2	2,637,723	1,312,635	991	424	30.0	150
Central R. R of N. J.... 1922	689	227,506	250,417	32,153	4,822	66.9	266,756	119,712	230	29	11.3	58
1921	679	253,506	283,737	37,615	5,599	59.2	377,401	183,385	200	62	23.7	15
Chicago & Eastern Ill.....1922	945	228,409	238,285	2,624	5,636	62.2	313,251	140,317	123	38	23.8	40
1921	1,131	209,042	210,002	2,464	4,719	62.3	280,946	134,708	125	46	26.7	52
C., C. C. & St. L.. 1922	2,383	676,322	725,639	11,845	21,063	62.7	1,279,072	595,158	295	151	33.9	6
1921	2,382	582,206	607,679	2,245	15,272	56.3	971,405	399,845	307	140	31.4	39
Elgin, Joliet & Eastern....1922	459	93,321	104,366	5,970	2,865	67.0	202,699	107,451	87	20	18.4	21
1921	456	76,599	82,825	4,589	2,273	65.8	165,811	86,793	98	10	9.3	36
Long Island 1922	394	41,981	43,837	8,056	464	58.4	26,425	9,066	36	8	18.6	1
1921	395	40,669	46,869	7,780	447	57.8	25,942	9,701	35	7	16.5	4
Pennsylvania System 1922	10,902	4,025,405	4,282,811	269,764	108,085	66.2	6,498,957	2,987,661	2,644	765	22.4	726
1921	10,893	3,913,626	4,245,353	301,078	101,222	61.3	6,980,607	3,451,651	2,638	794	23.1	849
Phila. & Reading..........1922	1,119	463,687	500,995	50,130	10,746	65.7	663,639	328,025	395	73	15.7	232
1921	1,119	499,605	563,379	69,715	12,139	61.7	829,446	429,439	376	81	17.6	167
Pocahontas Region:												
Chesapeake & Ohio........1922	2,548	814,100	884,582	20,359	26,092	59.1	2,024,131	1,113,960	445	98	18.1	43
1921	2,545	830,054	895,530	25,115	24,215	55.9	1,971,182	1,072,786	441	114	20.5	35
Norfolk & Western........1922	2,228	1,022,663	1,271,000	54,841	29,107	57.1	2,376,028	1,289,796	620	92	13.0	134
1921	2,210	754,457	897,846	36,431	21,281	57.5	1,676,333	911,164	600	96	13.8	199
Southern Region:												
Atlantic Coast Line.......1922	4,922	673,495	679,429	10,090	16,013	63.9	806,057	296,544	324	86	20.9	21
1921	4,887	578,976	579,697	7,736	13,161	62.0	683,610	251,673	303	120	28.3	36
Central of Georgia.........1922	1,915	250,145	256,142	4,742	5,399	70.0	267,094	104,275	115	15	11.5	...
1921	1,908	248,631	249,711	3,337	4,919	66.1	264,794	111,635	109	24	18.0	...
I. C. (inc. Y. & M. V.)...1922	6,137	1,823,673	1,838,821	45,259	48,479	60.5	3,019,202	1,250,681	732	101	12.1	17
1921	6,151	1,541,461	1,546,630	36,607	39,205	63.1	2,453,295	1,057,489	681	102	13.1	8
Louisville & Nashville.....1922	5,021	1,819,805	2,052,159	78,332	33,428	61.9	2,161,212	1,027,331	602	79	11.6	...
1921	5,026	1,525,126	1,632,900	58,870	26,068	59.4	1,684,824	784,349	544	107	16.4	28
Seaboard Air Line........1922	3,537	445,951	452,365	8,126	9,810	64.7	511,087	197,869	207	67	24.6	2
1921	3,537	375,925	380,375	4,951	7,988	68.5	404,081	162,208	167	92	35.4	...
Southern Ry. 1922	6,942	1,340,100	1,365,679	29,472	29,511	66.1	1,531,302	610,665	897	146	14.0	23
1921	6,942	1,165,151	1,184,634	27,007	24,463	64.4	1,316,733	532,590	885	239	21.3	68
Northwestern Region:												
C. & N. W...............1922	8,419	1,343,493	1,373,840	18,024	30,007	65.5	1,597,585	656,571	811	232	22.3	95
1921	8,299	1,326,126	1,356,769	14,063	27,327	63.6	1,532,254	636,619	852	239	21.9	129
C., M. & St. P.[1]..........1922	11,027	1,456,685	1,497,847	64,668	38,267	66.5	2,045,125	891,747	831	232	21.9	121
1921	10,618	1,313,505	1,346,474	59,600	31,797	65.6	1,713,140	747,753	830	223	21.2	176
C., St. P., M. & O.......1922	1,726	314,535	339,995	14,128	6,009	70.4	318,348	139,631	162	51	24.0	32
1921	1,726	267,606	278,218	10,167	4,918	71.3	249,796	106,167	162	51	23.9	50
Great Northern 1922	8,263	837,947	873,805	42,666	25,690	63.1	1,557,853	754,787	589	141	19.3	122
1921	8,164	681,568	700,809	25,351	18,746	63.3	1,117,264	531,595	605	178	22.7	260
M., St. P. & S. Ste. M....1922	4,355	472,079	495,824	8,816	11,421	72.5	573,806	266,763	343	61	15.0	18
1921	4,225	371,767	488,591	4,516	8,471	72.1	410,678	183,991	349	51	12.8	53
Northern Pacific 1922	6,389	790,103	827,515	50,853	23,679	66.8	1,307,838	587,813	539	140	20.6	97
1921	6,408	627,943	656,742	43,716	17,881	70.6	968,384	454,391	532	153	22.3	141
Ore.-Wash. R. R. & Nav..1922	2,186	197,316	218,185	28,982	4,671	72.3	251,401	112,951	123	33	21.3	1
1921	2,198	162,270	173,895	17,577	3,986	74.4	217,321	104,746	117	41	26.0	12
Central Western Region:												
Atch., Top. & Santa Fe....1922	9,798	1,398,865	1,465,336	66,750	38,136	66.7	2,130,191	831,387	748	155	17.1	171
1921	9,771	1,326,884	1,397,571	61,331	34,107	64.7	1,946,138	728,909	793	171	17.7	183
Chicago & Alton...........1922	1,010	270,646	274,269	6,594	6,246	66.0	338,542	132,220	106	45	29.8	27
1921	1,010	329,899	335,246	4,588	6,754	60.0	420,821	184,575	137	42	23.3	17
Chic., Burl. & Quincy.....1922	9,326	1,329,829	1,389,234	69,420	34,945	65.6	1,902,532	819,983	762	213	21.9	123
1921	9,326	1,329,815	1,384,955	60,551	31,564	62.0	2,021,833	933,966	680	266	28.1	104
Chic., Rock Isl. & Pacific..1922	7,662	1,386,132	1,408,195	15,052	31,577	67.0	1,666,856	665,881	623	125	16.7	64
1921	7,661	1,407,627	1,429,429	11,108	30,629	65.6	1,684,022	678,724	585	160	21.5	37
Denv. & Rio Grande West.1922	2,593	213,014	258,804	48,660	4,915	70.4	280,608	138,105	237	70	22.8	35
1921	2,593	146,236	176,539	29,768	2,690	66.7	158,525	77,746	229	76	24.9	60
Oregon Short Line........1922	2,360	299,846	317,412	25,995	6,890	68.7	394,544	181,230	174	56	24.3	53
1921	2,359	244,805	250,743	15,198	5,279	63.6	315,202	140,803	183	43	19.0	60
Southern Pacific 1922	6,983	1,099,575	1,264,372	229,217	32,922	66.1	1,862,159	725,011	577	149	20.5	20
1921	6,975	1,168,887	1,353,693	273,472	32,764	66.6	1,881,931	749,258	592	184	23.7	24
Union Pacific 1922	3,707	682,178	694,577	31,552	23,463	75.0	1,175,515	483,398	407	114	21.9	183
1921	3,615	723,320	735,230	30,983	22,414	74.7	1,181,376	513,251	382	149	28.0	122
Southwestern Region:												
Gulf, Colo. & Santa Fe....1922	1,895	193,258	202,557	5,007	5,115	66.0	285,403	124,221	127	23	15.4	33
1921	1,895	254,136	258,653	3,915	6,164	64.4	360,503	163,621	89	57	38.9	...
Missouri, Kans. & Tex....1922	1,658	237,574	237,587	5,214	6,838	62.0	388,297	158,585	144	38	20.9	67
1921	1,710	225,840	226,065	7,329	5,806	60.6	335,341	136,468	147	34	19.0	60
Mo., Kans. & Tex. of Tex..1922	1,718	196,104	200,640	4,402	3,562	60.3	209,715	82,521	89	49	35.7	17
1921	1,740	210,462	214,974	2,947	3,908	57.5	241,218	98,165	99	36	26.8	23
Missouri Pacific 1922	7,305	956,490	965,334	30,407	24,743	70.7	1,326,603	601,524	423	155	26.8	7
1921	7,264	1,026,983	1,033,792	27,005	22,969	65.2	1,348,072	608,264	404	165	29.0	21
St. Louis San Francisco....1922	4,683	891,157	905,176	15,177	16,519	62.9	980,499	427,209	363	87	19.3	11
1921	4,683	688,897	696,724	11,177	11,697	64.2	677,270	290,400	328	147	30.9	59
Southern Pacific Lines (in.1922	3,710	542,392	548,932	3,473	10,928	65.6	641,205	284,061	200	95	32.2	21
Texas and Louisiana)[2].....1921	3,647	488,481	489,687	3,245	9,355	62.5	560,613	242,842	182	115	38.7	9
Texas & Pacific...........1922	1,953	218,412	218,431	1,293	5,588	66.9	299,544	117,533	135	67	33.2	31
1921	1,952	237,891	238,085	2,802	5,279	67.5	282,396	112,871	121	68	36.0	25

[1] Includes Chicago, Terre Haute & Southeastern from July 1, 1921, only.

Compared with June, 1921, for Roads with Annual Operating Revenues above $25,000,000.

Region, road and year	Average number of freight cars in line daily: Home	Foreign	Total	Per cent of serviceable	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car-miles per car-day	Net-ton miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotive and tender	Passenger service: Train-miles	Passenger-train car-miles
New England Region													
Boston & Albany	1922 3,147	5,...	...,...	7.8	574	1,026	365	17.1	318	26.9	7,083	194	305,325	2,103,145
	1921 3,375	4,224	7,749	6.8	908	966	377	21.1	393	29.3	7,778	203	307,691	2,081,869
Boston & Maine	1922 16,760	14,345	31,...	...	1,531	1,101	428	18.2	224	16.8	2,833	150	814,309	4,611,464
	1921 18,212	12,897	31,109	...	3,091	1,604	457	21.7	248	16.6	3,132	147	867,147	4,733,413
N. Y., N. H. & H.	1922 24,496	15,743	40,239	25.1	573	1,246	478	17.7	171	13.4	3,506	151	1,021,833	6,583,867
	1921 24,810	14,532	39,342	20.8	1,900	1,231	521	22.2	199	13.5	3,993	154	1,054,382	6,897,899
Great Lakes Region:														
Delaware & Hudson	1922 11,656	5,018	16,674	7.9	4,408	1,547	695	24.8	322	18.8	6,049	186	195,106	1,076,491
	1921 11,044	4,783	15,827	12.0	1,532	1,661	810	33.3	576	29.2	10,359	176	195,069	1,050,073
Del. Lack. & Western	1922 17,973	6,679	24,652	11.7	30	1,555	624	19.6	365	26.3	9,051	157	488,205	3,599,080
	1921 17,763	6,416	24,179	9.3	774	1,700	790	26.3	538	30.6	13,074	161	490,175	3,641,819
Erie Inc. Chic. & Erie	1922 38,437	16,410	54,847	18.3	6,796	1,962	726	23.3	366	24.2	8,698	139	662,403	4,926,366
	1921 40,520	14,775	55,295	14.9	13,079	1,904	861	26.6	414	23.5	10,143	132	668,169	5,066,239
Lehigh Valley	1922 32,096	8,136	40,232	12.0	8,191	1,654	725	24.0	292	17.9	8,916	158	338,635	2,725,018
	1921 33,225	8,786	41,011	18.3	3,957	1,758	825	29.1	349	19.1	10,859	158	358,156	2,723,155
Michigan Central	1922 16,491	13,095	29,586	17.8	.....	1,695	654	79.8	363	27.4	5,876	114	562,983	5,066,533
	1921 19,812	12,404	32,216	17.1	2,014	1,641	618	20.9	271	21.2	4,780	117	573,442	5,028,171
New York Central	1922 79,760	43,967	123,727	18.4	10,062	1,988	800	21.2	335	23.2	7,294	113	2,392,700	20,195,028
	1921 90,018	46,086	136,104	14.1	31,673	2,004	845	25.1	324	21.1	7,800	112	2,312,784	19,246,684
N. Y., Chic. & St. L.	1922 3,724	5,496	9,220	7.9	663	1,628	616	18.8	767	59.7	13,853	103	98,437	689,794
	1921 5,621	5,171	10,792	15.8	1,655	1,589	594	19.3	566	44.9	11,964	98	86,802	555,190
Pere Marquette	1922 10,747	10,301	21,048	12.4	383	1,351	591	23.0	287	18.2	2,770	117	282,866	1,530,654
	1921 11,436	8,608	20,044	16.4	1,000	1,296	535	24.7	286	17.7	2,608	130	314,071	1,563,114
Pitts. & Lake Erie	1922 20,139	10,504	30,643	32.2	5,932	1,980	1,116	36.5	106	4.4	14,256	85	113,997	586,771
	1921 17,736	7,268	25,004	25.1	1,931	2,273	1,328	40.7	124	4.7	13,824	96	107,096	572,645
Wabash	1922 12,076	10,316	22,392	11.2	712	1,460	604	20.6	507	34.1	4,700	136	535,556	2,949,685
	1921 13,166	9,642	22,808	10.4	1,159	1,528	639	21.9	440	29.2	4,152	148	516,314	2,752,472
Ohio-Indiana-Allegheny Region:														
Baltimore & Ohio	1922 68,600	34,487	103,087	14.8	7,858	1,545	761	29.1	415	21.3	8,170	171	1,458,257	9,193,805
	1921 72,087	27,739	99,826	11.3	6,892	1,595	794	33.0	438	22.5	8,436	175	1,356,941	8,622,487
Central R. R. of N. J.	1922 20,981	8,195	29,176	5.8	11,422	1,173	526	24.8	137	8.2	5,792	211	369,654	1,787,229
	1921 20,498	8,421	28,919	23.8	4,801	1,489	723	32.8	211	10.9	9,009	175	359,932	1,756,282
Chicago & Eastern Ill.	1922 15,912	4,946	20,858	14.6	7,317	1,371	614	24.9	224	14.5	4,949	150	210,304	1,361,476
	1921 16,615	3,288	19,903	10.2	4,861	1,344	644	28.5	226	12.7	3,970	165	217,614	1,412,660
C., C., C. & St. L.	1922 17,416	19,737	37,153	14.2	6,330	1,891	880	28.3	534	30.2	8,326	112	682,096	4,206,040
	1921 18,098	15,721	33,819	11.8	5,191	1,668	687	26.2	394	26.7	5,595	131	703,165	4,375,450
Elgin, Joliet & Eastern	1922 8,914	5,578	14,492	11.6	40	2,172	1,151	37.5	247	9.8	7,798	120	(1)	(1)
	1921 9,993	3,368	13,361	7.3	3,387	2,165	1,133	38.2	217	8.6	6,340	114	(1)	(1)
Long Island	1922 2,126	3,090	5,216	4.8	109	629	216	19.5	58	5.1	767	388	222,296	1,312,964
	1921 2,309	3,435	5,744	2.5	1,237	638	239	21.7	56	4.5	820	382	216,940	1,255,828
Pennsylvania System	1922 202,302	80,793	283,095	12.9	34,267	1,614	746	27.6	352	19.2	9,135	138	4,961,892	33,013,523
	1921 221,756	67,999	289,755	11.9	62,515	1,784	882	34.1	397	19.0	10,562	128	4,967,337	32,822,583
Phila. & Reading	1922 25,006	11,355	36,361	4.7	9,507	1,431	767	30.5	301	15.0	9,768	176	493,985	2,278,772
	1921 28,377	10,444	38,821	9.7	7,874	1,660	860	35.4	369	16.9	12,796	168	518,311	2,360,312
Pocahontas Region:														
Chesapeake & Ohio	1922 35,713	16,346	52,059	14.5	678	2,486	1,368	42.7	713	28.2	14,573	114	440,680	2,524,121
	1921 41,652	12,000	53,652	8.8	2,114	2,375	1,292	44.3	667	26.9	14,050	116	433,739	2,463,447
Norfolk & Western	1922 29,063	11,743	40,806	5.3	.....	2,323	1,261	44.3	1,054	41.7	19,299	152	387,372	2,394,028
	1921 36,366	5,800	42,166	8.6	2,603	2,222	1,208	42.9	720	29.2	13,743	152	394,937	2,471,169
Southern Region:														
Atlantic Coast Line	1922 18,189	10,087	28,276	15.3	.....	1,197	440	18.5	350	29.6	2,008	118	687,309	4,282,524
	1921 22,298	7,076	29,374	19.6	.....	1,181	435	19.1	286	24.1	1,716	123	716,762	4,368,952
Central of Georgia	1922 4,034	4,666	8,700	11.1	.....	1,068	417	19.3	400	29.5	1,815	150	324,497	1,655,482
	1921 5,344	4,237	9,581	16.0	.....	1,065	440	22.7	388	25.9	1,950	141	311,762	1,525,486
I. C. (Inc. Y. & M. V.)	1922 40,041	24,967	65,008	11.4	4,025	1,656	686	25.8	641	41.1	6,794	127	1,416,621	8,221,856
	1921 47,899	17,212	65,111	12.0	8,376	1,592	686	27.0	541	31.8	5,730	127	1,405,221	8,091,672
Louisville & Nashville	1922 32,188	22,592	54,780	11.2	70	1,188	565	30.7	625	32.9	6,820	161	987,160	5,707,163
	1921 39,620	15,120	54,740	25.9	108	1,105	514	30.1	478	26.7	5,202	159	935,800	5,462,924
Seaboard Air Line	1922 12,564	9,846	22,410	34.6	.....	1,146	444	20.2	294	22.5	1,865	157	532,930	3,009,837
	1921 11,794	6,987	18,781	26.2	.....	1,075	412	20.3	288	20.7	1,529	176	542,482	3,132,979
Southern Ry.	1922 34,664	23,159	57,823	18.5	.....	1,143	456	20.7	352	25.7	2,932	177	1,255,603	7,317,971
	1921 40,339	16,641	56,980	13.8	2,962	1,130	457	21.8	312	22.2	2,557	187	1,258,794	7,467,298
Northwestern Region:														
C. & N. W.	1922 46,015	24,273	70,288	8.4	5,100	1,189	489	21.9	311	21.7	2,600	143	1,591,382	10,211,084
	1921 49,579	22,381	71,960	8.9	6,500	1,155	480	23.3	295	19.9	2,557	172	1,664,756	10,414,545
C., M. & St. P.	1922 51,069	22,416	73,485	17.0	.....	1,404	612	23.3	405	26.1	2,696	137	1,450,427	9,183,440
	1921 44,970	17,708	62,678	17.4	3,400	1,304	569	23.5	398	25.8	2,347	155	1,472,182	9,234,209
C., St. P., M. & O.	1922 3,835	9,400	13,235	13.3	1,645	1,012	414	23.2	352	21.5	2,696	130	308,426	1,830,249
	1921 4,426	10,899	15,325	13.3	2,949	933	397	21.1	231	15.0	2,050	175	313,904	1,817,762
Great Northern	1922 45,090	5,993	51,083	14.2	.....	1,859	901	29.4	493	26.6	3,045	117	978,907	6,238,557
	1921 46,866	5,477	52,343	21.4	.....	1,639	789	28.4	339	18.9	2,171	146	974,870	6,230,668
M., St. P. & S. Ste. M.	1922 18,596	6,197	24,793	8.6	2,900	1,216	565	23.4	359	21.2	2,042	111	448,209	2,789,231
	1921 18,278	5,427	23,705	10.9	4,433	1,105	495	21.7	259	16.5	1,452	124	448,661	2,710,645
Northern Pacific	1922 34,092	7,954	42,046	11.4	159	1,655	744	24.8	466	28.1	3,067	122	885,396	6,378,567
	1921 39,016	6,670	45,686	13.8	9,429	1,542	724	25.4	332	18.5	2,364	119	864,917	6,011,058
Ore.-Wash. R. R. & Nav.	1922 7,232	2,043	9,275	3.0	2,831	1,274	572	24.2	406	23.2	1,723	198	256,198	1,865,299
	1921 5,506	2,696	8,202	3.0	2,516	1,339	646	26.3	426	21.8	1,589	199	250,969	1,796,117
Central Western Region:														
Atch., Top. & Santa Fe	1922 50,377	12,589	62,966	8.4	10,691	1,523	594	21.8	440	30.3	2,828	134	1,732,194	13,905,498
	1921 48,301	13,343	61,644	11.2	8,506	1,467	549	21.4	304	28.5	2,487	141	1,566,685	11,634,102
Chicago & Alton	1922 9,971	4,776	14,747	3.7	1,200	1,251	489	21.2	299	21.4	4,363	169	277,118	1,621,391
	1921 10,189	4,371	14,560	4.4	1,186	1,276	559	27.3	423	25.8	6,090	174	286,145	1,644,524
Chic., Burl. & Quincy	1922 48,152	20,519	68,671	9.9	8,799	1,431	617	23.5	398	25.6	2,931	142	1,504,899	10,367,872
	1921 49,933	17,360	67,293	15.3	3,608	1,520	702	27.8	463	29.8	3,338	152	1,498,238	10,067,042
Chic., Rock Isl. & Pacific	1922 33,010	14,168	47,178	10.8	4,592	1,203	480	21.1	470	33.3	2,897	142	1,299,408	7,941,718
	1921 34,120	16,725	50,845	11.8	7,913	1,196	482	22.2	445	30.6	2,953	150	1,338,108	7,932,082
Denv. & Rio Gr. de West.	1922 13,785	2,760	16,545	10.0	2,789	1,317	648	28.1	278	14.1	1,775	184	278,746	2,069,421
	1921 13,575	2,388	15,963	7.6	1,542	1,084	532	28.9	162	8.4	999	214	160,647	1,034,446
Oregon Short Line	1922 7,048	2,669	9,717	8.3	154	1,316	604	26.3	622	34.4	2,560	131	292,790	2,248,897
	1921 7,314	2,356	9,670	6.5	1,588	1,288	575	26.7	485	28.6	1,990	163	302,530	2,278,578
Southern Pacific	1922 23,588	22,334	45,922	5.5	5,248	1,694	659	22.0	526	36.1	3,461	140	1,471,410	12,727,102
	1921 23,448	22,055	45,503	9.4	3,674	1,610	641	22.9	549	36.0	3,581	143	1,389,878	11,144,238
Union Pacific	1922 17,481	6,429	23,909	15.3	1,540	1,723	709	20.6	674	43.6	4,346	130	917,064	8,134,019
	1921 20,494	5,875	26,369	22.9	5,691	1,633	710	22.9	649	37.9	4,733	143	935,684	8,454,827
Southwestern Region:														
Gulf, Colo. & Santa Fe	1922 6,921	4,011	10,932	4.9	547	1,477	643	24.3	379	23.6	2,186	127	192,298	1,118,625
	1921 8,264	2,653	10,917	4.9	432	1,419	644	26.5	500	29.2	2,879	135	189,985	1,114,378
Missouri, Kans. & Tex.	1922 8,793	5,816	14,609	7.7	4,633	1,634	668	23.2	362	25.2	3,188	127	260,349	1,837,796
	1921 8,074	4,574	12,648	7.5	2,357	1,485	604	23.5	360	25.2	2,661	133	263,345	1,888,221
Mo., Kans. & Tex. of Tex.	1922 275	9,835	10,110	7.3	1,589	1,069	421	23.2	272	19.5	1,585	145	266,007	1,619,075
	1921 373	12,627	13,000	4.5	1,524	1,145	466	25.1	253	17.4	1,881	152	269,913	1,680,934
Missouri Pacific	1922 29,204	18,727	47,931	10.3	2,000	1,387	631	24.4	417	24.3	2,754	139	911,067	5,374,636
	1921 32,853	18,007	50,860	10.0	5,289	1,313	592	26.5	399	23.1	2,791	144	894,450	5,211,703
St Louis-San Francisco	1922 20,451	12,324	32,775	7.4	.....	1,100	479	25.8	435	26.7	3,042	163	736,144	4,267,652
	1921 21,340	8,793	30,133	7.4	.....	983	422	24.8	321	20.1	2,067	171	758,795	4,318,101
Southern Pacific Lines (in Texas and Louisiana)	1922 7,624	11,717	19,341	8.3	1,393	1,182	525	26.1	491	28.7	2,560	121	534,962	3,546,387
	1921 9,322	13,069	22,391	19.7	3,264	1,148	497	26.0	362	23.3	2,219	128	511,301	3,267,132
Texas & Pacific	1922 6,686	4,966	10,652	19.3	.....	1,371	538	21.0	368	26.1	2,006	132	285,742	1,855,106
	1921 6,554	4,523	11,077	21.9	.....	1,187	474	21.4	340	23.6	1,927	143	292,392	1,921,363

[1]No passenger train service.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Foreign Railway News

South African Railways to Extend Lines

After two years' postponement, owing to the depressed state of trade and the consequent financial stringency, a program of new railway construction has been put before the Union of South Africa Parliament by the Minister of Railways, according to the Times (London) Trade Supplement.

This program includes 851 miles of track, estimated to cost over £4,000,000, and if account is taken of the line from Windhoek to Gobabis in the South-Western Protectorate, the construction of which was undertaken for the relief of unemployment, the total length of line being, or to be built, exceeds 1,000 miles. As electrification work, to cost over £4,000,000, is in hand on the Natal main line, as well as sundry minor deviations and betterments throughout the system, the chief engineer and his staff are likely to have plenty to do for several years to come.

Most of the new railways will be light branch lines serving agricultural districts that at present have no railway communication. In some cases they will be prolongations of existing spurs, but in others they will be new branches off the main system. They will all be on the normal gage of 3 ft. 6 in., except three, which are to be of 2 ft. gage.

Among them the Franklin-Kokstad, and Franklin-Matatiele extensions—25½ and 47½ miles in length respectively—are of interest, as forming links in the long projected direct connection between the Cape and Natal provinces. For seven years Franklin has been the terminus of a line 140 miles long, which leaves the Natal main line at Mason's Mill, about a mile from Pietermaritzburg. Although Kokstad is a town of 3,500 people the railhead has remained 22 miles away by road, and the fact that this extension is now to be put in hand, in addition to one of about double the length, to link up the neighboring East Griqualand village of Matatiele, suggests that future policy regarding the routes to be followed by the Cape-Natal connection has now been settled and that the two systems will be linked together within the next decade.

There are two spurs of the Cape Eastern main line running towards East Griqualand. That nearer to the coast extends from Amabele Junction, 51 miles from East London, to Umtata, and is 175 miles long. It traverses very difficult country, looping over itself and twisting about so much that the bee-line distance is exceeded by fully 75 per cent. It seems evident that the Kokstad fork of the line coming from Natal is destined to be linked up with the Umtata dead end. The latest survey of the route from Kokstad to Umtata gives a distance of 151½miles. If this gap is bridged the total distance from Durban to East London, via Kokstad, will be about 610 miles, compared with 916 miles by the present route via Bloemfontein and Ladysmith. Between Port Elizabeth and Durban the saving would be only 17 miles, and between Cape Town and Durban, the present route is 150 miles shorter than that via Umtata and Kokstad.

The termini of the new lines from Touws River to Ladysmith (89 miles) and Oudtshoorn to Calitzdorp (34 miles) will be only about 30 miles apart, and their general alinement is such that if they are eventually extended to meet one another they may form an important cross connection between the Cape Western and Midland main lines and one which will shorten the distance between Cape Town and Port Elizabeth by perhaps 30 miles, as compared with the route via Worcester and Mossel Bay. Touws River is 160 miles from Cape Town on the Western main line and is the point to which it has been suggested that that line should be electrified.

The branch from Fort Beaufort to Bredasdorp will assist to open up the somewhat isolated area towards Cape Agulhas in the extreme south of the Continent. Bredasdorp will, indeed, be the most southerly railway station in Africa, though about 20 miles north of Cape Agulhas itself.

The railway from George to Knysna (42 miles) will place Knysna—which shares with Port St Johns at the mouth of the Umzimvubu river the distinction of being one of the two ports of any consequence that are not linked up with the Union railway system—in connection with the Mossel Bay-Port Elizabeth route.

The narrow-gage line from Upington (on the Orange river, where the railway that connects the Union with the South-West Protectorate crosses) to Kakamas will follow the south bank of the Orange and give railway facilities to an irrigation area that has been attracting settlers in recent years. A few miles below Kakamas are the great Aughrabies Falls, where the river drops 400 feet. Though, like the Victoria Falls, they are too far from an industrial area to offer much immediate inducement as regards power development, it is possible that they will eventually be utilized for railway electrification and industrial purposes.

The Ermelo-Lothair line, which will be about 27 miles long, is at first glance purely an agricultural feeder. In view of the fact that it heads eastward, it may, however, possess some significance in connection with the manœuvring that is in progress between the Union and the Mozambique administrations regarding a renewal of the convention regulating traffic, customs matters, and labor recruiting. It has been stated that if the convention is not renewed the Union will develop Kosi Bay, on the northern Zululand coast, as a rival port to Lourenço Marques, and to do so the first step would be to provide a railway to the bay. It has been assumed that such a railway would connect with the existing system near Piet Retief, and the Ermelo-Lothair line does not fit in very well with either the Kosi Bay plan or the older scheme of building a railway across Swaziland from Breyten, to link up with a short section built several years before the war by the Portuguese on the strength of an assurance from Lord Milner—then Governor of the Transvaal—that the Transvaal railways would be extended to meet it. There has been much controversy about the failure to carry out that promise, but the fact appears to be that, in so far as reduced mileage was an inducement, it has ceased to have much weight, the Apex-Witbank cut-off having so shortened the distance from Johannesburg to Lourenço Marques that the Swaziland line would be practically as long as the existing route.

Relief Administration Tells of Railway Improvement in Russia

Russian railroad transportation is coming back, according to the American Relief Administration. Trains are being speeded up, time tables revised and freight is being moved at a rate which a few months ago seemed impossible.

The Relief Administration, whose huge shipments of corn and other foodstuffs into the famine districts taxed the capacity of the roads for months, has all but completed its grain shipments and from now on will confine its traffic chiefly to child-feeding commodities and medical supplies.

From 50 cars sent out in August, 1921, by the Administration, the number had risen in March to 8,585 and although the opening up of navigation on the Volga and its tributaries decreased the rail shipments, permitting to date the movement of some 46,000 metric tons of grain by water, rail shipments have continued heavy, amounting to 5,710 cars in April and 7,846 cars in May.

Each month from August, 1921, up to and including March, 1922, showed an increase in the number of cars dispatched and each month during that period, with the exception of February, showed an increase in the number of cars arriving at their destination. But the number of cars arriving did not keep pace with the number dispatched. In other words, at the close of each month there was an increased number of cars en route.

Not until April did the tide turn. In that month 5,710 cars were dispatched into the famine districts from the ports and from the warehouse centers and 7,197 arrived at their destination. At the end of March there were 8,684 cars en route, or 99 more than had been dispatched in any single month since the operation began late in August, 1921. But the end of April saw the number of cars en route reduced from 8,686 to 7,197, and although 7,846 cars were dispatched in May the end of May saw the number en route reduced to 6,783.

The chief of the transportation department of the Administration, Philip Matthews, says that present indications point to a reduction of the number of food cars en route as of the end of June to 3,000.

He also predicts that figures will show that by the first of July not more than 10,000 tons of the grain shipped from the United States for the American Relief Administration remained unevacuated from the ports. Shipments will, of course, continue after that date, of the remaining grain and also of the child-feeding commodities, such as white flour, cocoa, vegetable fats, rice and beans.

Equipment and Supplies

Locomotives

THE UNION PACIFIC has ordered 15, 2-10-2 type locomotives from the Baldwin Locomotive Works.

THE WABASH, CHESTER & WESTERN has ordered 2 Consolidation type locomotives from the Baldwin Locomotive Works.

THE TENNESSEE, ALABAMA & GEORGIA has ordered 1 Consolidation type locomotive from the Baldwin Locomotive Works.

MCKELVEY BROTHERS, Hollidaysburg, Pa., has ordered 1, 50-ton superheated Shay locomotive from the Lima Locomotive Works.

THE NEW YORK CENTRAL is having repairs made to 50 locomotives of various types, at the shops of the Rome Locomotive Works.

THE MISSOURI, KANSAS & TEXAS has placed an order with the Lima Locomotive Works, Inc., for 40 Mikado and 5 Pacific type locomotives.

THE LOUISVILLE & NASHVILLE has ordered 30 Mikado type locomotives from the American Locomotive Company. These locomotives will have 26 by 30 in. cylinders and a total weight in working order of 295,000 lbs.

Freight Cars

THE CENTRAL OF NEW JERSEY is having 200 steel hopper cars repaired at the shops of the Pressed Steel Car Company, and 300 at the shops of the Standard Steel Car Company.

THE PHILADELPHIA & READING, reported in the *Railway Age* of July 10 as inquiring for 100 refrigerator cars, has ordered this equipment from the American Car & Foundry Company.

THE POLISH GOVERNMENT has ordered 7,000 freight cars from the War Department of the United States Government. These cars were originally built for overseas service during the war.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE reported in the *Railway Age* of July 22 as inquiring for 300 composite gondola cars of 50 tons' capacity, has ordered 300 cars from the Pullman Company.

Passenger Cars

THE ATCHISON, TOPEKA & SANTA FE, reported in the *Railway Age* of July 1 as inquiring for 8 buffet library cars, has ordered this equipment from the Pullman Company.

Iron and Steel

THE NEW YORK CENTRAL is buying 200 tons of fabricated steel for improvements at Elyria, Ohio.

Signaling

THE SOUTH SIDE ELEVATED RAILROAD, Chicago, has ordered from the Union Switch & Signal Company an electro-pneumatic interlocking for Jackson Park; Model 14 machine with eight working levers. All principal routes will be protected by electro-pneumatic train stops.

THE NORTHWESTERN ELEVATED of Chicago has ordered from the Union Switch & Signal Company an electro-pneumatic interlocking for Howard Street Terminal; Model 14 machine with 23 working levers for 43 signals and eight automatic stops, and 19 levers for switches. The signals are the low type standard on the Northwestern Elevated. Alternating current track circuits will be used for control and indication instruments.

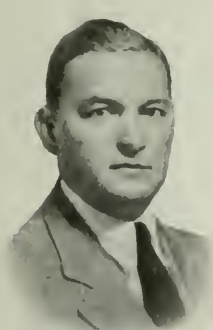
Supply Trade News

The office of the **Hardwood Manufacturers' Institute** was removed on August 16, from Memphis, Tenn., to 1020 South Wabash avenue, Chicago.

The Florandin Equipment Company has been organized by C. H. Florandin, with offices at 110 West Fortieth street, New York, to act as representatives of the Conveyors Corporation of America, Chicago. Mr. Florandin for several years was eastern manager of the Conveyors Corporation before forming his own organization.

G. B. Pierce, who has been connected with the **Westinghouse Air Brake Company** for the last 12 years as a mechanical expert, at the St. Paul office, has been promoted to air brake engineer and transferred to the Orient where he will act in that capacity both for the Westinghouse Air Brake Company and the Westinghouse Traction Brake Company, in a territory covering Japan, China, Manchuria and Korea. Early in September Mr. Pierce will sail for Japan to associate himself with W. G. Kaylor, manager of the Westinghouse Air Brake interests in the Orient, with whom he expects to make his headquarters in Tokyo. Mr. Pierce was formerly in railroad work. Having served as a fireman, he became an engineman on the Montana division of the Northern Pacific in 1901. He later served as acting road foreman of engines on the same division and for three years was a member of the local examining board on transportation rules at Livingston. In 1910 he left this road to join the Westinghouse Air Brake Company.

H. A. Matthews, formerly sales manager of the railway division of the U. S. Light & Heat Corporation, Niagara Falls, N. Y., has been elected a vice-president. Mr. Matthews entered the railway supply business in 1912 with the U. S. Light & Heat Corporation at Chicago. Prior to that time he had been employed by the Lake Shore & Michigan Southern as clerk to the general superintendent at Cleveland, and later entered the services of the Pullman Company. For seven years he was secretary to the president of the Pullman Company, which position he held up to the time he joined the U. S. L. forces at Chicago. In 1917 he was transferred to the factory at Niagara Falls and placed in charge of the railway sales department.



H. A. Matthews

The New York Air Brake Company's plan for refinancing contemplates an authorization of 100,000 shares of Class A preference stock without par value and 300,000 shares of common stock without par value. Of the latter 200,000 shares are to be exchanged for the now outstanding $10,000,000 common stock of $100 par value at the rate of two shares for one, the remaining 100,000 shares being reserved for Class A preference stock. A banking syndicate is being formed to underwrite the new Class A preference stock which will be offered to stockholders at $50 a share. Class A stock will be entitled to receive cumulative quarterly dividends at the rate of $4 a share per annum. After the common stock has received $4, the two classes share equally in any additional dividends. Preferred stock is redeemable after January 1, 1926, in whole or in part, at $60. It is convertible at $50 a

share into common stock at $50 a share. Edward B. Smith & Co. and Dominick & Dominick are the bankers handling the financing. The proceeds of the financing plan estimated to raise about $5,000,000 will be used to liquidate all loans from banks and for additional working capital. The company has done no new financing since 1904 at which time the amount was increased to $10,000,000 of common. The company has outstanding $3,000,000 of first mortgage bonds due in May, 1928. The company's sales for the first six months of 1922 are reported by the bankers to have been $2,620,000 as compared with $2,400,000 for the entire year 1921. Unfilled orders on hand are the largest in the history of the company.

Obituary

Edward S. Shepherd, president of Crerar Adams & Co., Chicago, died at his home in that city on August 21. Mr. Shepherd was born in Orleans, N. Y., on May 28, 1845, and entered railway service in the purchasing department of the Illinois Central, with headquarters at Chicago, in 1865. He served this company four years and in 1869 entered the service of Crerar Adams & Co. as a salesman. He served in that capacity until 1877. During that year he was made a junior partner in the company and in 1890 was elected president which position he has occupied for the past twenty-three years.

E. S. Shepherd

Coleman Sellers, Jr., president of William Sellers & Co., Inc., Philadelphia, Pa., who died on August 15, as was mentioned in the *Railway Age* of August 19, was in his seventieth year and had been ill for several months. His connection with the Sellers house, then a partnership, began in 1873 immediately after his graduation from the University of Pennsylvania. After serving a practical course in the shops for several years, he took a position in the drafting room of which he soon became the head. He was appointed assistant manager in 1887, becoming at the same time a director of the company. He was elected engineer in 1902 and president in May, 1905, which last office he held continuously until his death. He also was a man of liberal ideas, and while his principal inclinations and activities were in mechanical and engineering lines, he took keen interest in many other directions, scientific, literary, educational and the arts, and was active in the civic life of Philadelphia. He was long active in the affairs of the Franklin Institute, of which he was vice-president at the time of his death. He was a member of the Board of Commissioners of Navigation of Pennsylvania, to which he was appointed in 1907. He was active in the affairs of the American Society of Mechanical Engineers, the American Society of Naval Architects and Marine Engineers and the Engineers Club of Philadelphia of which he was one of the founders. He was president of the Chamber of Commerce from 1909 to 1913. He served as chairman of the local draft board during the early stages of the war.

Coleman Sellers, Jr.

Frank Burr Smith of Milford, Conn., works manager of the Bullard Machine Tool Company, Bridgeport, died on August 16 at Grace hospital, New Haven. Mr. Smith was born at Fairfield, Conn., on November 22, 1872, and obtained his early education in the public and high schools of Bridgeport. He entered the employ of the Bullard Machine Tool Company at its old Broad street plant in 1890 as a machinist apprentice and upon completion of his apprenticeship he was connected with its engineering department. He subsequently served in different machine shops and at one time was connected with the Atlantic Iron Works of Boston, and later was with the Laird Gold Production Company as mechanical engineer. In 1903 he went to the DeLaVergne Machine Company, as expert erection and installation engineer. He returned in 1911 to the Bullard Machine Tool Company, and represented this company in a sales capacity, making his headquarters successively at Chicago, Cleveland and Philadelphia. The last year of his sales work was spent in England. He became manager of the employment and industrial relations department at the Broad street plant, and when that plant was disbanded in 1920, and all manufacturing was transferred to the Black Rock plant, he was made works manager and continued in that capacity until his death.

Trade Publications

DRINKING WATER SYSTEMS.—A folder entitled "A Neglected Source of Economy," has recently been issued by the Armstrong Cork & Insulation Company, Pittsburgh, Pa., which deals with the savings that can be effected in shops by the use of refrigerated drinking water systems.

DIRECT DRIVE AXLE GENERATOR.—Specifications and description of a direct drive axle generator and system for the electric lighting of railway cars are contained in a 16-page bulletin published by the Products Distributing Corporation, 360 Madison avenue, New York, N. Y. The equipment described in this bulletin will be offered to the railroads by the above company and will be built by the Wagner Electric Company, St. Louis, under the E. M. Fitz patents. The booklet is profusely illustrated with photographs and line drawings and contains brief specifications and descriptions of the equipment. A blue print insert is included on which curves are shown giving the characteristics of the generator.

ELECTRIC TRACTION.—Progress in Steam Railway Electrification is the title of bulletin No. 44016 issued by the General Electric Company, Schenectady, N. Y. The bulletin contains 20 pages and is illustrated with photographs. It reviews some of the more important electrifications throughout the world for which the General Electric Company has supplied the apparatus, either in its entirety or in the more important parts. This includes the Baltimore and Ohio, the Paris-Orleans, the New York Central, the Great Northern, the Michigan Central, the Victorian Railways in Australia, the Canadian Northern, the Butte, Anaconda & Pacific, the Chicago, Milwaukee & St. Paul, the Bethlehem Chile Iron Mines in Chile, the Spanish Northern, the Imperial Government Railways of Japan, the South Manchurian Railway and the Central of Paulista in Brazil.

TRAIN LIGHTING EQUIPMENT.—The Safety Car Heating & Lighting Co. has recently issued two new catalogues and an elaborate folder which will be of interest to anyone connected with train lighting work and of especial interest to the users of safety equipment. One of the catalogues bears the title, "Operation of Under-Frame Car Lighting Equipment" and the other, "Pintsch Gas Car Lighting Fixtures." Both catalogues are profusely illustrated and contain 60 and 52 pages respectively. A novel and useful feature has been introduced in the Under-Frame catalogue, which consists of cross-indexed tables which show at a glance which of the various generator parts can be used interchangeably on two or more of the ten types of generators manufactured by the Safety Company.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company, which was reported in the *Railway Age* of April 22 as authorizing the construction of a new division office building at Newton, Kan., has awarded the contract for this structure to Swanson Bros., Topeka, Kan. The building will be 70 ft. by 160 ft. and will be three stories high, costing approximately $200,000.

CANADIAN PACIFIC.—This company has prepared plans for new stations at Napinka, Man., and Chaton, Alta. A new detention shed will be erected at Coutts, Alta., and the roundhouse at Medicine Head, Alta., and Calgary will be enlarged. This company is also planning to install two 90-ft turn tables at Brandon, Man., and North Bend, B. C., and a coaling plant will be constructed at Secretan, Sask. A transfer barge will be constructed on Kootenay Lake, B. C., and the temporary wharves at Nelson, B. C. will be made permanent.

CHICAGO, BURLINGTON & QUINCY.—This company will accept bids until September 1 for the construction of a one-story brick freight house, 20 ft. by 60 ft. at Zeigler Junction, Ill.

ILLINOIS CENTRAL.—This company has awarded a contract to the Ellington-Miller Co., Chicago, for the altering of its freight house at Indianapolis, Ind., at an estimated cost of approximately $40,000. This company has also awarded the contract to the Ellington-Miller Co. for alterations to its fruit sheds at Mound, Ill.

ILLINOIS CENTRAL.—This company, which was reported in the *Railway Age* of August 5 as calling for bids for the construction of 12 water treating plants, has awarded contracts for those at Galena, Ill., Amboy, Ill.; Fort Dodge, Ia., and Council Bluffs to Joseph E. Nelson & Sons, Chicago, and those at Wall Lake, Ia.; Logan, Rockwell City and Denison to the Railroad Water and Coal Handling Company, Chicago.

IRON COUNTY.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from a connection with the Los Angeles & Salt Lake at Lund, Utah, for a distance of 22.6 miles southeasterly through Iron County, Utah.

LOS ANGELES & SALT LAKE.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a branch from Lund to Cedar City, Utah, 32 miles.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—This company closed bids August 14 for the construction of a passenger station at Menasha, Wis., and a 21-stall roundhouse at Gladstone, Mich.

THE MISSOURI, KANSAS & TEXAS.—Contracts have been awarded to the Graver Corporation, Chicago, for one 15,000-gallon per hour Graver Type "K" ground operated water softener with storage capacity at top of softener capable of holding 100,000 gallons of treated water for installation at Glen Park Yards, Kansas City, Kan.; one 10,000-gallon per hour Graver Type "K" ground operated water softener for installation at Nelogony, Okla.; one 5,000 gallon per hour Graver Type "K" ground operated water softener for installation at Eufaula, Okla., and for four standpipes 14 ft. diameter by 32 ft. high and one 18 ft. diameter by 32 ft. high for installation in Texas.

SAN FRANCISCO-SACRAMENTO.—This company, in conjunction with the California State Department of Public Works, will construct an overhead crossing over its tracks near Denverton, Solano county, Cal., at an estimated cost of $26,000.

THE UNION PACIFIC.—Contracts have been awarded to the Graver Corporation of Chicago, for one 30,000-gallon per hour Graver Type "K" ground operated water softener for Granger, Wyo. This treating plant will be equipped with two standard Graver pressure filters 8 ft. diameter to 12 ft. long. The contract also covers the reconstruction of five present treating plants to the improved Graver Type "K" design.

Railway Financial News

BALTIMORE & OHIO.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligations and liability in respect of $6,750,000 of equipment trust certificates to be issued by the Girard Trust Company of Philadelphia to be sold at not less than 96.4.

BIRMINGHAM & NORTHWESTERN.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $750,000 of 4½ per cent refunding gold bonds for the purpose of refunding maturing bonds and providing security for a loan from the Interstate Commerce Commission.

Acquisition.—See Gulf, Mobile & Northern.

CHESAPEAKE & OHIO.—*Preferred Stock Issue.*—A special meeting of stockholders will be held at Richmond, Va., on September 26 to approve a plan to offer to common stockholders the right to subscribe at par to 20 per cent of their holdings for approximately $12,558,500 of new 6½ per cent cumulative preferred stock, series A. The proceeds will be used to finance additions and betterments. The offering has been underwritten by Kuhn, Loeb & Co., and the National City Company. It is subject to the approval of the Interstate Commerce Commission. This issue is the first of a total of $30,000,000 over a term of years.

A circular to the stockholders says in part:

In the annual report of your company for 1921 reference was made to the comprehensive budget prepared by your officers of additions, betterments and improvements which should be made during the next four years in order to adequately and economically accommodate the present day maximum volume of traffic, provide for anticipated growth and render its facilities more nearly equal to those of your principal competitors. Among the principal items included in this budget are the extension of your terminal facilities at Hampton Roads, the enlargement of your shop and round house facilities, and such additions to your main line and passing tracks, including the reduction of grades, as will render practicable the economical and expeditious handling over your entire main line of the maximum train load which can be moved with modern power of the type in use upon your lines. The present estimate of the probable cost of this work, including incidental operating charges of about $1,150,000, is about $16,500,000, expenditure of which will be spread over the next four years. It is estimated that the making of these expenditures will realize an annual saving in operating expenses, based upon 1920 performances, of nearly $4,000,000. Your directors believe that the present is a favorable time for arranging the necessary financing of this work, and in connection therewith for making suitable provision for the future capital requirements of your company.

GULF, MOBILE & NORTHERN.—*Asks Authority to Purchase Road.*—This company has applied to the Interstate Commerce Commission for an order approving the acquisition by purchase of the property of the Birmingham & Northwestern, and also for authority to issue $300,000 of capital stock for the purpose.

MEMPHIS, DALLAS & GULF.—*Sold.*—This road was sold in sections on August 15 under court order to Sears Lehmann, of St. Louis, Mo., who represented different interests. The road formerly operated between Hot Springs, Ark., and Dalark, 125 miles, until recently when the Interstate Commerce Commission authorized the receiver to abandon 51 miles.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*Asks Authority to Sell Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell $747,000 of first consolidated mortgage 5 per cent gold coupon bonds dated April 2, 1888, and due April 1, 1928, to provide for the payment at maturity of bonds of its Jasper and Centreville branches. The bonds are to be sold on a 6 per cent basis.

NEVADA-CALIFORNIA-OREGON.—*Authorized to Abandon Line.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of 16 miles of this company's railroad between Hackstaff and Wendel, Calif. The company had applied for a certificate to abandon its entire line, but the commission instituted an investigation on its own motion of the divisions received of joint rates and last week issued an order increasing the division on traffic interchanged with the Southern Pacific at Wendel. In that proceeding it reached the conclusion that the road as a whole cannot be abandoned, but that portion of the southerly 16 miles between Wendel and Hackstaff where traffic was interchanged with the Western Pacific may be abandoned.

PENNSYLVANIA.—*Asks Authority to Lease Subsidiaries.*—This company has applied to the Interstate Commerce Commission for authority to lease for 999 years the properties of the Toledo, Columbus & Ohio River; Cleveland, Akron & Cincinnati; Cincinnati, Lebanon & Northern; Pittsburgh, Ohio Valley & Cincinnati; Englewood Connecting; South Chicago & Southern; Indianapolis & Frankfort; Louisville Bridge & Terminal Co.; Wheeling Terminal Company and Ohio Connecting.

Panhandle Lease Opposed.—The Continental Insurance Company, of New York, has filed a bill in equity in the Federal Court at Philadelphia, seeking to restrain the 999-year lease of the Pittsburgh, Cincinnati, Chicago & St. Louis to the Pennsylvania. The complainant contends that under the proposed lease the Pennsylvania is to pay a rental to the Panhandle sufficient to cover the operating and fixed charges, and the common stockholders are to receive dividends of 4 per cent for five years and 5 per cent thereafter. It is asserted that earnings last year were sufficient to pay 6 per cent.

Dividends Declared

Fonda, Johnstown & Gloversville.—Preferred, 1½ per cent, quarterly, payable September 15 to holders of record September 5.

New Orleans, Texas & Mexico.—1½ per cent, quarterly, payable September 1 to holders of record August 25.

Erie & Pittsburgh—1¾ per cent., payable September 9 to holders of record August 31

Trend of Railway Stock and Bond Prices

	Aug. 22	Last Week	Last Year
Average price of 20 representative railway stocks	73.64	70.61	54.54
Average price of 20 representative railway bonds	89.67	88.65	75.34

FREE TRANSPORTATION BY EXPRESS COMPANIES of merchandise for their employees is unlawful; and this point, decided by the Commission in 1918, and by the Supreme Court in 1909 is reaffirmed in a decision handed down on July 10, last. The case of 1918 was reopened at the request of the American Railway Express Company, which asked to have the benefit of an amendment to the law, made in 1910, under which the prohibition of free passes was modified by a provision that it should not prohibit the privilege of "passes or franks . . ." This was the first use in the law of the term "frank." The proviso was introduced, however, for the benefit of telegraph and telephone companies, and the Commission holds that it does not apply to franks issued for the transportation of merchandise. Although the word is one commonly used for merchandise passes, Congress in discussing the bill which became law in 1910, rejected a clause allowing express companies to carry packages free for employees.

Photo by Keystone

After an Accident Near Laurel, Md.

Railway Officers

Executive

C. W. Snider has been elected secretary of the Wichita Falls & Southern, succeeding **L. F. Linney**. **O. B. Womach**, auditor, has also been appointed assistant secretary.

Financial, Legal and Accounting

A. E. Delf, assistant comptroller of the Duluth, South Shore & Atlantic, has been promoted to comptroller with headquarters at Marquette, Mich.

W. C. Chisholm, general solicitor of the Grand Trunk, has been placed at the head of the legal department, succeeding W. H. Biggar, vice-president and general counsel, deceased.

H. H. Larimore, assistant general attorney of the Missouri Pacific with headquarters at St. Louis, Mo., has been appointed general attorney and interstate commerce counsel with the same headquarters.

C. G. Hurlbut, traveling agent of the Chicago, Milwaukee & St. Paul, with headquarters at Minneapolis, Minn., has been appointed assistant freight claim agent, with headquarters at Seattle, Wash., succeeding **H. Schroeder**, resigned.

W. F. West, an attorney with the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has been appointed general solicitor with the same headquarters. **E. M. Smith**, has been appointed general land and tax attorney, with headquarters at Cleveland. **C. C. Collister** has been appointed general attorney.

NEW GRAND TRUNK EXECUTIVE

At a meeting of the board of the Grand Trunk Railway System held in Montreal on August 17, W. D. Robb was appointed ranking vice-president of the company with the title of vice-president and general manager. Mr. Robb will take up the duties of Howard G. Kelley, whose resignation as president of the railway is announced.

H. G. Kelley

The official statement issued at the close of the meeting of the board was as follows:

"The chairman, Sir Joseph Flavelle, laid before the meeting a copy of an order-in-council approved on the 14th of August, 1922, accepting the resignation of Mr. Howard G. Kelley as a director of the company, and appointing Graham A. Bell, deputy minister of railways, in his place. Inasmuch as Mr. Kelley's resignation from the board of directors has, under the railway act, the effect of rendering vacant the position of president of the company, it was thereupon resolved that W. D. Robb shall be the ranking vice-president of the company with the title of vice-president and general manager, and shall exercise the authority and perform the duties hitherto exercised and performed by the president."

Howard G. Kelley has been connected with the Grand Trunk System since October 1, 1911, and president since September 1, 1917. He was born on January 12, 1858, at Philadelphia, Pa. He graduated from the Polytechnic College of Pennsylvania and began railroad work in 1881 as assistant engineer on location and construction of the Northern Pacific. In 1884 he left

that road and engaged for a time in [illegible]. Three years later he joined the St. Louis Southwestern as resident engineer and superintendent of bridges and buildings. Two years after he was made chief engineer. On March 1, 1898, he became consulting engineer of the St. Louis Southwestern and also chief engineer of the Minneapolis & St. Louis. On July 4, 1907, Mr. Kelley was appointed chief engineer of the Grand Trunk System and on October 1, 1911, was elected vice-president in charge of construction, operation and maintenance. On September 1, 1917, he was elected president of the Grand Trunk. He also became, at the same time, president of the Grand Trunk Pacific and chairman of the board of the Central Vermont. In May, 1920, Mr. Kelley became chairman of the committee of management for the co-ordination of the Grand Trunk Railway with the Canadian Government System.

W. D. Robb is the first native born Canadian to be called upon to occupy the chief executive office on the Grand Trunk Railway System. He is also the first chief executive of the Grand Trunk to have risen step by step, with unbroken service, from an apprenticeship in the company. Mr. Robb was born at Longueuil, Quebec, in 1857, his father having come to Canada from Scotland to join the Grand Trunk in its construction stage. He received his early education at Sherbrooke Academy and at St. Francis College, Richmond, Que. He began his career with the Grand Trunk in 1871 as an apprentice machinist. He was appointed night foreman at the Montreal shops in 1883, and was promoted to the position of foreman at Belleville in charge of the motive power and car department in the same year. In 1897, he was appointed master mechanic of the middle division with headquarters at London, Ont., and in 1901 was made acting superintendent of motive power at Montreal. Mr. Robb was promoted to the office of superintendent of motive power in 1902, a position which he occupied until his appointment in 1917 as vice-president in charge of motive power, car department and machinery. His jurisdiction was extended in 1918 to take in the operating, maintenance and construction departments of the system.

W. D. Robb

Operating

O. W. Stewart has been appointed acting trainmaster of the Chicago, Milwaukee & St. Paul, with headquarters at Red Wing, Minn., succeeding **F. M. Corbett**, transferred.

J. A. Shepherd, assistant to the general manager of the Kansas City, Mexico & Orient, has been appointed superintendent of car service with headquarters at Wichita, Kan.

W. D. Dilley, assistant superintendent of the Louisville, Cincinnati and Lexington division of the Louisville & Nashville with headquarters at Louisville, Ky., has been promoted to superintendent with the same headquarters, succeeding **C. W. Bradshaw**.

Traffic

W. C. Thorn, city passenger agent of the Great Northern with headquarters at St. Paul, has been promoted to district passenger agent with the same headquarters.

J. E. Roberts has been appointed freight claim agent of the Southern Pacific of Mexico with headquarters at Guaymas, Sonora, Mexico, succeeding **L. W. Mayhood**.

F. D. Wilson, traveling freight and passenger agent of the Union Pacific with headquarters at Reno, Nev., has been promoted to general agent with the same headquarters.

P. B. Miller has been appointed general agent of the Green Bay & Western; the Kewaunee, Green Bay & Western and the Ahnapee & Western, with headquarters at Seattle, Wash.

C. C. Treueb, city passenger agent of the Pennsylvania, with headquarters at Chicago, has been promoted to division passenger agent with headquarters at Detroit, Mich., effective September 1. **A. B. Smith**, district passenger representative with headquarters at Chicago, has been promoted to division freight agent with headquarters at Wheeling, West Va.

Mechanical

W. R. Meeder has been appointed master mechanic of the Missouri & North Arkansas with headquarters at Harrison, Ark., effective August 12, succeeding C. W. Bugbee, who has resigned.

F. W. Boardman, fuel supervisor of the Texas & Pacific with headquarters at Dallas, Tex., has been appointed general master mechanic with the same headquarters. He is succeeded by **L. E. Dix.**

H. Englebright, master car repairer of the Southern Pacific at West Oakland, Cal., has recently retired from active service after 52 years of continuous service with the same road. Born in New Bedford, Mass., June 10, 1852, Mr. Englebright was taken by his parents to California at the age of five when the gold mines were still the dominant industry in that state. He entered the service of the old California Pacific as a blacksmith apprentice in 1869 and worked at this trade at various points until 1892 when he was appointed roundhouse and car foreman at Fresno, Cal. He was appointed general car foreman at San Francisco in 1898 and master car repairer at Oakland, Cal., in 1900, which position he held continuously until his retirement after an interesting experience which has seen the linking of the west to the east by the first transcontinental line, the development of motive power from 35-ton to 225-ton engines and the introduction and subsequent universal use of the automatic air brake, of which device he has made a particular study.

H. Englebright

Engineering, Maintenance of Way and Signaling

E. B. Sloan has been appointed chief engineer of the Southern Pacific of Mexico with headquarters at Empalme, Sonora, Mexico, succeeding C. K. Bowen, resigned.

H. C. Phillips has been appointed valuation engineer of the Midland Valley, with headquarters at Chicago and Muskogee, Okla. **L. A. Hodgson** has been appointed assistant valuation engineer, with headquarters at Muskogee, Okla., effective August 9.

J. B. Pope has been appointed consulting valuation engineer of the Southern Pacific with headquarters at San Francisco, Cal. **G. E. B. Welles** has been appointed engineer of land valuation. **J. H. Baker** has been appointed assistant engineer of valuation.

E. M. Hastings, principal assistant engineer of the Richmond, Fredericksburg & Potomac, has been promoted to chief engineer with headquarters at Richmond, Va. **C. E. Dare** has been appointed engineer maintenance of way with headquarters at Alexandria, Va., effective August 15.

Purchasing and Stores

George Kefer, chief clerk in the purchasing department of the Long Island, has been appointed purchasing agent succeeding H. B. Hodges, retired. Effective September 1.

Harrison B. Hodges, purchasing agent for the Long Island at Jamaica, N. Y., who will retire on September 1 under the pension rules of the company, has been purchasing agent of this road for the past 25 years. He was born at Barre, Mass., on August 14, 1858, and after completing his grammar school education he attended the Boston Latin School and then specialized in the study of chemistry at the Universities of Leipsic, Heidelberg and Bonn in Germany. He also studied the engineering side of chemistry and building construction at Polytechnicum in Aix-la-Chapel. He was then for five years instructor in chemistry and German at the Harvard University. In 1886 Mr. Hodges began railway work as chemist and superintendent of tests on the Union Pacific, remaining with that road until 1892 when he went to the Baltimore & Ohio as engineer of tests. In 1895 he was appointed superintendent of tests on the Southern Railway and on January 1, 1897 he became purchasing agent of the Long Island Railroad.

H. B. Hodges

Obituary

George E. Simpson, general supervisor of transportation of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, whose death on August 16 was reported in the *Railway Age* of August 19, was born on May 25, 1847, at Concord, N. H. Upon completing his course of study in the public schools of that city, he entered railway service with the Chicago, Burlington & Quincy as ticket agent and operator, with headquarters at Buda, Ill. He was promoted to chief train dispatcher, with headquarters at Galesburg, Ill., and held this position until May 1, 1882, when he became superintendent of telegraph of the Chicago, Milwaukee & St. Paul, with headquarters at Milwaukee, Wis. On October 1, 1888, he was promoted to superintendent of transportation, with headquarters at Milwaukee and Chicago. February 1, 1913, he was made supervisor of transportation, with headquarters at Chicago, which position he held until the time of his death as noted above. Mr. Simpson was a member of the general committee on transportation of the American Railway Association and was also a member of the executive committee of the Western Demurrage & Storage Bureau.

G. E. Simpson

Roy L. Stall, assistant general passenger agent of the Pennsylvania with headquarters at Pittsburgh, Pa., died suddenly in that city on August 22. Mr. Stall was formerly stationed in New York as district passenger agent for several years.

H. G. Herbel, general attorney of the Missouri Pacific, with headquarters at St. Louis, Mo., died August 11 after a short illness.

W. A. Drake, assistant to the vice president of the Atchison, Topeka & Santa Fe, with headquarters at Prescott, Ariz., died August 19.

William Cross, formerly assistant to the second vice president of the Canadian Pacific, with headquarters at Winnipeg, Man., died at his home in that city on August 16. Mr. Cross was born in 1842 at Birkenhead, England, and entered the employ of the Canadian Pacific in 1863. From that date to 1882 he was consecutively journeyman and foreman of the erecting shops at Montreal. He was then promoted to master mechanic of the Eastern division where he remained until 1887 when he was transferred to the Western division. From April 1, 1900, to November 1, 1901, he was consulting mechanical engineer of the same division. On the latter date he was appointed engineer of tests and continued in this capacity until February, 1904, when he was promoted to assistant to the second vice president in charge of mechanical matters west of Ft. William, Ont. He retired on January 1, 1908.

Edwin Chamberlain, assistant engineer of the Philadelphia & Reading, died on August 15. Mr. Chamberlain was born in Philadelphia, Pa., on September 30, 1854. He was educated in the public schools of Philadelphia, the Lackawanna School, Scranton, Pa., and entered the scientific department of Lafayette College, Easton, Pa., in the class of 1880. In the fall of that year he entered the service of the Philadelphia & Reading, engineering department, and in March, 1883, he was appointed division road master at Reading, Pa., subsequently serving as division engineer until 1886. He was then transferred to the Philadelphia division where he remained until January, 1887, when he was transferred to the chief engineer's office and made surveys for the extension to Bound Brook, N. J. In 1888 he left railroad work but the following year returned in charge of location and construction work of various extensions of the Reading. In 1892 and 1893 he was engaged upon surveys and report for an electric railroad between Trenton and Paterson, N. J., and between Raritan and New Brunswick, also reconnaissance and report for a steam road between Mahaffey and the Youghiogheny river in Indiana and Westmoreland counties, Pa. He subsequently served as city engineer at Reading, Pa., and from 1897 to 1898 was engaged on the enlargement and improvement of the water supply of the City of Binghamton, N. Y. He returned to the Reading in December, 1899, making surveys for the Reading Belt Railroad, and had charge of the construction work. From 1902 to 1904 he had charge of the construction of the Norristown Connecting Railroad, including the bridging of the Schuylkill river at Norristown, and then for two years was in charge of the construction of the New York Short Line between Cheltenham and Neshaminy Falls, Pa., together with the relocation and double-tracking of the Philadelphia, Newtown & New York between Olney and Cheltenham. From 1906 to the time of his death he was engaged in the elimination of grade crossings in Philadelphia.

E. Chamberlain

Frederick G. Sherman, superintendent of telegraph of the Central of New Jersey, with headquarters at Jersey City, N. J., died on August 20 at his summer home in Pulaski, N. Y.

EDITORIAL
Railway Age

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Some Things That Must Be Done

THE RAILROADS and the public are approaching a transportation crisis. This is chiefly due to the general resumption of bituminous coal mining after a general suspension of it for almost five months. The railway shop employees' strike will make the problem presented more difficult to solve but it would be difficult without any railway strike.

The railways apparently will be called upon to move as much or more traffic as ever before, and under very unfavorable conditions. If the strike in the anthracite mines continues they will have added to their other embarrassments the necessity of supplying with bituminous coal the eastern territory which is accustomed to using anthracite. This will complicate the situation by making it necessary to move a large volume of coal over new routes.

If the public interest is to be adequately served there must be the closest and heartiest co-operation between the railways themselves and between them and shippers and consignees. The available facilities of each individual railway must be used with the utmost efficiency, and through proper co-ordination of effort the greatest possible results must be secured with their facilities as a whole.

The solution of the problem will require that certain specific things be done. Any railways, shipper or consignee that does not do all of these things that it or he can do will assume the responsibility of interefering with efforts to deal effectively with a situation which concerns the welfare of all.

1. Every effort must be made to move without delays perishable products and foodstuffs which would deteriorate and be partially or wholly lost if prompt and sufficient transportation were not afforded them.

2. Fuel must be moved to the maximum capacity of the railways.

Service Order No. 23 of the Interstate Commerce Commission fully authorizes preferred movement for these commodities and no valid excuse could be offered for not giving them such movement. If it is necessary for any railway, in order to handle all the perishables and fuel offered to it, to divert traffic to other lines, this should unhesitatingly be done. It would be a crime against the welfare of the railroads and the American people for any railroad to allow the movement of perishables and fuel to be interfered with by attempts on its part to handle traffic which it could not handle satisfactorily and which neighboring lines could handle satisfactorily.

3. Refrigerator and coal cars should be unloaded promptly regardless of expense and regardless of the free time allowed by demurrage rules. For a consignee under present conditions to delay the unloading of cars merely because he has the legal right to do so under the published tariffs would be a crime against the public welfare.

4. The railroads should move cars promptly after they are unloaded, especially refrigerator and coal cars. They should do this to afford proof to shippers and consignees that they are making every effort to utilize equipment with the greatest efficiency. For a railway to prevail upon a shipper to unload a car promptly and then allow it to stand around for twenty-four or thirty-six hours or even longer, as often has been done in the past in periods of heavy business, would afford very persuasive evidence to shippers and consignees that the railways were not doing their best.

5. Empty cars, no matter where they are, should be moved as promptly as loaded cars. Unless this is done the maximum possible use cannot be obtained from all the serviceable cars available.

6. Cars should be loaded to their maximum capacity in disregard of prescribed carload minimums and trade customs. Under present conditions the necessity of utilizing the full capacity of every serviceable car is too obvious for discussion.

7. Individual railroads should refuse to allow their lines, yards and terminals to become burdened with more cars, whether loaded on their own lines or received from connections, than they can keep moving satisfactorily. Study of the freight car statistics of individual railroads in past periods of heavy freight movement demonstrates one fact beyond question. This is that in every such period some railways have allowed to accumulate on their tracks more cars than they could keep moving. Congestion has resulted and the number of ton-miles of freight movement secured by these railroads has been reduced far below the maximum they could have secured if they had not let so many cars accumulate on their lines. The managements of many railways have been seriously at fault because they have not had the intelligence or the courage, after they have begun to get more cars on their lines than they could keep moving, to refuse to load more cars or to receive more from connections until they could get existing congestions cleared away. Past experience demonstrates that times come when the most efficient utilization of cars demands that individual railways shall refuse to attempt the impossible task of trying to handle more cars than they have locomotives, tracks and yards for handling.

8. The railroads as a whole, and every individual railway, should adopt means of keeping the public as a whole and the public along their own lines reasonably well in-

formed as to their situation from week to week, and even from day to day. If the shipper understands that a railroad actually is handling as much freight as it ever did before, or that it is making reasonable progress with its repairs to equipment, he will be less inclined to find fault or to go to governmental agencies to secure explanations or the correction of seeming deficiencies. A great many complaints about railroad service go to the Interstate Commerce Commission and state regulating bodies which would never go there if local railroad officers and agents were furnished sufficient information and instructed to give that information to railway patrons. This is a work in which the traffic departments of the railways could well specialize during the next few weeks or months.

Farmers and business men are greatly disturbed about present and prospective transportation conditions. We think they exaggerate the extent to which the shop employees' strike is interfering, or will interfere, with the handling of traffic, but whether this is the case remains to be seen. If the railways should fail to do the very best they can under the prevailing conditions, or fail to secure the utmost co-operation from shippers and consignees, the results might be very serious to both the railways and the public. On the other hand, if, in spite of all the adverse conditions, the railways should succeed in handling satisfactorily the enormous business that is coming, it would be a triumph for them which would confer such great benefits on the public that it could not fail to win the public's gratitude and appreciation.

The situation has its dangers, but it affords a great opportunity. Let no ground be given for the charge that in this emergency the railroads "broke down!"

Poor Tools Always a Handicap

Railroad shops have always been more or less handicapped by machine tool equipment, inadequate as to amount, power, or time-saving features of operation. This lack of modern machine tools is felt with unusual keenness at the present time because the striking shop men, familiar through long experience with the limitations of the old equipment, could get results of a kind, whereas the new men are still in the process of learning these conditions and cannot, therefore, be expected to get the same production. This point is well illustrated by the case of a certain large planer which has been in railroad shop service many years and developed a decided tendency to plane taper. In short work the taper is hardly noticeable but in planing work six feet long, for example, there is a taper of at least $\frac{1}{8}$ in. The machinist who, previous to the strike, operated this planer for many years was accustomed to make allowance for the taper-cutting tendency of the machine by shimming up the work at one end an amount equivalent to $\frac{1}{8}$ in. in six feet. The amount of time lost in this shimming process and taking trial cuts can be readily imagined, and when finally done the work was probably less accurate than if performed on a modern planer. Obviously, an operator unfamiliar with the vagaries of the old planer would find it difficult, if not impossible to do accurate planing and it would not be strange if important work was occasionally spoiled. Is there any excuse for the continued use of railroad shop machine tools of which the operators must learn the individual peculiarities before they can produce even moderately accurate work? Railroad mechanical officers are confronted by many pressing problems and not the least of these is the necessity of procuring modern shop machinery to replace some of the present equipment which is fit only for the scrap pile.

An Incentive for Fuel Economy

The settlement of the coal strike makes it certain that the price of coal will remain high for some time. This is an unpleasant fact, but one which cannot be ignored. The higher the price of fuel, the more the railroads can afford to spend to save it. The prospects of shortage should lead every road to attack the problem of fuel economy with renewed energy. Of course, railroad officers have many other things on their minds just at this time, but unless the matter is given attention now it is likely to be overlooked. An effective system of supervision to promote economy in the use of fuel should be organized if it does not already exist. Many of the employees will feel the need of fuel in their households this winter. Could there be any more opportune time for arousing interest in fuel saving? Equipment too should not be overlooked. Even if the shops cannot now apply betterments that would reduce fuel consumption, a definite program should be laid out which can be put into effect without delay when shop conditions return to normal.

Money Saved by Using Form 19

One way to save coal is to avoid unnecessary stops of heavy freight trains; and E. W. Weston's report of saving 500 tons a day in this way, on the Northern Pacific, is just as good a lesson today as it was when printed in the *Railway Age* February 18, 1922, page 418. It ought today to be a better lesson than it was then, for our relish for lessons in coal saving is much keener. There is another reason for avoiding stops, namely, to get the merchandise in the cars to its consignees in quicker time, and to avoid detaining passenger trains and other freight trains. The only thing that was done on the Northern Pacific to accomplish the remarkable saving in money and improvement in service was to abolish the rule requiring trains to stop for conductors to go into the station office to endorse train orders, which orders could be delivered just as well to a train in motion. Five unnecessary stops in each freight train trip was the estimate of what the use of Form 31 would cost on the Northern Pacific. The use of Form 19 for all train orders is recommended by a good number of good men. Using this means of speeding up your freight trains may save you $10,000 in freight revenue between now and next Christmas, saying nothing of coal.

Business As Usual

Strikes, a war, government operation, an industrial depression and more strikes have made the life of the railroad man a case of "one damned thing after another" for such a long time that it is almost accepted as the normal condition. However, it serves to place some men in the state of mind where they feel that they must devote all of their waking hours to emergency or routine duties and that they cannot spare time for retrospect, study or any other considerations designed for

the improvement or advancement of either their individual capabilities or those of the properties which employ them. It is this attitude which raises the recurring question as to the wisdom or propriety of holding the annual conventions of the established associations of railway officers and as a direct result of this feeling certain of the conventions have been abandoned in the last six or seven years. So also at present there is a tendency in some quarters to assume a weak-kneed attitude with respect to the two coming conventions of maintenance of way officers, namely those of the roadmaster's and the Bridge and Building associations, notwithstanding the fact that neither of these organizations has missed an annual meeting since it was organized. It is true that all efforts at the settlement of the shop strike have been abandoned, but this does not present a situation on the railroads that is more critical than many others which have obtained coincident with previous meetings of these associations of supervisory maintenance officers. Nevertheless, some of the members of these associations may have a feeling that they would be remiss in their duty to the properties if they should absent themselves for the purpose of attending these meetings. It is therefore incumbent on the higher officers to take such steps as are necessary to insure that no misunderstanding exists with respect to the attitude of the managements concerning the matter of participation in the conventions.

220 Locomotives in August

The month of August does not usually supply any considerable amount of equipment buying. There seems to be a tendency for the big orders to be placed in the spring or fall months. Why this should be is a question; but that it is the case is nevertheless true. August this year proved to be no exception as concerned car orders, but it was very much of an exception in the case of locomotive orders. The orders reported for the month totaled 220 locomotives, 576 freight cars and 22 passenger cars. The 220 locomotives made the month the best so far this year with two exceptions—April and July—and they brought the year's total of locomotive orders in the first eight months of the year to 1,055. This figure is far from breaking any records but considering how slowly locomotive buying picked up earlier in the year it is not bad. It is unfortunate that freight car orders were not forthcoming in greater volume; we shall hope for better results in September. The equipment orders for August and for the eight months including August are tabulated as follows:

Car and Locomotive Orders

	Locomotives	Freight cars	Passenger cars
January	5	7,960	235
February	8	14,721	160
March	76	5,550	25
April	272	30,507	540
May	99	18,337	235
June	22	11,097	37
July	353	15,675	120
August	220	576	22
Total 8 months	1,055	104,423	1,374

The locomotive orders in August included large purchases by a number of important companies. Among the leading items were: Baltimore & Ohio, 15 Pacific; Erie, 30 Mikado; Union Pacific, 55 Mountain, 10 Mallet and 15 Santa Fe; Louisville & Nashville, 30 Mikado, and Missouri, Kansas & Texas, 40 Mikado and 5 Pacific type locomotives. There are a number of important locomotive inquiries still pending.

One Way To Raise Wages

Wages in terms of money is one thing; *real* wages in terms of the necessities, conveniences and luxuries which may by purchased by them is quite another. As the *Railway Age* has repeatedly said, production in this country today—and it is true to a much greater extent in most other countries—is inadequate; so inadequate, indeed, that many people are forced to live at a standard so low that they are restricted to the bare necessities of life. To prove this it is only necessary to take the figure for total production in this country for any one year and after subtracting from it the cost of carrying on the government, a reasonable allowance for the expansion and development of new industries, and a sufficient amount to maintain educational and the cultural interests, to divide the remainder by the number of families in the country. The resulting figure, considering that the products are not evenly distributed, indicates that many families are living at an extremely low standard. This is against the best interests of the community and of the individuals in it.

It is in the interests of all of us that workers should have sufficient means and leisure time to improve themselves to a standard which will at least make them good citizens. Superficial thinkers advocate raising wages to bring this about. It is true, of course, that this may temporarily help any one class that may be given an increase in wages, but, how about those who do not receive an increase? Mere raising of wages does not insure any greater production; in fact, ofttimes it is accompanied by a decrease in production. If the raising of wages does not result in increased production, then the fact still remains that enough goods are not being produced to provide a reasonable amount for all of the people and those on the lower scale must still suffer, even though there may have been a general increase in wages and these classes may have participated in the same ratio as the others.

If raising wages will not supply the remedy, what will? Waste and lost motion must be eliminated from industry to as great an extent as possible, and the employees must be led to an appreciation of putting forth their best efforts to increase production. This will in effect increase the *real* wages, regardless of the money wages, and make it possible to raise the standards of living.

Strikes—attempting to settle things by force—are frequently resorted to by the workers, but they are a prolific source of loss of production and are tremendously costly to all concerned, including the innocent by-stander. They may have been quite necessary in the past to awaken communities to abuses and to bring about better standards in industries, but surely the time has come when the average of intelligence in this country is such that better ways of settling disputes may be found—must be found, indeed, for strikes border too closely upon anarchy for this day and age.

The Journal of Commerce (New York) has suggested that "What we really need in all our industries and especially in the public utilities, is a baptism of understanding of economics, a better realization of the natural law which governs business enterprises." This is all very true and sounds simple enough. As a matter of fact, however, the problem of getting all of the executives and workers to understand the simple economics underlying the industrial situation, and then to conduct themselves accordingly—for their own sakes as well as in the interests of the community at large—is stupendous and has many serious complications. It cannot be worked out in a day or in a generation. It must be worked out, however, even though the progress may be slow, if we are not to invite the same sort of disaster that has taken place in other countries where these fundamental truths have been misunderstood or disregarded.

The development and efficient operation of the railroads

is vital to the welfare of the country. The item of labor is a larger factor in transportation than in most other industries. The problem of supervision is far more difficult than in other industries because of the great variety of classes of workers involved and the fact that they are spread over comparatively vast territories. Because the human element is so important in this great industry, which is so necessary to the continued prosperity of the country, it is exceedingly important that all of the employees—from the chief executives to the laborers and apprentices—should appreciate their full responsibilities as workers and as citizens, and function with the greatest possible efficiency.

What is the quickest and shortest way in which this may be accomplished? Unfortunately there are no short cuts which will give permanent results, although there are some things which because of their importance may be given precedence in working out the problem.

One thing is vital, and that is, that the managements become fully awakened to the necessities of studying the personnel and directing it according to the best thought and the best modern practices. Some industries in this country and abroad have gone a long way in blazing a trail in the right direction. Unfortunately many of the railroad managements —most of them in fact—have been so hounded with problems of regulation and legislation, finance, etc., that they have to a large degree overlooked the vital importance of giving special attention to this larger question of personnel. If the managements can first be fully awakened to the importance of this question and then will install strong personnel departments which will report direct to the chief executive, and see that the best thought and methods which have been developed in other industries are adapted and applied to the railroads, then we shall have gone a long way toward final solution of the problem.

Equipment Acquired and Retired in 15 Years

WITH THE RAILWAYS apparently about to be called upon to handle the heaviest traffic in their history it is highly pertinent to consider how much the equipment they have in service has been increasing within recent years as compared with earlier years. Because of the shop employees' strike much is being said now about the condition of the equipment they have. There is no question that there are excessive numbers of locomotives and cars in bad order. This was true before the shop employees' strike began, and of course the amount of bad order equipment has increased since then. The large amounts of bad order equipment when the strike began were due to the fact that for a long time previously the earnings of most railways had been so small relatively to their operating expenses that they had to retrench sharply in every way possible, including the repairs to equipment.

But the difficulty the railroads apparently are going to have in handling all the traffic offered them is only partly due to the excessive amount of equipment in bad condition. It is going to be much more largely due to the relatively small increases that have been made for several years in the numbers of locomotives and cars in service. Some statistics which have just been compiled by the Bureau of Railway Economics from the records of the Interstate Commerce Commission, showing the numbers of new locomotives and cars put into service and the numbers retired from service during each of the last 15½ years, strikingly indicate how much the increase in the amount of equipment has declined since the policy of restrictive regulation of railways was put into effect by the federal and state government 16 years ago.

For purposes of comparison we have divided the statistics regarding the equipment acquired and retired during the last 14½ years into those for two almost equal periods. One of these is the period of seven years, 1908-1914, inclusive; the other the period embracing the years ended June 30, 1915, to December 31, 1921, inclusive, making 7½ years. The accompanying table gives the statistics regarding the equipment installed and retired during these two periods. The figures show that the numbers of locomotives, passenger train cars and freight cars retired in the two periods did not differ widely, although the numbers of each class of equipment retired in the second period was less than in the first period. There were, however, heavy declines in the amount of equipment in service in the second period as compared with the first period. These were, of course, entirely due to the fact that there were very heavy declines in the numbers of new locomotives, passenger train cars and freight cars put in service in the second period as compared with the first period.

The net results were as follows:

In the seven years ended in 1914 the number of new locomotives put in service exceeded the number retired by 10,579, while in the period of 7½ years ended with 1921 the number

EQUIPMENT INSTALLED AND RETIRED DURING THE PERIOD JULY 1, 1907, TO DECEMBER 31, 1921

Class I Railways

Year ended	Locomotives: Number installed	Locomotives: Number retired	Locomotives: Net increase or decrease	Passenger train cars: Number installed	Passenger train cars: Number retired	Passenger train cars: Net increase or decrease	Freight-train cars: Number installed	Freight-train cars: Number retired	Freight-train cars: Net increase or decrease
June 30, 1908	3,227	1,140	I 2,087	2,183	1,630	I 553	171,556	70,976	I 100,580
1909	1,549	1,333	I 216	1,786	1,591	I 195	67,925	83,223	D 15,298
1910	3,073	1,452	I 1,621	3,505	1,914	I 1,591	134,593	75,652	I 58,941
1911	3,634	1,468	I 2,166	4,250	1,701	I 2,549	125,532	68,031	I 57,501
1912	2,861	1,858	I 1,003	3,060	1,387	I 1,673	97,972	69,876	I 28,096
1913	4,381	2,338	I 2,043	2,823	1,842	I 981	162,670	96,825	I 65,845
1914	3,245	1,862	I 1,383	3,629	1,854	I 1,775	150,813	96,985	I 53,828
Total, 7 years	22,030	11,451	I 10,579	21,236	11,919	I 9,317	901,061	561,568	I 348,902
June 30, 1915	1,114	1,507	D 393	2,664	1,385	I 1,279	86,012	90,347	D 4,335
1916	1,475	2,576	D 1,101	1,261	2,156	D 895	88,254	109,996	D 21,742
*6 mos July 1, to Dec. 31, 1916	993	1,108	D 115	897	1,000	D 103	63,476	53,136	I 10,290
1917	2,148	1,423	I 725	2,535	1,671	I 864	117,310	62,253	I 54,957
1918	2,803	977	I 1,826	1,817	1,051	I 766	65,749	56,624	I 9,225
1919	2,062	999	I 1,063	435	670	D 235	76,019	43,274	I 32,745
1920	1,017	1,254	D 237	621	885	D 264	56,044	75,197	D 39,153
1921	1,206	1,062	I 144	1,633	806	I 827	61,648	62,538	D 890
Total, 7½ years	12,818	10,926	I 1,912	11,863	9,624	I 2,229	593,862	552,765	I 41,097

I Increase. D Decrease

* Obtained by taking one-half of returns reported for the year ended December 31, 1916.

SOURCE: For years 1908 to 1920 from summaries of the Interstate Commerce Commission. Data for the year 1921 compiled from annual reports of the railways to the Interstate Commerce Commission.

of locomotives put in service exceeded the number retired by only 1,912. In the first period the net increase in the number of passenger cars in service was 9,517 and in the second period only 2,229. In the first period the net increase in the number of freight cars in service was 548,902, while in the second period it was only 41,097.

When statistics showing this same general tendency have been cited in the past it has frequently been answered that while the increase in the numbers of locomotives and cars within recent years have been smaller than formerly, the average power of the locomotives and the average capacity of the cars put in service have been greater than formerly. The fact is, however, that the average tractive power of locomotives and the average capacity of freight cars were increasing as fast in proportion in the seven years ending with 1914 as in the seven years ending with 1921. Therefore, these statistics regarding the relative increases in the numbers of cars and locomotives reflect with approximate accuracy the relative increases in the total tractive power of locomotives and the total capacity of cars.

The railways in 1916, after a period of depression, were called upon to handle a vastly increased business. They had with which to handle this business about 6,300 more locomotives and about 201,000 more freight cars than they had five years before. The railways in 1922, after another period of depression, are again called upon to handle a greatly increased business. At the beginning of the present year, however, they had only 3,500 more locomotives and only about 57,000 more freight cars than they had five years before. The development of the railways already had seriously slowed down before the big increase in business came in 1916. In consequence, in spite of the increase in facilities which had occurred in preceding years, they found it extremely difficult in the years from 1916 to 1920 to handle all the business offered to them. But the decline in their development has been much greater since 1916 than in the years immediately preceding 1916.

In view of the large amount of equipment now in bad order and of the relatively very small net increase in the amount of equipment in existence which has occurred within recent years it is plain that if the increase in traffic now coming is to be anywhere near as large as that which began in the latter part of 1915 the railways will find it extremely difficult, if not actually impossible, to cope with it. If this should prove to be the case it will be futile, and worse than futile, to attribute it entirely, or even mainly, to the relatively large amount of equipment now in bad order. The situation with respect to bad order equipment can and probably will be remedied in a comparatively short time. Remedying the serious deficiency of equipment actually in existence will present a much more difficult and important problem. It is but a part of a proportionately great deficiency of facilities of all kinds, including main tracks, sidings, yards, terminals, shops, stations, and so on. This larger problem can be solved only by allowing the railways as a whole to earn net returns over a period of years sufficient to enable them to raise very large amounts of new capital.

The problem presented by the excessive amount of bad order equipment undoubtedly will be solved within a comparatively short time, although probably not in time to prevent its existence causing a great deal of trouble during the rest of the year 1922. The problem presented by the necessity for a very large increase of railway equipment and facilities of all kinds cannot and will not be solved this year, and will not be solved for years to come, unless the policy of regulation followed in future is very different from that which has been followed during the 15 years in which has occurred the decline in the expansion of the railways reflected by the statistics regarding the equipment put in service and retired that are presented herewith.

Letters to the Editor

[The Railway Age welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

A Good Suggestion

Hailevville, Okla.

To the Editor:

In sorting out an accumulation of *Railway Ages* a few days ago it occurred to me that those which I did not care to file away would make good reading for the track and bridge foreman and laborers along the railroad. On this division there are about 50 gangs, so I bundled up three copies in each package and marked them for the foremen at the different places.

The average foreman is desirous of improving his education in railway work and there is no better information to be found than in the pages of the *Railway Age*. Some of these men are in isolated places, housed in box cars and do not have an opportunity to secure such reading matter. I do not know what disposition the superintendents make of their *Railway Ages*, but I believe it would be a good plan if, after they have served their purpose, they would pass them along to others who do not have the opportunity to read such a valuable periodical on railway work.

J. L. Coss,
Train Dispatcher, Rock Island Lines.

Looking Forward—With Results

Philadelphia, Pa.

To the Editor:

To study human nature and to improve himself in the details of disciplining his subordinates are primary duties of a railroad superintendent; if he is not fairly competent in these features he is not a good superintendent. The injunction to energetic progress in this direction is, I take it, the salient point in your editorial of August 26 on "Looking Ahead." Looking ahead is all right for an editor; it is his duty to look, and to proclaim what he sees. But it is the duty of the railroad officer to *move* ahead; to do something. An operating officer is a commander of ranks of men who are moving ahead, whether he will or no; if he does not direct them in the right way they will progress in some other way. To wait to see which way the rank and file desire to be led is fatal. The politician may pursue this policy, but the business man or the engineer cannot. I am reminded of a word of Dwight L. Moody, the great evangelist of the last century. He was equal to a major general as a commander and leader. Being told by church officers that for two years they had been aiming to accomplish a certain object, he said, "Isn't it about time you fired?"

Isn't it about time that the superintendents and foremen to whom you are preaching took pencil in hand and, as they look ahead, put down on paper what they see—and what they are going to do about it? One can look too far ahead. It may be a salutary exercise to set the first day of next month as the time to put into actual practice some good resolve that thus far has been only a vague intention. Bismarck, another great general of the 19th century, said that he was able to decide great questions, because he had to. He did not ascribe his success to genius. The time came when he was forced

to reach a decision, and he decided. An important duty of a general manager may be to force his subordinates to bring certain perplexities to a head at a definite time.

I write from the standpoint of a representative of the people. In conducting inquiries into railroad practices, there is a constant dampener in the almost universal plaint of railroad officers that their plans for future improvement are delayed by all sorts of obstacles, which they profess to deplore but which they do not seem to combat with any reasonable vigor. The proper function of a railroad commissioner is not to drive the railroad manager, but to arouse him (where he is lazy or neglectful) to drive himself. As I read your little lecture I queried whether you were not directing your readers' eyes too far into the future. Please tell them some specific thing to do right now! For example, that trainmaster or locomotive foreman who, for a year, has shown that he is never going to be a strong man, and whose conduct and policies have given frequent evidence of a softness which will forever postpone decided success—what is going to be done about him? If he is going to be asked to resign, or if he must be transferred to some other position—*When will action be taken?*

One who investigates railroad practice from the outside finds himself very often in contact with officers who seem to have studied human nature and who know what good discipline requires, but whose arm that ought to put good discipline in force, with a human touch, seems to be partly paralyzed. Please, Mr. Editor, go out among your readers and find out what answer they are making to the express or implied criticisms in your editorial.

COMMISSIONER.

A Lawyer's Reflections on the Recapture Clause

NEW YORK.

TO THE EDITOR:

Your Washington correspondent in a recent issue (*Railway Age*, July 15, page 106) speculated interestingly as to the recapture basis under the Transportation Act, 1920. It was suggested that the 6 per cent provision of clause 6 of Section 15-a of the Interstate Commerce Act may be held to be subject to fluctuation; that changes in the "fair return" may reduce or increase this 6 per cent. It was suggested that the recent fixing of the fair return at 5¾ per cent could conceivably operate to reduce the 6 per cent in clause 6 to 5¾ per cent; but reasons were advanced for a contrary holding.

No lawyer's opinion can settle this problem. It will doubtless get judicial interpretation in the course of time. But a lawyer's reflections may be of interest to some of your readers.

1. By ordinary canons of statutory interpretation, clause 6 would be read by itself. The 6 per cent is there expressed as a flat rate. No relationship between it and the "fair return" is implied. The figure 6 stands squarely on its own base as a fixed unchangeable integer.

2. Your correspondent hints that clause 5 (which provides that income "*so* in excess of a fair return" shall be held in trust for the United States) might subject to recapture one half of the income in excess of a fair return, rather than that in excess of 6 per cent. While the word "so" may lend momentary support to that theorem, the proposition would seem to fall when it is remembered that the thing to be held in trust is "*such part* of the excess, *as hereinafter prescribed*." "Such part" must be, or ought to be, one-half of the excess not only above a fair return but also above 6 per cent, as prescribed by clause 6, immediately following.

3. His reference to the second sentence of clause 9 discloses a real difficulty in statutory construction. A court would be in duty bound to give clause 9 some meaning, if at all possible. If excess income be based on a flat 6 per cent, then there would need to be no computation or adjustment to determine excess income in a year in which the "fair return" had been changed. It seems difficult to give this sentence any rational meaning. It would be, under ordinary circumstances, an unwarrantable extension of the court's power to interpret statutes for a court to hold that this sentence in clause 9 turned the fixed figure "6 per cent" in clause 6 into a flexible fluctuating figure. I must confess my present inability to make any reasonable disposition (except by my paragraph 5, below) of that portion of the second sentence of clause 9 which relates to calendar years subsequent to 1920. It looks as if the legislative mind had thought that there would have to be a new computation of excess income whenever the fair return was changed; but it was in error in so thinking where the fair return is reduced below 6 per cent.

4. Your correspondent states that "the commission has as yet made no ruling, etc." Categorically, this is accurate. Inferentially, however, a ruling has been postulated in "Reduced Rates, 1922" (No. 13,293, decided May 16, 1922, at page 682), the commission saying:

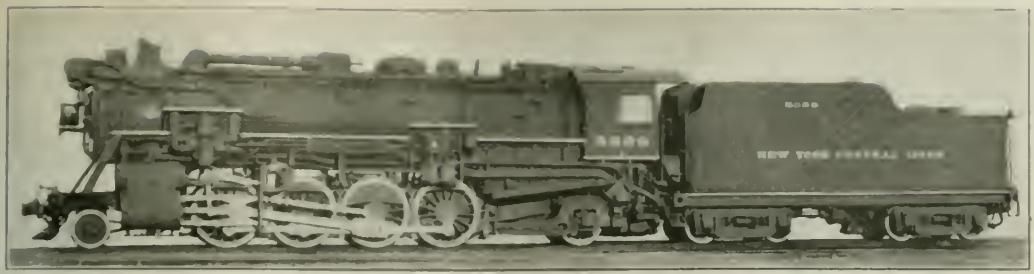
> "Paragraph (6) of section 15a provides for the disposition of net railway operating income *in excess of 6 per cent.* . . . . . One-half of the excess goes into a reserve fund" etc.

Here, at least, the commission did not intimate that the recapture basis is flexible

5. One would be deficient in a sense of humor not to mention another possible area of speculation, viz.: Suppose that the commission should fix the fair return at 8 per cent (or any rate in excess of 6 per cent). Would the recapture still be one-half of the excess over 6 per cent? Logically, would it not have to be so, on the grounds above discussed? Perhaps. But it might equally well be argued that, reverting to clause 5, the thing held in trust for the United States is that "in excess of a fair return;" and that "such excess" in clause 6 means the excess above a fair return (clause 5) no less than it means the excess above 6 per cent (clause 6). In other words, the 6 per cent is, for recapture purposes, a minimum but not a maximum. If the fair return is fixed at 6 per cent or less, recapture relates to excess above 6 per cent; but if the fair return is fixed *above* 6 per cent, the carrier must get its full fair return before the recapture provisions come into play. This branch of the discussion is doubtless academic: nothing but another world war or other universal calamity would be likely to lead the commission to entertain consideration of a fair return exceeding 6 per cent.

ROBERTS WALKER.

CROSSING CROSSINGS INCAUTIOUSLY continues to be a popular amusement. The Pennsylvania Railroad has just completed another check upon automobile drivers at selected crossings in Pennsylvania, New York, Delaware, Maryland, and Virginia, noting the circumstances of 831 cases of gross negligence. At one crossing, during a period of 17 hours, 73 cars, bearing license tags from five different states, averaged 37 miles an hour when running across the railroad tracks and in two instances they were making almost a mile a minute. At another crossing nineteen new and inexperienced drivers were observed; fifteen tried to "beat" other automobiles across the railroad tracks and one car was driven 25 miles an hour in the dark without lights. It was not possible to tell how many cars had defective brakes, but four recent accidents at crossings on the Pennsylvania were ascertained to be due to this cause.



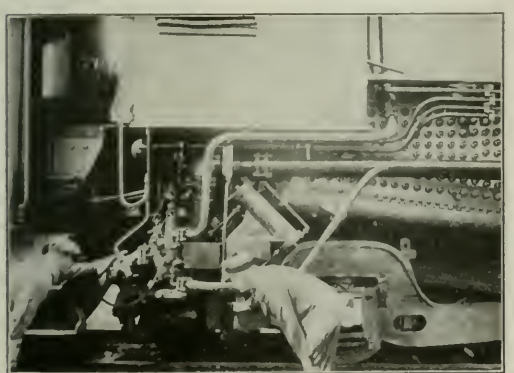
Left Side View of Michigan Central No. 8000

Michigan Central Mikado Has Many Special Features

Modern Appliances Co-ordinated to Give Maximum Efficiency—Refinements in Design to Reduce Weight

Few locomotives built in recent years have created as much interest as the special Mikado type, No. 8000, built for the Michigan Central by the Lima Locomotive Works, which was described briefly in the *Railway Age* of July 22, 1922, page 171. Further details including drawings, have now been made available.

As outlined in the earlier article, the object of the design was to provide the maximum hauling capacity with the minimum fuel consumption and without exceeding the allowable limit of weight. The Michigan Central was already using a very well designed Mikado, designated as type H17E, and the problem of effecting a marked improvement over the performance of this locomotive was a difficult one. That a satisfactory solution was found is indicated in Table I.



Rear of Locomotive, Showing Stoker, Booster and Grate Shaker

It will be noted that with an increase of 1.8 per cent in total weight, the maximum tractive force without the booster has been increased 7.6 per cent and with the booster, 26.3 per cent. The weight per cylinder horsepower, based on Cole's method, has been decreased 5.1 per cent. This does not take into account the improvement in performance due to the feedwater heater, high degree superheat and the operation of auxiliaries with superheated steam. The estimated performance curve shows a maximum of 3,070 cylinder horsepower, an increase of 17.0 per cent and a decrease of 12.8 per cent in weight per cylinder horsepower.

The figure for the boiler horsepower of No. 8000 by Cole's method is an approximation because only incomplete data are available regarding the evaporation from 3¼-in. boiler tubes. The figures are given to afford a comparison of the two boilers on the basis of a steam consumption of 20.8 lb. per horsepower hour. While any prediction of the water rate for this locomotive is subject to error, 18 lb. per horsepower hour does not seem too low. At this rate the estimated boiler output would be 3,160 hp. and since the feedwater heater increases the steaming capacity, the evaporation should be fully up to the cylinder requirements.

TABLE I—COMPARATIVE DATA FOR CLASS H17E AND NO. 8000

	Class H17E	No. 8,000	Increase Per Cent
Weight on drivers, lb.	246,000	245,500	0.2*
Total weight, lb.	328,000	334,000	1.8
Cylinders, diameter and stroke	27 in. by 30 in.	28 in. by 30 in.	...
Tractive effort without booster, lb.	59,000	63,500	7.6
Tractive effort with booster, lb.	.....	74,500	26.3
Cylinder horsepower, maximum (Cole)	2,624	2,824	7.6
Weight per cylinder horsepower (Cole), lb.	125	118	5.1*
Cylinder horsepower, maximum, estimated from performance curve	.....	3,070	17.0
Weight per cylinder horsepower, estimated lb.	.....	109	12.8*
Boiler horsepower, maximum (Cole)	2,420	2,735	13.0
Weight per boiler horsepower (Cole)	135	122	9.6*

*Decrease.

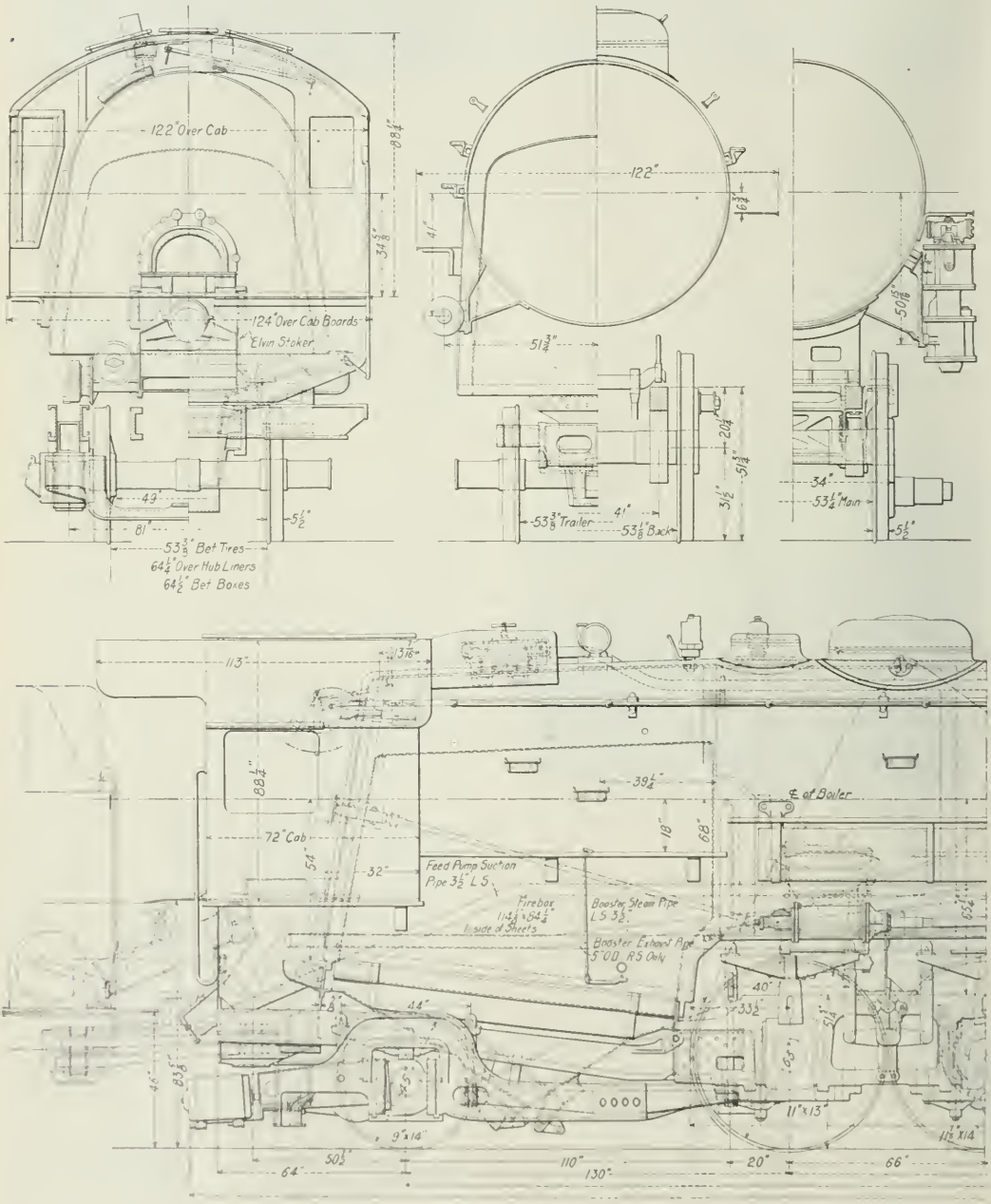
Another primary consideration in the design of No. 8000 was fuel economy, not necessarily the burning of less fuel than previous locomotives, but the ability to obtain greater drawbar output for the fuel consumed. This object was attained by incorporating into the design well-known fuel-saving devices properly proportioned with respect to the locomotive and its appliances to give the best results.

The Superheater Company's type *E* superheater is used and provides steam for all auxiliaries as well as the cylinders. This design of superheater permits of using but one size of tube and the entire boiler is equipped with 3½-in. tubes. A large proportion of these tubes contain superheater units and the steam is raised to a higher temperature than is obtained from the usual type *A* superheater. The design also provides a greater total steam area through the units than the type *A* and at the same time permits of greater gas area through the tubes. In view of this greater gas area, more heat is absorbed from the gases before they pass into the smokebox and consequently there is a better boiler and superheater performance and less heat is lost through the stack. The damper usually found in the type *A* superheater has been omitted because the throttle is ahead of the superheater and protection to the units is afforded by the flow of steam through them for the blower and the other auxiliary apparatus when the main engine is shut off. A removable

plate is applied to the smokebox over the superheater header to facilitate the tightening of joints when assembling the superheater. The Superheater Company's feedwater heater is applied which utilizes a portion of the exhaust steam to heat the feedwater from tank temperature to about 225 deg. F., the condensate being returned to the tender.

The firebox is supplied with coal by an Elvin stoker and is equipped with the American Arch Company's type *P* double firebrick arch, consisting of two sets of refractory brick supported on two horizontal rows of arch tubes, each comprising four 3½-in. tubes. This design of firebrick arch is new. Its purpose is not only to ensure complete combustion, but to improve water circulation in the boiler, the chief object of the double rows of arch tubes.

Additional economy of steam is secured by the use of superheated steam in the auxiliaries, including the air com-

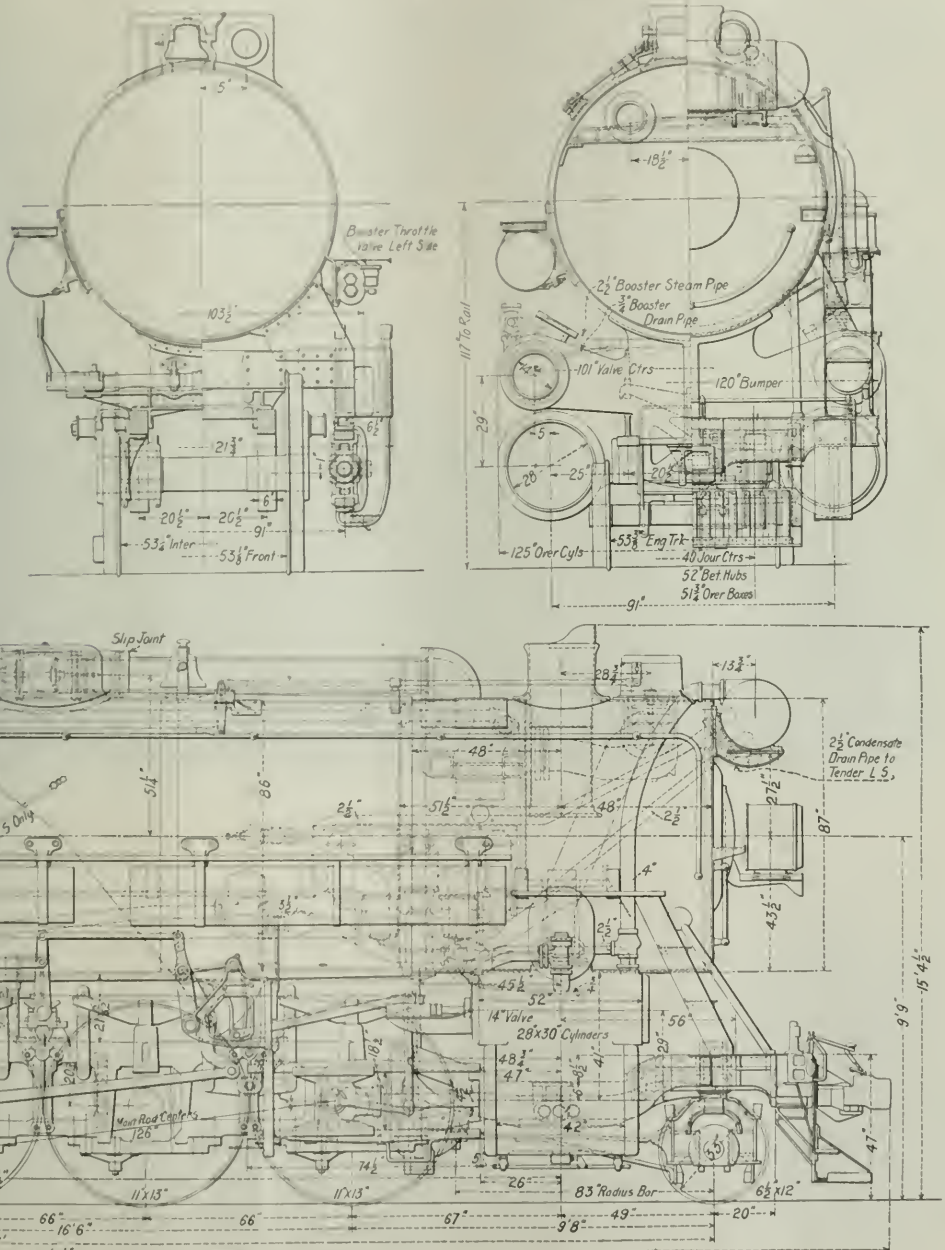


Side Elevation and Sections of

pressor, feedwater pump, blower, turbo-generator, stoker and locomotive booster. These accessories at times use more than 25 per cent of the steam from the boiler. The consumption per unit of work done is quite high and the saving by superheating the steam should be relatively large.

Reduction of Weight and Dynamic Augment

Careful attention was given to all the details of design to eliminate every pound of unnecessary weight. Little opportunity for reduction was found in the boiler or frames, but surprising savings were made in some of the minor details. For example, by refinement in design, the foundation brake rigging was cut down 1,800 lbs. without sacrificing strength. The use of magnesia lagging saved several hundred pounds. One of the reasons for the selection of the Elvin stoker was its relatively light weight.



Michigan Central Mikado Locomotive

To keep down the weight of the locomotive, the axles and main crank-pins were made hollow and Lima special quality steel, which is a chrome-vanadium steel heat treated by annealing, was used in main and side rods. Great care was also exercised in the design of the reciprocating parts so that not only was a saving made in the static weights, but it was also possible to reduce the dynamic augment, or pressure at the rail due to excess counterbalance. Table II indicates the relative dynamic augment of Class H7E, and No. 8000 at operating speeds of 30, 40 and 50 miles per hour. The reduction of 52 per cent in the maximum dynamic augment shows the advantage of the high-quality steel used in the running gear.

Table II—Dynamic Augment of Class H7E and No. 8000

	30 m.p.h.		40 m.p.h.		50 m.p.h.		Decrease,
Wheels	H7E	8000	H7E	8000	H7E	8000	per cent
Front	3,430	1,920	6,100	3,420	9,520	5,340	44
Intermediate ..	4,040	1,920	7,180	3,420	11,200	5,340	52
Main	2,040	1,470	3,630	2,610	5,680	4,080	28
Back	3,510	1,860	6,240	3,300	9,750	5,160	47

Special Features of Construction

In order to attain the objects sought in the design of No. 8000 many innovations were made in the construction. The special features are the subject of patents now pending.

The boiler is of the straight-top type and carries 200 lb. per sq. in. pressure. The barrel has an outside diameter of 86 in. at the first ring and contains 253, 3¼-in. flues, 20 ft. long. The firebox has a grate area of 66.4 sq. ft. There is no combustion chamber but, as mentioned above, a double arch is applied on eight arch tubes. One of the interesting details is the large mud-ring corners which have a radius of 12 in. This easy curve makes it possible to apply rivets instead of patch bolts, improves the circulation around the firebox and facilitates inspection and cleaning. The heating surface of the firebox and arch tubes is 291 sq. ft. and of the flues, 4,287 sq. ft.

To insure that dry steam is delivered to the superheater, a steam separator is placed at the highest point in the dome. Any entrained moisture is removed from the steam before it enters the dry pipe and is returned to the boiler.

New Throttle Arrangement

The throttle valve, instead of being located in the dome, is placed in the top of the smokebox just ahead of the stack, shutting off the steam from the cylinders but not from the superheater. On account of this arrangement an outside dry pipe with a shut-off valve as clearly shown below, is used so that the steam can be shut off and the throttle ground without blowing down the steam pressure on the boiler. To reduce the number of joints, the dome and the back end of the dry pipe are made integral of a steel casting.

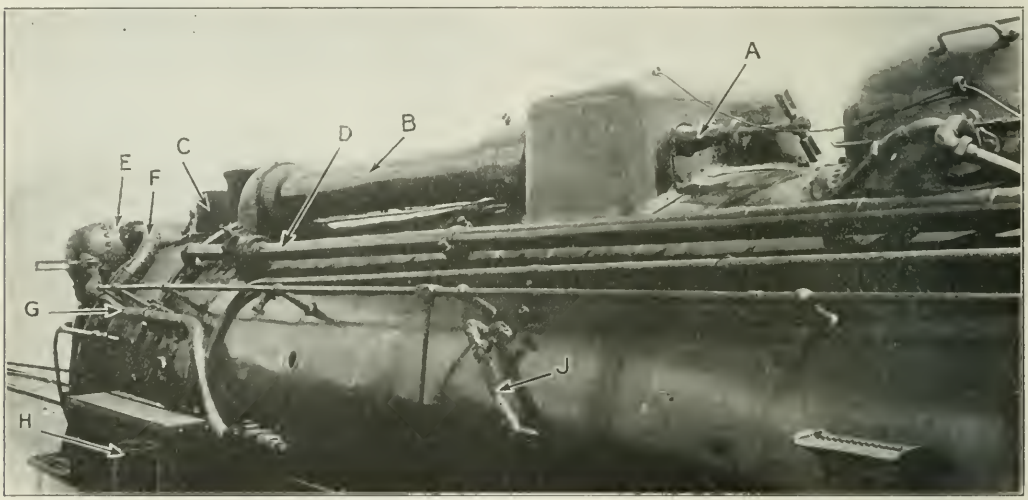
The steam after flowing through the dry pipe and superheater tubes, passes to the right side of the superheater header, which has a main outlet leading to the throttle which supplies the main cylinders and the booster and a smaller connection to the superheated steam pipe to the turret which supplies the other auxiliaries. The throttle valve is located at the top of the smokebox where it is readily accessible. It is of the usual double-seated poppet type with top lift operated by outside rigging. The expansion of the boiler tends to change the setting of the throttle valve and to overcome this the Jones compensating arrangement has been applied.

The cylinders and valves are in accordance with the usual practice with the exception of the valve travel which has been increased to 8¾ in. by a special design of Baker valve gear controlled by the Franklin type D Precision power reverse gear. The booster, which adds 17.3 per cent to the starting tractive effort of the locomotive, is the latest design type C-1 using superheated steam. The exhaust steam from the booster is discharged out of the stack, thus creating additional draft and increasing the steaming capacity of the boiler at low speeds.

The feedwater heater is carried on brackets secured to a permanent top section of the smokebox front. This elevated location of the heater enables the water condensed from the exhaust steam to flow to the tender by gravity. The arrangement of the smokebox front avoids any difficulty in removing it to reach the front end netting or superheater.

Superheated Steam for Auxiliaries

Reference has already been made to the use of superheated steam in the auxiliaries. Special arrangements have been made so that if necessary, saturated steam can also be used. Two turrets are mounted over the firebox just ahead of the cab. The left-hand turret is connected to the superheated steam pipe leading back from the header and



Forward End of Boiler from Left Side

A, Shut-off Valve; *B*, Outside Steam Pipe; *C*, Throttle; *D*, Superheated Steam Pipe to Turret; *E*, Feedwater Heater; *F*, Exhaust Steam Pipe to Heater; *G*, Feedwater Discharge Pipe from Heater; *H*, Feedwater Pump; *J*, Drain Pipe from Steam Separator.

carries transverse pipes leading to the right turret. The right turret has a connection to the saturated steam space in the boiler which is normally shut off. A stop valve is located in the superheated steam pipe to the turret just back of the point where it issues from the smokebox, so that by opening the valve between the right turret and the boiler and closing the valve in the steam pipe, saturated steam can be used. It is of interest to note that no changes in the design of the auxiliaries were necessary to adapt them for superheated steam, the only modifications being in the use of materials that would withstand the higher temperatures.

The tender has a capacity of 10,000 gal. of water and 16 tons of coal. It is carried on Commonwealth four-wheel trucks and has a Commonwealth cast-steel tender frame.

The accessories used on this locomotive include the Commonwealth-Franklin engine truck, type B Delta trailing truck with constant resistance centering device, Franklin radial buffer and unit safety drawbar, Pyle-National type K-2 headlight generator, Franklin grate shaker, Franklin adjustable wedge and driving box spreader and cellar, Franklin sprinkler and McLaughlin flexible joints.

The dimensions, weights and factors are as shown in the tabulated data sheet:

LOCOMOTIVE DATA SHEET

Railroad	Michigan Central
Type of locomotive	2-8-2
Service	Freight
Track gage	4 ft. 8½ in.
Cylinders, diameter and stroke	28 in. by 30 in.
Valve gear	Baker
Valves, kind and size	Piston, 14 in. dia.
Maximum travel	8½ in.
Outside lap	1¼ in.
Exhaust clearance	⅛ in.
Lead in full gear	⅜ in.
Weights in working order:	
On drivers	245,500 lb.
On front truck	30,000 lb.
On trailing truck	58,500 lb.
Total engine	334,000 lb.
Tender	199,700 lb.
Wheel bases:	
Driving	16 ft. 6 in.
Rigid	16 ft. 6 in.
Total engine	37 ft. 0 in.
Total engine and tender	71 ft. 6½ in.
Wheels, diameter outside tires:	
Driving	63 in.
Front truck	33 in.
Trailing truck	45 in.
Journals, diameter and length:	
Driving, main	11½ in. by 14 in.
Driving, others	11 in. by 13 in.
Front truck	6½ in. by 12 in.
Trailing truck	9 in. by 14 in.
Boiler:	
Type	Straight top
Steam pressure	200 lb. per sq. in.
Fuel, kind and B.t.u.	Bituminous coal, 14,000 (appr.)
Diameter, first ring, outside	86 in.
Firebox, length and width	114⅛ in. by 84¼ in.
Height, grate to crown sheet, back	68½ in.
Height, grate to crown sheet, front	87 in.
Arch tubes, number and diameter	8—3½ in.
Combustion chamber	None
Tubes, number and diameter	253—3¼ in.
Tubes, length	20 ft. 9 in.
Tubes, spacing	¾ in.
Tubes, inside diameter	2,982 in.
Gas area through tubes	26 sq. ft.
Net gas area through tubes	9.47 sq. ft.
Grate type	Table
Grate area	66.4 sq. ft.
Heating surfaces:	
Firebox, total arch tubes	291 sq. ft.
Tubes	4,287 sq. ft.
Total evaporative	4,578 sq. ft.
Superheating	1,[illegible] sq. ft.
Comb. evaporative and superheating	6,[illegible] sq. ft.
Tender:	
Style	Rectangular
Water capacity	10,000 gal.
Fuel capacity	16 tons
Special equipment:	
Brick arch	American Arch Co., double arch
Superheaters	Superheater Co., Type B
Feedwater heaters	Superheater Co.
Stokers	Elvin Mech. Stoker Co.
Booster	Franklin Ry. Supply Co.
General data, estimated:	
Rated tractive force, 85 per cent	63,540 lb., with booster 74,500 lb.
Cylinder horsepower (Cole)	2,824
Boiler horsepower (Cole) (est.)	2,735
Speed at 1,000 ft. piston speed	37.5 m.p.h.
Steam required per hour	58,700 lb.
Boiler, evaporative capacity per hour	56,900 lb.
Coal required per hour, total	9,180 lb.
Coal, rate per sq. ft. grate per hour	138 lb.
Weight proportions:	
Weight on drivers ÷ tractive force	3.86
Weight on drivers ÷ total weight engine	.735
Total weight engine ÷ cylinder horsepower	118
Total weight engine ÷ boiler horsepower	122
Weight per sq. ft. of combined heating surface, lb.	52.5
Boiler proportions:	
Boiler horsepower ÷ cylinder horsepower	96.9 per cent
Comb. heating surface ÷ cylinder horsepower	2.25
Tractive force ÷ comb. heating surface	9.99
Tractive force × dia. drivers ÷ comb. heating surface	630
Cylinder horsepower ÷ grate area	42.5
Cylinder horsepower ÷ net gas area of tubes in sq. ft.	298
Firebox heating surface ÷ grate area	4.38
Firebox heating surface ÷ evap. heating surface	6.36 per cent
Superheating surface ÷ evap. heating surface	38.9 per cent
Tube length ÷ inside diameter	80.5

Engine No. 8000 has been in operation since about the first of June between Detroit and Toledo, and between Toledo and Jackson, Mich. The Michigan Central Railway is preparing to make exhaustive tests of the engine, data from which will be available at a later date. So far the engine has exceeded the expectation of the builders, both in developing high drawbar pull and in economy of operation.

On June 24, 9,254 tons in 138 cars were hauled from Detroit to Toledo, without help, a distance of 47.6 miles in 3 hr. 31 min., no trouble being experienced in starting this train with booster in operation; in fact, for the first 10 miles the tonnage was 9,394 tons in 140 cars, 2 cars being set off on account of hot boxes. On June 30, 10,039 tons were hauled over this division in 147 cars, no assistance being required to start or haul this train.

No trouble has been experienced in maintaining full boiler pressure when operating at maximum capacity.

The evaporation per pound of fuel is phenomenal, as for three of the full tonnage runs made between Detroit and Toledo, the total water divided by total fuel averaged 9.7 lb. which indicates a combined efficiency for the boiler and superheater of about 77 per cent.

Right Side of the Locomotive, Showing Removable Plate Over Superheater Header and Outside Throttle Rigging

Net Increase in Equipment in 15½ Years

A TABLE comparing the number of cars and locomotives installed on the railways of the United States during the 15½ years from June 30, 1907, to December 31, 1921, with the number retired each year has been compiled by the Bureau of Railway Economics from statistics of the Interstate Commerce Commission and annual reports of the roads to the commission for 1921. This shows a net increase of 16,229 locomotives, 13,504 passenger train cars, 581,945 freight train cars and 54,116 company service cars.

EQUIPMENT INSTALLED AND RETIRED DURING THE PERIOD JULY 1, 1906, TO DECEMBER 31, 1921

CLASS I RAILWAYS

Year ended	Locomotives: Number installed	Locomotives: Number retired	Locomotives: Net increase or decrease	Passenger-train cars: Number installed	Passenger-train cars: Number retired	Passenger-train cars: Net increase or decrease	Freight-train cars: Number installed	Freight-train cars: Number retired	Freight-train cars: Net Increase or decrease	Company service cars: Number installed	Company service cars: Number retired	Company service cars: Net increase or decrease
June 30, 1907	5,774	36	I 3,738	1,989	41	I 1,948	192,896	1,541	I191,355	11,509	109	I11,400
1908	3,227	1,140	I 2,087	2,183	1,630	I 553	171,536	70,976	I100,580	12,568	5,978	I 6,590
1909	1,549	1,333	I 216	1,786	1,591	I 195	67,925	83,223	D 15,298	7,322	5,341	I 1,981
1910	3,073	1,452	I 1,621	3,505	1,914	I 1,591	134,593	75,652	I 58,941	15,033	6,818	I 8,215
1911	3,694	1,468	I 2,226	4,250	1,791	I 2,349	125,532	68,031	I 57,501	12,931	6,921	I 6,010
1912	2,861	1,858	I 1,003	3,060	1,387	I 1,673	97,972	69,876	I 28,096	10,630	8,800	I 1,830
1913	4,381	2,338	I 2,043	2,823	1,842	I 981	162,670	96,825	I 65,845	13,014	8,507	I 4,507
1914	3,245	1,862	I 1,383	3,629	1,854	I 1,775	150,813	96,985	I 53,828	12,354	8,159	I 4,195
1915	1,114	1,507	D 393	2,664	1,385	I 1,279	86,012	90,347	D 4,335	10,228	11,787	D 1,559
1916	1,475	2,576	D 1,101	1,261	2,156	D 895	88,254	109,996	D 21,742	13,086	13,446	D 360
6 mos. July 1 to Dec. 31, 1916*	993	1,108	D 115	897	1,000	D 103	63,426	53,136	I 10,290	6,986	4,779	I 2,207
Dec. 31, 1917	2,148	1,423	I 725	2,535	1,671	I 864	117,210	62,253	I 54,957	9,445	6,627	I 2,818
1918	2,803	977	I 1,826	1,817	1,051	I 766	65,249	56,024	I 9,225	9,310	5,530	I 3,780
1919	2,062	999	I 1,063	435	670	D 235	76,019	43,274	I 32,745	5,905	4,190	I 1,715
1920	1,017	1,254	D 237	621	885	D 264	36,044	75,197	D 39,153	6,608	5,409	I 1,199
1921	1,206	1,062	I 144	1,633	806	I 827	61,648	62,538	D 890	4,277	4,709	D 432
Total 15½ years	38,622	22,393	I16,229	35,088	21,584	I13,504	1,697,819	1,115,874	I581,945	161,226	107,110	I54,116
Equip. in service as of Dec. 31, 1921.	Locomotives 65,004			Passenger-train cars 54,331			Freight-train cars 2,346,787			Company service cars 104,385		

I Increase. D Decrease. * Obtained by taking one-half of returns reported for the year ended December 31, 1916.

figures represent the period before the new production resulting from the Cleveland settlement of the bituminous coal strike was attained.

The car surplus continued to decrease during the period, August 8 to August 15, to a total of 140,253 cars, which included only 10,453 box cars and 111,521 coal cars. There were, however, shortages amounting to 37,172 cars, of which 13,215 were in the Southern district and 8,574 in the Central Western district.

The number of cars furnished for coal loading during the week of August 12 was 82 per cent of the requirements, as compared with 86 per cent the week before. The number of cars loaded, however, was greater than the week before, 84,471. The cars required were 143,995 and the cars placed were 118,725.

The percentage of open top cars placed for all kinds of loading was 89 as compared with 87 the week before.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING during the week ended August 19, the seventh week of the shopmen's strike, showed an increase of 3,639 cars as compared with the week before, to 856,219, in spite of a reduction in coal loading of 2,600 cars. This was within 21,000 cars of the loading during the last week before the shop strike and represents an increase of 41,072 cars as compared with the corresponding week of 1921, although a decrease of 111,884 cars as compared with the corresponding week in 1920. As compared with the previous week, increases were shown in the loading of livestock, forest products and particularly miscellaneous freight, but decreases were shown in the loading of grain and grain products, coal, coke, ore and merchandise. As compared with the corresponding week of last year increases were shown in the loading of all classes of commodities except grain and grain products and coal and there were increases in all districts except the Central Western and the Southwestern. These

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, AUGUST 19, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Total revenue freight loaded: Corresponding year 1921	Total revenue freight loaded: Corresponding year 1920
Eastern	1922	10,409	2,779	8,907	1,276	5,640	6,941	65,270	97,529	198,751	.....	.....
	1921	8,932	2,824	40,660	1,056	4,525	2,884	59,164	78,514	.....	198,559	236,017
Alleghany	1922	3,915	3,198	21,806	4,304	2,900	12,549	49,751	78,988	177,411	.....	.....
	1921	3,382	2,592	41,117	2,300	2,284	6,876	44,810	55,660	.....	159,021	204,341
Pocahontas	1922	106	254	21,330	266	1,172	26	4,395	2,560	30,199	.....	.....
	1921	192	214	18,385	95	1,210	4	4,800	3,699	.....	28,599	34,311
Southern	1922	4,024	2,189	15,728	783	17,994	1,038	34,917	33,912	110,584	.....	.....
	1921	3,666	1,894	21,677	270	14,042	167	36,376	30,671	.....	108,763	128,396
Northwestern	1922	15,155	6,813	4,796	1,023	15,285	44,097	29,215	37,316	153,700	.....	.....
	1921	17,388	7,592	8,204	421	10,250	20,584	28,627	34,519	.....	127,585	168,096
Central Western	1922	16,750	11,620	6,357	386	7,263	2,090	31,499	51,317	127,282	.....	.....
	1921	20,456	10,287	18,075	163	6,096	812	31,219	41,959	.....	129,067	131,266
Southwestern	1922	5,444	2,903	3,035	164	7,680	460	14,878	23,728	58,292	.....	.....
	1921	6,050	3,096	4,395	219	6,402	660	15,960	26,771	.....	63,553	65,676
Total western districts	1922	37,349	21,336	14,188	1,573	30,228	46,647	75,592	112,361	339,274	.....	.....
	1921	43,894	20,975	30,674	803	22,748	22,056	75,806	103,249	.....	320,205	365,038
Total all roads	1922	55,893	29,756	81,959	8,201	57,934	67,201	229,925	325,350	856,219	.....	.....
	1921	60,066	28,499	153,513	4,524	44,809	31,987	220,956	271,793	.....	815,147	.....
	1920	41,638	27,098	204,178	16,188	64,850	78,840	203,088	332,223	.....	.....	968,103
Increase compared	1921	.....	1,257	.....	3,677	13,125	35,214	8,969	53,557	41,072	.....	.....
Decrease compared	1921	4,173	.....	70,554	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1920	14,255	2,658	.....	.....	.....	.....	26,837	.....	.....	.....	.....
Decrease compared	1920	.....	.....	122,219	7,987	6,916	11,639	.....	6,873	111,884	.....	.....
August 19	1922	55,893	29,756	81,959	8,201	57,934	67,201	229,925	325,350	856,219	815,147	968,103
August 12	1922	57,867	28,370	84,559	8,420	56,163	69,197	230,652	317,652	852,580	808,269	971,269
August 5	1922	58,512	26,507	79,246	8,442	55,898	66,218	229,287	327,241	851,351	786,178	935,730
July 29	1922	59,170	27,104	76,374	9,112	58,197	64,147	234,567	331,062	859,733	795,432	936,366
July 22	1922	57,566	27,455	76,060	9,949	58,512	64,417	239,510	327,655	861,124	788,034	928,418

Compiled by Car Service Division, American Railway Association.

Negotiations for Separate Agreements Fail

Executives of 52 Class I Railroads Which Continued Mediations Unable to Reach Strike Settlement

Efforts of the executives of 52 Class I railroads to come to some kind of an agreement with their striking shopmen ended in failure on Friday, August 25, when the committee representing the executives which had met with the five train service leaders announced that the conferees had been unable to reach an agreement which was satisfactory to the shop leaders.

The negotiations broke on the usual issue of seniority, and there was again in evidence the lack of desire on the part of the shop leaders to enter into separate agreements.

The railroads offered to take back all the strikers, except such as had been proved guilty of acts of violence and to give them the positions of the same class as those held on June 30 at Labor Board rates of pay and at the same points; as many men were to be put to work before September 1 as possible and all before October 1. The executives' proposal contained the provision: "The relative standing as between themselves, of men returning to work . . . will be restored as of June 30, 1922, and they will be called back to work in that order as defined above." The executives further agreed that if after the men returned to work there remained any unsettled disputes that could not be adjusted by the carrier and the employees they should be referred to a commission consisting of the five train service brotherhood leaders and five executives, decision to be by majority vote. The agreement offered was with the understanding that "the terms shall be carried out by the officers of the companies and the representatives of the employees in a spirit of conciliation and sincere purpose to effect a genuine settlement of the matters in controversy." The railroads were, however, unable to agree to any program or method of adjustment which could affect the privileges of employees of the shop crafts who did not take part in the strike or those who had been employed since July 1.

The shop leaders did not find these concessions sufficient. Their rejection of the executives' offer was on two grounds—one relative to seniority and the other for the reason that to accept the terms of these roads would result in the desertion of the men on the other roads not involved in the discussion with the group of 25 systems. Their communication embodying the rejection said: "To accept or submit for acceptance the present proposal that carries no visible guarantee or assurance of protection of the rights or standing of the men as railroad employees held by them prior to strike and learned by years of continuous and efficient service, would mean that we ask the men on less than one-third the roads affected to return to work yielding to every demand of railroad management, receiving only such standing as employees as might be granted by managements after their return or later determined by the commission provided for in the proposal. . . ."

Negotiate With Brotherhood Leaders

Following the general meeting of the member roads of the Association of Railway Executives on Wednesday, which, by a vote of 254 to 4, had reaffirmed the executives' previous stand on seniority, 25 or more roads—representing with subsidiaries 52 Class I carriers—continued negotiations with the five brotherhood leaders.

These roads announced, as was reported in last week's *Railway Age*, that they proposed to make no agreement which would contravene the seniority stand of the association as a whole. It was stated that these lines were in a position to take back all of their men who had been on strike. The conferences with the five train service leaders, acting as mediators, began Wednesday evening. They continued all day Thursday and broke up about Friday noon, with the announcement that the results had been nil.

The carriers, in what came to be called the "rump convention," were represented in the conference by a committee of five. The chairman was Daniel Willard, president of the Baltimore & Ohio, and the other four were Charles Donnelly, president of the Great Northern; N. D. Maher, president of the Norfolk & Western; A. H. Smith, president of the New York Central, and Hale Holden, president of the Chicago, Burlington & Quincy. Others of the executives joined in the discussion. The train service leaders were the same five that conferred the preceding week with the committee representing the executives as a whole.

The first official announcement that the conferences, like the other conferences preceding them, had resulted in failure was contained in a statement by Daniel Willard, chairman of the executive committee. It was followed by a statement of the train service leaders issued in the form of a communication to the executives and the shop leaders. The shop leaders also made public a report which they were about to send to their rank and file The report reviewed the situation as a whole. It said that the shopmen had gone the full limit in the interest of peace. It concluded with this statement: "If we must fight, we'll show we know how. Now that the issue is again clearly defined and false hopes of early peace dissipated, the fight must be renewed with increased vigor and every man must do his full part to bring it to an early and successful conclusion. What will be your answer to the challenge?"

Would Take Back All Employees

The statement issued Friday by Daniel Willard, president of the Baltimore & Ohio and chairman of the committee representing the 25 roads, reviewed the situation as follows:

Following the general meeting of the Association of Railway Executives held in New York day before yesterday, a group of railroad presidents representing 52 companies with an aggregate mileage of 85,000 miles of line, continued in conference with the leaders of the five train and engine men's brotherhoods who had been acting as mediators for a further discussion of the shop crafts' strike. Conferences between a small committee representing these railroads and the brotherhood chiefs were held at the Yale Club, New York City, Wednesday evening, during a large part of Thursday and this forenoon. These railway executives, mindful of the increasing demands for transportation incident to the season of the year and anxious on that account to do everything that might be possible and practicable to bring about a settlement of the existing controversy, were hopeful that a further discussion might develop some plan or method for settlement which would not require the sacrifice of principles deemed fundamental by either party to the controversy.

Having in mind the normal requirements of the carriers for men of the shop crafts at this season of the year, together with the increased requirements resulting from a reduced working force for nearly two months, these companies, while unwilling to agree to any program or method of adjustment which would affect the rights or privileges of employees of the shop crafts who did not take part in the strike or those who had been employed since July 1, were willing to pledge themselves to find employment for all of the striking employees not guilty of proven acts of violence at their usual class of work, at the rates of pay fixed by the United States Railroad Labor Board and at the same terminal point.

With this important phase of the controversy disposed of there remained only the problem of reaching an understanding concerning the future relations between the railroad employees themselves

and between the employees who had been on strike their employing companies.

The railroads disclaimed any desire to take advantage of the situation to curtail the pension rights or other privileges which the striking employees had earned by virture of their term of service with the company and the roads in this conference agreed to take back all employees with such privileges unimpaired. These railroad companies felt at liberty to do this because such action on their part would not in any way affect or prejudice the rights or privileges of others who did not participate in the strike.

The railway executives also agreed that if after the men returned to work there remained any unsettled disputes growing out of the situation which the companies and the representatives of the employees were unable to settle in direct conference, such matters should be referred for final determination to a commission of ten members to be made up of the chief executives of the five train and engine men's brotherhoods who were acting as mediators, and five railway executives experienced in matters such as would naturally come before a committee of that kind.

The railway presidents also proposed that if an agreement could be reached along lines substantially as indicated above, they would endeavor to carry out the agreement in a spirit of conciliation and sincere purpose to effect a general settlement of all matters in controversy resulting from the strike. The railway executives were certain that, while making substantial concessions to the men on strike, such a settlement as proposed would in no way sacrifice the rights or privileges of the loyal men now employed on the properties represented.

The committee of mediators worked earnestly and helpfully with the carriers in an effort to bring about an acceptable adjustment. The railway executives who took part in the conferences sincerely regret the representatives of the striking employees, although definitely assured the substance of all that they asked for, were unwilling to agree to a settlement except under conditions which the railway executives were unwilling and unable to accept.

It is difficult to imagine any fairer basis of compromise than the one developed at yesterday's conference and agreed to by the carriers represented. It must be assumed, therefore, that the present controversy cannot be settled by that method.

52 Class I Carriers—85,000 Miles of Line

The following railroads participated in the conference and agreed to the proposition submitted by the carriers and declined by the striking employees.

Alabama & Vicksburg
Baltimore & Ohio
Buffalo, Rochester & Pittsburgh
Chesapeake & Ohio Lines
Chicago & Northwestern
Chicago, Burlington & Quincy
Colorado & Southern
Wichita Valley
Fort Worth & Denver City
Chicago, Indianapolis & Louisville
Chicago, Milwaukee & St. Paul
Chicago, Rock Island & Pacific
Chicago, St. Paul, Minn. & Omaha
El Paso & Southwestern
Erie
Hocking Valley
Lake Erie & Western
Louisiana & Arkansas
Minneapolis & St. Louis
New York Central Lines
Cleve., Cin., Chicago & St. L.
Michigan Central
New York Cent. incl. B. & A.
Pittsburgh & Lake Erie
New York, Chicago & St. Louis
Norfolk & Western
Norfolk Southern
Northern Pacific
Seaboard Air Line
Trinity & Brazos Valley
Virginian
Wheeling & Lake Erie
Winston-Salem Southbound

[The foregoing list does not include the names of subsidiary companies.]

Report of the Mediators

The train service leaders on Friday addressed a communication to Chairman Willard and to Bert M. Jewell, president of the Railway Department of the American Federation of Labor. The statement was signed by L. E. Sheppard, president of the Order of Railway Conductors; W. N. Doak, vice-president of the Brotherhood of Railroad Trainmen; W. S. Stone, grand chief of the Brotherhood of Locomotive Engineers; D. B. Robertson, president of the Brotherhood of Locomotive Firemen and Enginemen, and T. C. Cashen, president of the Switchmen's Union of North America.

The communication said:

The undersigned together with the chief executives of the other standard recognized railroad labor organizations not on strike, on invitation of the representatives of the shop men and others on strike which began July 1st last, offered their good offices as mediators in the controversy with the hope that a mutually acceptable settlement might be reached with regard to the one particular question which seemed to be the only stumbling block, viz: The fundamental rights of men on strike and their seniority standing when they resumed work

The offer was accepted and an interview was sought with President Harding and conferences with the President were held on the 12th inst., the question being presented to him from all angles. The President met a committee representing the Railway Executives' Association following his meeting with us on the 12th He also met them on Sunday, the 13th, but no progress toward settlement was made, but we were advised from the White House that the committee representing the railway executives were willing to meet the chief executives of the train and enginemen's organizations since which date mediation has been conducted by those whose signatures appear hereto.

The nine chief executives also met President Harding on the afternoon of the 14th and inasmuch as nothing had been accomplished at the Washington meeting the mediators came to New York and conferred with a committee of the railway executives on the 17th and 18th insts., but these efforts brought no satisfactory results.

Fully appreciating the seriousness of the situation confronting the people of the United States and with the determination to use every possible effort and every ounce of energy at our command we requested a conference with the entire body comprising the Railway Executives' Association which was at once arranged for, to be held in New York the 23rd.

At this meeting we presented the subject as briefly but as explicitly as we could, and made a recommendation for consideration by the entire body. Coupled with the recommendation was a request that if it were not accepted we would be glad to meet such members of the executive association as might look upon it with favor, or who would meet with us in further efforts to reach a solution of the problem. We were later advised that the recommendation was declined practically unanimously but that the chief executives representing 52 railroads with approximately 85,000 miles of track, were willing to meet us to give further consideration to the subject.

Conferences with a committee consisting of six railroad presidents, representing this group, were held on the evening of the 23rd, also two conferences on the 24th and again this morning, without avail.

While our conferences with both sides were most pleasant, we found we could not present a recommendation acceptable to both, because both parties insisted throughout that their respective contentions were based on principles which could not be set aside and which must be observed at all cost.

We reluctantly notify all concerned that we consider further efforts futile and with much regret announce that we have nothing more to suggest.

Shop Crafts Strike Committee Reports to Men

The report of the conferences sent out to the rank and file of the striking shopmen by the shop crafts strike committee was a detailed review of the situation as a whole, having special interest because it contained the text of the railway executives' offer and the shopmen's reply. The report follows:

In accord with our previous information to you the Railway Executives' Association met in New York City on August 23 in response to call of its executive committee to consider the proposals made on our behalf by the chief executives of the transportation organizations acting as mediators. . . .

After lengthy argument to the effect that a solid front on their part would break the morale of the men on strike and they would flock back to work, the executives voted to reaffirm their declaration of August 2—when in reply to President Harding they stated that they would not agree to the strikers returning with their seniority and other rights unimpaired.

However:—Within 24 hours after this declaration was adopted the executives of 52 Class I roads from the big meeting were giving consideration to ways and means of reaching a settlement without stating that they yielded on the seniority question. We may well question the good faith of any statement that they wished to really give the men their seniority rights as they positively refused to agree to a proposition that all strikers be *reinstated* claiming that reinstatement carried with it all seniority and other rights.

Several conferences were held, the mediators going from one meeting to the other, covering three days, with night sessions by both parties. Out of these sessions there developed the following as the final and maximum offer of the railroad executives.

Text of Executives' Maximum Offer

"1 In order to bring to an end the existing strike of shop employees upon the undersigned railroads and relieve the country from the adverse defects thereof and to expedite the movement of essential traffic, the following memorandum of agreement is made upon the understanding, which the parties hereto accept, that the terms hereof shall be carried out by the officers of the companies and the representatives of the employees in a spirit of conciliation and sincere purpose to effect a genuine settlement of the matters in controversy referred to below.

"2. All men to return to work in position of the class they originally held on June 30, 1922, and at the same point and as many of such men as possible are to be put to work September 1 at present rates of pay and all employees who have been on strike to be put to work or under pay not later than October 1 next, except such men as have been guilty of proven acts of violence.

"3. The relative standing as between themselves of men returning to work and men laid off, furloughed or on leave of absence, including general chairmen and others who were as of June 30, 1922, properly on leave of absence, will be restored as of June 30, 1922, and they will be called back to work in that order as defined above.

"4. If a dispute arises as to the relative standing of an employee or employees or if any other controversy arises growing out of the strike that cannot be otherwise adjusted by the carrier and said employee or employees, the matter shall be referred by the organizations parties to this agreement, the employees or the carrier in the interest of any employee who may be aggrieved to a commission to be established and constituted as hereinafter provided, for final decision by a majority vote.

"5. The commission referred to in paragraph 4 hereof shall be composed of the five chief officers of the train service brotherhoods and five railroad officers, experienced in matters of this kind and selected from among the railroads agreeing hereto. This commission shall be constituted forthwith upon the signing of this agreement and shall have jurisdiction to decide all cases that may be referred to it on or before May 21, 1923, but not thereafter.

"6. Inasmuch as this agreement is reached for the purpose of composing in a spirit of compromise this controversy with those crafts on strike on the railroads signing same, all parties hereto agree that neither this settlement nor any decision of the commission above provided for shall be used or cited in any other controversy between these parties or between the railroads signing the same or any other class or classes of their employees in any other controversy that may hereafter arise.

"7. Both parties pledged themselves that no intimidation nor oppression shall be practiced or permitted against any of the employees who have remained at work or have taken service or against those who resume work under this understanding.

"8. All suits at law now pending as the result of the strike to be withdrawn and cancelled by both parties."

Reply of Shop Craft Representatives to Proposal Submitted by Committee of Railroad Executives

After fully discussing every possible angle and phase of the situation the following reply was made:

"We have the proposal providing the terms which are suggested as a basis on which only part of the men on strike on certain railroads may return to work. Consideration of a proposal of this nature must necessarily embrace a serious consideration of the cause of the existing conditions and all matters leading thereto, as well as the effect of any steps taken at this time, as they will affect the welfare of the men involved and the peace, stability and efficiency in the railroad industry.

"The strike occurred because of conditions intolerable to the men, coupled with excessive reductions in wages. In accepting the proposal of President Harding, of July 31 of this year, the representatives of the men involved agreed to resumption of work without a settlement of either of the two remaining issues that were originally involved in the difficulty, namely those concerning wages and working conditions. In agreeing to resume work, and leave these matters to the Railroad Labor Board for rehearing, the men made all the concessions that should be required or expected of them in the interests of peace in the industry—the other issue involved in the strike, that of contracting out of shops and work, having been declared illegal by the Railroad Labor Board and all other government authorities that considered the matter. The question of the standing of the men on strike as railroad employees was not an issue until injected by the railroad managements, and only became an issue when railroad managements refused the terms of agreement proposed by President Harding.

"To accept or submit for acceptance the present proposal that carries no visible guarantee or assurance of protection of the rights or standing of the men as railroad employees held by them prior to strike and earned by years of continuous and efficient service, would mean that we ask the men on less than one-third of the roads affected, to return to work yielding to every demand of railroad management, receiving only such standing as employees as might be granted by managements after their return or later determined by the commission provided for in the proposal, and that the employees of less than one-third of the mileage now involved returning to work under such conditions, would leave the remaining employees of more than two-thirds of the mileage out of railroad employment and by returning to work would in that measure destroy the effectiveness of the strike as of today. Even on the roads represented the proposal does not contemplate the return to work of all men on strike. It only includes those who come under the heading of shop crafts, while it is known and agreed that many men other than those coming under this designation are at present on strike.

"There is no intent on our part to question the integrity of the officials of the roads now conferring, but it must be obvious to all that definite action can be taken only on matters clearly defined in any proposal made. Our first concern must be the interest of all the men involved. We, the representatives of the men on strike, cannot recommend to the men the acceptance of this proposal without deliberately sacrificing the interests of the men involved. We fully appreciate the help, interest, and efforts of the transportation organization executives in their capacity as mediators, and we regret it if compelled to report to our people that their splendid efforts failed, because of the arbitrary position taken by the carriers, to produce some clear concrete proposition that we can present to and conscientiously present to the men we represent for acceptance."

Conditions Favorable for Success, Say Leaders

The leaders of the so-called stand-patters among the executives have boasted that as soon as the men see how competent the roads are they would come running and crawling back begging for their jobs under any conditions that the executives chose to make.

We believe the railway executives are mistaken, and this mistake is in some measure due to the fact that the news of the conference and of possible peace have deterred our membership from actively prosecuting the strike, and the executives mistake this well intended inactivity for apathy and indifference. Despite the boast of the executives, we know, and government reports show, that the number of bad order cars and engines is increasing daily and at an alarming rate. With honest and adequate inspection enforced the number would be doubled overnight.

The best trains on all roads are arriving later each day, accidents due to defective equipment are increasing and causing public alarm and attracting government notice. The strike is just now becoming really effective.

The coal miners have just won their fight lasting 20 weeks. The coal dug will be an added burden to be carried by the roads. The textile workers of Lawrence, Mass., have just won their three-months' strike against reduction in their wages. The labor union crushers are having poor luck in their country-wide campaign. All industry is on the up-grade. Material of all kinds is in demand and the harvest must be moved.

If there was ever a strike that had every favorable condition surrounding it, this is it. If this can be lost now, no strike could ever be won.

Roads Declined to Desert New Men

Daniel Willard, president of the Baltimore & Ohio and chairman of the group representing the 52 roads willing to make a separate settlement, in a statement issued Monday, supplemented the report of the conference which he issued after its close on Friday. In this statement he included the following:

Having in mind the normal requirements of the carriers for men of the shop crafts at this season of the year, together with increased requirements resulting from a reduced working force for nearly two months, these companies were willing to pledge themselves to find employment for all of the striking employees not guilty of proven acts of violence, believing that the requirements of the situation would afford ample work for all for many months to come. It should be clearly understood, however, that at no time did any of the railroad presidents agree, nor would they agree, to make any settlement that would in any sence adversely affect the rights or the privileges of the old men who did not go on strike, or the new men who had been hired since the strike began. . . . .

The railway managers felt that the seniority rights which had been gained by the employees who remained in the service under well established rules were as much a part of their compensation as the money which they had received in wages, and they were not willing, under any circumstances, nor did they feel they had a right, morally or legally, to take from the men who had remained at work any part of their compensation, whether represented in money earned or privileges acquired. I think it must be admitted that the railroad executives of the minority group in their efforts to reach an agreement made every reasonable concession possible in order to accomplish that result. They were not willing, however to look upon their promise to the men already in the service, whether the promise was verbal or in writing, as a scrap of paper to be thrown aside at will. Short of that one thing, they were willing to grant every other concession which the men requested. It must be apparent, therefore, that no compromise settlement of

the situation is possible unless the railroad executives are willing to accept the policy that a promise or contract is something to be broken and not something to be kept.

Why Were the Concessions Rejected?

Observers profess to find it difficult to understand the unwillingness of the shop crafts leaders to accept the concessions offered by the group of 52 railroads. The shop leaders' rejection of the offer was apparently predicated on two grounds. One was that the concessions were in such form as not to concede to the strikers the entire seniority issue. The other—and there are many who give this factor increasing importance—is the lack of desire on the part of union leaders to make anything but a national settlement of the strike. The impression is that the shop leaders are gambling on the hope that equipment deterioration or congestion will continue to increase until the public becomes aroused or until conditions otherwise become so acute that the railroads will have to submit as a whole, the weaker roads requiring the other roads to come in with them on a national agreement.

It is also pointed out that for the shop leaders to have agreed to settle with the 52 roads would have been an admission of defeat not only as relates to the other roads not parties to the settlement, but as relates also to the broader issues of negotiations on a national basis, national agreements, etc., which have played leading parts in the shop crafts' program. The view expressed in the strike committee's statement to their rank and file reflects this view in that it mentions the idea that to give in to one-third the roads would mean the desertion of the men on the other two-thirds of the roads. This feature of the shop leaders still adhering to their desire for a national settlement is given great importance in many quarters. Many who earlier in the strike expressed the opinion that it was a strategic mistake from the union's point of view to have called a strike at all now supplement this opinion with the belief that the rejection of the offer of the 52 roads last Friday was a similar strategic mistake.

With reference to the mistake embodied in the strike call, they have hitherto pointed out that the inadvisability of the strike was promptly shown by the manner in which the original issues in the strike were dropped and made secondary to a new issue—seniority. The new development resulting from the rejection of the possibility of separate settlements is the opinion that the shop leaders are continuing to play a losing game. The idea is expressed that the number of roads that are in a position to take back all of their strikers is steadily decreasing as recruiting continues. Some of the roads are in a very good position and as time goes on they are reaching a better position and, in addition, are being joined by other roads which earlier in the strike and for one reason and another did not have a great success in bringing their forces up to normal.

The roads that are in most favorable condition are now at the point where they have established company unions or where they are in a position which approaches open shop conditions. It is very difficult to believe that conditions on these roads will do else than improve, in which case the effect on the shop unions will be decidedly adverse. Analysis of conditions such as these, the observers believe, indicates that Jewell and his strike committee would have made much the wiser decision had they secured such settlements as they could have made and salvaged as much as they could of the structure which they have now succeeded in tumbling about their heads. The impression on the part of these observers is that, at least, the shop strike committee is following very poor strategy. Some of the observers go so far as to declare that the shop leaders are carrying out a program which will prove detrimental to later unionism as a whole, simply in order to save their own faces in the situation which has arisen. One executive to whom these ideas were taken supplemented them by saying that it was his belief that before the thing was over the railroad shop unions would be back where they were 25 years ago and that by their unskillful activities they would have lost all the gains which they succeeded in securing over a long term of years and during Federal control in particular.

It is a general opinion that a compromise settlement of the strike has now become no longer possible. The strikers' leaders still express optimism—in public, at least—and speak with a measure of enthusiasm of the spirit which existed among the strikers in the East, as well as in the West. The executives, however, are more inclined to believe that developments will result in the gradual dying out of the strike, rather than in a settlement of it. In other words, they expect that forces will gradually be recruited to normal and the strikers finally will either return to work or seek employment elsewhere. This would have been possibly a too optimistic view even one week ago, but every tendency at present seems, it is believed by observers, to be in that direction.

Some Delays to Fast Freight

As the strike closes its ninth week, there is evidence that the walkout of the shopmen is having some effect on railway service, although, in general, reports are that in most centers conditions are gradually improving. Passenger trains, however, are still running late on many roads; fast freight service is not being handled absolutely on schedule and there has been congestion—in most cases temporary in character—at various terminals. Investigation shows that perishables and live stock from Chicago, which should be given third-morning delivery at New York, are arriving one day behind schedule. Other fast freight between Chicago and New York has a schedule calling for fourth-morning delivery at New York; this schedule is not being met. In the case of slow freight service congestion is reported at various places, but on the whole complaints of delayed movement are not being heard as yet in sizeable quantity. It is to be presumed that the delays to passenger and fast freight trains result to some extent from engine trouble, although it is difficult to determine how much may be due to that cause and how much to increasing demands for transportation service.

It is pointed out, however, that in the majority of instances traffic is being handled without undue difficulty, and certainly with less difficulty than the recent complications of strike and increasing traffic might be expected to warrant.

Federal Inspection Shows Equipment in Good Condition

The report of the condition of locomotives made by the Bureau of Locomotive Inspection of the Interstate Commerce Commission, as reported to the Senate on Tuesday, showed that the statements given out by the labor leaders to the effect that equipment was being operated in unsafe condition are wholly without foundation. The inspectors examined 4,885 locomotives at 717 different points. Of these, 2,456 showed conditions that are noted as defects under the Inspection Act. Only 169 were found to be not safe to operate and were ordered taken out of service. Of the remainder, the report stated that 992 locomotives had more or less serious defects and 1,295 had defects which would not give cause for immediate concern, but, in ac-

cordance with sound mechanical practice, should undergo repairs.

In reporting the results of the inspection the commission said: "The reports of our inspectors indicate a very general let-down in the matter of inspection by the carriers, which gives cause for concern." The opinion was expressed by one mechanical officer that it is hard to see how the commission reached this conclusion from the reports of its inspectors if any comparison was made with the reports for preceding years. The per cent of locomotives found to have minor defects in July of this year was 60.1, which is not much higher than usual. In the fiscal year 1918-1919 the percentage was 58; in 1919-1920, 52, and in 1920-1921, 49.7. If the roads were using equipment in unsafe condition, it would certainly be disclosed, it is pointed out, by the per cent ordered out of service. The reports for July show that 4.14 per cent of the locomotives inspected were ordered out of service, but in 1920-1921 the inspectors condemned 6.44 per cent; in 1919-1920, 7.65 per cent, and in 1918-1919, 7.41 per cent of the locomotives inspected. This is considered as indicating conclusively that fewer locomotives are being operated with serious defects at the present time than has been the case in previous years.

Locomotives to Be Repaired by Industrial Concerns

A new development in the strike during the past week or two has been the placing by various roads of contracts for equipment repair work with outside industrial concerns other than the regular car and locomotive builders. In most cases these contracts to outside concerns supplement repair work done in the railroad's own shops and repair contracts lately let to the regular builders.

One road which has entered upon an extensive program of this kind is the Erie. That road has recently been reported as having contracted with the Baldwin Locomotive Works and the American Locomotive Company for repairs to locomotives. It has let a number of contracts for heavy car repairs with various car-building plants and is about to let further contracts which will bring the total number sent to outside shops to 8,800. The new development is the sending of locomotives to industrial plants for heavy repairs. The Erie requires heavy repairs to about 75 locomotives monthly. Its own shops are now turning out about 25 monthly. The locomotive builders and the other industrial concerns which are undertaking to do locomotive repair work will take care of 50 more, with the result that the requirement of 75 will be met irrespective of whether improvement in the strike situation continues or not.

Other roads are understood to be taking care of part of their locomotive repair requirements similarly.

Buffalo & Susquehanna Offers Seniority

The Buffalo & Susquehanna, in a letter signed by President E. R. Darlow and dated August 24, has added its name to the list of roads willing to make a separate settlement and because it has as yet made no attempt to fill the places of its strikers, it is able to concede the seniority issue. The letter addressed to the former shop employees, said:

About four-fifths of the traffic of the Buffalo & Susquehanna being coal and coke, and there having been practically no such traffic since April 1, as a consequence of light earnings, it had been necessary to reduce the force prior to July 1, and when the shop crafts' strike came, it anticipated a further reduction of the forces for the same reason. Because of the absence of this traffic, and having in mind the fact that a majority of our employees are permanent residents of Galeton, many of them owning their own homes, the management did not take any steps to employ new men; and as all of the old men left the service, the question of the seniority status of such men as may come back into the service is not affected by the status of men who remained in the service or were employed subsequent to the strike; so that the former employees are now out of service because of a failure to settle a dispute on other railroads which has no application to this railroad.

6,499 Men Recruited on August 26

The total number of shopmen recruited by all the country's railroads on August 26 totaled 6,499, which was the largest number of men recruited on any single day since the beginning of the strike. The total exceeded by 624 the recruiting for the best previous day. Several railroads report that a large number of their new recruits are union men on strike on other roads. The forces in some of the shops are reported as having a percentage of 50 per cent of strikers from other roads.

Shop forces on the Eastern roads were reported as having reached 74.9 per cent of normal on August 25, this being a gain of 6,145 over the preceding week. L. F. Loree, president of the Delaware & Hudson, in his capacity as chairman of the Eastern Presidents' Conference, issued a statement following a meeting of the conference on Monday, as follows:

"The railroads in the Eastern district report their shop forces for the past five weeks to have been as follows:

	Number	Per cent	Weekly gain
July 25	97,724	62	...
Aug. 4	103,528	64.7	5,804
Aug. 11	111,324	69.0	7,796
Aug. 16	115,745	71.5	4,421
Aug. 25	121,890	74.9	6,145

"About 40,000 additional men will be required to bring the force up to the full roster of July 1. It is conservative to say that in four or five weeks all the places will be filled, even were the men now on strike not to seek re-employment. With the present force working 60 hours a week, as against the old force working 40 hours a week, the roads are getting more than a million man-hours of work more now than they were before the strike.

"The constant criticism of railroad operations has had the effect of preventing their really fine performance from being recognized. Last week they moved all the coal offered, about 54 per cent of a normal production. They moved 10 per cent more traffic than in the corresponding week in July. They had 4,918 locomotives in good order stored ready for service and 153,880 surplus freight cars on hand in good order. This was for the whole country. The situation in the East was better than the average."

The number of shopmen reporting for duty on the Pennsylvania System on August 29 rose above 93 per cent of a full normal working force. The reports from all regions show 51,132 men on duty, an increase of the past week of 827, and a gain as compared with the low point of the strike which was reached July 5, of 12,847.

The Erie on August 29 had 7,196 shopmen at work, 68 percent of its force on June 30, prior to the strike. The total includes 2,074 men who did not go on strike and 325 strikers who have returned to their jobs.

The Baltimore & Ohio, which was one of the roads which held the strikers' places open for some time after most of the other roads, but which began to fill them after negotiations looking to a separate settlement failed, reported on August 28, 60 per cent of a normal force. At Mount Clare shops 1,600 men are employed and something over 50 per cent of normal heavy repairs were turned out during August. The Baltimore & Ohio is still having difficulties handling traffic and has diverted considerable business to other roads.

Southern Has 36 Per Cent Normal Forces

The Southern Railway, which did not begin recruiting to fill the places of its strikers until August 15, reported on August 24 that it had 36 per cent of a normal force. In a statement issued August 24, President Fairfax Harrison said:

"Since we began recruiting August 15 the Southern Railway system has every day added to the skeleton force it had in its shops and round houses and now has all told 4,165 shopmen at work. This is 36 per cent of a normal force, but, what is more important, there are at work 20 per cent of normal roster of skilled craftsmen. All new men are rigidly examined for mechanical ability before they are employed, but there seems to be no lack

of candidates able to pass the tests, especially since the failure of the last negotiation for settlement of the strike. More new men will be added every other day."

Strike Conditions in Western Territory Show Continued Improvement

Continued improvement in conditions resulting from the shopmen's strike has been reported by practically all of the western carriers during the past week. The western lines on August 25 reported that 88,911 men were employed in their shops, an increase of 30,838 men since August 1, when the number employed was 58,073. The shop forces on that date were approximately 56 per cent of normal, the total number of shop employees on the western lines before the strike began being about 159,000, according to the Western Presidents' Committee on Public Relations.

"As these figures show," an announcement made on August 27 said, "there is a steady increase in the number of men at work. There are a few places where service is being interfered with by walkouts of employees in violation of their contracts, but it should be noted that the real interferences with operation are not due to the shop employees' strike. Except where these conditions exist the railways are handling all the traffic offered and on almost all western lines car loadings are substantially larger than they were a year ago or than they were this year before the shop employees' strike began."

The last week has not been without the usual quota of rioting, slugging, bombing and attempted intimidation directed at both the men now at work in the shops and members of the train service organizations who are free to determine whether or not their work now involves additional hazard. While the damage both personal and property from these outbreaks has been considerably smaller than it has been in previous weeks, this has been due more to fortunate circumstances than to any change on the part of those bringing about the disturbances.

Interest has been centered during the past week on the Chicago & Alton because of trouble at several small terminals. For some time minor disturbances have been reported at Roodhouse, Ill., on that road, culminating on August 25 in the attempted bombing of railroad property there. As a result of these developments members of the train service brotherhoods, particularly the trainmen and firemen, refused to continue work on the ground that these conditions made their work unsafe. Their action temporarily tied up the road and resulted in practically isolating Roodhouse and the surrounding villages. No serious inconvenience was caused, railroad officers handling the only passenger trains affected to other division points from which they continued to their destinations. The walkout did, however, result in curtailing both freight and passenger train movements and necessitated the rerouting of traffic for several days. The trouble at Roodhouse was ended on August 29 when members of the striking brotherhoods agreed to return to work after the national officers of the trainmen's and the engineer's organizations had instituted investigations of the unauthorized walkout and the trainmen were threatened with the loss of their union charter.

The agreement under which the strike at Roodhouse was ended provided that for the present night work would be eliminated as far as possible and that the men would not be required to take out locomotives which they believed to be defective.

Another cheerful report told of the end of the sporadic strike of train service employees at Joliet, Ill., on the Elgin, Joliet & Eastern. This settlement was based on the offer made to the strikers two weeks ago to the effect that the state militia on guard there should be withdrawn a short distance from the gate leading to the shops.

Similarly, train service employees of the Missouri Pacific who have been on strike at Jefferson City, Mo., agreed to return to work after having been out for several days. At Slater, Mo., where the train service employees of the Chicago & Alton have been out since August 26, conferences are being held and it is expected that the men will return to work immediately.

While the reports of settlement of these unauthorized walkout have exceeded the announcements of new moves of a similar nature, there are still several points in western territory where the men have either left the service or are threatening to do so.

The bombing of railroad property and the homes of loyal employees continues to be a pastime of strikers or strike sympathizers. Among the reports of this character which have appeared in the press during the past week are the following: a Chicago, Burlington & Quincy bridge at Spanish Lake, Mo., the Chicago & Alton shops and roundhouses at Roodhouse and Venice, Ill., the bridges of the same road near Roodhouse, the shops of the Chicago & Eastern Illinois at Danville, Ill., and the homes of loyal employees at Garrett, Ind., San Barnardino, Cal., and Montgomery, Ala.

Rioting, slugging and various forms of attempted intimidation have likewise been reported at New Orleans, La., where an Illinois Central work train was stoned, and at Herington, Kans., Shawnee, Okla., Little Rock, Ark., and Garrett, Ind.

Frequent reports of attempts to wreck trains have been made during the past week from various points in western and southern territory, but fortunately none of these attempts have resulted in great damage or in loss of life. Attempts to destroy property by bombing were reported at Sheboygan, Mich., Baring Cross, Ark., and Princeton, Ky.

Conditions on the Western roads were described on August 30 by the Western Presidents' Committee on Public Relations as follows:

"The opening of the coal mines in this territory has been followed by a relatively very large increase in the amount of coal being moved by the railways. The Illinois Central, the Chicago, Burlington & Quincy and the Chicago & Eastern Illinois under normal conditions originate a large coal traffic The total amount of coal loaded by these railways on August 22 was 1,202 cars. On August 26 this had increased to 2,679 cars and on August 29 to 3,924.

"The Western railways continue to report substantial increases in the number of men at work in their shops. The number of shop employees on August 29, the latest date for which the figures are available, was 92,229, an increase of 34,154 men since August 1. The number of shop employees of the Western railways is now 59 per cent of what it was before the shop employees' strike began."

Men Arrested in Connection with Gary Wreck

Four striking shopmen are under arrest and two others are being sought in connection with the Michigan Central express train wreck at Gary, Ind., on August 19, as reported on Page 392 of the *Railway Age* of August 26. Since the wreck, Federal, State, city and railroad police have been working on the case, and it is reported that the $5,000 reward offered by the Michigan Central for information which would lead to the arrest and conviction of the men responsible for the wreck resulted in a tip to the offices of the railroads' police forces which led to several arrests.

It is reported that a confession has been obtained from one of the men under arrest, in which he alleged that leaders of one of the shop craft local organizations told the men to "go out to Gary or somewhere in that neighborhood and jimmy up the track to cause trouble and make it appear that equipment is in bum condition and that it is dangerous for train crews to ride trains." According to the report, this man also claimed that plans had been made to wreck the Twentieth Century near Elkhart, Ind. These developments are being watched with interest by railroad officers.

M. of W. Employees Demand 48 Cent Minimum Rate

Labor Board Refuse E. F. Grable's Request for Approval of the "Living Wage" Principle

A DEMAND that the Railroad Labor Board immediately adopt the principle of the "living wage" and that the minimum rate of pay under this principle be set at 48 cents an hour, was served upon that body at the opening of the hearing on the wages and working conditions of maintenance of way employees on August 28. E. F. Grable, president of the maintenance of way employees' organization, and W. J. Lauck, "economist" for that organization, presented the demand, the former inferring that it must be met "regardless of all other considerations," and the latter analyzing the Transportation Act in an effort to prove that the term "just and reasonable wages," as used therein, was meant to be and is synonymous with a "living wage."

Mr. Grable, in opening the case for the maintenance of way men, painted a picture of the "dismal and hopeless" lives that the members of his organization have been forced to lead and their "struggle for actual existence" under the rates of pay fixed by the board, adding:

"These conditions cannot longer continue. If the board is to measure up to the standards of justice and equity upon which it was founded, it cannot give further sanction and approval to such conditions. To do so, would make it a by-word among railway employes. It would become the symbol of shame and hypocrisy —a mockery of justice. No matter what the financial condition of the railways may be; no matter what the alleged problems of post-war reconstruction, deflation, or railway financial rehabilitation may be, the necessity of the maintenance of way employes receiving living wage cannot be longer evaded or ignored.

"Our primary object in appearing before you today is not, therefore, to enter into any abstract argument as to the principle of the living wage. On the contrary, we assert our right to a living wage. We now know that the Transportation Act guarantees us this right. We are asking you merely to comply with the law, and to give us what according to the law is ours and of which we have been deprived during the past two years. Our conviction is, in the light of developments since we last appeared before you, that if we are again denied a living wage, that it will be incumbent upon this Board to demonstrate to the Chairman of the Senate Committee on Interstate Commerce, and to the President of the United States why it is not applying the law according to the purpose and intent of those who framed it. We are convinced that it is no longer a matter of argument but the plain duty of the board to accept and give a practical application to the living wage principle."

The board, Mr. Grable charged, has taken the "standards of compensation as it found them to be just, reasonable and adequate," and has merely increased or decreased these rates as the cost of living rose or fell. This, he contended, proves that "there has been no recognition of the 'living wage' in principle." To support his contention that the board has erred in not recognizing this principle, Mr. Grable said: "Senator Cummins, chairman of the Senate Committee on Interstate Commerce and the author of the Transportation Act, has publicly declared that it is the intent of the law to give the humblest worker the right to a living wage and, in order to avoid any possible misunderstanding or interpretation, he had prepared and would submit an amendment of the law clearly setting forth this purpose of the law for the guidance of the board."

Mr. Grable's specific request for a minimum wage of 48 cents an hour would place the yearly wage of section men at $1,175.04 per year, which he maintained is an "extremely moderate request."

"The railroads can afford to pay this wage," Mr. Grable said, "without any dislocating effects and without any financial disadvantages accruing to stockholders or shippers. It could have no injurious effect upon private industry. This request, in brief, is not only just and reasonable, but merely within the range of practical application. We are expecting for this reason to have the full amount of the minimum rate of 48 cents an hour awarded to us by the board. Because we are so restrained in our attitude and because our request is so reasonable and conservative, no smaller amount will be satisfactory."

The last wage decision of the board affecting maintenance of way employees was a "colossal blunder," according to Mr. Grable, and "indefensible from the standpoint of economical and efficient railway operating policy."

"The Board," Mr. Grable added, "we believe, should now come forward with real courage, acknowledge its blunder and at least place our membership on a subsistence level by awarding a minimum rate of not less than 48 cents an hour. The entire country will approve of such action."

A "Just and Reasonable" Wage Means a "Living Wage"

Mr. Lauck formally requested the board to accept the "living wage" principle, make it the basis of its action in the present case and hand down a formal ruling before proceeding further. In explaining his request for this ruling, he said that it meant "that the board accept and make the basis of its decision in this case, as well as part of its general policy in fixing the wage rate of railway employees, that (a) adult workers of the lower grades, unskilled railway employees, be awarded rates of pay which will enable them, under normal conditions, to earn yearly an amount sufficient to permit them to maintain standards of living that are approved as healthful and decent and that are promotive of genuine industrial economy and efficiency; and (b) that proper differentials above this minimum living wage be paid for added skill, responsibility, training and hazard."

A large part of Mr. Lauck's supporting arguments dealt with an attempt to construe the terms "just and reasonable," as applied to wages, to mean the "living wage" and that changes in the cost of living and other similar factors should not be taken into consideration until this "living wage" has been established in the railroad industry. The inference from his remarks was that the labor board had never followed the instruction given it in the law as he interpreted it and that the board, therefore, must now set to work to establish initial basic rates, "just and reasonable" wages, or the "living wage," the terms meaning the same thing, according to his interpretation.

The seven "relevant circumstances" enumerated in the Transportation Act as factors which should be considered by the board in fixing "just and reasonable" wages "assume the prior existence of some substantially 'just and reasonable' wage system and themselves provide merely for changes to meet changing conditions and for the correction of maladjustments in particular instances," it was Mr. Lauck's contention.

Mr. Lauck Asks Board to Make Up "Deficiencies" in the Law

After expressing his approval of the Transportation Act as a "sound and acceptable" law, Mr. Lauck pointed out that, whereas those clauses in the law aimed at the protection of property interests in the railroads are specific, those meant to protect the right of railroad labor are not so definitely expressed or developed with so much detail. "De-

ficiencies in the labor provision of the act" could be overcome, he said, first, by the passage of an amendment by Congress and, second, by rulings of the board, such as the "living wage" ruling requested by the employees.

"These rules would, of course, consist of pronouncements to the effect that the board had accepted certain principles and standards which, in his opinion, were sanctioned by the law and which it would accept as a basis for its future action," he added.

The action of the board in announcing 16 fundamental principles to guide the carriers and their employees in forming new working rules to take the place of the national agreements was cited as a precedent which the board could use to justify its compliance with the employees' latest request, Mr. Lauck contended.

In closing his brief, he attacked the arguments which have been made before by both the board and representatives of the railroads against the application of the "living wage" principle in the railroad industry, charging that "the opponents of the living wage have adopted an indirect method of attack and make much of alleged impracticabilities or the inability to pay living wages out of the national income, point out discrepancies in the alleged size of families, raise the question as to whether single men should receive as much as married men, declare that there is a fundamental danger in awarding wages which will probably be spent extravagantly or foolishly, and adopt similar arguments for mere extreme sophistries, in order to raise a smoke cloud of doubt and disfavor around the principles involved." He admitted at the same time that the "living wage" is not paid by private industries and that, therefore, it is necessary, in attempting to formulate a "living wage," to consider "what should be" and that "theoretical budgets" must be used.

Mr. Lauck Analyzes Railroad Arguments for Wage Cuts

The bases on which the railroads have argued for wage decreases in past hearings were attacked by Mr. Lauck in his brief. He said:

The argument of the railroads for lower wage rates is in three parts:

(1) That the Transportation Act requires the railroads to be operated in the most "efficient and economical" manner and this in turn requires them to reduce wage costs wherever possible.

(2) That the cost of living has declined more rapidly than wage rates.

(3) That railroad wages are above the level paid in outside industries for similar work, and that the railroads, if given a free hand, could employ men at lower rates than now being paid.

First, as regards the requirement of the Transportation Act that the railroads be conducted in an "economical and efficient" manner. What this means, of course (as appears when the Transportation Act is read as a whole), is simply that the railroads shall be run as economically as possible consistent with the payment of just and reasonable wages to their employees. Whatever wages the board decides are "just and reasonable" thereby become *ipse facto* "economical," within the intent of the Act.

Second, as regards changes in the cost of living, as previously pointed out, a change in prices or living costs is a "circumstance" to be considered by the board in adjusting wages, only when the original wage rates themselves are found to be "just and reasonable." It is at best a matter of argument whether wages, even if well above a living wage, should be reduced with every decrease in the cost of living. Notable authorities, indeed, have held that the maintenance of existing wages when cost of living decreases offers the simplest and easiest way by which labor may be given due participation in the constantly increasing productivity of modern industry.

Third, as regards wages in other employments. The railroads' demand for wage reductions of the maintenance of way and other employees rests primarily on their claim that wages in other industries are lower than on the railroads, and that if given a free hand they could recruit their forces at lower rates than now being paid. We do not admit these claims. Wages in other large basic industries, where wage adjustments are made through collective bargaining or through the action of voluntarily chosen arbitration tribunals, have as a rule undergone no significant declines. But even if these claims were true, we deny that they would be pertinent. For to argue that railroad wage rates should be reduced because the same men or other men might be hired at lower wages than now being paid, is to attack the whole theory of arbitration. It is a frank appeal to the old law of supply and demand, and we connot have wages determined by "supply and demand" (which means strikes, lockouts, and other forms of industrial warfare) and, at the same time, have a peaceful settlement of wage disputes by means of arbitration. If the matter is to be left to "supply and demand" then arbitration must be thrown overboard and the parties left absolutely unfettered to fight out their battle in the old tooth and claw fashion. If the matter is to be settled by arbitration, then the law of supply and demand must be thrown overboard.

It is, of course, proper that the wages paid in outside industries should be considered by the board as one of the "relevant circumstances" prescribed by the Transportation Act in determining what wages are "just and reasonable." But this factor must not be accepted as a controlling *principle*, and its use is always subject to these qualifications—first that the lowest paid worker receives a living wage, second that fair differentials for skill, hazards, etc., are observed, and, third, that comparison be made only in those cases where the wages in the other industries and employments have been fixed by fair and honorable means, such as collective bargaining and arbitration boards.

Mr. Lauck's testimony precipitated a lengthy discussion between the witness and Jacob Aronson, and J. G. Walber, representing the Eastern roads; Dr. C. P. Neill, representing the Southeastern carriers; J. L. Coleman and J. W. Higgins, representing the Western roads. Mr. Aronson developed the fact that Mr. Lauck was requesting the board to accept and definitely approve a principle without first ascertaining whether that principle could be applied to the industry. Dr. Neill brought out the fact that Mr. Grable had approved the submissions to the board by the individual railroads and their maintenance of way employees, that the dispute involved in each one of these submissions was the request of the employees for the restoration of the rates of pay in effect under the board's Decision No. 2 and that, therefore, the latter's new request for a minimum wage of 48 cents an hour could not be taken up by the board under the law, because no such demands were made by the representatives of the employees on the individual carriers.

M. of W. Workers Prefer No Overtime

In taking up the subject of primitive overtime after the ninth and tenth consecutive hours of work, a dispute involved in many of the submissions to the board, Mr. Grable cited the history of the overtime rules during the past four years, adding:

"We have no desire for any overtime, no matter what the rate. We do not care to work on Sundays and holidays and, if it were possible, or rather if it were practicable, we should be glad to have this board absolutely forbid all overtime and all work on Sundays and holidays. We realize, however, that an absolute prohibition of all overtime and Sunday work is impracticable, but it should be restricted to the very lowest minimum and it is for this purpose that we request the punitive rate of time and one-half."

Mr. Grable contended that "when a railroad knows it can have the services of an employee at any time for an additional two hours beyond the eight hours of the basic day without paying more than the regular pro rata rate, the railroad will make absolutely no endeavor so to arrange the work as to obviate the necessity for the extra time.

"The basic eight-hour day," he said, "is lost to us and its benefits are destroyed when the railroad can command our services for an extra two hours on week days and for 10 hours on Sundays and holidays without paying more than the regular pro rata rate. Our rest is gone, our recreation is lost, our family life rendered impossible under these conditions."

At the opening of the hearings, the question of whether or not the maintenance of way employees of certain Eastern carriers can properly be before the board in this case inas-

much as they have gone on strike without the sanction of their national organization and in violation of their agreements, was raised by Mr. Walber. In addition, Mr. Walber pointed out that some of the roads have formed new organizations of their employees to the practical exclusion of membership in the national union. Chairman B. W. Hooper of the board requested Mr. Grable to answer the point raised by Mr. Walber. The objecting roads included the New York, New Haven & Hartford, the Philadelphia & Reading, the Pittsburgh & West Virginia, the Delaware, Lackawanna & Western, the Grand Trunk, the Monongahela, the Pere Marquette and the Buffalo, Rochester & Pittsburgh.

Board Declines to Approve "Living Wage" Principle

The employees' request for approval of the "living wage" principle was flatly turned down by the board when it announced at the opening of the hearings on August 29:

It is superfluous for the board to announce in advance the principle or theory upon which it will fix wages in the pending dispute. It may be assumed by the parties in this case that the board will give full consideration to every circumstance set out in the statute for its guidance, but it will not go beyond that. The Transportation Act requires the board to establish wages that are "just and reasonable." It is within the province of the parties herein to make such contentions as they may respectively see fit as to what will constitute a "just and reasonable" wage. If the wage which the motion defines as the "living wage" should be demonstrated to be a "just and reasonable" wage, the board would adopt it; otherwise it would not. The board will neither limit nor enlarge the right of either party to present to the board his conception of what constitutes a just and reasonable wage within the meaning of the law.

This move evidently disrupted the plans of Mr. Grable and his associates, for he immediately asked for a recess in which to reconstruct his case.

This request was granted.

A. O. Wharton, the only member of the labor group on the board in Chicago at the present time, sponsored, in an executive session, a resolution embodying the request made by Mr. Grable. However, his vote was the only one cast in favor of this declaration in favor of the "living wage," all of the other members voting against it.

Grable Appeals to Washington

Following the rejection of the employees' demand for approval by the board of the principle of the "living wage," Mr. Grable appealed to Senator Cummins for the enactment of an amendment to the Transportation Act which would compel the board to specifically recognize this principle.

"We believe that the board's interpretation of the Transportation Act," Mr. Grable said in his telegram to Senator Cummins, "is absolutely wrong and we believe you will agree with us in this. We realize now, however, that the only way in which justice can be obtained is by action on the part of Congress."

Chairman Hooper, subsequently explaining the board's decision on the question of the "living wage," said:

"The issue raised by Mr. Lauck, statistician in the employ of the railway labor organizations, is largely a matter of phraseology. The Transportation Act directs the Railroad Labor Board to fix wages that are 'just and reasonable.' This the board has always endeavored to do, as it will in the pending case.

"Mr. Lauck says that a 'just and reasonable' wage must necessarily be a 'living wage.' Very well then; when the board has fixed a 'just and reasonable' wage it will be a 'living wage' and Mr. Lauck will have what he asks for though it be called by a different name.

"The board's ruling will have absolutely no practical effect on the development of the employees' case in the hearing now in progress. They will be permitted to introduce identically the same proof as though this question of terminology had not been raised and it will be accorded the same careful consideration."

When the hearings were resumed on August 30, Mr. Lauck and J. C. Smock, vice-president of the maintenance of way men's organization, began the presentation of their case repeating to a large extent the argument made at the opening hearing. Mr. Smock presented evidence to the board to show that his organization had been doing everything in its power to keep the membership on certain Eastern roads at work and to end the sporadic walkouts of maintenance of way employees.

During the course of the testimony the employees put in the record a file of letters written by business men to Chairman Hooper, urging the readjustment of the rates of pay of these employees. Upon being questioned as to the manner in which these letters came to be written the representatives of the employees were forced to admit that the representatives of the men had been instructed to influence their local business men to write these letters and that the material which they should contain emanated from the headquarters of the union.

Photo by Kadel & Herbert

An Open Observation Car on the C. M. & St. P.—Each Seat Protected by a Separate Windshield

Accident Investigations— April, May and June

THE TWELFTH quarterly issue of the Summary of Train Accident Investigations, prepared by the Bureau of Safety of the Interstate Commerce Commission, which is for the months of April, May and June, 1922, was issued on August 23.

This report covers eight collisions and seven derailments, as follows:

Collision	Chic., R. I. & Pac.	Plains, Kans.	April 19
Derailment	Baltimore & Ohio	Philo, Ohio	April 22
Collision	St. Louis-San Francisco	Girard, Kans.	April 25
Collision	Galv., Harrisb'g & S. A.	Lobo, Tex.	May 6
Derailment	Kansas City Southern	Allene, Ark.	May 14
Collision	Chic., R. I. & Pac.	Keats, Kans.	May 20
Collision	Ulster & Delaware	Grand Gorge, N. Y.	May 26
Collision	Atchison, Topeka & S. F.	East Ft. Madison, Ill.	May 29
Derailment	Southern	Middleton, Tenn.	June 7
Derailment	Pennsylvania	Brilhart, Pa.	June 7
Derailment	Louisville & Nashville	Hilberta, Ala.	June 15
Collision	Carolina, Clinchfield & O.	St. Paul, Va.	June 18
Derailment	Canadian Pacific	Lake View, Me.	June 22
Derailment	Virginian & Western	Glen Rogers, W. Va.	June 22
Collision	Norfolk & Western	Crumpler, W. Va.	June 30

Following are abstracts of these reports:

The trains in collision on the Chicago, Rock Island & Pacific near Plains, Kans., on April 19 were westbound passenger No. 311 and eastbound passenger No. 312, each consisting of a locomotive and three cars. The collision occurred in clear weather about 2:35 a. m. Moving between 20 and 40 miles an hour, the trains collided on a straight line; and in each train the baggage car was telescoped by the tender for the full length of the tender; but the passenger cars were not damaged. The locomotives were damaged but remained upright. Both enginemen were killed, and six persons were injured. Improper handling of a train order is given by the inspector as the cause of the collision; but the fact that both locomotives carried electric headlights introduces a question as to why neither engineman saw his danger in time to bring his train to a stop. The firemen apparently were able to give no information, and the reason for this failure is a matter of conjecture. Each fireman said that he knew nothing of the approach of the opposing train until he felt the application of the air brakes, at which time the opposing train was only a few rods distant.

The train derailed on the Baltimore & Ohio near Philo, Ohio, on April 22 was eastbound passenger No. 58, consisting of a locomotive and three cars. Moving at about 35 miles an hour, it was thrown off the track at a highway crossing, and the engine and first two cars fell down a 30-ft. bank. The engineman was killed and 13 passengers and 4 employees were injured. The crossing is on a curve of 2½ deg. and the cause of the derailment was dirt on the track, which appears to have been scraped upon or close to the crossing by a road scraper, being afterwards packed down by passing automobiles.

The trains in collision on the St. Louis-San Francisco at Girard, Kans., on April 25, were a southbound extra, consisting of 18 circus cars, which had just stopped for a crossing and was moving at about eight miles an hour, and southbound passenger No. 111, which ran into the rear of the circus train at about 15 miles an hour. One passenger was killed and 12 passengers and two employees were injured. The collision occurred at about 2:37 a. m. in a dense fog. The inspector finds that the extra was occupying the main track on the time of the superior train without proper flag protection. The extra had passed Farlington, seven miles north, with too little time to clear the passenger train at Girard, no block system being in use. The collision occurred within yard limits. The assistant superintendent was on the circus train, but he overlooked train No. 111; he said he was thinking about clearing a northbound train due at Girard at 3:20 a. m. The conductor and the flagman had not forgotten the passenger train, yet they had not thrown off any fusees and (the line being straight) apparently depended on seeing the headlight of the passenger train as well as if there had been no fog. The engineman and the fireman knew that they were on the time of the passenger train, but no whistle was blown to send out the flagman and they said they had full confidence in the competency of the men riding at the rear of the train. At the last minute a fusee was thrown off but it was only 300 ft. in the rear of the point of collision.

The collision on the Galveston, Harrisburg & San Antonio, near Lobo, Tex., on May 6, causing injury of 50 passengers, 12 employees and two sleeping car porters, occurred about 9:31 p. m., and was due to a string of freight cars becoming uncontrollable on a steep grade, and colliding with westbound passenger train No. 101, the freight cars at that time being in motion at about 20 miles an hour, while the passenger train was running at about 10 or 15 miles an hour. An eastbound freight train, entering the passing track at Fay, was obliged to push 13 cars of ballast forward some distance in order to clear the main track; and in the movement, nine cars of ballast became separated and ran down the grade on the main track. The inspector puts the responsibility primarily on the leading brakeman of the freight who should have made sure that the ballast cars were secure before allowing them to be moved forward. When he felt that there was something wrong, he got off and ran to one side, to get out of range of the locomotive headlight in order to see what had happened; and the cars got away from him. He had coupled the air hose between the locomotive and one of the ballast cars, but took no action to see whether or not the brake was working throughout the whole string. The conductor had been notified that the ballast cars would be in his way, but he did not pay personal attention to their movement; and he admitted that the brakeman was not entirely competent. There was no derail at the outgoing end of the passing track, the rule being to install these only where cars are regularly stored and where the grade is descending 26 ft. per mile or more.

The derailment on the Kansas City Southern, near Allene, Ark., on May 14, occurred about 11:30 p. m., and resulted in the death of the engineman and the injury of five other persons. Northbound passenger train No. 2, moving at about 40 or 50 miles an hour, was thrown off the track by the turning over of a rail, caused, according to the report, by the excessive speed over uneven track. For 800 ft. south of the point of derailment, the track was level in only two places and the maximum variation in height was 1⅝ in.; while the gage for this distance was from ⅛ in. to 1 in. wide. The section master said that the roadbed in that region was spongy in character. The locomotive was 4-6-2 type weighing 129 tons.

The trains in collision on the Chicago, Rock Island & Pacific at Keats, Kans., on May 20, were eastbound third-class freight No. 86, and eastbound second-class freight No. 994, the last named running into No. 86 while it was standing at the station, about 6:15 p. m. Two passengers were killed and three employees and one trespasser were injured. No block system is in use on this section of the road and the inspector says the cause of the collision was the failure of the flagman of the standing train properly to protect his train.

The collision on the Ulster & Delaware, near Grand Gorge, N. Y., on May 26, was between a work train, extra No. 21, and freight train extra No. 22, both headed eastward. The freight train ran into the work train and six workmen riding in the rear car of their train were killed. The work train was moving slowly backward. This train was not protected by flag. The conductor was occupying the main track under authority of two train orders, in the reading of which he had become confused. The second order changed the hour at which he must send out a flag

against the freight train, but he got some wrong impression in reading the two orders. The inspector finds that the railroad has no proper system for the examination and instruction of employees except when they enter the service or when they are promoted. The engineman of the work train had a correct understanding of the contents of the train orders but instead of conferring with the conductor as to the details of execution, he took it for granted that the conductor had provided proper protection before beginning the westbound movement. The fireman and the brakeman appear to have been ignorant of the second train order. "The necessity for close co-operation and thorough understanding between members of a crew applies with particular force to a work train."

The collision on the Atchison, Topeka & Santa Fe at East Fort Madison, Ill., on May 29 about 4:07 a. m. was between westbound passenger No. 1 and eastbound passenger No. 2, fourth section; the engineman of No. 1 and the fireman of the eastbound train were killed and 48 passengers and three employees were injured. The collision occurred at the switch at the east end of the single track which extends across the Mississippi river. The eastbound train was just entering the double track when it was struck by the westbound, which had passed a distant and a home signal, and a train order signal, all set against it. The eastbound train was moving at about 20 miles an hour and the westbound at about 30 miles an hour. The fireman of No. 1 said that the engineman saw the home signal and the train order signal; but for some unknown reason, says the report, "he took no effective measures toward bringing his train to a stop * * * He may have been so incapacitated as to be unable to take the proper steps. When the fireman directed the engineman's attention to the signal indications there was still time for the engineman to have stopped the train. The engineman acknowledged the indications to the fireman and had his hand on the brake valve," and so the fireman did nothing to stop the train. There was no evidence that the engineman had been in other than good physical condition up to the time the train approached the point of collision.

The train derailed on the Southern Railway near Middleton, Tenn., on June 7 was westbound extra freight train No. 567. About 2 a. m., while traveling at 25 miles an hour, the locomotive and 14 cars was thrown off the track at a washout and the fireman was killed. The inspector finds that the trouble was due to heavy rain of which the train dispatcher was notified as early as 8:15 p. m.; but the freight train was not given any warning. The station operator did not wish to offend the dispatcher by repeating his warning and he notified Grand Junction, west of Middleton, on another wire, requesting that eastbound trains be warned. The operator failed to notify the track foreman for which he is censured. This foreman had retired to bed about 8 o'clock being exhausted by hard work and worry incident to illness in his family, and so knew nothing of the heavy rain until he was called at 2:40 a. m. on account of the derailment. The operator who came on duty at 11 p. m. assumed that, as it had rained about three hours, the necessary precautions had already been taken. The inspector cannot decide the point in dispute as to whether the dispatcher had again been warned at 11:10 p. m.; but as there had been a washout at the same place only a short time before he should have exercised particular care. The railroad company is also held at fault for neglecting the drainage of the roadbed, the waterways having become clogged. If the drainage had been put in good condition the derailment "undoubtedly would not have occurred."

The train derailed on the Pennsylvania Railroad at Brilhart, Pa., on June 7 was westbound passenger No. 975, drawn by engine 1387. Moving at about 40 or 45 miles an hour, it was thrown off the track by some obstruction on the rail, and the locomotive was overturned. The fireman was killed and seven passengers and eight employees were injured. The locomotive, class K-2 of the 4-6-2 type, had on its front truck a transverse tie-rod, behind the leading wheels, used to overcome lateral movement in the brake shoes; the rod became broken or detached and dragged on the road bed. A careful search was made for a missing bolt, cotter key and nut, by which it was fastened to the left brake shoe, but nothing was found. The inspector concludes that this dragging rod probably threw a piece of ballast or some other substance up, and on to the rail, causing the derailment of the rear wheels of the truck.

The train derailed on the Louisville & Nashville at Hilberta, Ala., on June 15 was northbound passenger train No. 4, first section. Moving at about 50 miles an hour, it was derailed by running over a misplaced facing point switch and two employees of a warehouse near the side track were killed and three others were injured. On the train 53 passengers and 7 trainmen were injured. The locomotive was overturned and the warehouse badly damaged. The switch had been left in the wrong position by a trackman, and he and his foreman, who was nearby are held responsible for the derailment. The whole gang of trackmen had passed the misplaced switch without noticing it. The man at fault had carefully returned the switch key to the foreman without having closed the switch.

The trains involved in the rear collision on the Carolina, Clinchfield & Ohio, at St. Paul, Va., on June 18 were freight trains Nos. 301 and 706, the latter running into No. 301 at about 10 miles an hour. The leading train was at a standstill. One employee was killed, a brakeman of the 706, who was riding on the pilot of the locomotive. The collision occurred within the yard limits where, because of curves and trees, the view is short; and the view is also bad from the type of engine involved, which was 2-8-8-2. On account of the shape of the locomotive, the engineman was depending on the fireman; and, the conclusion of the inspector is that the collision was due to the failure of the fireman to notify the engineman that the main track was occupied. The fireman saw the standing cars and knew that there was no track of any kind alongside of the main track; yet, for some reason, he was under the impression that the cars were on a passing track and that the main track was clear. The failure of the brakeman on the pilot to warn the engineman or to save his life by jumping off cannot be explained; it is probable that he was either asleep or had become unable to take care of himself.

The train derailed on the Canadian Pacific near Lake View, Me., on June 22, was eastbound passenger No. 16. Moving at about 30 miles an hour it was derailed by a rock which had fallen from the top of a cut and lodged on the track. The locomotive was thrown against the wall of the cut and was stopped about 156 ft. beyond the point of derailment. The fireman was killed and one other employee was injured. The conclusion of the inspector is that heavy rains during the past two weeks probably had washed away the earth supporting the rock, which measured about 840 cu. ft. The track foreman, who had been in charge of this section for 25 years, had never known of any trouble in this vicinity from falling rocks.

The train derailed on the Virginia & Western near Glen Rogers, W. Va., on June 22, was a work train, moving at about 12 or 15 miles an hour with three cars ahead of the locomotive, and 10 cars behind. Two employees were killed and three injured, the killed having been riding on the leading car. The derailment was caused by a broken flange, the break being due to an old defect, the presence of which could not have been discovered by ocular inspection, although, says the inspector, its presence probably would have been discovered by a hammer test.

The trains in collision on the Norfolk & Western at

Crumpler, W. Va., on June 30 were a freight train and a locomotive without train; one employee was killed and eight were injured. This collision occurred on the North Fork branch, seven miles long, where extra trains register "on" and "off" the branch (at the junction) and thereafter adjust their rights to the road by means of telephone messages between conductors. Conductors of inferior trains make use of commercial telephones in the offices of the coal companies along the branch. They make no records of their conversations and the engineman depends on what he is told by the conductor. The collision occurred on a steep descending grade, where the view is very restricted. The damage to locomotives and cars was not great, but one engineman was killed. As the conductors had no record of their conversations, the inspector is unable to determine which of them is at fault. The report says that "greater safety in train operation on this branch undoubtedly would be provided by the adoption of standard methods as contained in the operating rules of the American Railway Association."

I. C. C. Finds Only 4 Per Cent of Locomotives Inspected Unsafe

WASHINGTON, D. C.

THE REPORT submitted by the Interstate Commerce Commission to the Senate on August 29 in response to its resolution asking whether the safety appliance and locomotive inspection acts were being violated, fails to find anywhere near as serious a condition as has been proclaimed by the labor leaders, although its inspectors' reports, the commission says, "indicate a very general let down in the matter of inspection by carriers which gives cause for concern." The commission says it is impossible to report the exact condition of all locomotives from day to day, but of the 4,085 locomotives and tenders inspected on 162 railroads during July, 2,456 disclosed defects more or less serious, but only 169 or 4 per cent were found not safe to operate and ordered withdrawn from service. Of the others, 992 were found to have defects less serious in character, but in need of prompt attention, and in 1,295 cases there were defects not such as to give cause for immediate concern, but such as in accordance with sound practice should have attention. The report, after quoting the Senate resolution, No. 327, is as follows:

The Locomotive Boiler Inspection Act approved February 17, 1911, has as its purpose the promotion of the safety of employees and travelers upon railroads, by compelling common carriers engaged in interstate commerce to equip their locomotives with safe and suitable boilers and appurtenances thereto, making it unlawful to use any locomotive engine propelled by steam power in moving interstate or foreign traffic, unless the boiler of such locomotive and appurtenances thereof are in proper condition and safe to operate without unnecessary peril to life or limb. The act provides that all boilers shall be inspected from time to time in accordance with the provisions thereof, and be able to withstand such test or tests as may be prescribed in the rules and regulations provided therefor.

By act approved March 4, 1915, the original act has been made to apply to and include the entire locomotive and tender and all parts and appurtenances thereof. The provisions of the act as amended apply to any common carrier or carriers, their officers, agents, and employees, engaged in interstate or foreign commerce.

As required by the act, the United States was divided by us into 50 locomotive boiler-inspection districts and one inspector assigned to each of such districts. It is required that each inspector shall make such personal inspection of locomotives under his care from time to time as may be necessary to fully carry out the provisions of the act and as may be consistent with his other duties, but he shall not be required to make such inspections at stated times or at regular intervals.

It is further provided that whenever any district inspector shall, in the performance of his duty, find any locomotive not conforming to the requirements of the law or the rules and regulations, he shall notify the carrier in writing that the locomotive is not in serviceable condition and thereafter such locomotive shall not be used until in serviceable condition.

Specifically, as to the matters included within the Senate Resolution:

Instances have been brought to our attention where, in our opinion, the act, as amended, referred to in Resolution 327, recently has been violated. It is impossible for us to accurately report the extent of such violations.

Inspection of locomotive boilers is at present being made in all federal locomotive boiler-inspection districts by our inspectors, but all inspections by the carriers as contemplated in section 5 of the act are not being made by and upon all common carriers engaged in interstate commerce. The reports from our inspectors indicate a very general letdown in the matter of inspection by the carriers which gives cause for concern. The carriers report various reasons for not making these inspections. Some of the reasons assigned are as follows:

"No monthly inspection made of this engine since 6-16-22 account of not having competent inspectors in the service due to walkout of the shop crafts.
"Unable to make inspection account insufficient help due to strike.
"Not inspected account strike.
"Inspection not made July.
"Unable to make inspections or tests account strike conditions."

There are approximately 70,000 locomotives within the general purview of the act. A determination as to the extent to which the act currently is being violated would involve ascertainment of the condition of each locomotive and information as to the use being made thereof. The condition varies even as to the same locomotive from day to day. It is not possible for us to make this determination. The locomotives referred to are housed or repaired at approximately 4,600 different points and are operated on more than 265,000 miles of track. We are permitted by the act to have 50 district inspectors. During July last they made 717 separate inspections covering 4,085 locomotives and tenders on 162 railroads. The July activity of our inspectors is typical. The act does not contemplate that our inspectors shall inspect all locomotives. Section 6 of the act provides that the inspectors' "first duty shall be to see that the carriers make inspections in accordance with the rules and regulations established and approved by the Interstate Commerce Commission, and that carriers repair the defects which such inspections disclose before the boiler or boilers or appurtenances pertaining thereto are again put in service."

The services of our inspectors are general in character, and they are given such direction as is designed to bring about a compliance with requirements by the carriers.

In pursuance of the duty of inspectors to see that requirements are complied with, and that equipment is kept in safe condition, the inspectors deal with the varying situations and conditions in that manner which is deemed likely to accomplish the best practical results. The exercise of discretion and judgment is always involved. Obviously a locomotive may be defective and in need of repairs and yet be in a condition in which it is "safe to operate . . . without unnecessary peril to life or limb." In many instances defects discovered and brought to the attention of carrier representatives are immediately repaired without retiring the locomotive. Under section 6 notice is given of the more serious defects and the locomotives are required to be retired.

While we are not in position to make report regarding the condition of all locomotives and the extent to which the requirements as to inspection and repairs are not being complied with currently, there are indications as to conditions generally and certain deductions and conclusions may be drawn from the conditions disclosed by the work of our inspectors during the month of July last. At 717 different points they made personal inspection of 4,085 locomotives. Of these, 2,456 disclosed defects of the varied character mentioned above and more or less serious; 169 were found to be in such condition that they were not "safe to operate" and notices were served upon the carriers under section 6 of the act requiring them to be withdrawn from service. Of the others, 992 were found to have defects less serious in character but in need of prompt attention. In 1,295 cases, defects, though not such as to give cause for immediate concern, were such as, in accordance with sound practice, should have attention.

It will be noted that it is the "use" of a locomotive not found to be in proper condition and safe to operate, and not the condition itself, which is a violation of the law. The withdrawal of locomotives for repairs, the restoration of locomotives to service, and the use of reserved or surplus locomotives, are factors contributing uncertainty when considering the condition of locomotives in service to which the act applies.

When considering the extent of our inspection, cognizance should be taken of the fact that the act limits the number of inspectors to 50, and that the amount directly appropriated to carry out its provisions for the current fiscal year is $290,000. This sum may be spent in monthly allotments of $24,166.66, as provided in the Antideficiency Act of February 26, 1906. The amount expended during the month of July, 1922, in carrying out the requirements of the act was $24,025.63.

A Study for the Front Elevation of the New Illinois Central Station at Chicago

Factors Governing the Design of Passenger Terminals*

An Analysis of the Operating Conditions Which Influence the Plans for a Large Station

By A. S. Baldwin
Late Vice-President, Illinois Central

RAILROAD PASSENGER SERVICE may be divided into two general classifications, suburban and through. Suburban service is that which has for its primary purpose the carrying of passengers between residential and business districts. This service, which in many respects resembles surface, elevated, or sub-surface street railway service, exists in large cities only. The distance traveled rarely exceeds 30 miles. Some suburban trains carry baggage, mail and express for local points served, mainly to relieve through trains of that burden, but as a general practice suburban trains carry passenger coaches only.

Through passenger service is designed to meet widely different requirements. The territories served generally cover large areas and the distances traveled are great as compared with suburban service. On some railroads, trains, exclusive of locomotives, move as units distances of 2,000 to 2,500 miles. This condition has resulted in the use of cars fitted with many comforts not required for short distance travel. Baggage is carried on trains with passengers. Sleeping, dining, and in many cases, observation cars are usual features of passenger train equipment. It is readily apparent that, with such a variety of cars, many of which must be turned at the terminal before a return trip can be made, and with the many movements necessary for repairing, cleaning, inspecting and supplying locomotives and empty rolling stock, arrangements for reducing switching movements should be given careful consideration.

General Types of Passenger Terminal Stations

Passenger terminals may be classified, with reference to the arrangement of their approach tracks, station tracks and station, into the following general types: (1) Sub Terminals; (2) Through Terminals; (3) Loop Terminals; (4) Combinations of the above.

A stub terminal is one in which the station tracks are connected at one end only. Generally the tracks terminate at a station headhouse or at a concourse leading to it, thereby enabling passengers to reach trains without crossing tracks or using stairs. The advantages in having a station located as near the heart of a city as practicable, or in having it adjacent to a thoroughfare, beyond which tracks can be extended have resulted in the construction of a large number of stub stations. The Jersey City station of the Central Railroad of New Jersey, the St. Louis, Mo., Union station, and South station, Boston, Mass., are of this type.

The *through terminal* has its station tracks connected at both ends. In this type it is necessary for passengers to use stairs, ramps, or elevators in order to avoid crossing station tracks at grade. The Pennsylvania Station in New York City, is an example of this type.

The *loop terminal* is a form of through terminal in which trains generally enter the station from the same direction, the main tracks converging from either end of the passenger platforms so as to form a loop or part of a circle, thereby permitting forward movement of trains from the point of entrance to the loop, through the station, to point of departure with the train reversed in direction. This type offers peculiarly favorable opportunities for the location of engine terminal and coach yard facilities. It is frequently used in street car terminals, but on account of the area required for the curves of long radii, its use for steam railroad operation is limited. The Broad Street station, Richmond, Virginia, is an example of this type.

Combinations of the three types of terminals mentioned are quite common and can frequently be made to advantage. The Union station, Washington, D. C., and the Grand Cen-

*Abstracted from a report prepared before the International Railway Congress in Rome in May, 1922.

tral station, Memphis, Tenn., are examples of combination through and stub terminals. The Grand Central Terminal, New York City, is an example of a combination stub and loop terminal, and is of particular interest in that it is not only the largest station, but also the only important double deck passenger station in America. The Union Station, Kansas City, Mo., is of the through type, but has station tracks and platforms of sufficient length to accommodate two trains. It can be operated either as a double stub terminal or with two trains on the same track operating in the same direction. The stairways are in the middle of the platforms. A double stub terminal with station tracks extending in opposite directions, but abutting a common passenger concourse, is now being constructed for the Chicago Union Station Company, Chicago.

In a stub terminal, every locomotive and car handled must, of necessity, pass in and out the one throat. This is not the case in through and loop terminals, where movements are generally continuous through the terminal and the interference from conflicting movements are reduced to a minimum. The through terminal, operated in both directions, has some disadvantages as compared with one operated in one direction only, but the interference is less than in the stub terminal.

The objections to the excessive throat movements in a stub terminal may be mitigated by providing a flexible and adequate throat arrangement. The number of throat or approach tracks required can be determined only after a thorough study of the individual terminal requirements. The tendency in design has been to favor a liberal number of throat tracks. If an adequate throat is not provided, even though there may be enough station tracks to handle the trains, congestion results.

The excessive back up and crossover movements necessary in a stub terminal tend to restrict its capacity. In through and loop terminals, the movement being in one direction, a train can follow the one preceding, while in the stub terminal a station track must be cleared by one train before another train can occupy it, consequently the capacity of through and loop terminals is considerably greater than that of stub terminals for the same number of station tracks.

Through trains, due principally to the time required to load and unload baggage, mail and express, require more standing time at station platforms than do suburban trains, consequently more suburban than through trains can be handled on a track in a given time.

The advantages of the through over the stub terminal, so far as capacity is concerned, decrease as the standing time of the trains in the trainshed increases, because the delay of clearing the station represents a smaller proportion of time per cycle of operation. For this reason, the objection to a stub terminal for through passenger service is not so great as for suburban service where the loss of time getting in and out of the terminal represents a large proportion of the total time involved.

Terminal	Year completed	Relation of through train to total trains handled	Number of approach tracks	Number of station tracks	Ratio of station tracks to approach tracks
Grand Central, Chicago	1890	100%	5	10	2.00
South Station, Boston	1898	55 —	8	28	3.50
Union, St. Louis	1904	86 —	6	32	5.33
D., L. & W., Hoboken	1907	7 —	6	14	2.33
Erie, Jersey City, N. J.	1910	3 —	5	12	2.40
C. & N. W., Chicago	1911	27 —	6	16	2.67
C. R. R. of N. J., Jersey City	1914	20 —	9	20	2.22
Can. Pac., Montreal	1914	86 —	4	11	2.75
Lehigh Valley, Buffalo	1916	100 —	3	9	3.00

Ratio of station tracks to approach tracks

The advantages of the through and loop terminals over stub terminals for switching movements are apparent. This is emphasized in the stub terminal if arriving trains head into the station, which is the general practice. If the train is broken up on the station tracks by a switch engine, baggage, mail and express cars cannot be switched to other tracks for handling until the coaches are unloaded and removed. The road engine cannot be released until the entire train

Terminals	Number of stations classified as to service: Suburban	Through passenger	Mail and express	Total	Total number of trains operated in and out of station, 1921 schedule: 24 hours: Suburban	Through passenger	Mail and express	Total	Peak hour: Suburban	Through passenger	Mail and express	Total	Maximum number of trains operated in station in one hour: Maximum number handled on any one station track in one hour: For suburban service.	For through service.	Past performance: One hour.	Estimated percentage of station capacity.	Estimated possible performance: All station tracks, based on 100 per cent performance.	Per station track.
Stub terminals:																		
South Station, Boston	All	All	All	28	297	344	19	660	55	32	0	87	4	2	101	100	101	3.61
Erie, Jersey City	All	4	0	12	363	10	3	376	49	0	0	49	9	1	54	100	54	4.50
C. & N. W., Chicago	12	4	0	16	230	81	3	314	39	11	0	50	5	2	50	75	67	4.19
C. R.R. of N. J., Jersey City	All	All	0	20	217	52	3	272	31	5	0	36	8	2	40	90	44	2.22
Union, St. Louis	13	All	9	32	38	217	14	269	4	44	0	48	3	3	69	100	69	2.16
D., L. & W., Hoboken	All	4	0	14	211	14	2	227	34	0	0	34	5	1	46	100	46	3.28
Canadian Pacific, Montreal	9	9	2	11	12	72	0	84	6	14	0	20	2	2	25	100	25	2.27
Grand Central, Chicago	0	8	2	10	0	40	4	44	0	7	0	7	0	1	7	60	12	1.20
Lehigh Valley, Buffalo	0	9	3	9	0	14	4	18	0	3	1	4	0	1	8	50	16	1.77
Through terminals:																		
Pennsylvania, New York	All	16	13	21	310	181	34	525	42	13	0	55	15	6	65	73(1)	89	4.24
Union, Kansas City	0	16	0	16	0	223	0	223	0	33	0	33	0	5	41	100	41	2.56
Union, Indianapolis	All	All	All	12	6	164	16	186	0	18	0	18	0	3	38	...	...	...
Union, Denver	2	9	0	10	12	82	0	94	2	11	0	13	1	3	21	100	21	2.10
M. C. Railroad, Detroit	0	10	1	11	0	85	5	90	0	12	0	12	0	3	17	85	20	1.82
Loop terminals:																		
Union, Richmond	8	8	2	10	6	38	4	48	2	6	0	8	2	1	10	20	50	5.00
Combination terminals																		
Grand Central, New York:																		
Lower Level (suburban)	17	0	0	17	225	0	0	225	36	0	0	36	6	0	...	...	...	...
Upper Level (through passenger)	0	25	7	32	0	133	15	148	0	10	1	11	0	4	...	...	...	...
Total	17	25	7	49	225	133	15	373	36	10	1	47	6	4	67	100	67	1.37
Union, Washington, D. C.	12	20	8	32	130	146	14	280	...	20	0	20	3	3	50	100	50	1.56
Union, Jacksonville	0	20	1	21	0	98	4	102	0	14	1	15	0	2	30	65	46	2.19
Macon, C. of Ga.	0	11	2	14	0	88	0	88	0	13	0	13	0	2	13	100	13	0.93
Union, Ottawa	All	2	0	8	64	6	0	70	12	0	0	12	4	1	15	100	15	1.87
Grand Central, Memphis	0	10	0	10	0	64	0	64	0	12	0	12	0	4	17	100	17	1.70
Union, Wichita	0	5	1	8	0	36	0	36	0	6	0	6	0	3	6	100	6	0.75

[1] At times Upper Level tracks are used for suburban trains and Lower Level tracks for through trains.

(1) Seven tracks worked to capacity, and fourteen tracks to sixty per cent of capacity.

Capacity of terminals

has been removed. This causes delay and excessive switching through the throat. If trains back into the station, time is lost in turning, and expense of maintenance is increased. In the case of a through terminal, or a stub terminal where trains back in, the road engine can be released at once and baggage, mail and express cars switched to other parts of the terminal, while coaches are being unloaded. In some through terminals the road engine, upon arrival, is disconnected and proceeds to the engine terminal and switch engines, operating from opposite ends, can then begin to break up the train. This method of operation clears the station tracks in minimum time.

From the foregoing discussion, the advantages of combining a loop with a stub terminal, such as the Grand Central Terminal, New York, become apparent. In that station incoming suburban trains, using the loop, proceed to the unloading platforms and then pass around the loop to loading platforms or to the yards as occasion demands. This operation permits following trains to use the same station tracks at much shorter intervals than would be possible if the loop were not provided and leaves the stub tracks for trains which cannot be so quickly discharged, or for outbound trains. The track design permits inbound trains after they have passed around the loop to occupy the stub tracks by a back-up movement; they can then be loaded and made ready for departure without the usual switching movements required for turning equipment in a stub terminal. The location of the stub tracks on the inside of the loop is advantageous in that it combines many benefits of a loop with those of a stub terminal and affords economical utilization of space.

Adequate Station Facilities

Adequate station facilities are essential for the elimination of unnecessary switching movements. It is the general practice to handle baggage, mail and some express on station platforms. From 20 to 30 minutes are required to unload a carload of baggage. The capacity of the station, therefore, can be increased by removing trains to an auxiliary storage yard immediately following the disembarking of passengers, which usually requires from three to five minutes. The train may back into the trainshed and unloading be completed after the rush period is past. Replies to the questionnaire indicate that this practice is employed in but three of the terminals reporting. In the case of fourteen other terminals, the station tracks are released for incoming trains by switching the partly unloaded baggage and express cars to other tracks used for that purpose. This practice will increase as demands upon the terminals, and resulting necessity, for releasing tracks quickly, increase. Provision of adequate facilities for this purpose will reduce switching movements by eliminating the necessity for handling cars into and out of the terminal. The capacity and flexibility of a station are increased if a track arrangement is provided which will insure double-track movements into and out of the station for all tracks. It has been the practice in some of the more recently constructed terminals to provide ladder tracks, wherever practicable, in order to afford parallel movements in the same or opposite direction. This increases the capacity of the terminal, permitting a greater number of simultaneous movements and making possible more intensive terminal operation.

Ladder tracks, turnouts and crossovers are costly. The number to be provided depends upon the number of switching movements required and the nature and volume of traffic and must be determined by the needs of each individual case.

Operation of some of the older passenger terminals is seriously handicapped by short station tracks. Trains have increased in the length through steady increase in the length of cars and number of cars per train. Cars 84 ft. in length are being used, and at times 15 or 16 cars of an average length of about 70 ft. are handled in one train. To meet this situation at stations having short tracks, the long trains are sometimes divided into sections and placed on two tracks. This involves extra switching to assemble the train, loss of time in pumping air and testing train lines, confusion to passengers and other objectionable features. In some terminals only a few of the middle trainshed tracks are of sufficient length to accommodate the longest trains. The necessity for handling trains on assigned tracks will limit the flexibility of the terminal. It is apparent that station tracks should, if practicable, be sufficiently long to accommodate the longest trains, although some short tracks can be used to advantage for short trains.

The unusual double throat arrangement of the St. Louis Terminal arose through the necessity for lengthening the station tracks, on account of the increase in length of trains. Originally there was but one throat which resulted in short outer tracks on each side of the trainshed. By dividing the approach into two throats the outside tracks were materially lengthened.

Internal crossovers, between two trainshed tracks and outside the limits of the interlocking plant, are under some circumstances, of value in reducing switching movements. Three such crossovers exit in the St. Louis Terminal, and six in the Washington Terminal. These are located from 300 to 400 ft. from the bumping posts and between adjoining tracks. They are used for placing in or taking out cars without moving the entire train. In the Washington Terminal, there are also crossovers at the head end of some of the station tracks which permit switching movements outside the limits of the interlocking plant. Due to the requirements at Washington, for unusually frequent transfer of cars from one train to another, these crossovers are of value in reducing switching movements.

A notable feature at the Washington Terminal is a turntable, located adjacent to the trainshed, used for turning railroad officers' business and privately owned cars, postal cars, and other passenger equipment, also for turning certain road locomotives which are operated on short turn-around schedules and do not have sufficient layover to permit running to the engine house for turning. The operating officers advise that the turntable is well located, and a decided advantage to operation.

In the suburban terminal of the Illinois Central at Chicago, internal crossovers are an essential feature of the track arrangement. The motive power is steam, but the engine and tender are combined in one rigid unit, operating equally well in either direction. This feature, common to many suburban steam locomotives, reduces switching movements and avoids the necessity for turning locomotives. By means of the internal crossover arrangement the locomotive on an incoming train can be released at once if the adjacent track is not occupied. It can then move around the train, connect with the opposite end and be ready for an outbound trip without switching the cars. In the meantime, passengers can occupy the cars and the train be ready for an outbound trip when the locomotive is reconnected. The throat arrangement of this terminal is restricted and the greater part of all movements both in and out must of necessity pass over a single throat track.

In 1920 during a street car strike, trains were operated continuously for several days into and out of this terminal at the rate of 544 in a 12 hour period, an average of 7.6 trains per track per hour; this was accomplished notwithstanding the fact that the terminal has a single track throat, is stub-ended, and operated by steam equipment which has to be supplied with water, sand and coal, and have fires cleaned. This would not have been possible without the crossover arrangement at the end of the tracks. This terminal is not interlocked.

In some of the older terminals, curves of shorter radii were used than are desirable with the long-wheel-base engines now being operated. On account of the delay and inconvenience resulting from switching on curves, it is desirable to have straight tracks where it is necessary for a large amount of switching to be done.

Head End Equipment

A large percentage of the movements of empty rolling stock at passenger terminal stations is due to handling what is ordinarily referred to as head end equipment, consisting of baggage, mail and express cars. The loading and unloading of these cars from the station platforms without switching them to facilities provided for their exclusive use will reduce switching movements.

The articles handled in baggage cars consist principally of trunks, boxes, chests, suitcases, hand-bags, bicycles, baby carriages and corpses. Ordinarily the passenger delivers his baggage to the station shortly before leaving time for his train and demands it upon arrival at destination. This precludes the separation of baggage facilities from the station.

It is not generally customary to operate exclusive baggage trains, consequently, the logical place to handle baggage is on the station platforms. If proper facilities are provided, a considerable part of the baggage can be unloaded simultaneously with the disembarking of passengers. This, however, can not be accomplished if baggage cars are filled to capacity, as from 20 to 30 minutes are required for unloading them. Handling baggage may thus become the factor controlling the capacity of station tracks. Replies to the questionnaire indicate that the practice of switching baggage cars to special tracks assigned to that service is followed to but a small extent and by only 7 of the 22 terminals reporting, it being the general practice to handle baggage on trainshed tracks. As this is desirable for reducing switching movements, sufficient station tracks should be provided, when practicable, to permit this method of operation.

Mail can be handled in a building separate from the passenger station. The requirements of mail service, however, demand that it be handled with dispatch so as to insure prompt transfer of this traffic between trains and postal stations.

The postal business, since the inauguration of parcel post in 1913, has grown rapidly. The practice of shipping the greater part of the mail in pouches of a uniform size permits effective handling by means of chutes and conveyors, but the cost of equipping every platform in a trainshed with mechanical equipment would not be justifiable. Mechanical equipment must, therefore, be confined to special tracks on which most of the mail can be handled. The greater part of less than carload mail can be unloaded while baggage is being handled, but it is usually more economical to switch carload mail to tracks equipped with chutes and conveyors. The large amount of mail handled at many terminals has brought about the construction of postal sub-stations connecting with or adjacent to the station facilities. This arrangement results in economy of operation through relieving congestion and expediting the handling of mail.

In the Grand Central and Pennsylvania terminals at New York City, mail is handled from and to the postal sub-stations direct by mechanical means. Special tracks are assigned to mail service. While this increases switching movements, it is not so objectionable as might be supposed because a large part of the mail in these terminals is handled in solid mail trains which require no additional switching. Mail carried on regular passenger trains in less than carload lots is handled largely on station platforms in the same manner as baggage. In the Chicago & North Western station, Chicago, there are four conveyors on which arriving mail can be thrown and conveyed to the mail room located beneath the tracks. These four conveyors serve eight tracks. It is possible to handle practically all the arriving mail on these tracks, which results in a minimum of switching. There is a growing tendency to operate solid mail trains on special station tracks equipped with mechanical means for handling, which reduces switching movements.

The express business has been growing rapidly during the past few years and is approaching the character of package freight. The movement of express is not associated with passenger travel and could as well be handled in facilities separated from the passenger station, were it not that express matter is usually handled on passenger trains. The rapid growth of express business has seriously interfered with the operation of some passenger terminals. This has resulted in a tendency to separate express business from the passenger terminal which is advisable where the volume of express business is sufficient to justify doing so.

Of the 22 stations covered by replies to the questionnaire, two only, the Chicago and North Western at Chicago and the Pennsylvania at New York, have adopted the practice of handling express in separate terminals. At Buffalo, New York, an express terminal, similar in operation to a less than carload freight house, has been constructed, and in this express terminal most of the express packing business for that city is handled.

In many terminals express is handled on practically all trains, the express matter not being of sufficient volume to justify the operation of trains exclusively for that business. It is, therefore, desirable to consider methods of handling express at passenger terminals from which its elimination is not practicable. The method is largely dependent upon the amount of express handled.

In most large stations the volume of express business is so great that it cannot be handled properly without providing special facilities separate from the station for its exclusive use. The express building should be located near the station and in direct connection with the station platforms by means of tunnels and elevators. The plan of South Station, Boston, affords a satisfactory illustration. With this arrangement so much as practicable of the less than carload express can be handled on station platforms and trucked to the express building, thereby reducing switching movements. The cost of handling in this manner will probably be greater than the cost of switching to the express building, if cars are filled to capacity, but less if the cars are only partially filled. A track arrangement somewhat similar to the one used at South Station, Boston, may be used, wherein one of the station tracks is made to extend through the station track ladder, parallel and adjacent to the throat tracks, in order that express cars on the same side of the throat as the express building can be switched to the express tracks without necessitating their being handled through the throat.

Two general methods of locating tracks serving express buildings are used and their arrangement has a direct bearing on the number of switching movements. One plan consists of two or more tracks parallel to the side of the express building; this requires that cars on these be placed with doors opposite in order to permit trucking through cars to the express building, as in freight house operation. With this arrangement, it is inconvenient to remove cars from the tracks until the loading or unloading of entire setting is completed. In the Central of New Jersey Terminal at Jersey City crossovers have been provided between the tracks to facilitate switching. The other plan is illustrated in South Station, Boston, where short tracks are utilized, connected with one or more lead tracks which permits switching on any track without disturbing the cars on other tracks. It is possible by this arrangement to so design a yard that express can be handled to and from any car without having to spot or to truck through cars. From

the standpoint of switching movements, as well as terminal operation, the last mentioned scheme seems desirable, especially where a large number of cars are to be handled. The plan adopted in the Jersey City station is adapted to terminals where the express business is not so large. A combination of these two schemes was used in the St. Louis Terminal.

Due to the increasing tendency to operate solid express trains, an important feature to consider in connection with design of express facilities is provision of tracks of sufficient length to handle solid express trains without unnecessary breaking up and switching. If practicable, a connection should be provided whereby trains can head directly from the main tracks into the express yard without moving first into the terminal and then back to the express yard. Switching movements can be materially reduced on outbound as well as inbound trains if a run-around track is provided to permit the engine to be moved to the rear of the train. An important feature to be observed in the design of such facilities is to so arrange them that they can be reached by a direct forward movement.

Advantages of Trucking Platforms

It has been emphasized that elimination of switching movements is effected by handling baggage, mail, and express on station platforms. This, under usual conditions, is objectionable on account of interference with passengers, or delay in handling baggage, mail, and express while passengers occupy the platforms.

The trouble is eliminated in some stub stations by requiring all trains to back in, as at the St. Louis Terminal where tunnels are provided which permit trucking without interference with passengers or crossing tracks at grade. It has been eliminated at Richmond, Virginia, through use of a loop, which allows baggage and express cars to stand beyond the ramps on which passengers gain access to the station. In some stations interference is avoided by delaying the unloading of baggage, mail and express until passengers have passed the head end of the train. This latter method, however, tends to increase the unloading time and to correspondingly decrease the capacity of the terminal. In some of the more recently constructed stations trucking platforms have been provided, each track having on the one side a platform for handling passengers, and on the other a platform for handling baggage, mail and express. Such construction takes up more room than the usual arrangement of a platform to each pair of tracks, but not so much as might be supposed, on account of the fact that through the elimination of trucking, the passenger platforms can be made narrower than would be otherwise necessary, and again the passenger platforms may be used without inconvenience for columns supporting the trainshed. In a recent design for a station it was found that under the usual method of a pair of tracks for each platform, 30 tracks could be obtained, whereas the introduction of trucking platforms afforded in the same space 28 tracks. The use of trucking platforms resulted in a reduction of but seven per cent in the number of tracks, whereas the operation would have been so greatly facilitated, through the expedition with which trains could be handled, as to far more than compensate for that loss. The trucking platform can be used also for such facilities as air, water, ice, etc., thereby reserving the passenger platform for exclusive use of passengers.

The station of the Denver Union Terminal Railway Company, has trucking platforms and that company advises that they have proven very satisfactory. The operating officials recommended that trucking platforms should be used even in restricted territory where the extra platforms would limit the number of station tracks. They claim an increased terminal capacity as station employees can work unhindered by passengers, thereby permitting the handling of baggage, mail and express in less time than would otherwise be possible, increasing the capacity of the terminal to such an extent as to overcome the reduction in station tracks. This condition would obtain only in passenger terminals where there is a large amount of baggage, mail and express handled. The Grand Central Station of the Illinois Central at Memphis, Tenn., is an illustration of a station having part through and part stub tracks, with trucking platforms for through tracks and elevators with subway connections for baggage.

Yards Located on Side of Throat

In a terminal of considerable magnitude, particularly if express facilities are provided adjacent to the terminal, as at South Station, Boston, it may be desirable to locate yards on either side of the throat. This arrangement may be of value in facilitating switching movements, particularly if one of the station tracks is extended through the ladder tracks, parallel to and outside the throat, thereby permitting the handling of cars from several station tracks without occupation of the throat. With such auxiliary yards, cars may be assembled and switching done without interfering with movements through the throat. Switching movements, which might handle two or three cars from the station to the coach yard, can thus be eliminated by consolidating a number of cars in auxiliary yards, and handling them as one unit to the coach yard. The auxiliary yards may also be used to advantage if the terminal is taxed to capacity and it becomes necessary to remove some of the trains from the trainshed tracks before baggage, express and mail are entirely unloaded, to make room for arriving trains. The partially unloaded trains may be stored temporarily in the auxiliary yard until the rush period is passed. These auxiliary yards may be used to advantage as storage for engines of outbound trains awaiting departure.

Separation of Through and Suburban Services

There are advantages to be gained by the separation, when practicable, of through and suburban service. The requirements of the two are, in most cases, dissimilar and may be better accommodated in separate terminals, unless the peak loads of both occur at different periods of the day, in which event the same facilities may be used for both services. In most large terminals, however, the rush periods of both occur simultaneously. The requirements for waiting room space and baggage, mail and express facilities for suburban service are practically negligible as compared with requirements for through service. It is, therefore, possible to provide adequate facilities for suburban business at relatively small expense, as compared with requirements for through service.

With separation of the services, it may be practicable to extend the suburban service into the business district of the city and to construct the through passenger terminal, which must of necessity cover considerable area, farther from the business district, and on land of less value. The elimination of the frequent movements of suburban service through the throat will relieve congestion and make more desirable operating conditions for both services.

Location of Coach Yards

The design and location of coach yards have a direct bearing on the number of switching movements of locomotives and empty rolling stock. As mentioned, coach yards should be as close to the terminal as practicable. Many large terminals are union stations and individual coach yards are owned by tenant lines thus preventing the most economical development. In the case of some terminals, such as the Grand Central and the Pennsylvania Stations at New York, the extreme cost of land precluded the consideration of a site for these facilities adjacent to the station. The logical location of coach yards relative to the station depends large-

ly on the type of terminal. In the case of a stub terminal the coach yard must, of necessity, be on the same end of the station as the main approach tracks. Crossover movements, with resulting interference in the throat, may be eliminated by locating sections of the coach yard on both sides of the main tracks provided the terminal is of sufficient size to justify two yards, otherwise engine and coach facilities should both be on the same side of the main approach tracks. When the terminal is of sufficient magnitude to justify independent coach leads these should preferably be designed to extend by the throat and into the terminal as was done in the Central of New Jersey Station at Jersey City.

In the case of a through terminal or of combinations of the different types, the location of coach facilities must be considered in connection with each individual problem.

The design of the coach yard influences the number of movements of empty rolling stock. Where practicable, coach yards should be connected at both ends. This permits switching from either end and continuous movements through the yard, eliminating back-up movements. The tracks should be long enough to accommodate practically all of the longest trains. If this is not done, a number of switching movements necessary to cut trains will result. It is believed by some that a coach yard stubbed on one end is advisable, particularly where sleeping cars are cleaned, in order to permit trucking supplies to platforms located between the tracks without the necessity for crossing the lead tracks. This makes a desirable arrangement for employees, but is objectionable from the standpoint of reducing switching movements. It is desirable to equip all tracks with air, water, steam and charging facilities, when practicable, as considerable additional switching results if tracks are not so equipped.

A practice has been adopted in a few terminals of providing separate facilities for dining cars, which requires that diners be switched to a commissary track for supplies. This increases switching movements. All of the replies except two recommend that dining cars be supplied at their regular position in the trains.

An efficient method of marking bad order cars to reduce switching has been adopted in some terminals. Two kinds of colored tags or cards are used, one white, indicating light repairs which can be made on the coach yard tracks, the other red, indicating heavy repairs for which cars must be sent to the repair tracks. If a white card is attached, the car is switched with others to the coach yard, but where red tags are used, the cars are set aside for transfer to the repair yard. By setting out bad order cars at the time the train is being put into the coach yard, unnecessary switching is eliminated.

Turning of Equipment

One of the most important features in terminal design and operation to be considered in discussing reduction of movements of locomotives and empty rolling stock is that of turning of equipment. If turning cannot be done expeditiously, unnecessary switching movements result. This can best be illustrated by a study of the manner in which turning of equipment may be accomplished in a stub terminal where no special provision has been made for this movement. It is the usual practice to locate baggage, mail and express cars on the front end of the train, immediately behind the locomotive. Before an arriving train can be made ready to depart from the terminal it is necessary to reverse its direction. If a wye or loop is not available for that purpose it becomes necessary to switch the cars to a turntable, reverse their direction and again handle them back to the coach tracks. If a wye is used for turning and is located some distance from the terminal, as is frequently the case, the cars to be turned are assembled in cuts and handled to the wye and then back to the storage yard, after which it becomes necessary to switch these cars to their respective tracks. This involves a large amount of switching. It is often practicable to so design a terminal as to largely eliminate such switching movements. The loop arrangement is, where practicable, ideal. The Grand Central Terminal, New York City is a good illustration. The Pennsylvania Terminal when considered in connection with Sunnyside Yard is perhaps the best example of an American through terminal in its provisions for turning equipment. If it is not practicable to have a loop in connection with a terminal the next most efficient method for turning is the use of a wye.

In the Union Station, St. Louis, the wyes are located immediately back of the station, and trains can be turned upon arrival or departure as desired. If a wye is used for turning of equipment, it should, if practicable be located between the station and the coach yards in order to effect the movement without unnecessary switching.

Engine Facilities

Regardless of whether movements are accomplished by road or switch engines, it is essential, in order to eliminate conflicting movements, to locate the engine facilities on the same side of the main track as the coach yards and as close as possible thereto. It is desirable to have independent leads connecting the engine facilities with the throat of the yard, where practicable, as was done in the case of the Jersey City Terminal.

Engine facilities should be arranged to permit the proper sequence of operation, so that back-up or crossover movements are not necessary in utilizing the various facilities. The usual practice is to locate cinder pits in front of the engine house, so that fires may be cleaned before the engine enters the house. It is customary to provide coal, sand and water facilities on the departure track so that engines can be supplied before proceeding to the station. On some of the older installations it is necessary for engines to make three separate stops for these supplies. In modern plants, it is the usual practice to secure coal and sand at the same location, and at some terminals water columns are provided so that engines may be supplied with coal, water and sand at one setting.

The operation of most locomotive terminals makes receiving and departure tracks for engines essential, as the work can then be accomplished with a smaller force of employees. The large number of engines necessary for the peak load can be accumulated in the auxiliary yards and worked in or out as fast as the number of employees will permit.

Right hand operation is the usual method, although sometimes this induces crossover movements. For this reason, it may be advantageous to reverse the method of operation within the terminal limits. In the case of the Jersey City terminal, left hand operation between the station and the engine facilities was adopted.

Electrification

Electrification of a terminal, as a means of reducing movements of locomotives and empty rolling stock, has been effective in certain stations where adopted for that purpose. A notable example of this is the Broad Street terminal, Philadelphia. The two types of passenger service which have been referred to as through and suburban are in most cases so different in character as to justify different types of motor equipment. These will be discussed separately.

In through service, the electric locomotive is used to a transfer point. Beyond this point, frequently located at less than a full operating division distance from the terminal, a steam locomotive is substituted. The advantage of electrification of through passenger service, so far as reduc-

tion of movements of locomotives and empty rolling stock at passenger terminal stations is concerned, is that the electric locomotives can be operated equally well in either direction. This eliminates the necessity for all movements which would otherwise be required to turn locomotives. An electric locomotive does not require the ordinary coal, cinder and water facilities, and consequently all movements necessary in connection with these facilities are eliminated.

In suburban service it is the general practice to carry the electrification to the limits of its operation, which makes possible the use of a rolling stock adapted solely to suburban traffic. This permits multiple unit equipment in which the cars equipped with motors may be grouped in trains without regard to end relation or sequence and controlled from either end of the train. Where the service does not justify the use of all motor cars, trailers, not so equipped, can be interspersed through the train and can be equipped with control apparatus that will permit the operation of the train from the trailers as well as from motor cars. The use of multiple unit equipment eliminates the switching movements necessary in transferring locomotives from one end of the train to the other, likewise the other movements incident to taking care of separate motive power. There is a gain in the capacity of the terminal due to the quicker acceleration of trains and shorter length of track occupied when there is no locomotive; and a number of trains may be stored on one track and dispatched therefrom without switching.

A small amount of switching may be required where trailers are used and likewise for sending motor cars to inspection pits for periodic inspection.

The trains, due to the fact that each car contains its own motive power or control, may be made of any practicable operating length, which in the case of steam operation is limited by the tractive effort of the locomotive. With the reduction in number of trains or increase in train length possible with electric operation, the number of switching movements and resulting terminal congestion are correspondingly reduced.

President Wants Emergency Authority

Would Not Desire, However, to Take Over Roads or Mines Except as Last Resort in Case of Grim Necessity

WASHINGTON, D. C.

WHILE PRESIDENT HARDING feels that if Congress is not to be in session he should be authorized to meet the situation in a great national emergency by a grant of power to take over temporarily for government operation the anthracite coal mines and perhaps certain railroads or systems, it was officially stated at the White House on Tuesday that the "last thing in the world" the President would want to do would be to exercise such power except "as a last resort in the case of grim necessity" and that to take over all the roads would be "unthinkable." He does not believe in government operation and if such authority were granted and exercised, which the President "hopes and prays" would never be necessary, it would be only under specific limitations depending on the conditions as they existed. However, it was made clear that the President has not asked Congress for such authority and does not intend to ask it in any formal way. If he had intended to, it was stated, he would have done so in his address to Congress on August 18.

However, while it is still the judgment of the President that he ought to be fortified with such authority if the Senate is going to take a recess, even if the House remains in session, it now appears unlikely that Congress will be willing to grant general power to the President to determine whether or not a sufficient emergency exists. This is partly due to opposition to the plan which crystallized on Saturday as the result of what is characterized at the White House as "unfortunate publicity," for which, however, the President did not criticise the press, following Senator Cummins' brief announcement that the government was considering taking over the mines and perhaps some of the railroads unless the situation should speedily improve.

A rather more complete and detailed explanation of the President's position on the question of government operation than is sometimes afforded was given on Tuesday. It was pointed out that while there is a popular impression that the President has the authority to do almost anything the public wants done, and while if the public welfare demanded it there probably would not be serious opposition to the taking over of the mines or certain roads temporarily, it would require rather a stretch of authority. The President regards the bituminous coal situation as "in the clear" since 90 per cent of the mines have signed up and approximately normal production is expected by another week and while he had no definite assurances he thought the anthracite strike would soon be settled. The government intends to press the enforcement of the laws, it was stated, and it was felt that perhaps the railroads have not yet completely demonstrated the performance of which they are capable, but if the fuel situation should be menaced by a paralysis of transportation the administration would regard it as its duty to take over the mines or certain roads. He was represented as believing that the grant of such authority would not have any effect on promoting a settlement of either of the strikes and that it might even delay it, but from his conversations with union leaders he does not believe they have the slightest wish for such legislation because they do not want the government to take only a few of the roads or perhaps only one road or system.

Careful consideration was given for a time to a plan for having certain roads taken over by federal receivers on the ground of inability to furnish adequate service but the President was convinced that while such a step would avoid the difficulties incident to compensating the roads which were experienced by the Railroad Administration it would not solve the problem as many roads are now in the hands of receivers and their situation is no different from that of the others.

The plans of the administration appeared to have marched up a hill and then marched down again between Friday night and Monday morning. At present writing the announced policy is to concentrate all efforts on promoting the movement and equitable distribution of coal at fair prices while awaiting the results of the latest efforts of Secretary Davis and Senator Pepper to bring the anthracite operators and the mine union together, and to learn the degree of success of the railroads in handling the bituminous coal production before talking further about government operation. The proposal that Congress enact legislation authorizing the President, if in his judgment the emergency should require it, to take over the mines or railroads has been temporarily abandoned and Congress or at least the House now proposes

to stay on the job to determine for itself whether the emergency develops.

For about 24 hours the earnest and persistent efforts of the President and of his various advisors to bring about peaceful, if not amicable, and immediate, if only temporary, settlements of the anthracite coal and railroad strikes seemed to have stumbled upon another form of encouragement to the strikers to hold on a little longer.

After a conference on the evening of August 25 at the White House between President Harding, Chairman Cummins of the Senate committee on interstate commerce, and Attorney General Daugherty, Senator Cummins announced that the anthracite operators and miners would be given one more opportunity to settle their differences but that unless there was a settlement within a few days he would introduce a bill authorizing the government to operate the mines. Also, he said, the railroads would be given a "reasonable" time in which to demonstrate their ability to furnish adequate service and those unable to do so would be taken over. He expressed confidence that legislation for such purposes could be rushed through Congress.

The announcement caused surprise because earlier in the day it had been stated officially at the White House that the President believed that further conferences on the anthracite situation would result in an adjustment and that the administration had no "new steps" in contemplation with reference to the railroad situation. It was understood that the President and his advisers felt that the railroad situation was less acute than that involving the anthracite supply, but that the temporary settlement of the bituminous strike had transformed the problem from one of production to one of transportation and distribution.

The announcement, however, or at least the way in which it was published, created a stronger impression than was desired by the President as to his intentions and it was soon apparent that it had caused surprise and concern among Republican leaders, some of whom went at once to the White House on Saturday morning to get the story at first hand, and on Saturday evening newspaper men were called to the White House and given a more detailed explanation. They were told by a White House spokesman that while President Harding wants Congress to give him the authority, whenever he may see fit to proclaim that a national emergency exists, in the event conditions should become so serious as to require it, he merely wanted the legislation before Congress recesses, as it was expected to do shortly, so as to be prepared for any condition that might arise while Congress is not in session, and that neither the introduction nor the passage of such legislation would indicate any determination on the part of the administration to make use of the authority, except in the case of an extreme emergency which he did not foresee. The President was still confident that such an emergency as would require such drastic action will be avoided.

The President in his public statements and in his talks to newspaper men has carefully refrained from uttering threats as to what he would do in any given situation and he has frequently taken the position that he prefers to give publicity to what he has done afterward than to what he may do in advance, because of the natural tendency of newspaper speculation. Occasionally, however, the efforts to maintain secrecy as to what the administration proposes to do have resulted in information reaching the press in the form of vague hints which readily lend themselves to exaggeration, that might have been prevented by a more definite statement.

Further conferences on the industrial situation were held during a week-end trip on the President's yacht, the Mayflower, on which Secretaries Hoover and Fall, Attorney General Daugherty and Senators Cummins and Kellogg were the guests of the President and after their return on Monday, Senator Cummins indicated that he might withhold the proposed bills for a while to await developments. At conferences on Monday also, it was decided that Congress should not adjourn but that the House should take a series of three-day recesses.

Strike-Questions Debated in Senate

A demand for prompt and "drastic" action by the government to settle the railroad and anthracite coal strikes was precipitated in the Senate on August 24 by the introduction of bills requested by the President in his address to Congress on August 18 to create a coal investigating commission and to provide for a temporary restraint of coal prices. This was shortly after the announcement that the conferences between the anthracite operators and the mine union and the committee representing the Association of Railway Executives and the brotherhood leaders had failed to result in a settlement of either strike.

The only definite suggestion made in the debate for settling the strikes was that the government take over the coal mines or railroads or both, but there was less definiteness as to just how the government would proceed to induce the strikers to return to work after it took them over, particularly in the case of the anthracite miners, who are practically all unionized.

A joint resolution authorizing the President to take over and operate the coal mines, part or all of whose products are transported in interstate commerce, was introduced in the Senate on August 24 by Senator Walsh of Massachusetts. A bill to restrain profiteering in coal by authorizing the Interstate Commerce Commission to use its priority powers to give preference in car supply to fair price coal was also introduced by Senator Cummins and the Senate also began consideration of bills to create a coal investigating commission.

The resolution was introduced by Senator Walsh after a heated debate in which he and others had criticized the President for failure to settle the coal and railroad strikes and had demanded immediate action. Senator Cummins had replied with a defense of the President's course, pointing out that he had no power to settle a strike but had been using all his influence to bring about a settlement by mediation and asserting that if senators thought the President ought to have the power to take over the mines, the inaction was theirs if they failed to initiate the necessary legislation.

The discussion of government operation of the coal mines was continued on August 25 when Senator Edge of New Jersey introduced a bill giving the President blanket authority to acquire title by condemnation or otherwise to any or all of the coal mines of the United States for such period of time as he deems necessary, and to distribute the coal therefrom. The bill also provided for an appropriation of such amount as might be necessary.

Apparently there was an idea in the minds of some of those who talked of government operation that a bluff in that direction might be sufficient to force a settlement, in spite of the well-known fact that both the miners' union and the railroad unions have repeatedly advocated government ownership and would naturally decline to settle if that result were to be the alternative. "Emphatic approval of the federal threat to seize and operate the hard coal mines in the event operators and miners fail to reach an agreement was voiced by President Lewis of the United Mine Workers," according to a press dispatch on Saturday.

Also some of those who talked as if government operation were a panacea apparently failed to recall that there was a rather extensive strike of shop employees—although it was declared to be unauthorized—in the summer of 1919 while the government was still operating the railroads and that the government settled it by allowing a small increase in wages, inserting in the Transportation Act a provision for

the creation of the Labor Board to pass on a further increase and turning the railroads back to private management with the wage demand still unadjusted.

The debate in the Senate indicates that a good many of our most prominent statesmen have paid more attention to fears as to what might happen if there were no anthracite this winter than they have to the fact that the railroads have continued throughout the shop stripe to handle over 850,000 carloads of freight a week, and that, although there has been some car shortage, commodities other than coal have been moving in greater volume than ever before at this season of the year. It was also apparent that some senators who are willing to go so far as to characterize strikes as criminal are not yet ready to withhold criticism from the railroad managements that are trying to make strikes unhealthy by standing firmly for the principle that a man cannot be a striker and retain a first lien on his job at the same time.

Bills for Investigation of Coal Industry and to Restrain Profiteering

The House had passed on August 23 the Winslow bill, to create the United States Coal Commission to secure information in connection with questions relating to interstate commerce in coal, one of the measures proposed by the President in his address to Congress on August 18. The Senate committee on education and labor had considered a somewhat similar bill introduced by Senator Borah but had written a substitute for it which it was proposed to substitute for the House bill.

The Cummins bill, intended to meet the President's suggestion for some form of temporary control of prices, was drafted under the direction of the Presidential Fuel Committee, composed of representatives of the Departments of Commerce, Interior, Justice and the Interstate Commerce Commission and submitted to the President by Secretary Hoover.

In his letter to the President, Secretary Hoover enclosed three draft measures offering alternative bases for mitigation of profiteering and for better distribution of coal during the present emergency. He said he had been advised that any direct legislation for the repression of extortionate prices has no constitutional basis and that the three alternatives are: Voluntary agreement with operators and distributors of coal, extension of the powers of the Interstate Commerce Commission to give priority to the movement of non-profiteering coal, and, third, for the federal government to enter the business of purchase and distribution of coal and by such competition to "put the balance wheel in the price situation." The third plan was the one which has been urged by the President in his address. Secretary Hoover said the necessary legislation for the latter two alternatives had been drafted, but that the commission prefers the draft in which federal authority is exerted through extension of the priority powers of the Interstate Commerce Commission as being less cumbersome, requiring less extension in the federal organization and being more expeditious of application than the alternative plan through actual government possession of coal.

"The committee is in agreement, he said, that the exertion of such powers in times of peace is highly distasteful, and can only be justified as a measure necessary to provide for the effect of a famine in so necessary a commodity.

"We are deeply impressed with the fact that, due to the almost total exhaustion of coal stocks and the inevitable and growing shortage in transportation, the difficulties of the country will be very great, even with the resumption of coal production, and unless there is legislation enacted that will curb profiteering and will give control to distribution, there will be great suffering and difficulties during the period of readjustment.

"The federal fuel distribution set up by the committee under Mr. Spencer upon a basis of voluntary co-operation between government departments, state agencies and the majority of operators of coal mines, is without funds for even incidental expenses, and without this agency it would be impossible at the present moment to maintain the essential public utilities and other services in the country. Even this service must shortly be abandoned unless provision is made by appropriation, and they cannot expect to be successful in the rapidly tightening situation and in the face of reduced transportation facilities unless its authority is increased."

Text of the Cummins Bill

The text of Senator Cummins's bill to control coal prices and distribution is as follows:

"A bill to declare an emergency respecting the production, distribution and price of coal and other fuel, to create an additional agency of the United States with respect thereto, to enlarge the powers of the Interstate Commerce Commission in establishing priorities and embargoes in the transportation of coal and other fuel in interstate commerce in order to prevent the exacting of unreasonably high prices for these commodities, and for other purposes.

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled.

"That by reason of prolonged interruption in the operation of a substantial part of the coal mining industry in the United States and of impairment in the service of certain common carriers within the jurisdiction of the Interstate Commerce Commission and engaged in commerce among the states, a national emergency exists which threatens to obstruct and hamper the operation of the United States and its several departments, the transportation of the mails, the operation of carriers engaged in commerce among the several states and with foreign countries, and to furnish an opportunity for the disposition of coal and other fuel at unreasonably high prices.

"2. The powers of the Interstate Commerce Commission under an 'Act to Regulate Commerce,' approved Feb. 4, 1887, as amended, including the Transportation act of 1920, and especially under Section 402 of said Transportation act, are, during the aforesaid emergency, enlarged to include the authority to issue orders for priorities, embargoes and other suitable measures in favor or against any carrier or region, or person, or corporation, and to take any other necessary and appropriate steps for the priority in transportation and for the equitable distribution of coal or other fuel, so as best to meet the emergency and serve the public interest, and to prevent upon the part of any person, partnership, association, or corporation the purchase or sale of coal or other fuel at prices unjustly or unreasonably high.

"3. For the purpose of assisting in carrying into effect the orders of the Interstate Commerce Commission made under existing laws, or under Section 2 hereof, there is hereby created and established an agency of the United States to be known as 'The Federal Fuel Distribution Commission,' and there shall be appointed by the President a federal fuel distributor who shall ascertain:

"A—Whether there exists within the United States, or any part thereof, shortage of coal or other fuel and the extent of such shortage.

"B—The fields of production of coal and other fuel and the principal markets to which such production is usually transported and distributed, and the means and methods of distribution thereat;

"C—The prices normally and usually charged for such coal and other fuel, and whether current prices, considering the costs of production and distribution, with fair profits, are just and reasonable;

"D—The nature and location of the consumers, whether persons, firms, corporations, municipalities or communities, which should receive priority in transportation and distribution under the acts to regulate commerce administered by the Interstate Commerce Commission, including the Transportation act of 1920, in time of shortage of coal and other fuel or the transportation thereof, to the end that an equitable distribution of coal or other fuel may be secured so as to best meet the emergency and serve the public interests.

"The Interstate Commerce Commission is hereby directed to receive and consider the recommendation of the Federal Fuel Distributor, based upon his reports upon the foregoing subjects and other information which it may secure in any manner authorized by law.

"4. The Federal Fuel Distributor may make such rules, regulations and orders as may be necessary to carry out the provisions of this act, and may co-operate with any department or agency of the government, any state, territory or department agency or political sub-division thereof, or any person or persons, and may avail himself of the advice and assistance of any department, commission or board of the government, and may appoint or create any agent or agency to facilitate the power and authority hereby conferred; and he shall have the power to appoint, remove and fix the compensation of such officers and employees not in conflict with existing laws, and make such expenditures for rent, travel and other operating expenses as shall be necessary for the due and effective administration of this act.

"5. Whenever the President shall be of the opinion that the

national emergency hereby declared has passed, he shall by proclamation declare the same, and thereupon this act shall no longer be in force or effect.

"6. For the enforcement of the provisions of this act, including personal services and every other expense incident to the enforcement thereof, there is hereby appropriated out of any money in the Treasury not otherwise appropriated, the sum of $250,000, or so much thereof as may be necessary."

The committee on interstate commerce held a meeting to consider the Cummins bill on Saturday but there was not a full attendance and Senator Pomerene and others were reported as insistent upon having hearings on the bill before voting to report it out. On Monday, however, the committee voted a report without recommendation on the bill with amendments limiting it strictly to one year and to interstate commerce. A bill similar to the Cummins bill enlarging the emergency powers of the Interstate Commerce Commission was introduced in the House on August 26 by Representative Winslow, but after a discussion in the committee on interstate and foreign commerce it was decided to hold a hearing on Monday. After the hearing the committee voted to report the bill favorably.

Secretary Hoover and Commissioner Aitchison appeared before the House committee in support of the bill. Mr. Hoover said that the theory that unchecked prices may lead to increased production has no application to the present situation because the total production of coal will be limited by the capacity of the transportation machine and would not be enhanced by increased prices. He expressed the opinion that a distribution of 9,000,000 tons a week would prevent any general closing up of industry. Mr. Aitchison said that the present powers of the Interstate Commerce Commission are not broad enough to let it give or refuse cars on the basis of their compliance or non-compliance with fair price levels.

Mr. Hoover said that production of anthracite is now 36,000,000 tons behind and that this cannot be recovered. Therefore an enormous burden will fall upon the bituminous producers and with the deteriorated condition of railroad equipment it would be impossible to move anywhere near sufficient coal to meet all needs. A production of 10,000,000 tons a week, he said, would give the government agency 5,000,000 to 6,000,000 tons a week for distribution, whereas it has had only about 1,000,000 tons.

J. D. A. Morrow, vice-president of the National Coal Association, and Edgar Wallace, legislative agent of the American Federation of Labor, opposed the price-control features of the bill.

Senator Calder, of New York, had begun the debate in the Senate on August 24 by declaring that the anthracite operators and the miners should be given 48 hours' notice that they must settle their differences and that if they fail to do so Congress should give the President authority to take over the mines. Senator Walsh said that if the President does not already possess such authority he should have suggested it to Congress. Senator Cummins pointed out that he had had no power to settle the strikes but had sought to bring about a settlement by mediation and had not asked for legislation because the negotiations were still in progress. After he had declared repeatedly that if Senators thought the President should be given authority to take over the roads or the mines, it was their duty to initiate the legislation without waiting for the President to ask it, Senator Walsh introduced his resolution.

Senator Lenroot, of Wisconsin, said it seemed to him that the time had come when the power should be given to the President, to be exercised by him in his discretion, to take over the railways, or any part of them that he may deem necessary, and to take over the anthracite mines, if he deems necessary "so that the government may be put in the place of one of the parties instead of merely being a mediator." He said he should prefer, however, that the President would himself ask that the power be given him.

Senator Borah, of Idaho, said he would be very sorry if as a result of the day's debate, the country should receive the impression that Congress was going to settle the coal strike. The states should co-operate, he said.

Senator Cummins took part in the debate mainly to answer criticisms of the President for inaction. He said he had introduced a bill at the request of the President to deal with the immediate emergency and that at the next session of Congress will come the time for the discussion on the question "as to what place unionism should occupy in the civilization of the United States."

"I have long believed," he said, "that it ought to be a crime for employees to strike wherever the government undertakes to adjudicate for them the disputes which arise between them and their employers. That is the final remedy, in my opinion. I do not think our civilization can long endure if a body of artisans, composing the whole number of artisans in that class in the country, can leave their employment by concert and conspiracy at the same time."

"But that is not the question now," he said. "We are now confronted with a situation that needs temporary legislation." He said that Senators Calder and Walsh were not at fault for not introducing bills authorizing the taking over of the anthracite mines "because we have all been in that attitude of hope and expectation, believing that the difficulties would disappear. But it is apparent now that they will not disappear and that all authority which the Constitution enables us to give to the executive or to other departments of the government must be given to meet the extraordinary emergency which has appeared and which is now more critical and menacing than it has ever been before."

Senator Nelson, of Minnesota, declared that "the root of this whole difficulty is unionism. It is not necessary to have the government operate the anthracite mines. Throw the mines open, allow them to run under the open-shop principle and protect them in that and you will have an abundance of coal, and you will get it at a lower price than when there is union mining."

Senator Cummins admitted that his bill would not produce any anthracite coal. He said he still had a lingering hope that the operators will come to an agreement with their employees, but that "if it is believed that the President by taking over the mines can secure men who will produce coal, then he ought to be given the power to do it. However," he said, "it is still to be doubted whether the President would be any more successful in hiring men to enter the coal mines than the operators have been, because he will either have to agree to their terms or he may not be able to secure the men."

Senator Cummins said he thought both sides are to blame in the anthracite strike and the railroad strike, and that they ought to have been composed long ago, but that the President had no power whatsoever to do so and had used all the influence he had as a mediator in the effort to do exact justice between the parties, "hoping that it would not be necessary to resort to the extraordinary measures which are now proposed and with which I am in full sympathy."

The Borah bill, as amended in committee, differs from the House bill in that it provides for a commission of five members to be appointed by the President, while the House bill provides for nine to be appointed by the President with the restriction that no one interested in the coal industry may be appointed. The original Borah bill had provided for representation of both operators and miners but this was omitted at the request of the President, who desired a commission representing only the public. The new Borah bill is also more specific than the House bill in naming the subjects to be considered by the commission in its investigation, including "the causes which from time to time induce strikes," and recommendations as to "standardizing the mines upon the basis of their economic productive capacity and regard-

ing the closing down of mines which, by reason of their natural limitations, or other conditions, fall below the standard." It also calls for a report as to the advisability or wisdom of nationalizing the coal industry.

Consideration of the Borah bill was taken up in the Senate on August 25, the bonus bill being displaced for that purpose, but on August 26 it was again set aside until Tuesday.

While there seemed to be general approval of the purpose of the bill, several senators expressed impatience for immediate action. Senator Robinson, of Arkansas, said he would join with others "now or tomorrow to provide by solemn legislative act that anyone conspiring to hinder, prevent or restrain interstate commerce in the transportation of coal shall incur a severe penalty, and to "make that law applicable to mine owners, to mine operators and to mine workers." That, however, he said, would not mine coal and there ought to be a settlement now.

Senator Fletcher of Florida, calling attention to the President's statement that the country is at the mercy of the United Mine Workers, said that such a situation ought not to be allowed to last 24 hours, much less until Congress meets in December. "In other words," he said, "here is a group of people at the throats of this government and this whole country and we will argue the question with them next December, if we live!"

Senator Townsend, of Michigan, said that all anyone now hopes for is a temporary solution which will tend to relieve the public, but what Congress ought to do is to enact some legislation which would afford a reasonable method for the prevention of the strikes which periodically occur.

The Cummins and Winslow bills were reported to the Senate and House, respectively, on Tuesday and debate was begun in the House. In his report to the Senate, Senator Cummins said in part:

"It may be that the law as it is conferred upon the commission what Section 4 of this bill explicitly grants, but the commission or some of its members are in doubt about it and if the Congress believes that the commission ought to exercise the power of controlling the transportation of coal so as to prevent both coal operators and coal dealers from exacting excessive prices for coal, then there ought to be no hesitation in clothing the commission with undoubted authority upon the subject.

"The present situation is an exceedingly grave one; at this time there is sharp coal shortage, of which some operators and many dealers are taking advantage. Inasmuch as the strike in most of the bituminous fields has been brought to an end, the bituminous coal production will constantly increase, and if it be assumed that the railroads could move promptly the coal that will be mined, it might be that the opportunity for extortion would shortly disappear. The fact is, however, that some of the railroads which carry a large part of the coal traffic are by reason of the railroad strike unable to move the coal that is actually being produced to the points of destination and therefore unless the railroads can speedily increase their facilities a coal shortage in many parts of the country is bound to continue and we will be in the same position as if coal were not being produced.

"It is to be observed that the action of the commission under the authority which it has, or authority which this bill gives it, is directed solely to interstate railroad carriers and will operate to prevent the transportation of coal under certain conditions, the control being confined to interstate shipments. The transactions wholly within a state must be dealt with by the state authorities. Sections 3 and 4 of the bill authorize the President to appoint a federal fuel distributer and this distributer does nothing more than to help carry out orders of the Interstate Commerce Commission to make the necessary investigation and to recommend to the commission the priorities and embargoes which in the opinion of the distributer should be issued and established."

In the House there were some suggestions that the President ought to be granted the emergency power he desires to take over mines or railroads and Representative Johnson of South Dakota said he would offer an amendment to the Winslow bill for that purpose. Representative Mondell, said, however, that Congress would be in session and that in his opinion it is not likely to take any action looking to the taking over of the mines or railroads in time of peace except in the face of an emergency so immediate and pressing that such action would constitute the only way out.

Attorney General Instructs Vigorous Prosecution

As a result of renewed reports of violence in various parts of the country, the attorney general on August 29 sent to all United States district attorneys a telegram instructing them promptly and vigorously to prosecute violators of injunctions obtained by railroads. He also announced the appointment of Hiram C. Todd as an assistant to the attorney general to take charge of the situation in the western states, with headquarters at Los Angeles. The telegram sent to the district attorneys read:

"In cases where injunctions have been violated, you are instructed under the direction of the court to promptly and vigorously prosecute the violators and urge the court to make sentences sufficiently severe to prevent repetition of such violations and as a deterrent to others. Transportation and the mails must no longer be interfered with and the laws must be enforced impressively. Report all such proceedings to me."

The attorney general has received numerous reports that the condition in which many locomotives is reported represents something more than ordinary wear and tear or shortage of repair work and he is said to have considerable evidence of sabotage in certain places such as sand in the bearings of locomotives, and reports received by the department indicate that locomotives which the Santa Fe employees refused to take out of Needles were in entirely safe condition for use.

William Jennings Bryan arrived in Washington on Monday prepared to offer his advice to the government to take over coal mines and railroads temporarily to "put an end to an intolerable situation." He delivered a letter to Senator Walsh expressing approval of his resolution to authorize the President to take over the mines, and also talked with various other members of Congress about it.

Zinc as a Sheet Metal in Building Construction

One of the rather remarkable results of intensive manufacture incident to the war has been the introduction of sheet and strip zinc as a building material. The development has been commercial rather than metallurgical since zinc, which is now coming into common use for building purposes in this country, has actually seen service on buildings in Europe for over a hundred years. In other words, it has been a case of finding new uses for an old material.

Zinc has a number of properties which commend it for the outer covering of buildings, particularly for such uses as roofs, gutters, corrugated siding, down spouts, weather strips, etc. It does not corrode or rust like iron or steel. It is cheaper than any of the other non-ferrous metals and it is readily worked into the various shapes necessary for its convenient use. Zinc has strength in tension of about 21,000 lb. per sq. in. Its ductility is less than that of soft steel but not enough less to cause any difficulty in crimping, curving or otherwise working the material. When zinc oxidizes on exposure to the elements the effect is to give it a coating of a silver gray color that is not only pleasing in ap-

pearance but serves to protect the metal underneath. Therefore, the occasion for painting is done away with entirely as regards protection and also in many cases for considerations of appearance. This elimination of the painting in some cases makes the zince as cheap as steel.

The service which zinc sheets are giving because of its properties has led to its recognition as a building covering by a number of the railroads. The new pier of the Erie at Weehawken will be covered entirely with this material. It has also been specified as a covering for coaling station structures by the Illinois Central; the Burlington; the Chicago, Great Western; the Central of Georgia and other roads. The Chicago & North Western is applying zinc shingles to a signal tower in Chicago and is using corrugated siding and roofing on a coaling station at the same point.

Zinc has two properties which require the observance of certain precautions in their use. It has a coefficient of expansion of 2.6 times that of steel; therefore, it must be applied in a manner that allows adequately for change of size of the sheet with changes of temperature. By the development of certain forms of expansion joints that now thoroughly establish standard practice, this introduces no problem to the erector. In cases where zinc comes in contact with other metals with the presence of water, electrolytic action takes place which tends to dissolve the zinc. Therefore, where zinc is used in gutters, down spouts and other places where it is subject to moisture, care must be taken to see that the zinc does not come in contact with other metal. On the other hand, it has been found entirely practicable to cover structural steel frames of buildings with zinc corrugated siding and zinc roofing without taking any of these special precautions.

As mentioned before, the zinc strips and zinc sheets are being used for a variety of purposes. One application which is receiving the particular attention of one manufacturer, the New Jersey Zinc Company, is gutters and down spouts which are used extensively. A large amount of interest is being given also to the design of exterior coverings of buildings from roof to ground line, while a development which is receiving the particular attention of another firm, the Illinois Zinc Company, is zinc shingles. These have an interlocking design not unlike the interlocking roofing tile but with the advantage that they are nailed to the roof boards like ordinary shingles. Owing to the fact that these shingles weigh no more than the ordinary wooden shingles, the roof construction need be no stronger than that ordinarily provided.

W. A. Webb Becomes Head of South Australian Railways

William A. Webb, formerly general manager of the Missouri, Kansas & Texas Railway, has been appointed chief commissioner of the State Railways of South Australia. He will sail early in October for Adelaide, South Australia, where his headquarters will be.

The chief commissioner of the railways of South Australia is their active manager. This is one of several notable cases in which foreign railways have come to the United States for managers. The last case of the kind which attracted widespread attention was that in which Henry W. Thornton, general superintendent of the Long Island Railroad, was appointed general manager of the Great Eastern Railway of England. He is now Major General Sir Henry Thornton, having acquired his military title as head of the British transportation forces during the war.

The State Railway System of South Australia has a total of 2,333 miles of line. Of this, 1,124 miles has a 5 ft. 3 in. gage, and 1,209 miles has a 3 ft. 6 in. gage. They have never been very prosperous, and in the year ended June 30, 1921, incurred a deficit of $2,733,550 after interest. The South Australian Railways form an important connecting link between the railways of the states of New South Wales and Victoria on the east and Western Australia on the west. The north-south transcontinental line from Port Darwin will, when completed, depend upon this system for connection with the other railways of the continent. One of the most important problems with which Australia's railways are now faced, beside that of insufficient earnings, is the unification of gages which are now so varied that transshipments are frequently necessary.

The state of South Australia lies in the south-central part of the continent and has an area of 380,070 square miles—about equal to that of Texas, Oklahoma and Louisiana combined. The topography of the state is varied—in one part there are mountains and there are also a number of rather large lakes; the predominant landscape, however, is the high plain, which in the extreme north and west becomes a desert. The state is predominantly agricultural, wheat and grapes being the most important crops. Other important products are wool and copper. The state has a population of about 450,000 and Adelaide, its capital city, has 190,000.

Mr. Webb was born at Eaton, Ohio, on May 16, 1878, and received a high school education there. He entered railway service with the Colorado Midland on October 16, 1890, and until November, 1900, served consecutively as messenger, roadmaster's clerk, trainmaster's clerk, telegraph operator, clerk and stenographer to superintendent, chief clerk to superintendent and stenographer to the president and general manager. In November, 1900, he went with the Colorado & Southern as secretary to the president and general manager, which position he held until May, 1903. He was then appointed chief clerk to the vice-president and general manager, which position he held until he was promoted to that of assistant to the vice-president in October, 1905.

He remained in this position until June, 1911, when he became general manager of the Texas Central. On May 22, 1912, he became assistant to the president of the Missouri, Kansas & Texas. He subsequently served as general superintendent, vice-president and general manager and chief operating officer of this railway, and in 1918 became general manager, under Government control of the Missouri, Kansas & Texas, the Wichita Falls & Northwestern, the Fort Worth & Denver City and the Houston & Texas Central, and later had his jurisdiction extended to the Abilene & Southern and the Union Terminal of Dallas, with headquarters at Dallas. In 1919 he became a member of Railway Board of Adjustment No. 1 of the United States Railroad Administration, with offices in Washington. On the return of the railways to private operation on March 1, 1920, he became vice-president and general manager of the St. Louis Southwestern. He resigned this position on May 10, 1921, and subsequently was elected to the position of president of the Cambria & Indiana Railroad, with office at Philadelphia.

As this brief biography of Mr. Webb shows, he has had long experience as an operating officer and operating executive on railways in the West and Southwest. It is probable that conditions in that territory resemble those in the state of South Australia as much as they do in any part of this Country.

It is believed that this is the first case in which a railway man who has received all his training in the United States has become the manager of a system of state railways, although some years ago Sir Thomas Tait, formerly general manager of the Canadian Pacific, became chief commissioner of one of the systems of state railways in Australia.

Coal Loading Shows Rapid Increase

WASHINGTON, D. C.

THE SETTLEMENT of the coal strike in most of the bituminous mines has resulted in a large increase in coal loading. Whereas during June the average daily loading was 15,540 cars, the loading on August 21 reached 19,048 cars. There was the usual reduction during the next three days to 17,772 on Tuesday, 18,169 on Wednesday and 18,784 on Thursday, but on Friday there was an increase to 21,866 cars and on Saturday to 22,178. For the week the total was 117,730 cars or approximately 6,500,000 tons. The highest previous loading since the coal strike was about 94,000 cars.

Coal loading for last Friday in the Allegheny district was 11.6 per cent in excess of the average daily loading for August last year, while in the Pocahontas district, an increase of 15.4 per cent was shown. Coal loading last Friday in the Southern district exceeded the daily average for August one year ago by 5.8 per cent. In the Eastern, Northwestern, Central Western and Southwestern districts, however, decreases compared with the daily average one year ago were reported. The three districts showing increases in production, however, are those in which non-union mining has been carried on throughout the suspension of work in union fields and in which earliest settlements were made. Practically all the railroads in those districts show a heavier movement than during the corresponding period last year. The districts showing decreases in coal production, however, are confined to producing territories where there was almost complete suspension of mining and where settlement was last made or had not yet been effected. The decreases shown are due entirely to lack of mining production and not in any way to any transportation deficiencies. Approximately 7,000 carloads of coal were consigned to lake ports last week. Because of the general resumption of bituminous mining it was announced on Monday, no more coal will be directed by the federal fuel distributor to the different states—except the Upper Lakes—under emergency orders under Class 1 priority unless the situation should again warrant such forced measures. All coal will be permitted to move as far as practicable under the Interstate Commerce Commission classified priorities. Thus the federal fuel distributor will issue no more No. 1 priority orders for coal to move to state organizations except possibly in connection with a plan for lake shipments. Coal shippers holding priority No. 1 orders placed through the federal fuel distribution agencies are expected to complete shipments on such orders unless by mutual agreement between shippers and the consignee. The issuance of emergency priority orders of Class 1 for railroads will continue until such time as the Interstate Commerce Commission has provided other plans for caring for the railroad requirements.

A new plan was being worked out under the Interstate Commerce Commission to secure an assurance of reasonable lake movement up to the capacity of lake transport.

The agreement as to price restraint with the non-union operators expired on Monday with the resumption of the union bituminous mines and the various district and general committees will cease to function as of September 2. About 70 per cent of the non-union operators have held to this agreement, and it is felt that the public has been saved a very large sum.

Pending the action of Congress and the state authorities, the only restraint upon price is the schedule of fair prices declared by governors or state coal commissioners in some of the states, to which it is earnestly hoped the operators and dealers will conform. These prices are about $4.50 per ton maximum in the Kentucky, Tennessee, West Virginia and Virginia fields, $3.75 for Pennsylvania thick vein and $4.75 for thin veins. Standards have not yet been set in other states.

The legislation before Congress can only control the price of coal moving over state lines, that is in interstate commerce. The price of coal produced and consumed in a state, together with the charges which wholesalers and retailers within the state may make, the latter including even interstate coal, should be controlled by the state authorities. Therefore, there can be no real control of profiteering unless the state authorities act.

Owing to the rapidity with which operations are being resumed in various bituminous fields, the United States Geological Survey estimated the present week's coal production at 8,000,000 tons. Revised estimates for last week are for a production of 6,400,000 tons. Coal was being produced Friday, August 25, at the rate of 7,400,000 tons weekly.

Authorizations were given by the Federal Fuel Distribution Committee for movement to the Great Lakes of all coal loaded in certain districts in West Virginia and eastern Kentucky on Monday, August 28. The districts included in the order are the same as those covered by the committee's program for lake shipments on Monday, Wednesday and Saturday of last week.

Notwithstanding the factor of a greatly increased production of bituminous coal, the Fuel Distribution Committee considers that the movement of a sufficient tonnage of coal to the Great Lakes region before the close of navigation is a serious problem. A program for facilitating the movement of the required tonnage is now being considered and will probably be announced very shortly. The tonnage of coal now at the head of the Great Lakes is from force of circumstances considerably lower than the amount of such stocks at this period in 1921 or in 1920.

Authorization has been placed in the Bluefield, West Virginia, district for the movement of a considerable tonnage of coal to the State Fuel Administration of New York, for distribution in that State to meet emergency needs. This coal will move to tidewater at Hampton Roads, Virginia.

The effect of a sharply increased coal production from fields recently reopened was manifested in the decreasing number of applications for emergency coal being received by Fuel Distributor Spencer. At the beginning of last week these applications were being received in great numbers. With the reopening of various coal fields many of these applications were returned with the advice to the applicants that their fuel requirements can no doubt best be taken care of in their own states.

A considerable number of authorizations for coal to be shipped from Kentucky and West Virginia districts to gas and electric light public utilities and ice plants in Indiana, Michigan, Illinois, Virginia and Ohio, and to canneries in Indiana and Michigan have been made by the Federal Fuel Distribution Committee.

At the request of Governor Baxter of Maine, a considerable tonnage of coal from southern West Virginia will be moved to alleviate the critical domestic fuel shortage in that state.

On representation of the district coal committee at Birmingham, Alabama, that the movement of railway fuel in that state could at this juncture probably best be handled on a pro-rata basis, Fuel Distributor Spencer has authorized the cancellation of Class 1 priorities for railway fuel heretofore placed in that state. The district committee at Birmingham, has been advised that, if the pro rata plan of distribution does not take care of railway fuel requirements, Class 1 priorities will be issued for all railway coal to come from Alabama.

The increase in production of bituminous coal, and the opening of fields recently closed, near to important markets, have made it possible for the Interstate Commerce Commission to rearrange the list of priority uses embraced in Service Order No. 23, as previously amended. By further amendments issued on August 29 the emergency uses are all embraced in Class 2; Class 1 is reserved for such extraordinary

cases as may be designated from time to time by the commission; all other uses fall within Class 3.

Certain pressing needs of the railroads and of the portion of the Northwest which must practically be served by water before the close of lake navigation will be met by proper assignments of particular shipments to Class 1.

The commission says that certificates from state fuel administrators or committees as to the character of use and bona-fides of the transaction will be deemed sufficient evidence for the carriers in carrying out the direction for priority as to coal for domestic and building heating purposes, as well as other evidence of the right of a particular shipment to be placed within the priority class.

Amendment No. 4 to service order No. 23 is as follows:

It is ordered, That paragraph numbered 7 of the said Service Order No. 23 adopted July 25, 1922, as subsequently amended, be, and it is hereby, further amended and supplemented to read as follows, effective on and after August 30, 1922:

7. That in the supply of cars to mines upon the lines of any coal-loading carrier, such carrier is hereby authorized and directed, to place, furnish, and assign such coal mines with cars suitable for the loading and transportation of coal in succession as may be required for the following classes of purposes, and in following order of classes, namely:

CLASS 1. For such special purposes as may from time to time be specially designated by the commission or its agent therefor. In designating special purposes under this reservation, the commission or its agent will designate the class of relative priority which such special purpose or particular shipment or shipments shall receive.

And subject thereto in order of priority:

CLASS 2. For fuel for railroads and other common carriers, and for bunkering ships and vessels; for public utilities which directly serve the general public under a franchise therefor, with street and interurban railways, electric power and light, gas, water, and sewer works, ice plants which directly serve the public generally with ice, or supply refrigeration for human food stuffs; hospitals; for the manufacture and production of food stuffs and medicines and for the manufacture of containers therefor; for the United States, state, county, or municipal governments, and for their hospitals, schools, and other public institutions—all to the end that the foregoing may be kept supplied with coal for current use for such purposes, but not for storage, exchange, or sale; for bituminous coal consigned to a pool or pools of lake cargo or bunkerage coal at any port upon Lake Erie for transshipment by water to ports above Lake Erie; bituminous or anthracite coal, or coke for household use and for the heating of buildings. It is not intended by this paragraph to give any priority as between the classes of persons and uses mentioned herein.

CLASS 3. Other purposes.

No coal embraced in Classes 1 or 2 shall be subject to reconsignment or diversion except for some purpose in the same class or a superior class in the order of priority herein prescribed.

For the more prompt and effectual administration during the present emergency of the authorizations, directions, and requirements of this paragraph No. 7, the following persons are designated and appointed as agents of the commission with authority to give directions as to car service and to the matters referred to in paragraphs (15) and (16) of section 1 of the interstate commerce act, and referred to in this paragraph No. 7, viz.: John C. Roth, director, and E. H. DeGroot, assistant director; Frank C. Smith, chief inspector of the Bureau of Service of the commission, and S. J. Mayhood, B. S. Robertson, C. C. Semple, W. L. Barry, O. S. Reynolds, H. M. Priest, J. B. Ford, John T. Marchand, J. A. Emmart, W. L. Lloyd, A. R. Layman, Delbert Garman, F. F. Engles, L. P. Green, T. L. Stevens, C. J. Bailey, C. D. Thomas, W. S. Rice, W. D. Anderson, W. B. Moore, J. Patterson, J. F. Stewart, John E. Barr, Wm. J. Kiniry, T. J. Davis, T. F. Sullivan, and the directions so given by them shall be regarded as directions of the commission.

Arrangements for the pooling of lake coal in accordance with the revised plans of the Federal uFel Distribution Committee had practically been completed on Wednesday. The original intention was to have the pool go into effect September 1, but the perfection of details may necessitate delaying actual operations for three or four days. Dumpings of coal at lower lake ports for shipment to upper lake territory last week amounted to 240,000 tons. Reports covering the first two days of the present week indicate total dumpings for this week amounting to 400,000 tons. It is understood that agreements for the shipment of lake coal to the amount of several million tons have been arranged between coal operators in Ohio, Pennsylvania, West Virginia, Kentucky and the lake shippers.

B. S. Robertson of the Interstate Commerce Commission has been designated to represent that commission and the Federal Fuel Distribution Committee at Cleveland, in the passing upon applications from lake shippers for permits for the movement of coal under the new lake program.

With the readjustment of the system of fuel distribution, following the promulgation of the recent amendment to Interstate Commerce Commission, Order No. 23, it is expected that coal under contract or purchase will move generally through its usual channels in accordance with its priority. Where the use for which the coal is to be put is not clearly shown by the order or billing, the state authorities can issue certificates giving this information. This action will automatically determine the classification of the coal under Order No. 23. The co-operation of the Federal Fuel Distribution Committee may be obtained by the state authorities in cases where urgently needed fuel supplies cannot be obtained by the means above outlined.

The Coal Operators' Advisory Committee, headed by C. E. Bockus of the Virginia Coal & Coke Company, which has been assisting the Federal Fuel Dustributor, disbanded on Wednesday. Although it is expected that the various district coal committees will disband after this week, it is probable that the naval and Interstate Commerce Commission representatives will remain at their stations for some time for the purpose of adjusting various details.

A new high record was established on Monday, August 28, when 30,054 cars were loaded for shipment. This exceeded by 7,876 cars the number loaded on Saturday. Loadings on Monday were equivalent to a weekly production of approximately 10,000,000 tons. There was an increase over the preceding day in all districts and the total for Monday exceeded by 6,366 cars the average daily loadings in August last year, when there was no railway strike in effect, while except in the Northwestern and Central Western districts, where there was only a slight difference, loadings on Monday in all districts exceeded by a considerable margin the average daily loadings in the same districts in August last year.

Loadings on Monday were nearly twice the average daily loadings in June, 1922, each district exceeding the daily average for June except the Pocahontas, where loadings on Monday totaled 5,785 cars, while the June average was 5,872 cars.

Coal loadings by districts on Monday were as follows:

District	Cars
Eastern	4,052
Allegheny	8,702
Pocahontas	5,785
Southern	5,228
Northwestern	922
Central Western	3,968
Southwestern	1,397
Total	30,054

Belief that the railroads would be able to handle enough coal to supply current needs this winter was expressed by Secretary Hoover. He pointed out that the best performance of the roads for a week in the past was about 13,500,000 tons, while for the next six weeks they might be called upon to haul 17,000,000 tons a week if they could do so. This total could be cut down, however, by confining distribution to current requirements. One of the difficult problems arises from the accumulation of some 20,000 to 25,000 loaded cars on the Southern coal carrying roads while somewhere between the non-union coal fields and the Northwest there is approximately 600,000 tons of coal consigned to the lake region under priority orders. It is hoped to move 1,200,000 tons a week to the lake ports before the close of navigation but it is regarded as certain that all-rail shipments to the Northwest will be necessary during the winter.

General News Department

Three Men Burned to Death was the tragic result of a highway crossing disaster at Rockwood, Mich., one day last week.

Electrification of Montreal Harbor Railway Proceeding Rapidly

Electrification of the Harbor Railway Terminals, Montreal, with a total trackage of 58 miles, is proceeding, and it is expected that by the end of September 42 miles will have been electrified. The remaining 16 miles will probably be completed next season, according to a statement issued by M. P. Fennell, manager of the Montreal Harbor Commission. Electric locomotives of a type especially suited for harbor work will be purchased by the Commission.

International Commerce Chamber to Meet in Rome

The second general meeting of the International Chamber of Commerce will be held in Rome, Italy, from March 18 to 24, 1923. Present indications are that from two to three hundred American business men will be in attendance. Opportunity will be afforded to Americans in attendance to take numerous side trips to study economic conditions in Mediterranean countries, the Near East and Western Europe. Further details can be secured from L. C. Zapf, secretary, American Section, International Chamber of Commerce, Mills building, Washington, D. C.

New York Railroad Club Meeting

H. C. Pearce, director of purchases and stores of the Chesapeake & Ohio, will present a paper at the meeting of the New York Railroad Club on Friday evening, September 15, on "The Real Functions of the Department of Purchases and Stores." He will discuss the purpose, scope and organization of the purchases and stores department, or the "service of supply" as it is frequently called. The necessity of conserving the material resources will be touched upon, with suggestions as to how it may be accomplished and at the same time improve the promptness and efficiency of the delivery of material to the user.

Transportation Day at Canadian National Exhibition

Thursday, September 7, has been set aside as Transportation Day at the Canadian National Exhibition, which opened at Toronto, Ont., on Saturday, August 26. The exhibition has a number of transportation exhibits and a special program will be arranged for railway men on September 7.

The Canadian National Railways is exhibiting four different types of self-propelled motor coaches and is directing special attention to the importance of these coaches in improving branch line service. The Canadian National Railways is also exhibiting a complete transcontinental train of steel equipment, consisting of a Pacific type locomotive, baggage car, colonist car, first-class coach, tourist sleeper, dining car, first-class sleeper, compartment-observation car and a mountain observation car.

Steel Treaters and Drop Forgers Will Meet in Detroit

Final arrangements are being made for the fourth international steel exposition and conventions of the American Society for Steel Treating and the American Drop Forging Institute to be held in the General Motors building, Detroit, Mich., Oct. 2-7.

The exposition will be the largest ever held as practically all of the floor space has been sold and many exhibitors who desired to be present cannot be accommodated. There will be quite a number of exhibitors not present at previous shows due to the fact that the Drop Forging Institute is holding its annual convention simultaneously and in the same building with the American Society for Steel Treating.

The General Motors building is especially adapted for exhibition purposes. In the large exhibition hall, there are 30,000 sq. ft., while the two wings on the same floor leading to the exhibition hall have 20,000 sq. ft. of additional display space. Arrangements have been made so that in one section of the hall gas furnaces will be in operation, while electrical furnaces and other equipment requiring power will be displayed throughout the hall. Practically all of the exhibits will be in operation.

At the three previous expositions held in Chicago, Philadelphia and Indianapolis, the attendance has been in excess of 10,000, and it is expected that because of the great interest in Detroit as a heat treating center as well as a market for steel products, the attendance will be in excess of 15,000.

Proposed Penalties for Obstructing Interstate Commerce

A bill making it a felony under the federal laws for any person or persons willfully, by physical force, or intimidation by threats of physical force, to obstruct or retard the orderly conduct or movement of interstate or foreign commerce or the make-up or disposition of locomotives and cars, was introduced in the Senate on August 23 by Senator Sterling of South Dakota. The bill would also impose penalties for willful attempts to destroy, injure or impair any of the tracks, switches, roundhouses or terminal facilities of any railroad used in interstate commerce with the intent to interfere with commerce, and make persons chargeable with such interferences chargeable with murder in the event that lives are lost as a result.

Passengers Relieved by Wig-Wag Signals

Southbound passenger train No. 3105 of the New York, New Haven & Hartford was derailed on the afternoon of August 24 about four miles north of Newport, R. I., and three of the twenty passengers on the train were slightly injured. The road at this point runs along the shore of Narragansett Bay and the first relief that was secured for the train came from a vessel of the United States Navy, which sent a crew of 30 men. Naval radio telegrapher F. C. Burst, had just alighted from the train, at the last preceding station; and, seeing the trouble he ran to the scene of the accident. Mounting the roof of one of the cars he attracted the attention of the men out in the bay by wig-wag signals. Lieutenant Matthews, who came with the relief crew, took all of the passengers to Newport on the Navy launch, before the doctors and ambulances had arrived. The locomotive of the train did not leave the rails; and the tender and the three cars were not much damaged.

Labor Opposes Kellogg Alien-Protection Bill

Representatives of organized labor at hearings before a Senate committee on August 23 and 24 vigorously opposed the enactment of the Kellogg bill authorizing the federal government to punish offenses against aliens in violation of treaty rights, which was urged by the President in his address to Congress on August 18 in order to give the government power to deal with such cases as the Herrin massacre in the event of failure of state and local authorities to act. Edgar Wallace, legislative agent of the American Federation of Labor; N. P. Alifas, of the International Association of Machinists, and A. S. Lovell, vice-president of the Brotherhood of Locomotive Engineers, objected to the bill on the ground that its purpose was to "put the federal government in the business of strike-breaking on the pretense that the rights of aliens may be affected." Mr. Lovell said that thousands of aliens are killed each year through railroad accidents and that the bill would make possible huge bills for compensation against the federal government.

A Billion and a Quarter

James C. Rogers, the veteran general paymaster of the Pennsylvania Railroad, who, as announced in the *Railway Age* of July 8, page 91, was retired on pension on July 1, had been connected with the general offices of the Pennsylvania and of the Philadelphia, Wilmington & Baltimore since November 1, 1869. Until the merger of the last named road with the Pennsylvania, he was employed mainly in the treasurer's department, and he entered the same department in the larger company. In 1905, he was assigned to the work of introducing the cash system of payment of wages on the Pennsylvania lines east of Pittsburgh and Erie. This work occupied his time for five years, involving as it did the training of many paymasters and clerks and the supervision of the construction of pay-cars. In January, 1919, under the United States Railroad Administration, the payment of wages by checks was resumed. During the ten years up to that time, there was paid out from the pay-cars one billion two hundred and fifty-two millions of dollars. The losses resulting from errors in payment from the pay-cars during this ten-year period averaged $558.27 a year, a showing which is regarded as attesting the high quality of the work of the paymaster's department, as carried on under Mr. Rogers' direction. This is equal to one dollar in every $224,000 paid out, or less than one two-thousandth of one per cent. Mr. Rogers has been general paymaster of the Pennsylvania System since 1920. He is also president of the Veteran Employees' Association of the general offices at Philadelphia, and he will continue in this position.

Earnings for July

Incomplete reports so far filed with the Interstate Commerce Commission show that 104 out of 200 Class I railroads had a net operating income in July of $46,263,000, compared with $43,938,000 for those same roads in July last year. Complete reports for all the Class 1 roads are expected to be available in about a week.

Operating revenues for the 104 roads totaled $272,628,000, a decrease of 2.6 per cent under those for the same month last year, while their operating expenses amounted to $207,087,000, a reduction of 5.2 per cent compared with those for the same roads during July, 1921. The 104 roads represent a mileage of 141,380 miles.

Incomplete reports for 57 railroads in the Eastern district, representing 43,430 miles, show that those roads had a net operating income in July of $15,970,000, compared with $20,510,500 for the same carriers last year. Their operating revenues totaled $132,116,000, a reduction of 5.3 per cent compared with July, 1921, while their operating expenses amounted to $106,666,000, a decrease of 4 per cent under those for the same month in 1921.

Sixteen railroads in the southern district with a mileage of 18,780 miles had a net operating income of $4,435,800, compared with $3,459,000 for the same roads in July last year. The operating revenues for those southern roads totaled $30,604,000, an increase of 2.10 of 1 per cent over July last year, while their operating expenses amounted to $24,792,000, a reduction of 3.2 per cent compared with the operating expenses of the same carriers in July one year ago.

Reports for 31 railroads in the western district, representing 79,169 miles, gave their net operating income as $25,856,700, compared with $19,900,000 in July last year. Their operating revenues totaled $109,907,000, which was practically the same as that for July last year, while their operating expenses were $75,628,000, or a reduction of 7.5 per cent under the same month one year ago.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

Air Brake Association.—F. M. Nellis, 165 Broadway, New York City. Next convention, May 1-4, 1923, Denver, Colo. Exhibit by Air Brake Appliance Association.

Air Brake Appliance Association.—J. F. Gettrust, The Ashton Valve Company, 318 W. Washington St., Chicago. Meeting with Air Brake Association.

American Association of Demurrage Officers.—F. A. Pontious, Supervisor of Demurrage and Storage, C. & N. W. Ry., Chicago.

American Association of Dining Car Superintendents.—L. A. Stone, C. & E. I. Ry., Chicago. Annual meeting, Oct. 17-20, San Francisco, Cal.

American Association of Engineers.—C. E. Drayer, 63 E. Adams St., Chicago.

American Association of General Baggage Agents.—E. L. Duncan, 332 So. Michigan Ave., Chicago.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 10 and 11, Seelbach Hotel, Louisville, Ky.

American Association of Railroad Superintendents.—J. Rothschild, Room 400 Union Station, St. Louis, Mo.

American Electric Railway Association.—J. W. Welsh, 8 W. 40th St., New York.

American Railroad Master Tinners', Coppersmiths' and Pipe Fitters' Association.—C. Borcherdt, 202 North Hamlin Ave., Chicago, Ill.

American Railway Association.—J. E. Fairbanks, General Secretary, 75 Church St., New York, N. Y. Annual meeting, November, 1922.
Division I.—Operating. J. C. Caviston, 30 Vesey St., New York, N. Y.
Freight Station Section (Including former activities of American Association of Freight Agents). R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.
Medical and Surgical Section. J. C. Caviston, 30 Vesey St., New York.
Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association). J. C. Caviston, 30 Vesey St., New York, N. Y.
Safety Section. J. C. Caviston, 30 Vesey St., New York.
Telegraph and Telephone Section (including former activities of the Association of Railway Telegraph Superintendents). W. A. Fairbanks, 30 Vesey St., New York, N. Y. Annual meeting, September 19-21, 1922, The Antlers, Colorado Springs, Colo.
Division II—Transportation (including former activities of the Association of Transportation and Car Accounting Officers). G. W. Covert, 431 South Dearborn St., Chicago, Ill.
Division III—Traffic. J. Gottschalk, 143 Liberty St., New York.
Division IV—Engineering. E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Exhibit by National Railway Appliances Association.
Construction and Maintenance Section. E. H. Fritch.
Electrical Section. E. H. Fritch.
Signal Section (including former activities of the Railway Signal Association). H. S. Balliet, 30 Vesey St., New York, N. Y. Next meeting, November 21 and 22, Hotel McAlpin, New York.
Division V—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Exhibit by Railway Supply Manufacturers' Association.
Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Next meeting, which was scheduled to be held Sept. 5-7, has been postponed.
Division VI—Purchases and Stores (including former activities of the Railway Storekeepers' Association). W. J. Farrell, 30 Vesey St., New York, N. Y.
Division VII—Freight Claims (including former activities of the Freight Claim Association). Lewis Pilcher, 431 South Dearborn St., Chicago, Ill.
Car Service Division—C. A. Buch, 718 18th St., N. W., Washington, D. C.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Next convention October 17-19, 1922, Cincinnati, Ohio. Exhibit by Bridge and Building Supply Men's Association.

American Railway Development Association.—A. Leckie, Industrial Agent Kansas City Southern Ry., Kansas City, Mo.

American Railway Engineering Association.—(Works in co-operation with the American Railway Association, Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Exhibit by National Railway Appliance Association.

American Railway Master Mechanics' Association.—(See American Railway Association, Division V.)

American Railway Tool Foremen's Association.—R. D. Fletcher, 1145 East Marquette Road, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.

American Short Line Railway Association.—T. F. Whittelsey, Union Trust Bldg., Washington, D. C.

American Society for Steel Treating.—W. H. Eiseman, 1600 Prospect Ave., Cleveland, Ohio. Annual convention, Oct. 2-7, 1922, General Motors Building, Detroit, Mich.

American Society for Testing Materials.—C. L. Warwick, University of Pennsylvania, Philadelphia, Pa.

American Society of Civil Engineers.—Prof. J. H. Dunlap, University of Iowa, Iowa City, Ia. Regular meeting 1st and 3d Wednesdays in month, except July and August, 33 W. 39th St., New York. Fall meeting, October 4-9, Palace Hotel, San Francisco, Cal.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York.
Railroad Division—A. F. Stuebing, Manager Editor, Railway Mechanical Engineer, Woolworth Bldg., New York.

American Train Dispatchers' Association.—C. L. Darling, 1310-1311 Mallers Bldg., Chicago, Ill. Next convention, June 18, 1923, Chicago.

American Wood Preservers' Association.—S. D. Cooper, A. T. & S. Fe R. R., Topeka, Kan. Next meeting, January 23, 1923, New Orleans, La.

Association of Railway Claim Agents.—H. D. Morris, Northern Pacific R. R., St. Paul, Minn.

Association of Railway Electrical Engineers.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

Association of Railway Executives.—Thomas De Witt Cuyler (chairman), 61 Broadway, New York, N. Y.

Association of Railway Supply Men.—A. W. Clokey, 1658 McCormick Bldg., Chicago. Meeting with International Railway General Foremen's Association.

Association of Railway Telegraph Superintendents.—(See American Railway Association, Division I.)

Association of Transportation and Car Accounting Officers.—(See American Railway Association, Division II.)

Bridge and Building Supply Men's Association.—D. I. Higgins, American Valve & Meter Company, 332 S. Michigan Ave., Chicago. Meeting with convention of American Railway Bridge and Building Ass'n.

Canadian Railway Club.—W. A. Booth, 53 Rushbrook St., Montreal, Que.

Car Foremen's Association of Chicago.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS.—M. ... Secretary, 6-4 Federal Reserve Bank Bldg., St. Louis. ... last Tuesday in month at the American Hotel Annex, St. ...

CENTRAL RAILWAY CLUB.—Harry D. ... 2 ... St., New York. September meeting has been postponed.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. P. Elliott, Terminal Railroad Association of St. Louis, East St. Louis, Ill. Annual convention, ... Hotel Sherman, Chicago.

CHIEF INTERCHANGE CAR INSPECTORS AND CAR FOREMEN'S ASSOCIATION.—D. B. Wright, 34th St. and ... Ave., Chicago, Ill. Meeting with Chief Interchange Car Inspectors and Car Foremen's Association.

CINCINNATI RAILROAD CLUB.—W. C. Cooler, Union Central ... Cincinnati, Ohio. Meetings, 2d Tuesday in February, May, September and November.

EASTERN RAILROAD ASSOCIATION.—E. N. Bessling, ... F St., N. W., Washington, D. C.

FREIGHT CLAIM ASSOCIATION.—(See American Railway Associations, Division VII.)

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—C. H. Treichel, Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Friday in month, Room 1414, Manhattan Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—George P. White, 747 Railway Exchange, Chicago. Meeting with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, 702 E. 51st St., Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn. Next convention, September 5-8, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—C. W. Sullivan, Garlock Packing Co., 376 W. Madison St., Chicago. Meeting with International Railway Fuel Association.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Division V.)

MASTERS' CAR BUILDERS' ASSOCIATION.—(See A. R. A., Division V.)

NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—Warren C. Nixon, Western Tie & Timber Co., 905 Syndicate Trust Bldg., St. Louis, Mo.

NATIONAL ASSOCIATION OF RAILWAY AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Next convention, September 26, 1922, Detroit, Mich.

NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, People's Gas Bldg., Chicago. Annual exhibition at convention of American Railway Engineering Association.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, excepting June, July, August and September.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3d Friday in month, except June, July and August, at 29 W. 39th St., New York.

PACIFIC RAILWAY CLUB.—W. S. Wallner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 600 Liberty Bldg., Broad and Chestnut Sts., Philadelphia, Pa. Annual dinner, February 1, Waldorf-Astoria, New York.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, General Electrical Co., Chicago. Annual meeting with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—R. J. Himmelright, 17 East 42nd St., New York. Meeting with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, C. & O. Ry., Richmond, Va. Next meeting October 10-13, 1922, Pittsburgh, Pa.

RAILWAY SIGNAL ASSOCIATION.—(See A. R. A. Division IV, Signal Section.)

RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A., Division VI.)

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meeting with A. R. A., Division V.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 19 and 20, Asheville, N. C.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W. Ry., Sterling, Ill. Annual convention, September 19-21, 1922, Hotel Statler, Cleveland, Ohio. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—L. L. Carrier, Car Serv. Agt., Tenn. Cent. Ry., 319 Seventh Ave., North Nashville, Tenn. Next meeting, October 19, St. Augustine, Fla.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—H. S. White, 9 N. Jefferson St., Chicago.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Annual convention, October 31-November 3, Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—Bruce V. Crandall, 14 E. Jackson Boulevard, Chicago. Regular meetings, 3d Monday each month except June, July and August.

Traffic News

Railroads during the first six months of this year handled 170,209,000,000 net tons of freight, as compared with 163,587,000,000 in the first six months of 1921, according to the monthly bulletin of operating statistics published by the Interstate Commerce Commission. For June the number of net ton miles was 29,049,000,000 as compared with 28,146,000,000 last year. The average percentage of unserviceable locomotives for the first six months was 23.4 and of cars 13.8. The average car miles per day was 22.7 as compared with 21.5 last year and the net tons per loaded car 26.4 as compared with 28, and the net ton miles per car a day 390 as compared with 374. The net ton miles per mile of road per day averaged 4,027 as compared with 3,880.

Coal Production

Shipments from mines opening under the Cleveland wage agreement have already materially increased production of bituminous coal, the Geological Survey announced in its bulletin of August 26. An output of at least 6,000,000 tons for the week of August 21-26 was already assured by the reports for Monday, Tuesday and Wednesday, and additional tonnage from other districts that are known to have signed the agreement may raise the total to 6,250,000 tons. Production of anthracite, however, remained practically zero.

The sharp increase in output is indicated by the statement of cars loaded daily. On Monday, mines in Eastern Ohio and parts of Central Pennsylvania were shipping coal, and the loadings for that day were 19,043 cars, an increase of 3,340 cars over the preceding Monday. Loadings on Tuesday declined somewhat but on Wednesday and Thursday increased again, largely exceeding those of the week before. These increases were due to first shipments from Illinois and other western districts which carried the total up to 18,748 cars on Thursday. On Friday the loading was 21,866 cars. The increase came almost exclusively from mines formerly closed by the strike. In the Middle and Southern Appalachians, transportation difficulties still limited output and shipments were but little larger.

Interchangeable Mileage Ticket Investigation

The Interstate Commerce Commission has announced hearings, to be begun at Washington on September 26, before Commissioner Meyer, with a view to the issuance of such orders as may be necessary to carry out the provisions of the interchangeable mileage ticket law, approved by the President on August 18. The principal section of the law reads:

"The commission is directed to require, after notice and hearing, each carrier by rail, subject to the Interstate Commerce Act, to issue at such offices as may be prescribed by the commission interchangeable mileage or scrip coupon tickets at just and reasonable rates, good for passenger carriage upon the passenger trains of all carriers by rail subject to this act. The commission may in its discretion exempt from the provisions of this amendatory Act either in whole or in part any carrier where the particular circumstances shown to the commission shall justify such exemption to be made. Such tickets may be required to be issued in such denominations as the commission may prescribe. Before making any order requiring the issuance of any such tickets the commission shall make and publish such reasonable rules and regulations for their issuance and use as in its judgment the public interest demands; and especially it shall prescribe whether such tickets are transferrable or non-transferrable, and if the latter, what identification may be required; and especially, also to what baggage privileges the lawful holders of such tickets are entitled."

Willful refusal to issue or accept the tickets is subject to $1,000 fine. At the hearing the carriers' proposals will be heard first, to be followed by cross-examination and then the direct testimony of commercial and other organizations and individuals and cross-examination thereon. Each carrier seeking exemption must file with the commission a written statement to that effect on or before September 15.

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has rendered its decision as a result of its investigation of the rates on bunker coal in which it holds that the maintenance of lower rates on coal for delivery at ports to vessels whether as cargo or for bunker purposes is not in violation of the fourth section of the interstate commerce act or otherwise unlawful.

Court News

Power of I. C .C. to Award Reparation for Overcharges

On a hearing before the Interstate Commerce Commission of a petition for reparation for unreasonable rates "heretofore and hereafter charged to petitioners," evidence having been taken without objection as to shipments both before and after filing of the petition, the Circuit Court of Appeals, Third Circuit, holds the commission had power to award reparation for overcharges after as well as before filing petition.—Lehigh Valley v. G. B. Markle Co., 279 Fed. 261.

Insufficient Evidence of Unusual Jolt of Train

In an action by a female passenger for injuries alleged to have been caused by being thrown against the side of a seat by an unusual movement of the train, the Missouri Supreme Court holds that her characterization of the jar as "an awful jolt and jar," and "the worst jar I ever witnessed on the train in my life" was of slight, if any, assistance in determining the real character of the jar; and her evidence that the jolt "threw" her against the seat was insufficient to show an unusual movement, in the absence of evidence that anything else in the car was disarranged or that any other passenger had suffered inconvenience.—Elliott v. Chicago, M. & St. P. (Mo.), 236 S. W. 17.

Failure to Give Notice of Claim for Loss Bars Recovery—Goods Stolen

The Circuit Court of Appeals, First Circuit, holds that where the consignee has failed to give the notice of claim required by the bill of lading (Act of March 4, 1915) claim for recovery is barred except for negligent delay in delivering the property, or negligence while loading or unloading it or in transit, resulting in the consignee's loss.

The fact of nondelivery does not suffice to show neglect where it appears that the goods were stolen and the circumstances attending the theft do not authorize an inference of lack of reasonable precaution. The party asserting negligence must prove it.—Gillette Safety Razor Co. v. Davis, 278 Fed. 864.

Burden of Proof in Fire-Setting Cases

In an action for damages for the burning of plaintiffs' seedhouse by sparks the North Carolina court held the defendant entitled to a new trial for error in imposing on the defendant the burden of rebutting the prima facie case by a preponderance of the evidence. The court said: "When the plaintiffs proved that the property had been destroyed by fire escaping from the defendant's locomotive, they made a prima facie case of negligence for the consideration of the jury; or, as Mr. Justice Pitney says, such proof furnished circumstantial evidence of negligence; but it did not impose upon the defendant the burden of rebutting the prima facie case by the preponderance of the evidence.—Sweeney v. Erving, 228 U. S. 233. . . . Standing alone, the prima facie case warranted but did not compel the inference of negligence; it furnished evidence to be weighed but not necessarily to be accepted, it made a case to be decided by the jury but did not forestall the verdict."—Bertie Cotton Oil Co. v. Atlantic Coast Line (N. Car.), 110 S. E. 660.

Foreign Railway News

British Concern Gets Order for 21 Locomotives

The British firm of Sir W. G. Armstrong, Whitworth & Company has, according to The Engineer (London), received from the Bengal North Western Railway an order for 21 locomotives.

English Coal Strike's Cost to Railway Employees

LONDON.

According to the financial report of the National Union of Railwaymen, the miners' strike of last year cost the railwaymen's organization nearly £750,000 ($3,645,000 at the normal rate of exchange) in unemployment payments.

Two Swiss Railways Electrified Throughout

The St. Gotthard line in Switzerland is now completely electrified for both freight and passenger service. The line extends from Lucerne to Chiasso on the Italian border, a distance of about 180 miles. Grades of 2.5 per cent are common and there are many tunnels, the longest of which is 9¼ miles. Completion of the electric operation of the Rhaetian Railways in Switzerland was celebrated in May of this year.

Indian Railways to Buy Locomotives and Cars

The East Indian Railway, according to Modern Transport (London), will during the fiscal year 1923-24 add 37 locomotives to its supply of motive power and contemplates similar additions annually for the next few years. From 2,000 to 3,000 goods wagons will be acquired annually during the next five years and 136 passenger cars will be purchased before March, 1923. The road is also doing a considerable amount of double tracking.

The Bengal-Napur Railway will spend 1,567,000 rupees for passenger cars and 11,630,000 rupees for goods wagons (one rupee equals 32.4 cents at par).

Railway Consolidation Making Rapid Progress in Britain

The amalgamation of all the railways of Great Britain into four non-competitive companies is proceeding rapidly. The most recent announcement of this nature was a plan for the consolidation of the six companies making up the Eastern group. These companies are the North Eastern, the Great Central, the Great Eastern, the Great Northern, the North British and the Great North of Scotland. In the case of the amalgamations, as with those previously announced, consolidation is effected, not by lease or acquisition of stock, but by the exchange of stock of the old companies for stock of the amalgamated company—an exchange effected generally on the basis of earning power of the stocks rather than on their par values.

Australian Road Uses Motor Cars

LONDON.

The Victorian Railways, Australia, have adopted the rail motor car to handle passenger traffic on short spur lines and over other sections where it is uneconomical to provide a service of steam trains, says the Times (London) Trade Supplement. Experiments in the past have been made with steam and gasoline cars but for various reasons these have failed to give satisfaction. In the new system an ordinary motor-truck chassis is used as the power unit, the steering gear being removed and standard railway tires fitted to the wheels. The car, which has been designed to provide the maximum of floor space, has a seating capacity for 43 persons and all unnecessary tare weight has been eliminated. It is open at the sides but is provided with blinds which can be lowered for protection against inclement weather. The seats all face to the front and are of the usual tramcar type, and while they afford little lodgement for dust, provide ample comfort for short journeys. Hand luggage and parcels can be accommodated under the seats and the doors have been arranged near the front end so that the driver may be able conveniently to collect fares

and issue tickets to passengers. A trailer built on similar lightweight lines has also been constructed and will be attached to the rail motor-car as traffic requirements warrant. Both the motor car and the trailer are lighted by electricity. The maximum speed will be from 25 to 30 m. p. h., but the average speed will be considerably less, depending on the frequency of stops.

Improvements Undertaken by Cuba Northern

Improvements are being carried out by the Cuba Northern at Moron, Cuba, to include the construction of a locomotive repair shop, car and coach shop, transfer table, smith shop and foundry, power house and saw mill. A contract for the construction and all necessary tools has been given to the Baldwin Locomotive Works. All the buildings will be of steel frame with galvanized sides and the improvements will cost about $675,000. The shops are to be ready for operation by November 1, 1922. The Cuba Northern has given a contract also to the Frederick Snare Corporation for erecting at Port Tarafa, one of the company's terminals, two sugar warehouses of the same type of construction as the buildings at Moron.

Spanish Railway Officials Here to Study Electric Traction

Senor Don Jose Moreno Ossorio, general manager of the Norte Railway in Spain, and several other Spanish railway experts who are working out plans for the proposed electrification of the Norte Railway are in America on a tour of inspection. The other members of the inspection party are Don Mario Viani Caballero, chief engineer of the motive power department, Norte Railway; Prof. Don Jose A. Perez Del Pulgar, professor of electrical engineering, Instituto Catolico de Artes e Industrias; and R. F. Hamilton, consulting-engineer of the Sociedad Espanola de Construccion Naval, which represents the Westinghouse Electric International Company in Spain.

The initial electrification on the Norte system, which is one of the largest in Spain, will include about 40 miles of line running from Ujo through the mountainous Pajares section in the north. Three thousand volts direct current will be used in this section, and water power will be purchased from the Electra de Viesco Company in Asturias. More extensive electrification is planned for the future on the Madrid-Venta De Banos section of the railroad.

Spanish Railroad Officials at Westinghouse Plant

The accompanying photograph was taken in the plant of the Westinghouse Electric and Manufacturing Company at East Pittsburgh, Pa. The members of the party are: left to right, rear row—N. W. Storer, general engineer, Westinghouse Electric & Manufacturing Company; Don Jose Moreno Ossorio, general manager, Norte Railway; Don Mario Viani Caballero, chief engineer, Norte Railway; left to right front row—R. F. Hamilton, Sociedad Espanola de Construccion Naval and Prof. Don A. Perez Del Pulgar.

Equipment and Supplies

Locomotives

THE MISSOURI PACIFIC has ordered 25 Mikado type locomotives from the American Locomotive Company.

THE MISSOURI, KANSAS & TEXAS has ordered 10, eight-wheel type switching locomotives from the American Locomotive Company.

THE LONG ISLAND RAILROAD is inquiring for six locomotives of a type suitable for heavy passenger service in the summer and for freight service in the winter.

Freight Cars

THE NEW YORK, NEW HAVEN & HARTFORD is inquiring for 6 caboose cars.

THE BALTIMORE & OHIO is inquiring for 1,000 steel hopper cars of 55 tons' capacity.

THE BELT RAILWAY OF CHICAGO is inquiring for 150 hopper cars of 55 tons' capacity.

THE PITTSBURGH & WEST VIRGINIA is inquiring for 6 steel-underframe caboose cars.

THE ST. LOUIS-SAN FRANCISCO is inquiring for 500 hopper car bodies of 50 tons' capacity.

THE CINCINNATI, INDIANAPOLIS & WESTERN is inquiring for from 200 to 300 high side gondola cars of 50 tons capacity.

THE AMERICAN OIL COMPANY, Baltimore, Md., has ordered 5 tank cars of 10,000 gal. capacity from the Standard Tank Car Company.

THE PHILLIPS PETROLEUM COMPANY, Bartlesville, Okla., has ordered 75 insulated tank cars of 8,000 gal. capacity from the Standard Tank Car Company.

THE CHILE EXPLORATION COMPANY, New York City, is inquiring for from 20 to 25 hopper bottom dumping ore cars for export. These cars are to have a capacity of 50 tons.

THE PACIFIC ELECTRIC, reported in the *Railway Age* of August 12 as inquiring for 200 dump cars of 50 tons' capacity, has ordered 200 National dump cars from the American Car & Foundry Co.

THE TENNESSEE, ALABAMA & GEORGIA, reported in the *Railway Age* of August 12, as inquiring for 20 box cars and 20 gondola cars is now asking for 25 box cars of 40 tons' capacity and 25 gondola cars of 50 tons' capacity.

THE JACOB DOLD PACKING COMPANY, Buffalo, N. Y., reported in the *Railway Age* of April 8 as inquiring for from 50 to 100 refrigerator cars, has renewed its inquiry for from 50 to 100 beef refrigerator cars with steel underframes. These cars are to have a capacity of 80,000 lb.

Passenger Cars

THE RICHMOND, FREDERICKSBURG & POTOMAC is asking for prices on six cars for passenger service.

Iron and Steel

THE GRAND TRUNK has contracted with the American Bridge Company for 200 tons of fabricated steel for bridges in Michigan.

Machinery and Tools

THE MISSOURI PACIFIC has ordered 1 2,500-lb. single frame steam hammer from the Niles-Bement-Pond Company.

THE LOS ANGELES RAILWAY CORPORATION has ordered a No. 1 car wheel lathe from the Niles-Bement-Pond Company.

Supply Trade News

The Compagnie des Appareils P. et M., has been organized with headquarters at No. 7, Rue Scribe, Paris, as the French agency for the selling of the rail anti-creepers of the P. & M. Company with which company it is associated.

H. A. Matthews, announcement of whose appointment as a vice-president of the **U. S. Light & Heat Corporation,** Niagara Falls, N. Y., was made in the *Railway Age* of August 26, will continue to have charge of sales in the railway division, his full title now being vice-president, sales, railway division.

Fay, Spofford & Thorndike, consulting engineers, 200 Devonshire Street, Boston, Mass., have admitted to partnership John Ayer, Bion A. Bowman, Carroll A. Farwell, Ralph W. Horne, Ralph T. Jackson, George L. Mirick, Barzillai A. Rich, and Warren D. Trask, who have been long associated with the above firm.

Trade Publications

INSULATING COMPOUNDS.—A small 16-page booklet has just been issued by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., which describes the insulating and soldering compounds manufactured by that company. The materials treated in the publication are baking varnishes, air-drying varnishes, insulating compounds, finishing materials, insulating glue, soldering flux, and lubricating oil.

TWENTY-FIVE THOUSAND is the number of men, according to a Montreal dispatch, who have gone from that region to western Canada to work in the harvesting of Canada's great wheat crop. Of this number about 18,000 went over the Canadian Pacific and the balance by the Canadian National and Grand Trunk Railways. It is said that probably 80 per cent of those who go west for harvesting return to eastern Canada before the middle of the winter.

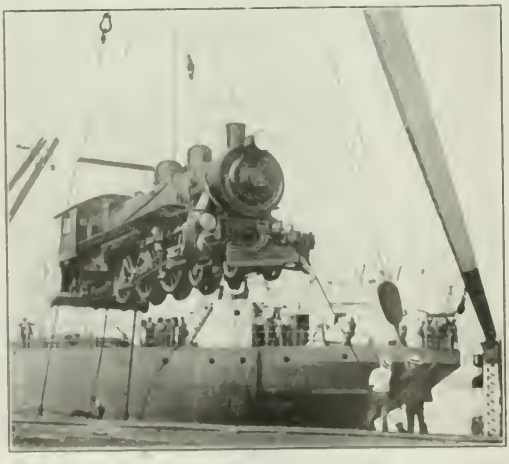


Photo by Underwood & Underwood

A Baldwin Locomotive for the Argentine State Railways

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company has awarded the contract to the Truscon Steel Company, Chicago, for the sash for the new boiler and tender shops at Albuquerque, N. M.

ATCHISON, TOPEKA & SANTA FE.—This company, which was reported in the *Railway Age* of August 5 as receiving bids for a new boiler shop at Albuquerque, New Mexico, has awarded the contract to C. A. Fellows & Co., Los Angeles, Cal.

BALTIMORE & OHIO.—This company has awarded a contract to the Vang Construction Company, Cumberland, Md., for the erection of a 65-ft. through plate girder span highway bridge over its tracks at Collingdale, Pa. A contract has been awarded to the Seaboard Construction Company, Philadelphia, Pa., for the erection of a bridge over Elk creek, Clarksburg, W. Va. The structure will consist of two 60-ft. deck plate girder spans with timber trestle approaches. To the same company has been awarded a contract for a 78-ft. through plate girder highway bridge at West Alexander, Pa.

CHICAGO, BURLINGTON & QUINCY.—This company, which was reported in the *Railway Age* of April 22 as preparing plans for the construction of shop facilities at Denver, Colo., has awarded a contract for this work to the Stearns-Rogers Company, Denver.

CHICAGO, ROCK ISLAND & PACIFIC.—This company, which was reported in the *Railway Age* of August 12 as preparing plans for the construction of a one-story passenger station 40 by 330 ft. at Moline, Ill., will accept bids September 5.

ELGIN, JOLIET & EASTERN.—This company will construct a 75 ft., double track deck plate girder span with ballast floor and a 25 ft. approach span across the Grand Calumet river at Gary, Ind.

ILLINOIS CENTRAL.—Through an error, it was reported in the August 26 issue that the contract for altering this company's fruit sheds at Mounds, Ill., had been awarded to the Ellington & Miller Co. This contract was instead awarded to Joseph Nelson & Sons, Chicago.

ILLINOIS CENTRAL.—This company has awarded a contract to Mortimer & Lindstrom, Chicago, for the construction of a 12-in. and a 15-in. sewer in connection with the rearrangement of sewers across the right-of-way between Twenty-fifth and Fifty-first streets, Chicago. This company has also awarded a contract to the Underground Construction Company, Chicago, for the construction of a circular brick sewer, 7-ft. in diameter, on Rhodes avenue, and a contract to the Great Lakes Dredge & Dock Company Chicago, for driving 1,100 ft. of new breakwater between Twenty-ninth and Thirty-first streets, Chicago.

UNION PACIFIC.—This company has awarded a contract to the Graver Corporation of Chicago, for the erection of a 200,000-gal. steel water storage tank at Ogallala, Neb., and an 800,000-gal. steel water storage tank at Council Bluffs, Ia.

VANCOUVER HARBOR TERMINAL RAILWAY.—Consul General F. M. Ryder, Vancouver, B. C., reports that plans for the construction of the first section of this railway, which is to connect the Great Northern with various piers and docks at an estimated cost of $80,000 have been made. The project is under the direction of the Vancouver Harbor Commission and it is not thought likely that work will be undertaken on the project until a new harbor board can be named.

THE PENNSYLVANIA RAILROAD reports that its surprise checking, conducted during the month of July, in the Eastern Region, shows that efficiency in train operation has not been impaired, in the slightest degree, by the shopmen's strike. The records show a perfect performance in more than 99.9 per cent of the cases. A total of 33,807 tests were made, and but 38 failures were recorded. Eight divisions had absolutely perfect scores. They were the Philadelphia, Cumberland Valley, Cresson, Trenton, Baltimore, Norfolk, Elmira and Schuylkill Divisions.

Railway Financial News

BUFFALO CREEK & GAULEY.—*Asks Authority for Equipment Trust Certificates.*—This company has applied to the Interstate Commerce Commission for authority to issue $340,000 of 6 per cent equipment trust certificates and $86,000 of additional capital stock.

CHESAPEAKE & OHIO.—*Trackage Rights Authorized.*—The Interstate Commerce Commission has issued a certificate authorizing this company to operate by means of trackage rights over a line of the Norfolk & Western between Waverly and Valley Crossing, Ohio, 62 miles.

CHICAGO & ALTON.—*Receivership.*—Judge George A. Carpenter, in the Federal Court at Chicago, on August 30, appointed W. G. Bierd, president of the Chicago & Alton, and W. W. Wheelock, an attorney, receivers for the road. Silas H. Strawn, who was named as counsel for the receivers, issued the following statement:

The Chicago & Alton has for several years been unable to meet all of the interest on its six per cent general mortgage bonds, but the holders of these bonds have permitted the interest to remain unpaid in the hope that general railroad conditions ultimately would adjust themselves in such a way as to restore the property to an assured and reasonable prosperity.

The directors, however, have been hopeful that these conditions soon would approach more nearly to normal, or would, in part at least, be met by offsetting factors of a helpful character. But such excessive costs bear particularly heavy on short railroads with expensive terminals, such as the Alton, which operates a little more than 1,000 miles and has terminals in the three great cities of Chicago, St. Louis, and Kansas City, with an average freight haul of only 185 miles and an average passenger haul of only 65 miles.

The receivership at the present time, however, was precipitated by the great falling off in earnings due to the coal strike and also to the further long continued and extra expense due to the shopmen's strike. The company's normal coal traffic is heavy, and practically all mines on its line had been closed since April 1, thus entailing heavy loss in revenue, and at the same time it has been compelled to buy much of its fuel coal from Southern fields, which, with added freight charges paid foreign lines, cost it two or three times the former price.

A committee to protect the interests of the holders of the Chicago & Alton's $22,000,000 3½ per cent first lien 50-year gold bonds, due 1950, was formed at New York. The committee consists of the following members: F. H. Ecker, vice-president of the Metropolitan Life Insurance Company, chairman; J. H. Perkins, president of the Farmers' Loan and Trust Company; J. V. E. Westfall, vice-president of the Equitable Life Assurance Society; Bertram Cutler, of New York, and Asa S. Wing, president of the Provident Life and Trust Company of Philadelphia.

The Farmers' Loan and Trust Company will act as depositary for the committee.

CHICAGO RIVER & INDIANA.—*Asks Authority to Assume Liability.*—This company and the New York Central have jointly applied to the Interstate Commerce Commission for authority to assume liability in respect of $414,700 of equipment notes of the Chicago Junction.

CINCINNATI, INDIANAPOLIS & WESTERN.—*Authorized to Acquire Road.*—The Interstate Commerce Commission has issued a certificate authorizing the acquisition of part of the road of the Chicago & Indiana Coal Railroad extending from Brazil, Ind., for a distance of 25.76 miles in Parke County, Ind. This line is a part of the coal railroad division of the Chicago & Eastern Illinois which was recently abandoned.

GULF COAST LINES.—*Annual Report.*—This company's annual report for 1921 is reviewed in an article on another page of this issue entitled "Gulf Coast Lines Show Increasing Prosperity."

INTERNATIONAL & GREAT NORTHERN.—*Asks Authority to Issue Securities in Reorganization.*—This company has applied to the Interstate Commerce Commission for authority for the issuance of securities in accordance with the plan of reorganization of the International & Great Northern, announced under date of June 1 by J. & W. Seligman & Co., and Speyer & Co., reorganization managers. It is proposed to issue $20,000,000 first mortgage 30-year 6 per cent gold bonds dated July 1, 1922, $17,000,000 30-year 6 per cent adjustment mortgage bonds dated January 1, 1923, $7,500,000 of common stock and $2,400,000 of 6 per cent notes maturing March 1, 1930, to the director general of railroads.

Charter Granted.—A new charter of the International & Great Northern has been filed in the secretary of state's office of Texas which provides that the general offices will remain at Palestine, although efforts were made to have this requirement removed. Walter F. Woodul is president with headquarters at Houston, Texas.

PITTSBURGH & WEST VIRGINIA.—*Asks Authority to Issue Stock.*—This company has applied to the Interstate Commerce Commission for authority to increase its capital stock by the issuance of $4,500,000 of preferred stock to reimburse the treasury for expenditures.

ST. PAUL UNION DEPOT COMPANY.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for approval of its first and refunding mortgage to secure an issue of $20,000,000 of first and refunding mortgage bonds and for the issuance of $15,500,000 of such bonds to be guaranteed by the companies which own the stock of the depot company.

UPPER MARION & PLYMOUTH.—*Asks Authority to Issue Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue $350,000 of common stock for the purchase of equipment.

VIRGINIA.—*Authorized to Increase Dividend Rate.*—The Interstate Commerce Commission has authorized an increase in the dividend rate on $27,955,000 of preferred stock from 5 to 6 per cent.

Trend of Railway Stock and Bond Prices

	Aug. 29	Last Week	Last Year
Average price of 20 representative railway stocks	73.09	73.64	53.30
Average price of 20 representative railway bonds	89.51	89.67	75.39

Dividends Declared

Boston & Albany.—$2.00, payable September 30 to holders of record August 31.

Pittsburgh, Ft. Wayne & Chicago.—Common, 1¾ per cent, quarterly, payable October 1 to holders of record September 9; Preferred, 1¾ per cent, quarterly, payable October 3 to holders of record September 9.

A MICHIGAN CENTRAL passenger train bound from Toledo to Detroit, crashed into a motor truck loaded with turpentine and gasoline. The engineman and the fireman met death when they leaped from the engine into the flames that burst from the ruptured steel drums which contained the explosive fluids, and the driver of the truck died from burns five hours afterward.

Photo by International

A Washout Near Lyons, N. Y.

Railway Officers

Operating

C. L. Strom has been appointed trainmaster of the Chicago & North Western with headquarters at Benld, Ill.

H. P. Miller, general yardmaster of the Pennsylvania, has been appointed assistant trainmaster with headquarters at Ft. Wayne, Ind.

W. L. Whiter, transportation inspector of the Pennsylvania, with headquarters at Ft. Wayne, has been appointed assistant trainmaster, with the same headquarters.

Charles H. Gaffeney, chief clerk to the superintendent of telegraph of the Central of New Jersey for the past 20 years, has been appointed superintendent of telegraph, with headquarters at Jersey City, N. J., to succeed F. G. Sherman, deceased. Mr. Gaffeney will also act as superintendent of telegraph for the Western Union Telegraph Company at Jersey City.

Traffic

C. E. E. Ussher, passenger traffic manager, rail lines, of the Canadian Pacific with headquarters at Montreal, has been promoted to general passenger traffic manager, a new position, with the same headquarters.

C. B. Foster, assistant passenger traffic manager with headquarters at Montreal, has succeeded Mr. Ussher as passenger traffic manager, rail lines. Mr. Ussher was born on December 29, 1857, at Niagara Falls, Ont., and entered railway service in 1874 as a clerk in the office of the auditor of the Great Western (now the Wabash). From 1876 until 1880 he was a clerk in the general passenger office of the same road and, from the latter date to 1883, chief ticket clerk of the Wabash, St. Louis & Pacific (also now a part of the Wabash). For a few months during 1883 he served as a rate clerk for the Chicago & Atlantic (now Chicago & Erie) and from then until 1886 engaged in private pursuits in Hamilton, Ont. He then became chief ticket clerk for the Canadian Pacific and, in 1889, was promoted to assistant general passenger agent. In 1898 he became general passenger agent, eastern lines. Nine years later he was promoted to assistant passenger traffic manager and, in 1910, to passenger traffic manager, which position he was holding at the time of his recent advancement. Mr. Foster was born on September 30, 1871, at Kingston, N. B., and was educated in the public schools. His entire railway service has been with the Canadian Pacific, his first position, which he took in 1891, being stenographer to the division passenger agent at St. John, N. B. In 1893 he became traveling passenger agent and, in 1899, chief clerk in the passenger department. In 1902 he was promoted to district passenger agent and, in 1908, to assistant general passenger agent, Western lines. In 1910 he was promoted to general passenger agent, Western lines, and several years thereafter to assistant passenger traffic manager, which position he held at the time of his recent promotion.

C. E. E. Ussher

C. B. Foster

Allan Cameron has been appointed Oriental manager for the Canadian Pacific railway and steamship lines with headquarters at Hong Kong, China.

Purchasing and Stores

George Kefer, whose appointment as purchasing agent of the Long Island with headquarters at Jamaica, Queensborough, New York City, was announced in the *Railway Age* of August 26, was born in New York City on November 22, 1870. His early education was obtained in the public schools of Whitestone, Long Island. After graduation in 1885 Mr. Kefer entered the employ of the Long Island Railroad as a messenger in the accounting department, then located at Long Island City. He subsequently served in various clerical capacities in the same department. On November 1, 1889, he was appointed chief clerk to the purchasing agent, which position he held for about 33 years until his recent promotion to purchasing agent as above noted.

G. Kefer

Obituary

W. B. Deveny, shop superintendent of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., was killed in an automobile accident on August 22.

A. E. Killam, formerly for many years general inspector of bridges and buildings of the Intercolonial Railway and president of the American Railway Bridge and Building Association in 1913, died at Moncton, N. B., on August 20, at the age of 88.

Burwell Boykin McCaa, auditor freight accounts of the Seaboard Air Line died on August 16 at Norfolk, Va. Mr. McCaa was born at Gainesville, Fla., in November, 1863. He entered the service of the Florida Transit Company, now a part of the Seaboard Air Line, in 1881, and has been in the continuous service of the Seaboard Air Line and its predecessors for over 40 years. In 1894 he was appointed traveling auditor at Jacksonville, Fla., remaining in that position until 1905 when he was promoted to auditor freight accounts, with headquarters at Portsmouth, Va. He also served for several years on important committees of the Railway Accounting Officers' Association of America.

F. G. Sherman, superintendent of telegraph of the Central of New Jersey whose death on August 20 was reported in the *Railway Age* of August 26, was born in 1855 near Beloit, Wis. In March, 1873, he began railway work as a night operator on the Chicago, Burlington & Quincy, subsequently serving as operator and station agent until 1882 when he went to the Chicago, Milwaukee & St. Paul as operator and agent. In 1884 he returned to the Burlington as dispatcher at Aurora, Ill., and in September, 1899, entered the service of the Philadelphia & Reading as train dispatcher. Three years later he was appointed assistant trainmaster of the Central of New Jersey and in October, 1910, was promoted to superintendent of telegraph.

Representatives of the Association of General Contractors, at a hearing before the Interstate Commerce Commission at Washington on August 25 urged a modification of the commission's Service Order No. 23 to give shippers of building materials an equal opportunity in the use of open top cars, with users of coal for commercial purposes.

Railway Age

EDITORIAL

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The Five-Cent Differential

In many railroad shops and roundhouses it is customary to pay gang leaders and assistant foremen a differential of five cents an hour over the maximum mechanic's rate. This small differential and the fact that gang leaders and assistant foremen are on an hourly basis, with pay reductions for all time off, proves insufficient incentive to make men in the ranks aspire to these positions. Moreover, such men as do accept supervisory positions on an hourly basis of pay feel that their interests are more closely allied with the shopmen than with the managements, their sympathies being to a great extent with the former. That this condition is a reality and no mere supposition was forcibly illustrated at an important eastern terminal where, on the first day of the shopmen's strike, the entire plant was deserted except for two men, the master mechanic and general foreman. An entirely new organization had to be developed and that without the help of assistant foremen or gang leaders. The railroad in question is certainly paying a big price for its failure to put these men on a monthly rate and unite their interests with that of the railroad. Railroad shop foremen have seldom been trained, encouraged or paid in proportion to the importance of their work. This has a bad effect in normal times by reducing the incentive to become foremen. It is a common occurrence to hear a capable mechanic, who has shown evidence of executive ability, absolutely decline to accept a position as gang leader or assistant foreman on the ground that the additional responsibility and work involved would be in no way paid for by the five-cent differential over his present rate. Lower supervisory officers paid on this basis can hardly be blamed for a lack of enthusiasm and loyalty to roads which value their services so lightly.

Results of Careful Crossing Campaign

The fact that 35 more persons were killed in grade crossing accidents on 66 of Class I roads in June and July, 1922, than in the same period in 1921 is no discouragement to the Careful Crossing campaign, but should be considered more as an indication of what would have happened if no campaign had been inaugurated. Although 1,300,000 posters were issued, an equal number of automobiles was sold in the same period. Considering that there are some 10,700,000 licensed automobiles in service in this country, the campaign has only begun to take effect. Publicity to the extent of some two miles of newspaper columns has been produced in the leading city newspapers and this together with the personal efforts of local railroad employees in speaking before public gatherings is only now starting to show favorable results while the slogan "Cross Crossings Cautiously" is just beginning to find a fixed place in the mind of the automobile driver. The railroads cannot afford to slacken their effort at the end of the four months' drive on September 30, but should make plans to carry on indefinitely this work which has been started so efficiently. The entire cost of the campaign to date is reported to be only $50,000, a small sum compared with the damages which the railroads would have had to pay for only a few of the accidents that have been prevented. The railroads have a vital interest in saving lives and damages and safety agents and claim agents should be encouraged to make plans for the coming year that will insure the Cross Crossings Cautiously campaign the continued enthusiasm of the public for in such lies the success of one of the most serious and comparatively expensive features of railway operation today.

Blame for Violence

The leaders of the striking shopmen decry violence and think it unfair that their organizations should be condemned for the illegal actions of a few individuals. But how is a union to be judged otherwise than by the control it exercises over its members? No employer could afford to enter into a contract with a union which could not keep its members from constantly walking out on outlaw strikes. There is no strength whatever in a union except that which it has from the collective action of its members. If members cannot be kept from doing things not authorized by the union as a whole acting through responsible officers then the term "union" is a misnomer. The transportation brotherhoods would not now stand very high in the eyes of anyone if they had not been able to put a stop to the sporadic walkouts which caused so much trouble a few weeks ago. As it is, by vigorous action of the officers, these unions have escaped with but little public condemnation and with the ability of their leaders to control their members unquestioned. The leaders of the striking shopmen apparently do not realize, however, their interest in bringing to justice the perpetrators of acts of violence. Only by proving their ability to keep their membership from such acts which are, it is to be hoped, considered contrary to the policy and best interests of the unions, can they convince anybody that the organizations they head are real unions rather than leaderless mobs. The blaming of organizations for illegal acts of a few individuals is not so unjust as the strike leaders would have it believed. Let them and their law-abiding members convince the public that they are doing their utmost to detect and bring to justice all the lawbreakers within their ranks and less of blame for their organizations will be heard when illegal acts occur. The mere denouncing of violence is unconvincing; an earnest effort to bring criminals to justice would have a force beyond that of words.

Locomotives as Important as Cars

Since the coal strikes have been settled, there has been considerable comment both among railroad men and in the newspapers regarding the possibility of a serious car shortage. Shippers naturally regard the car supply as an index of the general condition of the railroad, but operating officers recognize that it is only one factor in handling traffic and an ample supply of serviceable locomotives is quite as important. If the shopmen's strike continues for some time, the problem of repairing locomotives is likely to be more troublesome than that of keeping cars in service. It is comparatively easy to recruit and train car repairers, but locomotive work requires more skill and experience. For that reason, it is not unlikely that when cold weather comes the

supply of serviceable locomotives will be the limiting factor in determining how much business the railroads can handle. Within three months there will probably be snow storms in the northern states, and traffic will be near the peak. Roads that are short of power should look ahead now and decide whether they will have ample capacity in their own shops or whether it will be advisable to make contracts for repairs.

Strikes and Public Opinion

The New York Times of Sunday carried this paragraph in its railway strike story: "Commenting on the effectiveness of the strike in the Metropolitan district, John J. Dowd, chairman of the Central strike committee, yesterday called attention to the weekly review of the State Bureau of Farms and Markets, which said: 'The food supplies of New York City in the last week showed the effect of demoralized railroad transportation in considerably reduced receipts and increasingly late arrival of trains.'" There is a saying—or would belief be a better word—that strikes of employees of public utilities are won or lost depending upon the effect of public opinion. There must be either something wrong with this saying or with the shop strikers' publicity. It does seem difficult to understand how the shopmen hope to curry the public's favor by showing that their strike is handicapping the transportation of this same public's essential food supply. They say that kicking and abusing a dog makes the unfortunate canine love its master all the more. Public opinion certainly is not on the side of the strikers in the present difficulties. Maybe the public has not been abused and kicked around enough. And then again, maybe the public is not like a dog, nor the striking shopmen the public's master.

Another Big Week

The *Railway Age* last week pointed out that the orders for locomotives reported in its issues for August totaled 220—making August, normally a month characterized by mid-summer dullness in equipment purchases, the best month so far in 1922 with two exceptions, April and July. Hardly was last week's issue on the press when orders were reported as having been placed by several roads totaling in number—exclusive of orders previously reported—225. All these orders will be found in this week's equipment and supply column, and possibly some additional orders reported between the time this is written and the time of going to press. This will give us a single week, at a time of the year when one should least expect it, better than all but two of the months so far this year. The week will be the best week we have had thus far this year and not the least factor of interest is that the total of 225, even without later additions, will approach the total for all 52 weeks of last year—namely 239. August and early September are not usually good months in locomotive purchases. However, there is no question, as there has been no question for quite an extended period of time, that the locomotives are urgently needed. Presumably prices are favorable. Fortunately, also, the net earnings of the carriers are at last such that equipment purchases can be more readily financed. The orders in the total of 225 include 100 Decapod and 15 Pacific for the Pennsylvania; 40 Mikado and 10 Pacific for the Chicago & North Western; 21 Mikado (in addition to 25 previously reported) and 4 Mountain for the Missouri Pacific; 12 Mikado for the Louisville & Nashville; 4 Mikado and 3 Pacific for the Monon and 9 locomotives on smaller orders.

Remember the Lessons of 1920

In the summer and fall of 1920 the railways were called upon to handle the heaviest traffic in their history. Under the stress of necessity they rendered more service than ever before. By reason of the demands made upon them, they set out to reach the goals of 30 miles per car per day and 30 tons per car set by the American Railway Association, and actually reached the average of 28.5 miles per car per day and 31.2 tons per car. By these measures they increased the capacity of the railroads of the country equivalent to nearly a million cars without the expenditure of any money for facilities, but by merely using more intensively those which they already possessed. With the removal of this pressure with the decline of business, car loading and car movement decreased accordingly. After months of light traffic the railways are again confronted with a freight movement which bids fair to equal or surpass that of 1920. With the country extremely short of coal only 60 days in advance of winter and with a grain crop of record proportions, in addition to a large movement of miscellaneous traffic, it is evident that the roads are facing a task of the first magnitude if they are to escape congestion and embargoes. There is now no time for delay. Present conditions demand that the lessons of 1920 be recalled and that measures which aided then be put into effect now before the facilities are congested.

The Marine Borer Again

At one time it was commonly understood that wood-destroying borers were to be encountered only in marine waters coming under the general classification of tropical or semi-tropical. The prevailing opinion had it that they were a serious menace to timber structures only along the South Atlantic seaboard, the Gulf Coast, and certain portions of the Pacific Coast. However, investigations made during the last five years have disclosed an increased activity of these forms of marine life, both in the way of intensified destruction in their usual haunts and in the extension of their manifestations to waters which had previously been assumed to be free from their inroads. Of most alarming proportions was the destructive action experienced in San Francisco bay during 1919 and 1920, which served largely to upset the prevailing understanding with respect to the activities of the borers, as well as the degree of immunity to be afforded by well-known protective measures. In a sense the problem of the marine borer had assumed the same perplexing character that has been encountered in the study of the action of sea water on concrete. Both vitally concern the railroads as large owners of waterfront property. The experience at San Francisco led to the formation of a committee of investigation which has been expanded through the agency of the National Research Council to an organization of national scope. Recently attention has been directed to New York harbor and the adjacent waters, with the result that both teredo and limnoria have been discovered in a number of locations. While there is nothing in the present outlook there to indicate any prospect of repeating the alarming results experienced in San Francisco bay, and although the scientific investigations have not yet been carried to a point where definite conclusions may be formulated, the investigations now under way will be worth many times what they cost by reason of the facts to be ascertained and also because they will be instrumental in disclosing possible defective conditions before they have progressed far enough to assume dangerous proportions. Moreover, those who are responsible for the prosecution of this nation-wide study are confident that increased knowledge of the subject will lead to the perfection of preventive measures.

The Injunction in the Shop Employees' Strike

THE INJUNCTION obtained by Attorney General Daugherty from the federal court at Chicago in relation to the shop employees' strike is one of the most sweeping and important ever issued. There can be no question about its effect on the strike. Some evidence regarding that is already available. It was issued a few days before Labor Day. If it had not been issued, Labor Day probably would have been marked by more violence than any preceding day of the strike. Reports show, however, that Labor Day was a quiet day in the strike. The assertion of the power of the federal government still commands respect even in communities where sympathy with the strikers is so prevalent that local authorities have refused to give protection to railway employees and property. The additional protection afforded to men who are willing to work will cause a rapid increase in the number of men employed in the shops and hasten the end of the strike.

The injunction forbids roughly two classes of acts. First, it forbids issuance by the labor leaders of any instructions or public statements to members of their unions to induce them to do or say anything to cause any railway employee to leave his work or to cause any person to abstrain from entering the employment of a railway. Officers and members of the unions are restrained from picketing or in any manner, by letters, circulars, telephone messages, word of mouth or interviews, encouraging any person to leave the employ of a railroad, or to refrain from entering such employ. Interference with employees, going to or returning from work by opprobrious epithets, jeers, taunts or entreaties is forbidden.

Second, the injunction prohibits conspiracies or agreements to hinder transportation, interference with or obstruction of railway operation in any way, trespassing on railway property and every form of intimidation or violence.

Many persons will question the wisdom of or justification for the sweeping prohibitions of the class of acts first mentioned. Whether from a purely legal point of view they infringe upon the rights of free speech and the freedom of the press is one question. The courts are the bodies to determine that. Whether as a matter of public policy it is desirable to forbid such acts is another question. The plain purpose of the labor provisions of the Transportation Act is to prevent labor controversies from resulting in interruptions of transportation by reason of lockouts or strikes. The Attorney General's statement asking for an injunction and the phraseology of the injunction order do not deny, and therefore tacitly concede, the legal right of the shop employees to strike. But if they have a legal right to strike, have they not also the legal right to do everything of a peaceful character which may help them to make the strike successful?

Regardless of the legal questions involved, if the right to strike be conceded, can it then be right or wise to prohibit the labor leaders from issuing statements or instructions to their members, or their members from acting in accordance with these statements and instructions as long as the leaders and the men do not resort to or incite intimidation and violence? It is obvious that to prohibit free communication between the leaders and the members of their unions and to prohibit the strikers from trying peacefully to persuade men not to work, is an invitation to labor leaders and those in sympathy with them to denounce the government and courts for denying the right of free speech and to include in their denunciations the owners and managers of the railways as having induced the government and courts to take this action.

Of course no similar questions can be raised from either the standpoint of law or public policy regarding the action of the government and the courts in taking drastic action to stop intimidation and violence in connection with the strike. It is perfectly useless for the labor leaders to deny, as some of them do, that the strikers have, throughout the country, resorted to intimidation and violence in every form. The evidence regarding what they have done is so voluminous and conclusive that to deny what it plainly shows discredits those who make the denials, and makes most people feel that their denials really amount to a defense and encouragement of the very class of acts which they deny are being committed. It is the duty of every government to suppress intimidation and violence in every form and for whatever purpose. When the purpose of intimidation and violence is that of interrupting interstate transportation and inflicting incalculable loss and suffering not merely on the railways but on every class of the public, the duty of the federal government, whose authority and power are the only authority and power extending throughout the entire country, to step in and suppress the intimidation and violence becomes plain beyond all question. The strikers by their own conduct, whether incited and approved by their leaders or not, have compelled the government to choose whether it would take the step it has taken or abdicate its most important functions.

It is a notable fact that in the statements the labor leaders have issued denouncing the injunction, they have sought to justify their denunciations solely by criticisms of it based upon its alleged attack upon the rights of free speech and the freedom of the press. If the injunction had been directed only against intimidation and violence and incitements to them, it would have been much more difficult for the labor leaders to have influenced any considerable number of people by their complaints against it. Neither they nor any other persons except avowed revolutionaries attempt to justify the use of threats, assaults, arson, and murder in labor disputes.

What the government really is aiming at, of course, is to stop intimidation and violence for the purpose of interrupting transportation and everything said or done having this object. The sweeping prohibitions of the injunction can be justified only upon the ground that if it were made less sweeping it would not accomplish the vital object it is meant to attain.

The Coal Shortage and the Railroad Strike

WITH THE COUNTRY threatened by, and, indeed, already experiencing, a serious coal shortage, it is most important that the responsibility for the situation should be apportioned fairly by the public among those to whom it belongs. No facts available will help the public more to apportion this responsibility than the following: In the week ended August 19, the last week before the termination of the coal strike had enabled work in the bituminous mines to be generally resumed, the amount of bituminous coal produced and transported was 4,609,000 tons. In the week ended September 2, the second week after the coal strike was ended, the total amount of coal produced by the mines and transported by the railways was about 9,500,000 tons, an increase of over 100 per cent. The *Railway Age* said in an editorial in its issue of August 5: "If the coal strike should end today the railroads could immediately increase by 100 to 150 per cent the amount of coal they are transporting, regardless of the shop employees' strike." The results have completely vindicated this estimate already.

Since the railways in such short time have, in spite of the shopmen's strike, proved able to make possible a production of such a largely increased tonnage of coal, is there still danger of a serious coal shortage, and, if so, why?

There is still danger and the reason for it is to be found

in the developments which have occurred in connection with the coal strike and the railway shop employees' strike. The coal strike began on April 1, almost 23 weeks ago. Before it began the mines were producing and the railways were moving an average of 10,700,000 tons of coal a week. The coal strike immediately cut this production down to less than 3,600,000 tons a week and up to the time the railroad strike began on July 1, the coal strike had prevented it from being increased to more than 5,250,000 tons a week. After the railroad strike began production declined to 4,200,000 tons a week, and, as already shown, up to the time the coal strike was ended, production was running at the rate of only about 4,600,000 tons a week. In the 20 weeks that the coal strike was in full effect the total production of coal was only approximately 90,000,000 tons, whereas, if the coal strike had not occurred it could easily have amounted to 180,000,000 to 200,000,000 tons. Therefore, the country today lacks approximately 90,000,000 tons of coal which it could have had if the coal strike had not occurred.

It is the deficiency of production, due to the coal strike, which is almost entirely, if not entirely, responsible for the present and prospective shortage of coal. For this deficiency of production the coal operators, the miners and the Government can divide between themselves the blame. None of the blame for it can fairly be laid upon the railroads.

What of the future? Can the railways, in spite of the shop employees' strike, transport enough coal fully to make up for the shortage that has accrued? All past experience, as well as existing conditions, indicate that they cannot. It is estimated the the coal mines of the country, if worked to their capacity, could produce about 19,000,000 tons of bituminous coal a week. The railways, if we may judge by past experience, cannot, when working to their capacity, transport an average of 12,000,000 tons a week. The railways have an extraordinary amount of equipment in bad order, and there will be for some time to come conditions which probably will make it impossible for them to move coal to their normal maximum capacity. While favorable weather conditions prevail, they may be able to move an average of 11,000,000 tons a week. It is not reasonably to be expected that they will be able to do much better than this on the average. It is impossible to have such a strike as the shop employees without having it interfere to some extent with transportation efficiency. This is merely another way of saying that in the railroad business, as in every other line of human endeavor, it is impossible to make an omelet without breaking eggs. If the railroads succeed in moving an average of 11,000,000 tons of coal a week, they will deserve not criticism, but the country's congratulations and thanks.

If they are unable to do better than this, how will the country fare? The total production of coal for the year 1922 up to September 2, was 223,521,000 tons. After that week there remained 18 weeks of the present year. If the railways should move during these weeks an average of 11,000,000 tons a week, this would make the country's total bituminous production for the year about 422,000,000 tons. This would be 20,000,000 tons larger than in 1921, but it would be 115,000,000 tons less than the average annual production in the four years ended with 1920. The result probably would be that throughout the fall and winter the country would be without substantial surplus supplies and that local and sporadic shortages constantly would develop; but if the available coal were well distributed, and domestic consumers and essential industries were given priority, the country could get through until spring without any real suffering and without serious interference with general business.

Based on past experience and present conditions, the *Railway Age* believes that this will be the outcome. The prospects certainly do not encourage optimism, but at the same time they do not justify deep pessimism because there is reason to believe that there will be closer co-operation and less friction between the railways, the coal operators and the coal dealers, due to the influence exerted by the government coal distributor and the Interstate Commerce Commission, than there have often been in the past. In the absence of such co-operation there probably would be serious trouble and all the influence of the government and public opinion should be exerted to bring about this essential co-operation.

Six Collisions

The Interstate Commerce Commission issued on August 28 its report on the cause of the collision of passenger trains at East Fort Madison, Ill., on May 29, when 48 passengers were injured; from which it appears that the engineman of the westbound train (who was killed) ran past three fixed signals, taking no effective measures to apply the brakes; though it seems, from the testimony of the fireman, that he was awake, saw the signals, had his hand on the brake-valve, and acknowledged the communications of the fireman. As is well said by Chief W. P. Borland, in the report, this is a case which shows that the use of automatic train stop apparatus is necessary to guard against the occurrence of similar collisions in the future.

And by a somewhat unusual succession of collisions, this same point has been demonstrated twice since then; two collisions, in each of which the engineman knew where he was going (had not "lost his bearings"), was wide awake, and had the benefit of practically all the aid that could be expected from the monitorship of the fireman. These three collisions, with three others of somewhat similar character, are tabulated as follows:

1. East Ft. Madison, Ill.; A. T. & S. F., May 29. Passengers injured, 48; engineman at fault was killed. Abstract in *Railway Age*, September 2, page 427.

2. Leeds, Mo.; Missouri Pacific, July 12. Passengers killed, 3; injured, 91. Engineman injured and no statement made by him. Mistake by all hands in reading train order; the reading evidently was perfunctory. Fireman was busy firing. Abstract in *Railway Age*, August 19.

3. Alsuma, Okl.; Missouri, Kansas & Texas, July 19. Passengers injured, 19. Wrong reading of train order by all members of freight train crew, and they met a passenger train, which they assumed had been annulled.

4. Logan, Mo.; St. Louis-San Francisco, July 22. Passengers killed, 5; injured, 107. Engineman of passenger train No. 9, who was killed, ran past distant and home block signals. Fireman not blamed by inspector. Reported in *Railway Age*, July 29, page 217.

5. Lester, Ohio; Pennsylvania System, August 1. Passengers killed, 4. Engineman said he misread his watch, and he passed from double to single track and met opposing train. Every member of crew knew that he was encroaching on the superior train's right, but none took action in season. Reported in *Railway Age*, August 12, page 310.

6. Ellwood City, Pa.; Baltimore & Ohio, August 6. Passengers injured, 31. Engineman of passenger train No. 9 ran with speed not under control even after having slackened at a cautionary automatic block signal (a grade or "tonnage" signal) indicating that he was in the same block with the freight train preceding. Fireman not blamed by inspector.

Numbers 4 and 6 are almost exactly like Ft. Madison, while numbers 2, 3 and 5 are like that case in that the fireman's monitorship proved of no benefit. The recognized safeguards are (1) visual block signals, (2) visual and audible block signals, and (3) block signals supplemented by automatic brake-setting apparatus. These three collisions (2, 3 and 5) occurred on lines having none of these safeguards. An audible signal either in the cab, like those on the Northern of France or the Great Western of England; or on the roadway, like those on the Boston & Albany, would arouse a sleepy or absent-minded engineman, or a fireman absorbed in his firing; but here were enginemen who failed, disastrously, when wide awake and, it seems, were fully cognizant of their surroundings. Advocates of automatic stops will have no lack of "frightful examples" in current collision records to enforce their arguments.

The advocate of automatic stops, however, will also have to look at this record in another aspect. It is quite generally agreed that such a refinement as the automatic stop should

be introduced first on the busiest lines. The device is designed as a safeguard against disasters due to inattention on the part of enginemen (and against nothing else) and it is on the busiest lines that there will be the largest number of enginemen; the most frequent chances of error. But these collisions occurred on lines that hardly come within that class; and four of them were on lines not yet equipped with automatic block signals. The sixth was on the Baltimore & Ohio main line to Chicago, but not on the section named in the Interstate Commerce Commission's order requiring stops to be installed. Number 1 was on a main line of the Santa Fe; but on a section which has no automatic signals. Number 4 was on a line covered by the I. C. C. order, but it is single track. The other three lines probably would be put by the Commission near the bottom of its list, one of them (No. 3) being a line of a company not named in the I. C. C. order. In short, the problem of "selecting" the locations where signals shall be reinforced by automatic stops—to adopt the phrase used in the British report—is a perplexing one. The reader who goes through the full reports of the Bureau of Safety on these collisions will find a variety of circumstances that may well puzzle the wisest governmental authority.

The one point that is clear is that the fitting of all danger points with automatic apparatus will be a work of years; and that, therefore, the duty of correcting our faults by well-known existing methods presses, today, the same as ever. Surprise checking still calls for the attention of every superintendent. Surprise checking is not a cure-all; but it has the merit of *helping to promote all other disciplinary measures.* The trainmaster who keeps this feature at high efficiency is not likely to forget or put in the background any important feature of train-safety. In this connection everyone should recall—and answer (to himself)—the complaint of a well-known officer of an Eastern trunk line; that he needed ten times more surprise checking than his appropriation allowed for. Was he right?

What Causes Inefficiency On the Railroads?

RAILROAD EXECUTIVES must take more aggressive and scientific steps to improve the relations between the men and the managements. The effect of the very best facilities and equipment can be completely nullified unless the men who operate them understand clearly just what is expected of them and are interested in their work and encouraged to put forth their best efforts. No greater gain can be made in efficiency and increased production than by securing a greater degree of interest and co-operation from the workmen.

"If we wish men to get on with their work wholeheartedly instead of devoting 60 per cent of their time doing their work and 40 per cent 'doing the boss,' then real grievances must be removed." These are not the words of a visionary or a theorist. They come from the head of a large manufacturing industry in Great Britain—a man noted for his sound common sense and for the splendid progress that he has made in securing the hearty co-operation of his employees. They are quoted from the book "The Human Factor in Business," by B. Seebohm Rowntree, who was also director of the welfare department at the Ministry of Munitions during the war.

There is unquestionably something seriously wrong in the industrial and transportation world today. No one will deny this.

We have suggested that conditions on the railways might be improved substantially through the development of something corresponding to the personnel departments that have given such an excellent account of themselves in certain of the larger and more progressive industrial organizations. Before considering the scope and duties of such a department it might be well to analyze conditions and determine the fundamental causes which lie at the bottom of most of the troubles in the industrial world today.

W. L. Mackenzie King, now Premier of the Dominion of Canada and formerly Minister of Labor of that country, has for many years been a close student of the industrial problem and has written a book entitled, "Industry and Humanity," a study in the principles underlying industrial reconstruction. In the introduction to this book he says: "The existing attitude of capital and labor toward each other is too largely one of mistrust born of fear. * * * * * If industry is to serve humanity, this attitude must be changed to one of trust, inspired by faith." In a later chapter (which discusses "the fears which circumscribe the freedom of effort" of labor, capital, management and the community), after outlining the fears which confront labor and capital, this significant statement appears: "It is worthy of note that as capital's fears of labor diminish, there appears to be a corresponding diminution in the fears by labor of capital, and *vice versa.* Remove all likelihood of strikes or attempts at restriction of output, and immediately the stimulus to investment of capital is increased, with corresponding increase in labor's opportunity of employment and reward. Similarly, remove the fear of unjust exactions by managements and capital, and of a reduction in remuneration where effort is increased, and immediately fresh stores of energy are released by labor, with certainty of gain to investment."

Mr. Rowntree in his book, "The Human Factor in Business," sums the situation up in this way: "It is coming to be generally realized that something must be done to render the economic position of the manual workers more secure. Although an appreciable number of them are in situations which hold out every prospect of permanency, the majority have constantly hovering over them a cloud of uncertainty with regard to the future. At any time they may be discharged at a week's or possibly an hour's notice, and since any reserve they have laid up is likely to be very slender, in times of trade depression they may be plunged with their families into serious want and privation. Even those who escape this tragedy, if they live to old age, will almost inevitably find themselves in very straitened conditions."

The fluctuations in business are not easily controlled. Much has been done in this country through the federal reserve banks and the prevention of crop failures to prevent extreme fluctuations, and much thought is being given by economists, financiers, engineers and others to developing measures which will overcome, at least to some extent, the cyclic business depressions. The individual industries, however, can do much to stabilize employment, at least in their own organizations, regardless of the larger measures which may be adopted by the country or communities as a whole.

Railroad employees feel the result not only of these fluctuations in business, but also, in some departments, of the seasonal changes. Much can be done to relieve these on the railroads if the problem is gone after in the right way. The difficulty is that it has not been given the real attention that its importance deserves. There are many things that can be done by a railroad or an industrial organization to insure greater permanency of employment. These matters, however, cannot be handled in a haphazard way, but require the most painstaking and thorough study and attention on the part of men who are specially fitted to handle them; these men, moreover, must have the hearty support and backing of the chief executive and the board of directors.

It is claimed by some that a railroad or a corporation is not justified in going so far as this to protect its employees. They will point out, for instance, specific instances of men

who have been well treated, who have not shown an appreciation of this treatment when emergencies came and it was assumed that they would put forth extra efforts or stand loyally by their employers. Such cases, however, are possibly the exceptions that prove the rule. At any rate, there are not a few instances of large companies whose principal strength today lies in the fact that they have unusually loyal bodies of employees who are putting forth their best efforts and who have been encouraged to do so through the liberal policies of the companies in dealing with them.

Fear, as Mackenzie King has said, lies at the very root of the unrest in the transportation and industrial world today. It must be banished; it has been to a large degree in some organizations. Why not in all? Ought not the railroads, because they are large employers, because their difficulties in dealing with men so widely scattered are so pronounced, and because their further development and progress are so vital to the country, deal more definitely and aggressively with the problem of getting the best and most loyal service from their employees? If they do not, what may it not cost them in the future in friction, strife and inefficiency?

New Books

The Invention of the Track Circuit. 113 *pages, 6½ in. x 9½ in. Paper covers; illustrated. Published by the Signal Section of the American Railway Association, H. S. Balliet, Secretary, 30 Vesey Street, New York. Price* $1.50.

This is a historical sketch designed as a memorial of Dr. William Robinson, the inventor of the track circuit, and it was published on August 20, the fiftieth anniversary of Robinson's original patent. It is the work of a committee —H. S. Balliet, K. E. Kellenberger and H. M. Sperry— appointed by the Signal Section at its meeting in June, 1921, in connection with resolutions adopted in memory of Dr. Robinson whose death occurred at Brooklyn, N. Y., on January 2, 1921.

The track circuit—the transmission of the electric current through the rails of a mile of track, as a means of giving a train of cars complete and ideal automatic control of a stop-signal at the rear to protect it against following trains—is a wonder, today, as it was fifty years ago, and the authors of this sketch have not needed to add any romance to the subject. It is a romance ready-made; while at the same time the story is an every-day fact. As showing the universal importance of this element in the signaling field—and therefore in the general scheme of the safety and celerity of train movement—the governmental statistics are quoted, showing, as of January 1, 1921, over 60,000 miles of track in the United States equipped with automatic block signals; which means 60,000 (more or less) delicate electro-magnetic instruments—track relays—in service day and night guarding the safety of passengers and trainmen and millions of dollars in property. In the New York subways alone, the operations of these instruments in a single day mount to numbers almost incomprehensible. The total of the individual passengers thus protected is *quite entirely* incomprehensible.

The book is divided into four parts. The first is a story of Dr. Robinson's activities made up largely from his own writings; the second is a notice of William A. Baldwin, who was general superintendent of the Philadelphia & Erie, now a part of the Pennsylvania System, and who was the first to recognize the importance of Robinson's invention and to give him a chance to try it in service. Robinson made an exhibition at the American Institute Fair in New York City in 1870 and, after the fair, sent his left-over circulars to railroad men in different parts of the country; and Baldwin's response to this circular led to the first installation at Kinzua, Pa. Theodore N. Ely, afterward chief of motive power of the Pennsylvania Railroad, was at that time assistant to Mr. Baldwin and had a share in making the arrangements for operation.

Part 3 is a description of the track circuit and its uses with all modern additions and modifications, written by J. P. Coleman of the Union Switch & Signal Co.

Part 4 is a short sketch by T. S. Lascelles, of London, telling of the introduction of the track circuit in Europe. Mr. Lascelles says that W. R. Sykes, the well-known inventor of the controlled manual block signal apparatus, experimented with the track circuit perhaps as early as did Robinson of this country. However, for well-known reasons, the track circuit made no progress in Europe and not until Americans introduced automatic signals there, many years later, was anything serious along practical lines accomplished.

The first part of this book contains an interesting compilation of facts not very generally known. The first installation was open circuit; but Robinson was the most severe critic of his own work and he soon arranged a closed circuit, and made other improvements. He seems to have been an early experimenter in the use of fibre for insulation, and about 1876 he devised a successful channel pin for fastening bond wires to rails. The second installation was at Irvine, Pa., and in both cases there was not only a visual signal but also a loud gong, which no engineman could pass without hearing it.

In December, 1875, Mr. Robinson moved from Pennsylvania to Boston and he made a small installation on the Boston & Lowell; and he started the company that subsequently became the Union Switch & Signal Company. In the three following years he made installations on the Boston & Providence and the Old Colony.

Robinson was born in Ireland, in 1840, and was graduated from Wesleyan University, Middletown, Conn., in 1865. He made other important inventions.

Railway Electric Traction, by F. W. Carter. 6 in. by 9 in., 412 pages, 204 illustrations including 13 insert plates. Bound in cloth. Published by Longmans, Green & Co., Fourth Ave. and 30th St., New York.

The book was written in England but the text is in no way confined to English methods as all of the principal installations of heavy electric traction throughout the world are discussed. There are ten chapters and an appendix. The first chapter is introductory and deals with the reasons for adopting electric traction and the relative merits of direct and alternating current systems. The author declares himself in favor of the direct current system. The Locomotive is the title of chapter II which is the longest one in the book. The design of the locomotive with relation to the effect on track is discussed extensively. Chapter III bears the title "Railway Motors" and is quite exhaustive. Motor control is presented in considerable detail in chapter IV. Chapter V deals with the distribution system including several types of third rail and overhead construction. Methods for determining sag, tension, etc., are included. Chapter VI deals briefly with power equipment. Systems of electrification are outlined in chapter VII. Chapters VIII and IX include a discussion of such subjects as train resistance, methods for calculating speed, time, and distance, energy requirements, etc. Power Supply is the subject of chapter X which deals broadly with sub-stations and power plants. The appendix consists of a table of locomotive statistics which includes most of the principal electric traction systems in the United States and Europe and gives data concerning the general characteristics of the various locomotives used.

Letters to the Editor

[The Railway Age welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

Revision of Operating Expense Classification

New York.

To the Editor:

The proposed revision of the operating expense classification, offered for the consideration of the Railway Accounting Officers' Association at the latter's annual meeting in June, is drastic. It would reduce the number of primary accounts from 197 to 69. The recommendations bear the mark of careful study. The extent of the revision it is explained is the reduction of accounting expense and the presentation of the figures in a simple, logical form so that essential facts may not be obscured by meaningless detail.

Any figures that should be compiled at all will bear the expense involved many times over. If the question of expense can be seriously raised the figures are not statistics but mere idle compilations and worthless at any cost. It would clear the air if the question of cost were never permitted to enter (except, of course, that the compilation should be by the cheapest method possible), but in its place were sharply raised the question only, are the figures useful; do they play real part in determining action. This is the only criterion.

It is not plain from the report at hand whether the committee recommends the entire abolition of the figures eliminated or only their elimination from the statistics required by the I. C. C. If there is no reduction in the compilations the saving by cutting figures out of the I. C. C. statistics is not great. If it is urged that the irregular detail clutters up and obscures the general presentation to which the I. C. C. figures should be confined, the remedy is by classifying the figures objected to in a subordinate order of detail where it applies. It is of course obvious that certain figures which may be significant on a particular road have no place in the statistics of roads as a whole. An illustration of this is "Coal and ore docks" or the sub-division of enginemen into steam locomotive enginemen and motormen. But the eliminations are not confined to figures of this character.

It is important to keep clearly in mind the purpose which any railroad statistics for the public are to serve. In the first place the statistical schedule prescribed is a device for identifying and verifying beyond cavil the final figure of net railway operating income. That is, the statistics are an auditing facility. Not unless there is reasonable assurance that reserves adequate and not too great have been set up for depreciation and contingencies is the net income figure even approximately reliable. To cover depreciation on all the several kinds of property into a single account is to merge essential distinctions into a general blur that baffles verification. If the depreciation charge is to be made at all it must be specific to the several kinds of property and must continue to be compiled in this form before reduction to a composite figure. We are aware there is a "no depreciation charge" school but we believe its position is untenable. Be that as it may the "no depreciation charge" theory does not prevail in this instance but it is only urged that the individual depreciation charge for each class of property need not be reported. In the plan for simplification proposed, of the 128 accounts abolished, 50 (40 per cent of the whole reduction) are had by destroying the identity of the depreciation charge and therefore come under the general objection here urged.

In the next place, railroads have been seriously criticized for their lack of cost accounts. Only as recently as within the last year has there been sharply raised the issue whether maintenance of equipment by outside shops was a measure of economy or of strategy, and in far too many cases the railroads had not at hand their own cost accounts to meet malign insinuations. But apart from such extraordinary situations railroads should have their costs currently to know at all times whether they are doing their work in the cheapest possible way. The writer is fully aware of the difficulties and the limbo of easy fallacies where so large and so variable a proportion of the unit cost is "overhead." But the administrative possibilities now coming to be so well understood by industrial managers is unknown to most railroad managers. To consolidate all the 10 accounts of building maintenance into a single head is to set up a figure that has no significance and at the same time precludes any cost accounting where buildings are involved. But on the other hand the consolidation of "Underground power tubes," "Tunnels and subways," "Right of way fences," "Snow and sand fences," "Crossings and signs," "Wharves and docks," "Coal and ore wharves" we believe to be legitimate where figures for several roads are taken together, because these are irregular parts of the transportation plant depending on local conditions and cannot be set against aggregate line mileage or aggregate performance.

So also the creation of the consolidated account "Other roadway and track maintenance" seems altogether excellent. The consolidation of the items of "Electric power system" is doubtful because while the mileage thus equipped is at present inconsequential it will soon be greatly enlarged and the detail is necessary to analyze the expense of such maintenance. The comment that separation of the labor cost of applying ties, rails, ballast and other track materials is a practical impossibility we do not believe well taken in view of the long experience on some roads in doing this very thing accurately on the basis of actual time spent.

The tender regard of "insurance" as an item in the classification we believe unjustified. It is properly a manager's memorandum by which he watches the rate of the insurance charge and the variation in the amount of insurance carried, but the cause of the insurance expense is neither the rate of charge nor essentially the proportion of insurance carried, but the aggregate of things exposed to risk and the extent of that risk. And on the function performed should be laid the burden of any risk incidental to their use. "Insurance" is a mere average of risk costs.

The old offenders "Stationery and Printing" and "Other expenses" are at last given the *coup de grace* which they have so long richly deserved. But the general casualty account does not commend itself. We believe each department, representing as it does assignment of function, should assume the burden of all its casualties. There is much to be gained by an expert oversight of all casualties and such supervision could very well be erected into a department as that of the Mechanical Engineer or the Superintendent of Tests; but the department where the casualty occurred should not be permitted in the general accounts to pass over its costs of this character merely for the purpose of creating a statistical entity called casualties. These are not casualties of the road at large but they are specifically referable to the several functions that affect the operation of the property.

In the "Transportation" accounts there has been a reduction from 50 to 15. Of the 35 accounts thus eliminated from "transportation," 5 have been transferred to the new general head "Casualties," 2 to "Miscellaneous operations," 4 have been eliminated altogether and 30 have been consolidated

to 6. Taking up these consolidations by turn, the merger of 4 accounts to "Station service" appears to be eminently correct and also the elimination of the distinction between electric motor and steam engine drivers, both on the road and in the yard. The consolidation of "Despatchers" with "Superintendence" is questionable. The remaining consolidations respectively on the line and in the yard abolish the time honored "locomotive performance sheet" items by merging their amounts respectively with train service and yard service expense. With due allowance for the exaggerated importance sometimes attached to these figures by themselves we believe they should not be allowed so easily to pass into the discard. In cases of the road expense the grouping of engine and train service expense has definite advantages but the inclusion in the same item of crossing protection and drawbridge operation is undesirable. In case of the yard expense the merger of yardmasters, clerks and switch tenders with engine expense is open to objection on similar grounds.

The transfer of "Operating sleeping cars" to "Miscellaneous operations" is correct but the elimination of "Express service" we believe is a mistake. The changes in "Traffic" and "General Expense" are admirable.

Behind these running comments lies the idea that the science of disbursement accounts and statistics is in its infancy. Its possibilities in "disciplining a property" as William Mahl used to say—holding it in economic balance and co-ordination at all times—are little realized. With the passing of competition in rates, with the progressive merger of the less to the greater unit in all the processes of the transportation operation there is grave economic menace, through loss of identity of the forces and values committed to a result desired, in sodden perfunctoriness.

A grave illustration at the instant is the "national agreement" whereby labor has endeavored to protect itself by limiting its adaptability on the theory that in no other way can it be secured against economic aggressions of mass capital. We believe a more exhaustive analysis of situations and processes is vital to all interests and the way to such philosophic insight to the problems is by cost accounting and statistics. A grave responsibility is now laid upon the Interstate Commerce Commission that railroads be not permitted to degenerate to the "cost plus" basis of operations for which the public foot the bills in helpless impotency.

J. Shirley Eaton.

Get Better Service From Freight Cars

Brookfield, Mo.

To the Editor:

To all appearances the shopmen's strike has about spent itself and with the advent of newly mined coal we will again be on the road to a rush business and incidentally to the worst car shortage we ever had, especially so far as coal cars, box and stock cars are concerned.

During and after government control I had many opportunities to study car shortages in various forms and in various places. I invariably found that inefficient distribution of the freight cars was a material factor in the shortage. Regardless of hard work and efforts on the part of officers pointing out different ways and methods of remedying conditions by circulars and words, the men behind the gun distributing the cars fell down and the railroads and the public suffered.

Henry Ford's success lies in the perfect system of distribution of his products, by experts. He does not apply two cars on one order unless he can sell both. We are applying two and sometimes three and more cars on orders for one. It is wastage.

We know the empties must go to the loads, but we also know that empties do not have to move in both directions, nor do more empties have to move towards the loads than can be used.

It is the wasted surplus of cars moving aimlessly around; cars furnished at a station where a car is unloading; conflicting tide orders; cars moving around unknowingly picked up by locals, and odds and ends of that nature, that I speak about, which if efficiently distributed will increase the loading, I should think, 25 per cent without a new car being built. Don't be skeptical and say it can't be done; I have done it and can demonstrate it to any doubter.

We pick out the cream of employees for positions as traveling passenger and freight agents, trainmasters and traveling auditors, but the man who distributes the freight cars slides into his job to fill a vacancy by the seniority route as any ordinary clerk. It is wrong—the very life blood of the railroad is at stake in furnishing cars and in furnishing them promptly. While looking into such matters at New York, Detroit, Buffalo, Denver, Minneapolis, Kansas City, St. Louis, Chicago and Ft. Worth, I got a fair idea of our troubles in distributing cars; there were as many methods as there were division points. Superintendents and other officers were too busy to give such matters much attention and when a car shortage occurred it was taken for granted it was so. It was not so. It was a case of inefficient distribution by incompetent men—men who had no training in the intricate workings of industrial switching and loading in our great switching terminals, or workings of local and through freights, and no knowledge of the shippers on the line and various characteristics of stations and agents, and who did not know the difference between a car with a hot box and one with a drawbar out, etc.

The railroad manager, who will rid himself of mediocre car distributors and put men on the job full of pep and energy and experience, and have them do nothing but see that no cars move aimlessly around, will have the satisfaction of being able to give 100 per cent service to the public with the cars available.

We are distributing cars today as we did 50 years ago, but our locomotives and other railroad tools have changed, so why not change the distribution of cars from a basis of incompetency to a basis of efficiency?

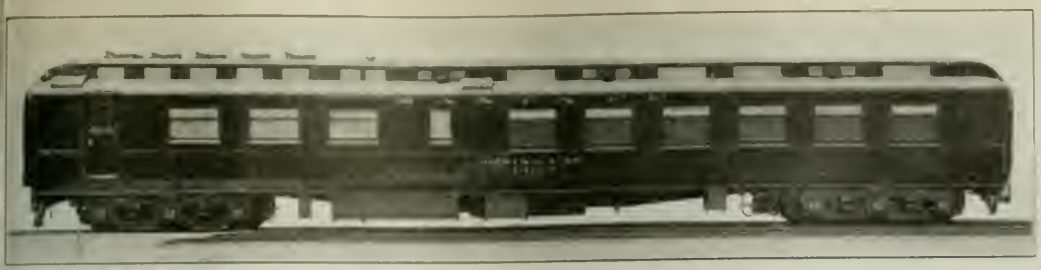
If you travel on freight trains you will learn from conductors and trainmen the facts outlined above.

The general office car distributor doesn't know the division car distributor, or his methods, in nine out of ten cases. Not one per cent of them have ever traveled over the road or seen the agents or shippers or the local conductor with whom they do business every day and who could give them hundreds of pointers. In some places the chief dispatcher attempts to use 30 minutes of his time for the distribution of cars; the result is failure.

If a railroad loads 1,500 cars a day and is short 500, it is losing at least 300 cars per day by improper distribution. It is of no use to send inexperienced inspectors out to inspect and check up what everybody knows. The science of proper distribution of cars is something that should be taken into consideration and which will greatly minimize our car shortages at no extra expense.

H. R. Dreyer.

Forty-five Thousand Dollars is the sum said to have been paid by the Philadelphia & Reading Railway in settlement of the claim of Miss Anna Fitzpatrick, who was hurt in the collision at Woodmont, Pa., last December. Sitting, with her sister, in the car next to the locomotive, her feet were crushed, and she sustained other injuries, while her sister was burned to death. The injuries to the feet kept Miss Fitzpatrick in the hospital 256 days and it is expected that she will have to have the attendance of physicians and nurses for a year longer.

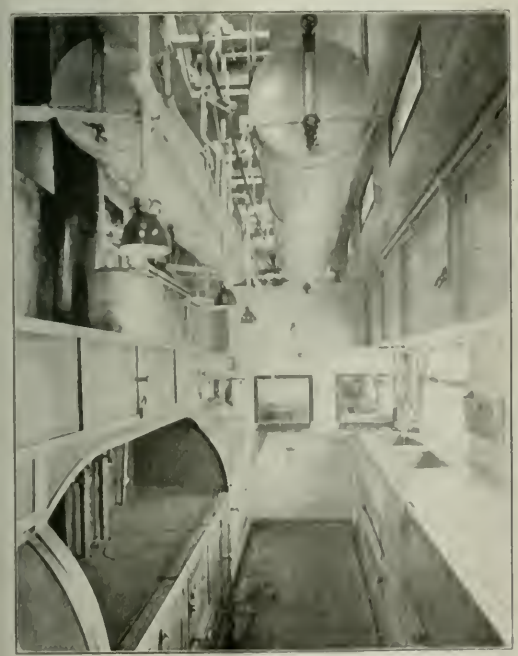


Santa Fe Dining Car from the Kitchen Side

Steel Diners for the Atchison, Topeka & Santa Fe

The Cars Are 86 ft. 6 in. Long Over End Sills and Weigh 171,000 lb.—Tables Seat 36 Persons

THE ATCHISON, TOPEKA & SANTA FE has recently placed in service eight all-steel dining cars. These diners, which were built by the Pullman Company, are without vestibules, are 80 ft. 6 in. long over the end sills and have a weight of 171,000 lb. in working order. The dining rooms are 38 ft. 8 in. long and have six single and six double tables with a seating capacity of 36. The tables are spaced 6 ft. 5 in. from center to center, which is 2 in. greater than the spacing on the older diners of this road.



The Kitchen, Looking Toward the Pantry

Daylight View of the Dining Room

Essentially the design of these cars is the same as that of the other all-steel equipment of the Santa Fe, the first of which was built in 1914. The underframe is designed to carry the load and consists of fish-belly center sills built up of plates and angles, channel side sills, and bolsters and cross bearers built up of channel pressings and cover plates. One of the principal differences in the design of the present cars is the use of structural channel sections for the side sills to replace the built-up sections employed in the first steel coaches. The body frame members are largely of pressed steel. The corner posts and side plates are of rolled Z-section; the balance of the side posts and cripples are of pressed Z-shapes. The belt rail is a continuous piece of

4-in. by 1[illegible]-in. rectangular section, with pressed Z-section window sills; the deck sill is a special angle pressing with a long horizontal flange; and the deck plate and carlines are channel pressings, the latter with closed ends. The sides of the cars are sheathed with ⅜-in. steel sheets.

The entire car body is insulated with a ½-in. layer of Insulite. This is applied on the car body between the posts and carlines against the outside sheathing and roof sheets. The underframe is covered throughout with a floor of No. 16 galvanized steel coated on both sides with Lucas car roof cement. The Insulite is then laid and covered with a heavy coat of petroleum asphalt, mopped on hot. On this are placed the transverse nailing strips for the floor. In the dining room the floor consists of a single thickness of ⅞-in. tongued and grooved yellow pine flooring. A double floor of the same material is laid in the kitchen while the single wood floor in the corridor is covered with Flexolith and surfaced with ¼-in. rubber tiling. The thickness of the nailing strips in the kitchen and corridor is reduced so that the surface of the floor is flush throughout all the several divisions of the car.

The interior finish of the dining room is of wood throughout and is built up of five-ply veneer Mexican mahogany. At all bearings, both on the sides and ceiling, the wood is backed with heavy canton flannel to prevent creaking. The steel interior finish in the kitchen, pantry and hallway is of 1/16-in. sheet steel, and is backed with one course of No. 12 fireproof duck, secured to the sheets with glue.

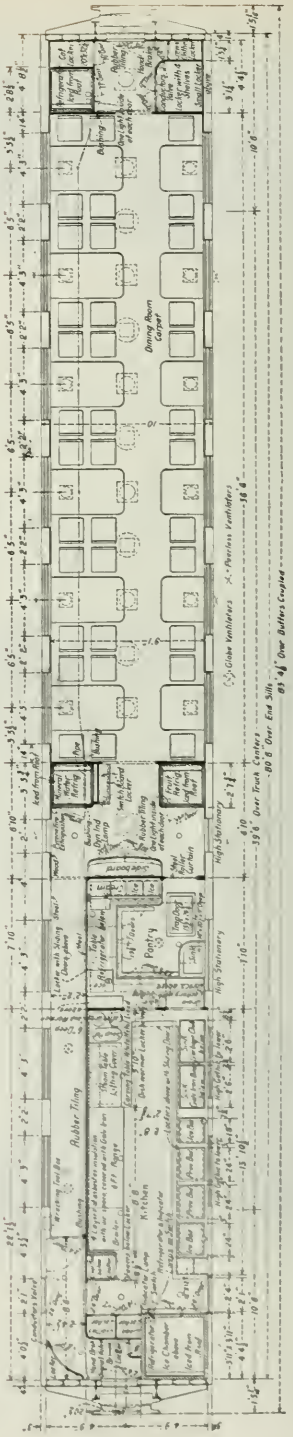
The arrangement of facilities in the car is clearly shown in the floor plan drawing. There are four refrigerators iced from the roof, the largest one located in the kitchen at the end of the car. Two of the others are located against the partitions at the kitchen end of the dining room, one on either side of the car, and the third at the opposite end of the dining room. In addition to the ice boxes in the kitchen and pantry, a large icebox for meat storage is located under the car to which access is had through a trap door in the pantry floor.

Side doors with 2-ft. 1-in. openings are located on either side of the car, 4 ft. 4½-in. back from the end. One of these doors opens directly into the kitchen, and the other into the corridor, with the door from the corridor into the kitchen directly opposite. The outside door on the kitchen side is in two sections arranged so that the upper section may be opened independently of the lower.

Power for the electric lights and fans is furnished by the U. S. L. axle light system, with truck suspended generator. The dining room is lighted by six center fixtures and six fixtures in the ceiling of the lower deck on each side. Safety fixtures are used throughout, those in the center being enclosed in 12-in. bowls, and those on the side in 8-in. bowls. Five ceiling fans of the revolving shutter type are placed between the ceiling lamps.

The Vapor Car Heating Company's thermostatically controlled vapor system is installed for heating the car, and three types of ventilators are used. The dining room is served by four Peerless ventilators opening through the deck sash, and two similar ventilators are also placed about the hall between the dining room and pantry. Globe ventilators are placed in the roof over the corridor and the pantry, two in the corridor and one in the pantry. Five adjustable hinged ventilator hatches, each arranged for operation in either direction are placed on the center line of the roof over the kitchen. These ventilators are directly over the range and steam table and provide a capacity for the movement of large volumes of air.

The cars are carried on six-wheel cast steel trucks with 5½-in. by 10-in. journals. They are fitted with Barber roller center plates and side bearings, and Simplex clasp brake rigging. The airbrake equipment is of the Westinghouse UC type.



Floor Plan of the Santa Fe Dining Cars

Coal Priority Bill Passed by the House

Will Control the Price of Coal at the Mines Through the Regulation of Coal Distribution

THE WINSLOW BILL to provide for federal regulation of coal distribution and an indirect control of the price of coal at the mines for the period following the strike settlements, during which there will be a general scramble for coal which would otherwise lead to a runaway market, was passed by the House on August 31 by a vote of 214 to 61 and the similar bill introduced by Senator Cummins was taken up in the Senate on September 1.

Under the House bill an attempt is to be made to prevent undue profiteering on the part of coal operators at least by authorizing the Interstate Commerce Commission "to issue such order or orders for priorities in car service, embargoes and other suitable measures in favor of or against any carrier or region, municipality, community, person, copartnership or corporation, and to take any other necessary and appropriate steps for priority in car sevice and in the equitable distribution of coal or other fuels so as best to meet the emergency, prevent extortion in prices charged for coal and other fuel, and promote the general welfare." The text of the Cummins bill was published in last week's issue.

Does Not Actually Fix Prices

No one is authorized by the bill to actually fix prices; the federal fuel distributor is to report to the commission, among other information, the prices normally and usually charged for such coal and other fuel, and whether current prices, considering the costs of production and distribution, are just and reasonable." On the basis of the information furnished cars may be allowed to be supplied for the shipment of coal at what the commission on the recommendation of the fuel distributor thinks is a fair price, and cars may be withheld from, or an embargo may be laid against, shipment for which an unreasonable price has been charged, or even apparently for which an unreasonable price has been offered, the purpose being to prevent the running up of prices by those who would bid against others for the opportunity to stock up with coal as well as by those who would take advantage of the opportunity to demand high prices. The prevention of retail profiteering is left to the action of state authorities.

Tired of Being Held Up

It might perhaps be inferred that the authors of the bill had possibly given some credence to the idea that coal strikes are not entirely one-sided affairs but that the desire to convert coal from a drug on the market to a highly prized and eagerly demanded luxury has something to do with them. In fact one of the reputed authors of the bill is understood to have unbosomed himself recently of the statement that he was getting tired after 30 or 40 years "of this business of scaring the American people to death and freezing them to death in the middle of August."

Almost frankly the bill uses the pretense of regulating interstate railroads in the use of their cars to accomplish a regulation of the price of fuel. But in case the commerce clause of the Constitution is not sufficient foundation for it, the preamble of the bill attempts to call into play the general welfare clause, the public health clause, the postoffice clause and the army and navy clauses. Congress is made to say that a national emergency exists, "which endangers the public health and general welfare of the people of the United States, injures industry and business generally throughout the United States, causes extortion, limits the supply of heat, light and power, threatens to obstruct and hamper the operation of the government of the United States and of its several departments, the transportation of the mails, the operation and efficiency of the army and navy, and the operation of carriers engaged in commerce among the several states and with foreign countries."

Many of the opponents of the bill in Congress asserted that it would operate to restrict the production of coal rather than increase it by shutting off the mines whose cost of production is above the average and because operators might not want to ship coal, under a priority order, to a consignee who might be slow in paying for it. However, the advocates of the bill point out that as much more coal can be produced than the railroads can handle, the available transportation service should be conserved for those who can and will sell it at a reasonable price. If the wagon mines cannot operate profitably on the price which Mr. Spencer and the Interstate Commerce Commission consider fair, or if an operator thinks he would rather hold his coal in the ground than sell it for those prices, there will be that many more cars for the others.

Hoover Favors Bill

Secretary Hoover, one of the chief sponsors of the bill, says that while high prices might under other conditions enhance production, the present problem is no longer one of production but of distribution. There will be much competition among producers, but the producer who has his coal in a car would have some degree of monopoly, at least he would have a monopoly of that car unless its use were regulated. It is understood that this time, having learned a lesson in 1920, the Interstate Commerce Commission does not propose to assign cars to people to use them in buying coal. It now proposes to see that the coal is bought by someone before the cars are assigned, and the prices will probably be based on those on which Secretary Hoover reached a voluntary agreement with a majority of the operators who were then producing coal.

Numerous amendments to the bill were offered but, with the exception of committee amendments, most of them were voted down or ruled out on points of order as not germane. One of the committee amendments was to insert in the preamble the words "and by reason of the disturbance in industrial conditions caused by the World War," as one of the justifications for the exercise of emergency authority. An amendment proposed by Representative Anderson to substitute a provision for the purchase of coal by a government agency was one of those held to be not germane. Representative Sanders' amendment to strike out reference to prices was defeated 76 to 36.

Other unsuccessful amendments proposed to limit the period of the bill to six months or a year, to fix the salary of the fuel distributor at $7,500, to provide that the Interstate Commerce Commission should exercise the powers granted without the aid of a fuel distributor, to provide that the price should be reasonable "to the ultimate consumer," to strike out the reference to "extortion" in the bill, and to reduce freight rates on coal by 50 per cent. Many of the amendments to tone down the effectiveness of the bill were offered by representatives from coal-producing districts, who warned those who voted for the bill that it would soon lead to the fixing of prices for commodities manufactured in other districts. One or two voices were raised to express disagreement with the idea of regulating prices downward in a period of scarcity without any provision for holding up

prices at time of dull market condition. An amendment offered by Representative Sanders was adopted providing that except as to prosecutions for offenses, the provisions of the act shall cease to be in force and effect January 1, 1924.

Borah and Cummins Bills in Senate

Discussion in the Senate of the Borah bill to create a coal investigating commission and of the Cummins bill to prevent profiteering by use of priority orders brought out much conflict of opinion. Senator Dial of South Carolina, who has a number of plants that use coal in large quantities, complained that he was unable to get coal which he had contracted for at $1.90 a ton because the operators notified him that Mr. Hoover had raised the price to $3.50 and that later the coal was diverted to other states under priority orders of the Interstate Commerce Commission. When Senator Kellogg reminded him that for a time only 4,000,000 tons of coal a week were being produced, and that public utilities and public institutions needed most of that, he said: "I think you might as well stop the public utilities as turn our labor out of employment and let them perish."

Senator Sutherland of West Virginia objected to regulation of the coal industry, saying that the entire trouble practically is one of transportation and that transportation is a "fine example of a government regulated industry."

Senator Kellogg replied that the roads had been in a position from April 1 to July 1 to handle the maximum of coal and they did not have it to handle, and that even if they were not crippled by the strike they could not transport all the coal in three months that should be produced and transported in six months.

Senator Reed of Missouri said the Interstate Commerce Commission was misusing its power in releasing 96,000 open top cars with sides less than 42 inches from its preferential coal order. He said the commission should exercise its power to divert the cars to the coal business instead of facilitating the handling of building materials.

Cummins Bill Under Discussion

The Borah bill was temporarily laid aside on Friday and the priority bill was taken up, the House bill being placed on the calendar without being referred to the committee on interstate commerce because it had already considered the similar Cummins bill. Senator Cummins moved that his bill be substituted for the House bill. In explanation of the bill he said that a majority of the members of the Interstate Commerce Commission felt that it was beyond their power to issue priority orders giving preference on account of the price of coal and that he would not be willing to give them that authority as a permanent matter. It should be limited to the emergency and even the President ought not to have the power to determine when the emergency exists. That, he thought, was for Congress to determine. However, he had no doubt that Congress, under its right to regulate commerce, if there was a starving community in one part of the country, could say that there shall be no cars loaded for any other purpose than to transport food, and that similarly it may say that only those operators who are willing to sell their coal to a community without coal at a fair price shall be allowed cars.

Senator Reed declared that this was merely a subterfuge to fix a price and that if Congress possesses such a power and starts to use it, "we may as well understand that we will have opened a door through which may come a lot of trouble That power, of course, we can declare at any time, whether there is an emergency or not. There is nothing in the Constitution about emergencies."

Senator Underwood said that instead of attempting such legislation now the government should have taken action long ago to stop the railroad strike. Senator Underwood's objection that no legislation is now proposed to deal with the railroad strike and his statement that the remedy lay in an anti-strike law, such as had been passed by the Senate at the time the Transportation Act was being framed, brought out an interesting statement from Senator Cummins that the Senate conferees at that time had not yielded on the anti-strike provisions until information had come to them that President Wilson would veto the bill if they were left in it.

"We put teeth in that bill," said Senator Underwood, "but when they carried it to conference they brought back an empty shell. The power to enforce the decree of a court is the only thing that makes the decree of value."

Wilson Threatened to Veto Anti-Strike Law

"For two months or more the Senate conferees attempted to maintain the Senate provisions in that respect," said Senator Cummins. "The House was adamant upon that subject, and although I am now betraying a secret which possibly is not generally known, it was not until the information came to the Senate conferees that if the bill was passed with the anti-strike provision in it, it would be vetoed, that the Senate conferees yielded to the House demands, and allowed the bill to pass without the provisions in it which I think are absolutely necessary to any effective railway regulation."

Senator Underwood replied that he did not criticise the chairman of the committee on interstate commerce, that he may have been compelled to yield in 1920, but that "when he surrendered he left the door wide open, and failed to put up the only barrier in front of a great transportation strike which can save the people of the United States from the dire conditions which are confronting them today."

Senator Cummins added that he had no direct word from President Wilson but that after the Senate had provided for a Labor Board of five members, all representing the public, and had made it unlawful to enter into a conspiracy or strike in order to coerce employers in disregard of the decision of the Labor Board, "gentlemen whom I shall not name but who were high in the councils of the labor people and of the Railroad Administration indicated to me that unless we yielded upon those points the President might find it difficult to sign the bill. It was at the very last minute that we changed the composition of the Labor Board, providing three members to represent the public, three to represent the railroads and three to represent the men."

Senator Cummins said he intends to introduce anti-strike bills at the next session of Congress, but that it would be impossible to control the present strike by any such legislation.

Senator Reed, who kept insisting that the bill would not accomplish the desired purpose and insisted that the important thing was to settle the railroad strike, ventured to "guess" that the freight engines and the cars necessary to transport the coal could be put in condition in two weeks time, although he thought Senator Cummins was understating it when he said that possibly 20 per cent of the engines and cars are in bad order.

In reply to objections because the bill does not reach dealers who may profiteer, Senator Cummins said it would reach the dealer who is shipping coal from one state to another just as completely as the operator will be reached, but that the remedy for retail profiteering is with the states.

Discussion of the Cummins bill was continued in the Senate on Tuesday and Wednesday. Senator Cummins in a long discussion pointed out that an important difference between the two bills was that this applied only to interstate shipments, while the House bill would cover also shipments within a state.

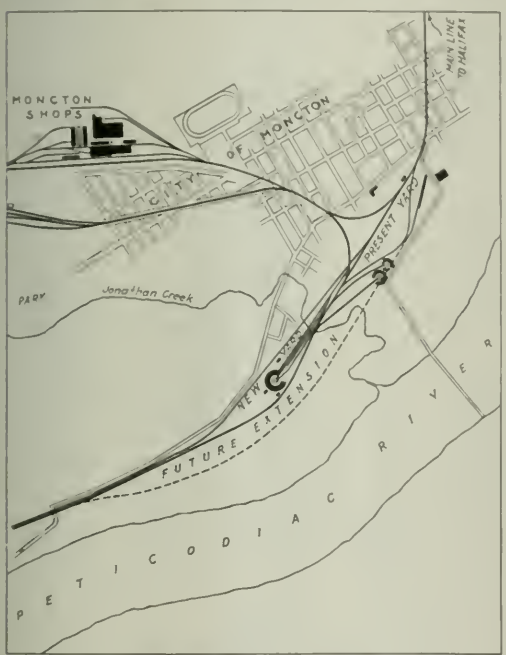
Senator Robinson made a long speech on Wednesday attacking the injunction obtained by Attorney General Daugherty.

Canadian National Increases Facilities at Moncton*

New Engine Terminal Provided as Part of Plan for Extensive Improvement at That Place

By S. B. Wass,
Terminal Engineer, Canadian National Railways, Fort William, Ont.

THE CITY OF MONCTON is situated on the Canadian Government Railways at the junction of the main line from Halifax to Montreal and the line from the city of St. John, and is also the eastern terminus of the Transcontinental Railway, which makes it the gathering point for traffic from the west to Halifax, Sydney and all points east of it, as well as the breaking up point for traffic in the opposite direction. By reason of this fact it is the most important



Map of the Moncton Yard

railway junction point in the Maritime Provinces, and requires adequate facilities for handling traffic rapidly and efficiently, and also for distributing empty cars and equipment of all descriptions to points where needed. For a number of years the yard has been too small to provide the necessary working capacity; and the tracks too short to accommodate the long trains hauled by the new large locomotives. The roundhouse and other facilities, which were old, were too small and without proper acilities or making the running repairs to the present-day large locomotives.

Layout of the Yard and Its Approaches

The old connection with the main line and trans-continental line, with the yard, is near the east end, and is by means of a wye connection, which resulted in a great deal of terminal detention. To eliminate this condition, and so simplify yard movements, a diversion was constructed from Mile 3.5 on the north main line to Mile 2.5 on the St. John subdivision, thence parallel to the St. John sub-division to the yard. By this means all traffic enters the yard from the west, making a simple east and west yard, except for the transfer to the Moncton shops, which traffic, being only local, is small.

A very complete ultimate layout has been designed, which includes east and west receiving yards, classification yards, which may be equipped with humps if required; east and west departure yards, transfer and storage tracks, new car repair facilities, new engine facilities, etc, so located that the construction of any additions or extensions required to meet traffic conditions may be carried on without materially interfering with traffic. This yard is arranged in units, so that it may be constructed and operated in sections as the traffic demands. The conception and design of this general layout originated with Collingwood B. Brown, recently chief engineer, Canadian Government Railways, and now engineering assistant to the vice-president, Canadian National Railways, Toronto. All of the expenditures and construction up to date have been in accordance with this ultimate layout.

Construction Work

The actual work of construction was commenced in the season of 1919, and consisted of three parts:

(1) The acquiring of additional land which was required on both sides of the present yard to provide for present and future requirements, and to avoid farm crossings.

(2) The construction of the diversion from the main line to the north, referred to above. The maximum grade used was 0.6 per cent, compensated for curvature, and involved the raising of the St. John sub-division to a height of 6.5 feet at the under crossing of the Salisbury road, Mile 1.8, and extension of this bridge from a single-track to a three-track structure. The contract for this work was awarded to the Dominion Construction Company, Ltd., and Wheaton, late in the season of 1919, and the work was completed early in 1920. A considerable saving in operating expenses was effected during the first winter by the use of this diversion for freight movement, although the old line was continued for passenger traffic use.

(3) The old freight shed was very inadequate for the local and transfer traffic. A new shed with additional trackage, arranged to conform with the new layout, was constructed. The structure is 400 ft. long by 40 ft. wide, of brick and structural steel construction. The contract for this work was awarded to engineers and contractors of St. John, and the work was completed early in the season of 1920. A transfer platform 500 ft. long was also constructed conforming to the new layout.

Construction Work During 1920

The engine house, coaling plant and other engine facilities are located on the high ground, where the foundation is good, just west of Johnathan creek, which crosses the yard at about Mile 0.6 and flows across the marsh, the level of which is approximately 25 ft. below the grade elevation.

* Abstracted from a paper presented at the meeting of the Engineering Institute of Canada at Winnipeg, Man., on September 7, 1922.

This marsh has an average width of about 400 ft., the Johnathan creek culvert being located at its extreme west side. The ground west of the culvert for a distance of 5,000 ft. was generally above grade ranging from zero to 15 ft., which necessitated considerabe excavation. The material was required partly to widen the embankment at the extreme west end of the yard, but mostly to make the embankment over the Johnathan creek marsh.

An extension of the Johnathan creek culvert under the old yard was also necessary. In order to have the site ready for building during the season of 1921, the construction of the culvert extension and grading for the site of the building was performed in 1920, so far as it could be done. A contract for this work was awarded to the Dominion Construction Company, Ltd., and Wheaton, and the work was completed by the end of 1920, about 95,000 cu. yd. of material having been excavated.

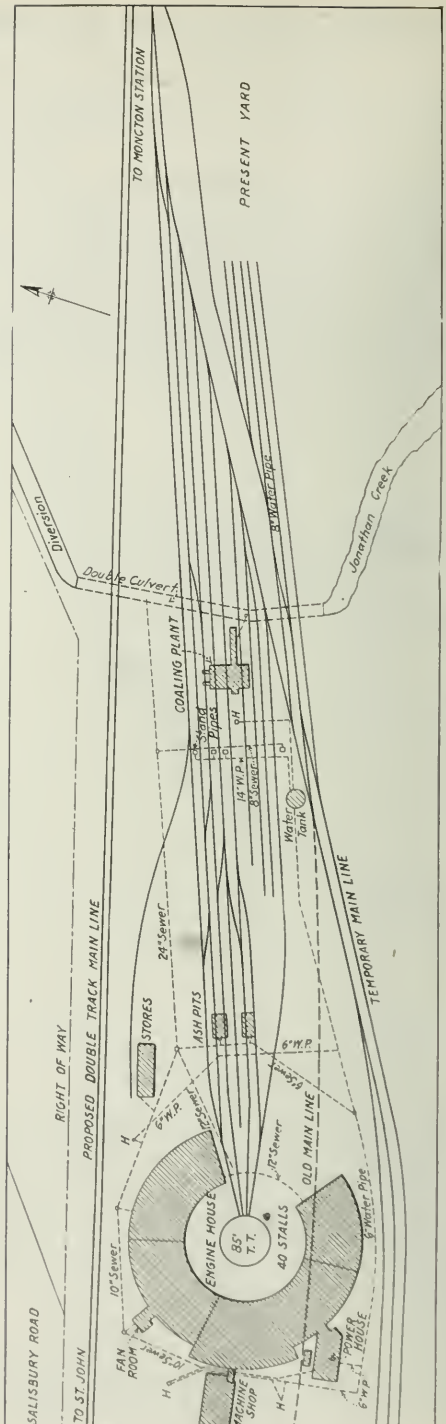
Work During 1921

The work during 1921 consisted of continuing the grading, diverting the main line, and construction of building and service tracks. It will be seen that a locomotive approaching the facilities will, under ordinary conditions, obtain the necessary attention in the following order: Coaling and sand, water, fire cleaning, housing. Three inbound and three outbound tracks have been provided, all of which are served by stand-pipes for water. Coaling facilities are provided on the three inbound tracks, and by means of cross-overs locomotives on two of the outbound tracks may be coaled with very little interference with the inbound locomotives. Four tracks have been provided with ash-pits and sufficient cross-overs have been provided to facilitate any desired movement of the locomotives. Fifty tracks to the turntable have been provided for; four are running tracks to and from the turntable, forty are entrances from the turntable to the forty-stall house, which is now constructed, and space or an additional six-stall section when required. All buildings except the water tank and coaling plant are constructed of brick on concrete foundations with mill type frames of fir, except the machine shop, which has a structural steel frame. This is one of the largest layouts for a single engine house in Canada.

As much of this work had to be performed in the present yard, without interference with traffic, it was decided to do it by the railway's own forces under the supervision of A. F. Stewart, chief engineer, with S. B. Wass, construction engineer, and E. R. Evans and H. L. Curie, assistant engineers, directly in charge of the work.

Sewer System

As the buildings were all located on the natural ground, composed of hard pan, very impervious to water, it was important that drainage be provided for the foundation excavations at the earliest possible moment, and the most effective method was to get the permanent sewerage system installed. The main sewer, extending from the outlet to the manhole opposite the ash-pits, is of 24-in. double strength, vitrified clay pipe 798 ft. long, placed 14 ft. below grade so as to drain the ash-pits. From this main sewer, branches of smaller sized pipe are carried to the turntable pit, engine wheel drop pits, and all other facilities requiring drainage. The total amount of excavation for sewer trenches was 4,960 cu. yd. in hard-pan material merging into rock, so that hand labor was considered to be too slow. Several alternative methods were discussed and it was finally decided to try a Marion railroad ditcher which was available. This machine was supported over the top of the trench on old bridge stringers and in one operation excavated the trench in front of it and deposited the material behind itself, the pipe having been laid and jointed by men working directly underneath the machine.



The New Engine Terminal

So successful was this method that frequently 55 lin. ft. of completed sewer was laid in a working day, and an average of 32 ft. per day was maintained during the whole operation

The Terminal Buildings

The engine house contains 40 stalls, 33 of which are 100 ft. in length with 65-ft. pits, and seven are 120 ft. long with 80-ft. pits. The house is divided into two sections of seven 100-ft. stalls; one section of seven 120-ft. stalls; one section of nine 100-ft. stalls, and one section of 10 100-ft. stalls. Three of the long stalls are provided with drop pits for driving wheels, and two with drop pits for tender wheels, so located that any pair of wheels on any of the railway's existing locomotives may be changed. The drop pits are all equipped with Taylor-Arnold pneumatic jacks. Each stall is provided with steam blower, with Barco connection, blow-off pipe, wash-out and boiler filling pipe, cold water connection and compressed air, all of which systems are connected with the power house, where the various pumps, hatwell, etc., are located.

The machine shop, 84 ft. long by 53 ft. wide, is located at the back of the long stall section of the roundhouse and connected to it by a passage way. It is provided with machines for light repairs, tool room and forge, with jib cranes for handling heavy parts, and a narrow-gage push-car track between the machine shop and the roundhouse stalls.

The stores and office building is 100 ft. long by 30 ft. wide. The foreman's office is in the west end of the building, and adjoining it are the booking and registering room, locker room, wash room, shower bath, etc. The oil cellar, fully equipped with storage tanks, and 10 self-measuring and registering oil pumps, is in the central portion of the building. The east end of the building, to be used for miscellaneous supplies, is fitted with racks and shelves, and surrounded with an eight-foot platform with ramps. This building is heated by low-pressure steam, supplied by the power house boilers.

The power house is attached to the back of the twelfth stall of the engine house and is 87 ft. by 44 ft. It is divided into two parts by a brick wall, the back part of which contains two 250-h.p. Babcock and Wilcox water-tube boilers, which were in use in the old power house, but have been retubed, thoroughly cleaned and repaired. The other part contains the air compressor, feed-water, wash-out and vacuum pumps, and steam-driven fan and heater coils. A hot-well is located just outside the power house for storage of hot water. This hot water is used for feedwater for refilling locomotive boilers, thus effecting a great saving in fuel.

The electric current is obtained from the railway power plant at the Moncton shops. It is used for operating the coaling plant and motors in the machine shop, in addition to a complete lighting system throughout. The lights in the engine house are so arranged with reflectors on the posts that an abundance of light may be obtained for work on any part of the locomotive, but economy may be effected by turning off those not required, as each stall is supplied with separate switches.

A mechanical coaling plant of 350-ton storage capacity, equipped to elevate coal at the rate of 50 tons per hour, was installed. It is provided with three coaling tracks, and one hopper track for receiving coal. It is operated by electric power from the railway system. The machinery was supplied and installed by Williams & Wilson, Ltd., of Montreal, under contract, but the construction of the building and all other work was done by the railway forces. Facilities are also provided for sand storage and supplying sand to locomotives at this plant.

Water is obtained from the city water supply and a steel tank of 150,000-gallon capacity is provided as a storage reservoir. Four 10-in. standpipes are provided for watering locomotives. The steel water tank was supplied and erected by the Dominion Bridge Company on a concrete foundation constructed by the railway forces.

Two double-track ash-pits, 40 ft. long, were provided. These pits are 12 ft. deep and so arranged that they may be operated as dry or flooded pits. They are constructed of reinforced concrete walls, lined with fire brick, with the sloping wall of steel rails under the tracks. The space between the two tracks, over the deep part of the pit, is covered with a wooden platform which is removed when the cinders are being taken out of the pits. The ashes are removed from the pits by a coaling crane with a clam-shell bucket. This crane is also used to load coal from storage piles or to coal locomotives in case the plant breaks down.

Construction

As all the buildings were required for operation at the same time, it was decided to carry on the constuction of them simultaneously and thus prevent the work from becoming congested For purposes of organizing a construction force, a fairly close estimate of the quantity of each class of work to be performed was made and from it an approximate estimate of the number of men and time required to perform each was obtained. By keeping in view the natural sequence of the work, a program was worked out by which the foundation work was kept well ahead of the concrete work, the concrete work ahead of the brick work, the brick work ahead of the carpentry, painting, piping, etc., and throughout the whole work there was very little interference of one class of work with another, so that a gang once organized to perform certain classes of work was kept up to full strength until the work was practically finished.

Bills of material were also prepared, orders were placed for these as early as possible and arrangements made for delivery in accordance with the general program of the work. By keeping daily records of material on hand, and by keeping the persons supplying the material daily advised of the material situation at the work, no serious delay was caused for material, although in some cases the men had to be shifted to another part of the work for a few days. This was true in the case of the steel window lintels, reinforcing for the concrete floor in stores building, pipe fittings and electrical supplies. Notwithstanding this, the general program of the work was very closely adhered to.

During the season 7.03 miles of permanent track with 43 switches were laid. This work could not be done continuously, but the layout was located on the ground, and wherever possible service tracks were laid in the position of permanent ones. A large amount of old track had to be taken up and shifted, and the locomotive crane was very useful in handling this material.

Transferring from Old to New Facilities

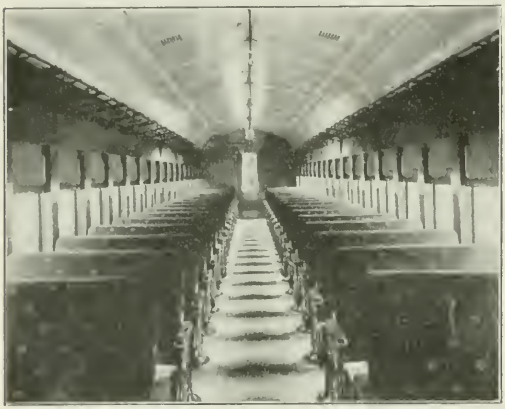
It was necessary to continue operation at the old facilities until the new ones could be used. About one-half of the machines in the old shop were belt driven, and these were installed in the new shop, while the motor-driven machines were left in the old shop until after the transfer had been made.

The transfer of the turntable naturally was the governing feature, and this was accomplished without any interference with traffic. The table was put out of service at the old house at 8 a. m. December 17, and was raised out of the pit without removing deck or rails, by a 75-ton wrecking crane, by a rather unique method. The crane lifted one end of the table, blocking was placed under the center, the table was then tilted over the blocking and the opposite end blocked up. By repeating this several times, the table was raised high enough to permit car trucks with especially constructed bolsters to be pushed under the table. By this

means the table was transferred to the new site by 4 p. m., where it remained till the following morning. During the night the crane was taken away on other service, and it returned at 11 a. m. By reversing the tilting process the table was lowered into the new pit, and at 4.30 p.m. December 18 the first engine went into the new house.

Steel Suburban Passenger Cars for the Philadelphia & Reading

THE PHILADELPHIA & READING is now receiving deliveries on the lot of 45 all-steel passenger and five all-steel combination passenger and baggage cars for suburban service which were ordered in February from the Harlan plant, Wilmington, Del., of the Bethlehem Shipbuilding Corporation, Ltd. With the placing in operation of these cars, the Reading is now using specially designed all-steel equipment for suburban traffic, a departure from the practice of using the older types of equipment in suburban service or on branch lines.



Interior of Suburban Coach

These suburban-type cars are designed for the same strength as main line cars and are of standard all-steel construction throughout. New main line all-steel cars for this road were described in the *Railway Age* of July 15, 1922, page 117. A noticeable feature, however, is the construction of the roof, which is of the single deck type, with 16 ventilators placed on top. This construction makes possible an unusually light and airy car.

There is but one saloon in each car, thus increasing the space for seats to a maximum providing a seating capacity of 48, six more than the Philadelphia & Reading standard main line coaches of the same length. The omission of the second saloon also has the advantage of widening out the aisle at the door, permitting quick emptying of the car. The saloon bulkheads are steel.

The coaches are of the wide vestibule type and are 63 ft. in length over the underframes. They are electrically lighted with Safety Car Heating & Lighting Company's body suspension equipment, and are heated by means of the thermo-jet system. The seats are Hale & Kilburn Walk-over design upholstered in Philadelphia & Reading standard plush. Four-wheel type trucks with 36-in. wrought steel wheels and clasp brakes are used, and the axles have 5½-in. by 10½-in. journals. Gould couplers, buffers and draft gear and Westinghouse air brakes are part of the equipment.

The interior finish of the coaches is painted mahogany color. The ceilings are finished in old ivory and striped to harmonize with the interior of the car. The sides, ends and roof are insulated with three-ply salamander, and the headlining is agasote.

APPEALS WITH NO HEART IN THEM.—J. O. Hackenberg, superintendent of the Pennsylvania Railroad at Buffalo, N. Y., speaking recently at a Sunday meeting of employees said, in part: Far too many railroad men today know the superintendent only as initials on a train order or a name on a discipline notice, and if I can convince you that he is a human being, with the same weaknesses, troubles and cares that each of you have, my visit to you will have been worth while. . . . I know and you know that I know, there have been cases where men have been fairly disciplined, getting what they justly deserved, where your chairmen have been instructed to appeal. No right thinking chairman can have his heart in such an appeal and many times it is lost simply because it was wrong. If you men would get behind the discipline and give it your full moral support, I am safe in saying that most of the need for discipline would disappear. Think this over, and the next time John Doe is disciplined and asks your support in having the discipline annulled, ask yourself the question, "Was John actually guilty?" and if he was, how many men did John take a chance of wrecking when he broke the rules? When a superintendent disciplines a man, it isn't because he enjoys it, but to try to keep a railroad safe. The man who deliberately takes a chance with his own life and limbs certainly will, with less hesitancy, take a chance with yours. When you sit on an engine and see a man take a foolish and needless chance, without going after him about it, you are simply adding to your own risk.

New All-Steel Suburban Coach for the Philadelphia & Reading

Safety Council Holds Annual Meeting in Detroit

Results of Careful Crossing Campaign and Safety Education of Children Chief Topics Discussed

THE ELEVENTH annual congress of the National Safety Council, which was held in Detroit, Mich., August 28 to September 1, extended well-merited recognition to its Steam Railroad section by the election of Marcus A. Dow, general safety agent, New York Central Lines, to the presidency of the Council. The Railroad section, which is one of 21 industrial branches of the congress, devoted the major portion of its deliberations to a discussion of the highway crossing hazard, which has been given special attention in the "Careful Crossing Campaign" instituted on June 1. In the absence of Isaiah Hale (A. T. & S. F.), chairman, A. O. Ridgway (D. & R. G. W.), vice-chairman, presided at the sessions of the Section which was attended by about 80 railroad safety officers representing 27 steam roads.

The chairman, in his annual report, cited as strong evidence that the safety first movement is effective in reducing train service accidents, the fact that the Brotherhood of Railroad Trainmen has been able to increase the brotherhood life insurance from $2,000 to $2,700 without increasing the cost to the insured. Mr. Hale's report supported this statement by figures taken from the Interstate Commerce Commission Accident reports for the last six years.

Fred Meyers, terminal superintendent of the Wabash, Detroit, in a paper on "Accident Prevention from the Standpoint of the Operating Department," cited a number of operating rules which, properly enforced, would put a real "kick" in the safety requirements. He suggested that in some cases there had been too much "safety organization" and not enough individual effort to place each man on his own responsibility. He has also found the committee men of the brotherhoods to be of great assistance in convincing the men that this safety movement was all for their personal welfare; they aid in eliminating long established dangerous habits. In a discussion of this paper, T. A. Carroll (Penn.) explained that as a means of getting home to each man, different divisions of that road had issued small bulletins entitled "Fusee," "Life Preserver," etc., covering the details of accidents and methods of preventing them. Bulletins detailing actual incidents on the home road seem to receive more attention than abstract statements.

W. F. Braden (B. & O.), presented a paper on the "Relative Importance of Supervision and Propaganda in Railroad Safety Work," in which he selected the Careful Crossing Campaign as the most striking example of successful propaganda launched recently by the railroads. He pointed out that in railroad safety work the psychology behind propaganda was, that a knowledge of danger was most readily impressed on the average railroad employee through the sense of sight; that is, by means of bulletins. The visual impression is strengthened by three qualities, exaggeration, motion and unusual conditions shown in the picture. In 100 tests the eye was found to make only 18 mistakes, whereas the ear made 34. The conclusion was that the average shop foreman, in his haste to turn out work, can not with his ordinary limited vocabulary hope to accomplish as much for the safety of the men by continued talks, as is possible by the use of the "universal language"—pictures and bulletins.

Progress Report on Careful Crossing Campaign

According to reports from 66 of the Class 1 roads 352 people were killed at highway grade crossings on these roads during June and July, 1922, an *increase* of 35 over the number for the same months in 1921. These figures were presented by H. A. Rowe, claim attorney of the Delaware, Lackawanna & Western, who is credited with originating the famous "Cross Crossings Cautiously" poster. Continuing, he stated that several roads had reported a reduction in such accidents, among which were: the Chicago & North Western, having 4 less deaths and 12 less injured in June and July, 1922, than the same period for 1921; the Baltimore & Ohio with 10 less killed and 9 less injured; the New York Central 1 less killed and 28 less injured; the Central of New Jersey, 13 less killed and 23 less injured.

Mr. Rowe also reported the results of a check on 300 average crossings made July 15 and 16, this year. Of 306,306 automobiles observed the drivers of only 156,607, or about 50 per cent, looked either way, and only 26,453, or about 9 per cent slowed down to less than 20 miles an hour. The speaker stated that 1,300,000 standard "Cross Crossings Cautiously" posters had been used in the campaign and that in this period an *equal* number of (new) automobiles had been sold. In the face of such odds Mr. Rowe felt that the fact that deaths and injuries have been restricted to even approximately the 1921 record was a great credit to the campaign. The death of 1,800 persons and injury to 5,000 annually for the past five years in railroad crossing accidents has begun to bring the nation to realize that instruments of death and torture are being promiscuously placed in the hands of incompetent persons, exposing innocent passengers on trains and in automobiles to the mercy of ignorant, heedless and criminally reckless drivers. Mr. Rowe advocated a united movement for the inauguration of legislation to establish a "standard of ability" to be required of automobile drivers. The speaker advocated a movement to influence local newspaper writers not to make a hero of the automobile driver involved in an accident but to place the blame where ie belongs, thereby convincing the public that any driver not observing caution is a fool, not a hero.

T. A. Carroll (Penn.) in discussing this paper said that there had been a gratifying degree of publicity. In 151 newspapers in the larger cities he had found 969 column-inches of copy on the careful crossing campaign and, including editorials and copied articles in smaller papers some two miles of copy had been produced on the subject. Considering that there is a combined circulation of some 89,000,000 copies of these papers it is fair to conclude that the American people have had this subject brought effectually to their attention. The slogan has been used in several cartoons published in prominent newspapers. This slogan is a real asset; it will stick as long as railroads cross highways. But the campaign is now only well started and requires the best efforts of all to keep it properly before the public. He closed by saying that the campaign has cost $50,000, a small amount compared to the good acomplished.

Safety Education Through the Public Schools

Marcus A. Dow (N. Y. C.) stated that just after the campaign had been started there was an increase in crossing accidents on the New York Central for two weeks and that no favorable results were noted until the first two weeks in July, but a reduction would be shown for the first half of August. The 10,000 local station agents on the New York Central have presented the standard N. Y. C. careful crossing speech to over 2,000,000 people. Mr. Dow urged the railroads to continue the campaign without abatement.

The work of planting safety habits into the lives of school

children was explained in detail by several speakers. L. G. Bentley (C. & O.) said that school children in the territory adjacent to the Chesapeake & Ohio were being taught to keep off the railroad right-of-way and cars. Personal work of safety agents among the children by the telling of interesting and vivid stories in the school rooms has accomplished gratifying results. Mr. Bentley has personally delivered his story of "Bill Day, the Boy Athlete" to 50,000 school children, and he received promises from these children to keep off the railroad. J. T. Broderick (B. & O.) stated that a three-year campaign in the homes and schools along the Baltimore & Ohio has resulted in a reduction of 20 per cent in persons killed and 34 per cent in injured. How children are taught to keep off railroad tracks in Detroit was explained by Miss Harriet E. Beard, supervisor of safety, Detroit Public Schools. A short one-act play enacted by the children demonstrated methods of arousing interest in safety and of impressing the children with the serious consequences of tresspassing on railways.

A systematic and efficient perodical examination of the eyes of all workmen was advocated by R. M. Little of the National Eyesight Conservation Conference. He claimed that over half of the employees of the average industrial plant have defective vision and as a result are nervous, restless and careless, this condition is a constant source of hazard. It can be remedied by glasses properly fitted.

he will resent the warning. On the other hand, the straight-from-the-shoulder request (or order), appeals to him and he will promptly obey, in the majority of cases. In closing Mr. Love emphasized the importance of co-ordination—let the eye follow the hand. Many men are prone to trust their hands in one direction while looking in another. Men should be trained to watch where they put their hands.

L. G. Bentley, general safety agent, Chesapeake & Ohio was elected chairman of the Steam Railroad section of the National Safety Council for the ensuring year. John Fitzhugh (G. C. & S. F.), vice-chairman and L. P. Green (M. St. P. & S. S. M.), Minneapolis, Minn., secretary.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR loading during the week of August 26 was the largest since October 21, 1921, amounting to 890,838, as compared with 828,883 in the corresponding week of 1921 and 1,001,308 in 1920. This was an increase of 34,679 cars over the previous week and of about 23,000 as compared with the highest previous week this year before the shop strike. The increase was mainly due to the increase in coal loading, following the Cleveland agreement, which amounted to about 30,000 cars more than during the preceding week. The loading of grain and grain products and ore was slightly less than the preceding week, but all other classes of commodities showed increases.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDING SATURDAY, AUGUST 26, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Misc. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	9,707	3,145	20,134	1,235	5,742	6,195	66,522	97,829	210,509	.....	.....
	1921	8,028	3,102	44,704	1,108	4,576	2,127	60,227	80,251	.....	204,123	244,935
Allegheny	1922	2,550	2,957	32,761	4,570	3,219	11,496	48,296	78,616	185,375	.....	.....
	1921	3,216	2,812	44,581	2,265	2,647	7,235	45,775	57,158	.....	165,699	212,335
Pocahontas	1922	200	214	20,547	263	1,109	87	4,604	2,580	29,604	.....	.....
	1921	173	198	16,846	98	1,227	.....	4,768	3,898	.....	27,218	36,322
Southern	1922	3,899	2,320	26,495	711	19,030	993	34,941	33,894	116,283	.....	.....
	1921	3,537	1,842	21,392	288	14,189	193	36,428	31,547	.....	109,407	129,425
Northwestern	1922	17,365	7,772	4,195	1,045	15,768	44,014	28,573	38,088	156,760	.....	.....
	1921	18,797	6,307	8,527	484	11,334	21,268	28,084	35,053	.....	129,854	170,486
Central Western	1922	15,160	12,555	9,183	396	7,705	1,999	32,175	52,970	132,143	.....	.....
	1921	19,161	9,895	18,507	190	6,294	859	31,189	42,103	.....	128,178	129,124
Southwestern	1922	4,741	3,083	3,715	170	7,893	347	14,889	25,526	60,164	.....	.....
	1921	5,926	2,763	4,956	197	7,140	250	15,984	27,197	.....	64,413	68,681
Total western districts	1922	37,206	23,410	17,093	1,611	31,366	46,360	75,637	116,384	349,067	.....	.....
	1921	43,884	18,965	31,990	871	24,768	22,357	75,257	104,353	.....	322,445	378,291
Total, all roads	1922	54,562	32,046	111,030	8,390	60,466	65,041	230,000	339,303	890,838	.....	.....
	1921	58,838	26,919	159,513	4,631	47,408	31,912	222,455	277,207	.....	828,883	.....
	1920	46,044	28,463	211,766	15,921	66,580	79,709	207,202	345,623	.....	.....	1,001,308
Increase compared	1921	.....	5,127	.....	3,759	13,058	33,129	7,545	52,096	61,955	.....	.....
Decrease compared	1921	4,276	.....	48,483	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1920	8,518	3,583	.....	.....	.....	.....	22,798	.....	.....	.....	.....
Decrease compared	1920	.....	.....	100,736	7,531	6,114	14,668	.....	16,320	110,470	.....	.....
August 26	1922	54,562	32,046	111,036	8,390	60,466	65,041	230,000	329,303	890,838	828,883	1,001,308
August 19	1922	55,893	29,756	81,959	8,201	57,934	67,201	229,235	325,350	856,215	815,147	968,103
August 12	1922	57,567	28,370	84,559	8,420	56,163	69,197	230,652	317,652	852,580	808,269	971,269
August 5	1922	58,512	26,507	79,746	8,142	55,898	66,218	229,287	327,241	851,351	786,178	935,730
July 29	1922	59,170	27,104	76,374	9,112	58,197	64,147	234,567	331,002	859,733	795,432	936,366

One of the interesting papers presented was "Simplicity in Accident Prevention Work," by A. B. Love (A. C. L.). Mr. Love explained that although the use of safety devices is good, the ultimate goal is to bring "the workman to a full realization of his personal needs and to the grave responsibility he assumes for his dependents, as well as the influence he wields over fellow-workers." Mr. Love called for better signs and posters. Placards displayed in shops or other places frequented by workmen should be brief, simple and clear, otherwise "they become so much wall decoration—nothing more." Instead of putting up a sign reading "The Best Safety Device Known is a Careful Man" substitute one like "Watch for Overhead Obstruction Here"; or "Keep Aisles Clear"; or "Do Not Leave Tools Where They May Fall Upon Some One." The first mentioned sign creates in a man's mind the idea that if he suffers injury he will not be considered careful, and will not be given credit for certain qualities which are attributable only to careful men. Thus

THE DAY'S WORK ON THE NEW YORK CENTRAL.—This is the title of a display advertisement recently published by the New York Central reading as follows: From midnight to midnight the New York Central Lines haul 100,000,000 ton-miles of freight. A ton-mile, the measure of transportation, is one ton moved one mile. A hundred million ton-miles are equivalent to moving a ton a distance greater than from the earth to the sun; or of moving 4,000 tons [a train of 80 large cars] around the world. In the same twenty four hours the passenger trains record 10,000,000 passenger miles, the equivalent of carrying more than 10,000 passengers from Chicago to New York. The day's work of the New York Central Lines is about one-tenth of the rail transportation of the United States, and is greater than that of all the railroads of England and France combined.

U. S. Gets Blanket Injunction Against Shopmen

Restraining Order Covers Many Strike Activities—A. F. of L. Threatens to Fight Enforcement

ONE OF THE MOST important moves in the shopmen's strike and probably the most far reaching and significant action ever taken in an industrial conflict by the United States government came out of a clear sky when Harry M. Daugherty, attorney general, appeared on Friday before Judge James H. Wilkerson of the Federal district court at Chicago, asking for and receiving a temporary injunction restraining all striking railroad employes over the country from interfering in any way with the operation of trains. The injunction names all of the officers of the Federated Shop Crafts and their system organizations, 250 men in all, and briefly restrains these leaders from:

From the World, N. Y.

A Common Target

Issuing any instruction or public statement to members of their organizations to induce them to do or say anything to cause any railway employe to leave his work or to cause any person to abstain from entering employment of a railroad.

Using funds of unions in furtherance of any act forbidden in injunction.

All officers and members of unions or their agents are restrained from:

Engaging in picketing.

In any manner, by letters, circulars, telegrams, telephone messages, by word of mouth or by interviews, encouraging any person to leave the employ of a railroad or to refrain from entering such employ.

Interfering with or obstructing any railway.

Hindering inspection, repair or equipment of locomotives or cars.

Conspiring or agreeing to hinder railroads in the transportation of passengers, property and mails.

Interfering with employees going to or returning from work, "by displays of force or numbers, threats, intimidations, acts of violence, opprobrious epithets, jeers, taunts or entreaties."

Loitering at or near places of ingress and egress for employees.

Trespassing on the premises of any railroad, or any other place except "where the public generally are invited to come to transact business."

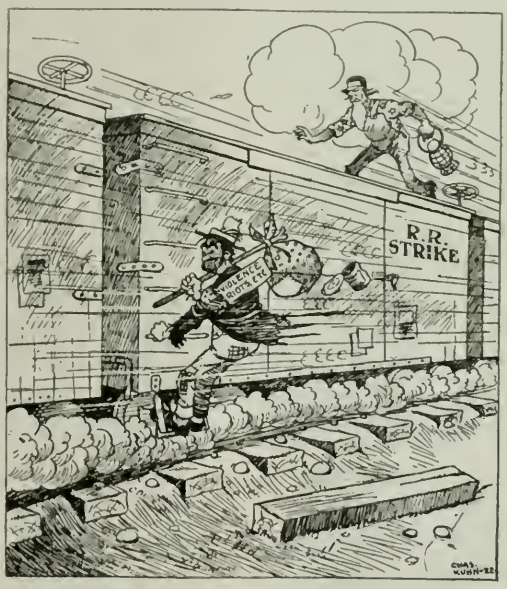
Doing any injury or bodily harm to any employee of a railroad.

Judge Wilkinson set September 11 as the date on which hearings will be held on the plea of the government for a permanent injunction.

The Government's Case

In presenting the government's case to the court Attorney-General Daugherty outlined the reasons underlying the government's application for an injunction in part as follows: The equipment of the railroad companies is so materially affected by acts of vandalism and inattention that the service of the companies is generally seriously impaired, and, in some instances, the railroads have abandoned the running of trains altogether.

"The railroad labor board is an agency of the government of the United States. In this particular contest, both parties submitted the differences in dispute to the regularly constituted governmental authority to hear disputes and render decisions thereon. The railroads were willing to comply with the decision which was the cause of the strike, but the defendants not only repudiated the decision but repudiated the labor board and its authority, and holds the labor board and the government of the United States in contempt."



From the Indianapolis News

Hookin' a Ride

Authority in the laws of the country to uphold the granting of the injunction are "ample" Attorney-General Daugherty said, citing the ruling of Judge Brewer in the Debs case as a precedent.

"I do not appear here as a representative of the railroads; I appear here by virtue of law requiring me to do so, representing

the government of the United States and the people of the United States. The government of the United States will never lift its hand against or touch a torch to the welfare of labor in its legitimate pursuit or to deny it what it is entitled to. The United States could not have been developed but for labor. Without that which labor produces the people of the United States cannot be prosperous, and, in fact, they cannot live.

Tomorrow it will be said by some persons that this proceeding is intended as a death blow to the unions. In my judgment, this movement is necessary for the protection and the preservation of the unions themselves.

Government Not Opposed to Labor Unions

The government of the United States is not opposed to labor unions if they perform such functions as can be performed in lawful America. Never, while the labor unions limit their activities to legitimate acts and lawful pursuits not injurious to society, at least while I speak, and to the extent that I can speak, for the government of the United States, shall a blow be struck at them. But it may be understood that, so long, and to the extent, that I can speak for the government of the United States, I will use the power of the government of the United States within my control to prevent the labor unions of the country from destroying the open shop. When a man in this country is not permitted to engage in lawful toil, whether he belongs to a union or not, with full protection and without interruption, the death knell to liberty will be sounded and anarchy will supersede organized government.

There are many who believe, on account of the arrogance of certain officials of labor unions, that the unions themselves should be destroyed. I do not think they should, but I think they should be corrected and restrained. If the acts of violence and murder are inspired by the unions, then it is time for the government to call a halt. No organization or association, no matter how well organized or how powerful it may be, can hold its constitution or its laws supreme over the government, the constitution and the laws of the United States of America.

No union, or combination of unions, can, under our laws, dictate to the American union. When the unions claim the right to dictate to the government and to dominate the American people and deprive the American people of the necessities of life, then the government will destroy the unions, for the government of the United States is supreme and must endure.

The right to work in this country is as sacred as the right not to be compelled to work, if a man is not disposed to do so, and every man must be made equally secure in his choice. I take notice of the fact that, in the legislative branch of the government, the situation is deemed so serious that the taking over of the railroads by the government is considered necessary.

I do not believe that time has yet come. The government has not reached the point where it will admit its inability to protect the rightful owners of property in their right to use that property for the general welfare of the whole people, and to require the owners of the railroads to furnish that service which is essential to the life of commerce, to the life of industry, to human life, and even to the very life of the government itself.

These defendants, considering the temperament of the people of the United States, can do no wiser or more beneficial thing for union labor than to consent that this temporary restraining order, if it should be granted by the court, be made permanent.

Service Should Not Be Interrupted

I am not in this capacity before this honorable court pleading any cause of the railroads as their advocate, except as may be necessary to the welfare of the American people. The railroads are built under pledge to operate their lines. Representing the American people in this proceeding, I demand that the operation of the railroads shall not be interrupted in the service the government requires them to perform.

The dispute between the employers and employees is not involved in this proceeding. We have passed beyond that point. A governmental body entitled to recognition and obedience has decided that dispute. I am not taking sides between the disputants at this time as an advocate of either.

It so happens in this instance that the railroads are willing to render the service the government requires they shall render. They are trying to serve the American people. They are trying to observe the law. They are endeavoring to furnish transportation. On the other hand, the defendants are preventing transportation and are offending against the law, as alleged in this bill, and by acts of violence are antagonizing and opposing the government of the United States.

But even though this widespread violence, this destruction of property, this threatening of starvation, and the hazarding and taking of human life as set forth in the complaint and situation were not present, no organization, no matter what its purpose or how powerful its plans and pursuits, can interfere with government and interstate commerce.

The underlying principle involved in this situation and this action is the survival and the supremacy of the government of the United States.

Has Received Requests for 40,000 Deputy Marshals

Adding to his prepared statement the attorney general told the court that because of lawlessness and violence against railroad property and railroad workers, his department had received urgent requests for no less than 40,000 deputy marshals to keep down the strike disorder. Already 5,500 marshals have been assigned, and in addition, special service men of the department have taken up similar work throughout the country, the attorney general said. The cost of such special service, he said, already expended was more than $1,000,000 for the first eight weeks' duration of the strike.

In California alone, Mr. Daugherty said, more than $75,000,000 worth of fruit and produce already had been destroyed because of the failure of transportation systems to move the crops. In Somerset, Ky., he said 25,000 cars of bituminous coal were congested in the railroad yards. Vandals had tampered with more than 5,000 cars there, he said, and as a result the nation was faced with suffering for want of coal. Fifty per cent of the engines of the nation's railroads have been rendered useless by lawless activities since the strike began, he said, and 1,000 mail trains canceled.

Jewell Issues Statement

As soon as news of the injunction granted Attorney General Daugherty reached him, B. M. Jewell, head of the Federated Shops Crafts, went into conference with his attorney, and later issued the following statement:

Enforcement of the injunction obtained by the attorney general against lawlessness and violence in connection with the shop crafts strike will be aided by every power of the shop crafts organization.

It can hardly be assumed that the federal court has intended to restrain, or has restrained, those lawful acts necessarily involved in carrying on the legitimate work of labor organizations, some or all of whose members are engaged in a legally conducted strike to accomplish lawful purposes. Such acts, including peaceful picketing, as have been repeatedly and recently held to be lawful by the Supreme Court of the United States, cannot be assumed to come within the provisions of the restraining order entered by Judge Wilkerson.

At least until advised that the constitution of the United States and the decisions of the Supreme Court are no longer to be relied upon as the law of the land, the officials of the organizations of railway employees will continue to perform their legitimate duties to their members, to aid them in the lawful pursuit of their lawful purposes, and to do all in their power, in conjunction with the officers of government, to restrain and to punish every unlawful act of those who are rightfully involved or who without right involved themselves in the operation of the railroads.

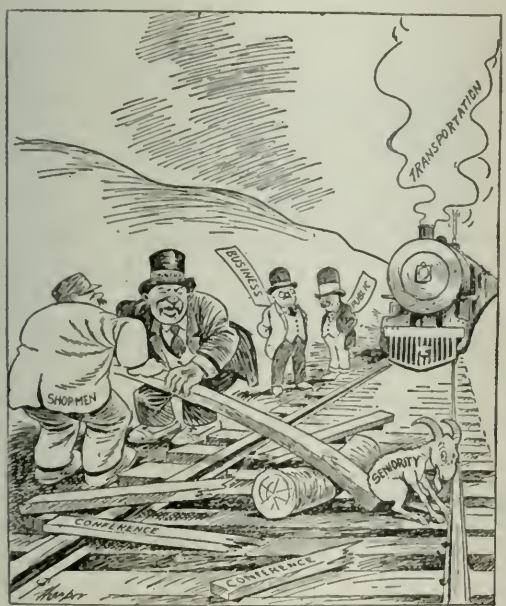
The Attitude of the Government

WASHINGTON, D. C.

The sweeping injunction obtained by Attorney-General Daugherty at Chicago on September 1 is in accordance with President Harding's repeated declaration of his purpose to enforce the laws to maintain transportation service. The President feels that the action was entirely justified by the situation and it has been announced at the White House that he is determined to make transportation as efficient as possible, now that the settlement of the coal strike has changed the fuel problem from one of production to one of distribution by reason of the heavy burden placed upon the railroads by the necessity for trying to make up for the lost production of the five months' strike.

If the injunction is not sufficient the President is prepared to take such other steps as may be necessary. This is taken to mean prosecutions for violations, although by some it has been interpreted to mean use of federal troops. In reply to a question as to whether any action was contemplated against the railway executives, it was stated at the White House that the President thinks they are "doing the best they know how at present," and that, if any action had to be taken in that direction, it would involve the railroad properties rather than the executives.

The injunction step has been under debate in the Cabinet for some time but it is understood the President was unwilling to approve of it until he had exhausted every effort to bring about a settlement by mediation and until the issue had been laid clearly before the public in such a way as to demonstrate plainly that the President was not being influenced by sympathy with either side and had not joined in any alleged campaign to "break the unions," but had waited until he



From the Birmingham Age-Herald

Looks As Though They'll Have to Wire Uncle Sam for the Wrecker

was forced to act to prevent the available fuel from being kept from the public by unlawful interference on the part of strikers in their efforts to keep others from taking "their" jobs. The injunction gives the federal government an opportunity to act where state and local authorities have been slow to prosecute cases of violence.

While the preparations of the government to use injunction proceedings to prevent a strike of train service employees last fall was instrumental in pointing a way to a calling off of that strike, the administration did not feel so sure of itself about July 1 in connection with the shopmen's strike, for two reasons. In the first place there was a rather general feeling that the strike threat was a bluff to see whether the Labor Board would yield, and in the second place it was not so clear that it could be argued before a court that a shop strike, conducted peacefully and consisting only of a withdrawal of men from service, could seriously interfere with interstate commerce. After the strike actually became effective an injunction could not return the men to work, but now that the railroads have been able to build up a sufficient force to carry on operations it is believed that it is only necessary to prevent interference with them. It is apparently the President's idea that if, with the injunction enforced and protection afforded, any railroad is not able to perform the necessary service with such assistance as its neighbors can afford it, then it will be time to consider the drastic step of government operation which the President has said he would undertake only as a last resort.

In reply to a question as to the possible effect on the strike of a reversal of the Labor Board's resolution of July 3, the President was represented as believing that no exigency would justify the board in determining its attitude or adopting any course under the menace of a strike.

That the strike situation was regarded by the administration as having probably passed the critical stage was indicated by an announcement on Friday that the Cabinet meeting that day had not discussed the strike, for the first time for several weeks, but had devoted its attention to other matters.

Newspaper stories regarding the status of A. O. Wharton as a member of the labor group of the Railroad Labor Board, under leave of absence as president of the Railway Employees' Department of the American Federation of Labor, have failed to cause any perturbation on the part of the President. It is understood that he was informed of the situation after the strike began, but not in any formal way, and it was pointed out at the White House that at the time of Mr. Wharton's renomination he was represented to the President as one of the ablest members of the board and there was no opposition to his appointment.

At the White House on Tuesday it was stated that the government does not intend to abridge the liberties of anyone under the Constitution, the idea being merely to prevent interruptions to interstate commerce.

Samuel Gompers on the Injunction

News of the Chicago injunction was met by Samuel Gompers, president of the American Federation of Labor, with violent denunciation and a rather indefinite threat of a "general strike." He said the federation has no authority to call a strike and he did not know what would be done, but that the matter of recommending a general strike would be taken up at a meeting of the executive council of the federation on September 9. It would then be his duty, he said, to bring to the attention of the executive council the numerous demands for such a strike received from various local organizations. He declined to say whether he would make a recommendation and while he said that the injunction would "stir up a hornet's nest" and hinted at action by the brotherhoods and other railroad labor organizations, he refrained from predicting what they would do. He attacked the injunction as an invasion of constitutional rights and a "process for the manufacture of radicalism and Bolshevism," and Attorney General Daugherty as acting as attorney for the railroads. Mr. Gompers discussed the injunction almost as if it were an injunction against striking, saying that strikes are not unlawful, and that all the shopmen have done is to "stop work and nothing else." It is the view of the federation, he said, that such injunctions should be treated as scraps of paper but he declined to say whether he would advise such a course on the part of the men enjoined.

The following telegram addressed to Mr. Jewell, signed by Mr. Gompers, was made public on September 2, at the headquarters of the American Federation of Labor: "At the meeting of the labor legislation representatives, July 21, a resolution was adopted conveying to you and through you to the striking railway shopmen the pledge of our sympathy and support to the fullest extent within our power. At the

meeting of the same conference this evening it was decided to ratify and emphasize the declaration made July 21 and pledge anew our sympathy and support and the best wishes for the success of the striking railroad shopmen in the attainment of their just cause."

W. H. Johnston, president of the International Association of Machinists, said the injunction would not cause the slightest abatement of efforts to win the strike. "We will ignore the injunction," he said. "It will give the men greater zeal to fight their battle." Mr. Johnston was also outspoken in his denunciation of the injunction, before it had been served on him, in a speech at a meeting of the former employees of the Washington Terminal Company.

Injunction Discussed in Senate

The dispatches also quoted Secretary Scott as saying that injunction and of Attorney-General Daugherty in asking for it was the subject of considerable criticism in the Senate on Wednesday.

Senator Robinson of Arkansas brought up the question in a prepared speech. Senator Watson of Indiana took issue with some of his statements and defended the course of the administration. He contended that until Judge Wilkerson had had the opportunity to hear argument on September 11 for and against making the restraining order permanent, an open discussion of the matter in the Senate was questionable.

Mr. Robinson conceded that it was proper for a judge to issue an injunction to prevent injury to persons and property during the prevalence of a strike, but he thought that the temporary order went too far, and that it infringed the constitutional guarantees of free speech, freedom of the press and the right of the people peaceably to assemble.

There seemed to be little disposition on the part of Senators to take part in the debate. Their frame of mind appeared to approximate that of Senator Watson in deprecating discussion pending the hearing on the application for a permanent injunction.

Shop Leaders Will Have Day in Court on Monday

Attorney General Daugherty complained in a statement issued Wednesday that many of the leaders of the striking railway shopmen have disappeared before they could be located by Federal process servers. He declared also that if labor leaders feel they have been deprived of the right of free speech, they will have full opportunity to express themselves in court on Monday "under circumstances that will give the greatest value to their utterances."

The statement said in part:

The Government will consider in due time what proceedings shall be taken against the few misguided labor leaders who have made incendiary speeches with the purpose of defeating the administration of justice. The rank and file of labor organizations are loyal and law-abiding citizens, and I am satisfied that they will be content to submit the issues in the Chicago injunction suit to the orderly processes of law and to abide by the decisions of the courts as to what is the law of the land.

A few misguided labor leaders—some of them avowed Bolsheviki—who have shown a contempt for the courts and the processes of law, need not complain that they are denied the full privilege of free speech. It is my intention, if it shall prove necessary to proceed with the equity suit, to give them the fullest opportunity of free speech and under circumstances that will give the greatest value to their utterances, for I propose, when the court next hears this case, that the leading defendants shall have the fullest opportunity to take the stand and testify under oath as to whether or not they are responsible for instigating and carrying on the unquestioned conspiracy to paralyze transportation in this country.

Daugherty Wants to See Correspondence

If they are reluctant to tell their side of the story, I shall be disposed—although the Government's evidence will make it unnecessary—to call the leading defendants to the witness stand, and they will then have, as I said, the fullest opportunity of free speech and under the most satisfactory conditions.

In this proposing to put before the country not only the Government's case, but any possible defense, I am somewhat hampered by the fact that the government's process servers have had great difficulty in locating the leading officials of the shop crafts organization. No lawyer has yet formally appeared for them in the Chicago suit, and this is disappointing, as I desired to serve notice upon him to bring into court next Monday all the books, letters, telegrams and other documentary data of his clients, so that the public could judge whether or not they continuously attempted to paralyze interstate commerce and thus starve the community in order to enforce by coercion their demands.

I am today instructing the United States attorney at Chicago to serve notice on the counsel for the defendants when such counsel is selected, to produce those of his clients who are the leading officials of the shopcrafts' organizations, together with all their books, correspondence, financial accounts, check books, and other documentary data. I must presume that they will welcome this opportunity to put their case before the court and thus the public, and I give little credit to the rumors that any of these defendants have gone to Canada and taken with them the records of their activities. Such a course would be foolish, as the Government is not without duplicates of much documentary evidence and can readily subpœna the telegraph companies to produce the telegrams.

If this minority of labor leaders who have denounced the actions of the courts are not willing to come into court and tell their side of their story on the solemnity of their oaths as witnesses, then the public, which only desires fair play, is likely to draw its own conclusion.

Collapse of Strike in Sight, Says Cuyler

On September 1, the railroads had approximately 305,000 employees engaged in the maintenance of cars and locomotives, as against about 400,000 in June, 1922. This is characterized in a statement issued Wednesday by T. DeWitt Cuyler, chairman of the Association of Railway Executives, as "the best evidence that the collapse of the strike is in sight." Mr. Cuyler's statement continued:

During the past week the railroads have been recruiting their forces at the rate of some 5,000 or 6,000 men per day. It is estimated that at least half of these are the older and more experienced men among the strikers. They are voluntarily returning to work on terms which do not violate the obligations of the railroads to either their loyal employees or to the new employees.

In many cases it was July 10, and in others July 17, before the railroad companies set about seriously to recruit their forces. Prior to those dates they generally held the positions of their striking employees open for them without loss of seniority and other rights. On July 10 the railroads had at work in their shops and roundhouses approximately 155,685 men. On July 20 the total number of these employees was only 162,749

From this it may be seen that practically the entire progress made in recruiting new employees has been since July 20. On July 31 the railroads had 191,440 employees of this class; on August 15 237,340; on August 31 approximately 292,000.

These figures do not include returns from some 50 railroads, which it is estimated have at least 13,000 men at work, making a total for the entire country of approximately 305,000.

Since the rights of the loyal men who remained at work and of new men engaged during this difficult period have been prominent in public discussion, it is interesting to note that there were about 155,000 loyal employees, and that about 150,000 new employees have been added.

Reviewing the situation more generally, the statement said:

The maintenance of equipment was materially improved in August, and will be still further improved in September.

The car loading figures issued weekly show that during the two months of the present strike the railroads have loaded with revenue freight over 500,000 more cars than they loaded during the same eight weeks of 1921, when there was no strike.

For the week ending August 25 bituminous coal production was increased to about 6,700,000 tons, from about 4,500,000 tons the preceding week. The probability is that the week ending September 2 will show that the railroads loaded over 9,000,000 tons which is more than an average weekly output.

While obviously, the commerce of the country cannot be carried with the same speed and facility as would have been possible had

no strike taken place at the same time the railroads are providing transportation for all essential purposes. Evidence of the ability of the roads to render effective transportation was furnished on Labor Day when the volume of business, the greatest in the history of the roads, was handled without friction and with only the usual delay incident to heavy travel.

The railroad companies deeply appreciate the support which has been given them in the present strike by the public opinion of the country.

If the people of the United States will continue to evidence their good will just a little longer, they will see the present strike terminated in such a way as to add greatly to their protection against unwarranted attempts to interrupt transportation in the future.

Recruiting of shop employees gave the railways a net increase in their number of shopmen of 2,419 on September 1, and of 1,144 on September 2. On Labor Day there was a further increase of 3,317. These figures are somewhat below

Photo by International

The Ruins of the Pennsylvania's Car Shops at Pittsburgh, Destroyed by Fire, Believed Incendiary, Killing Seven and Injuring Many

the totals which have reported for some of the preceding days of the strike.

Eastern Roads Have 79 Per Cent Normal Forces

L. F. Loree, chairman of the Eastern Presidents' Conference, in a statement Tuesday, announced that further gains had been made by the eastern roads in recruiting men to take the places of the striking shopmen. He said:

"The railroads in the eastern district report their shop forces for the last six weeks to have been as follows:

		Per cent.	Weekly gain
July 28	97,724	62.0	....
Aug. 4	103,528	64.7	5,804
Aug. 11	111,324	69.0	7,796
Aug. 18	115,745	71.5	4,421
Aug. 25	121,890	74.9	6,145
Sept. 1	130,910	79.86	9,020

"Any suggestion to the men not on strike is likely to be regarded by them as criticism, but without any criticism of their conduct or attitude, and solely from the point of view of one who has worked with them for more than 55 years, I cannot but feel that in view of the above showing those of them who desire to continue in the railroad service would be well advised if they availed themselves of what opportunity is left to secure positions."

Equipment Conditions

Bad order cars on August 15 totaled 335,575, or 14.8 per cent of the total cars on line. This was an increase of 10,992 cars over the total on July 1, when the shopmen's strike began, but a decrease of 9,438 cars from the total on August 1. The July 1 figure was 324,583 cars in bad order, or 14.3 per cent; the August 1 figure, 345,013 cars, or 15.3 per cent.

Commenting on these figures compiled by the Car Service Division of the American Railway Association, a statement of the Association of Railway Executives said:

The total number of bad order freight cars on August 15 last was 46,865 less than the total in need of repairs on August 15, 1921, and 3,247 less than on June 1, 1922, at which times no strikes of railway employees were in progress.

These tabulations are based on reports received directly by the Car Service Division from roads representing 98.6 per cent of the total mileage of the Class 1 railroads and owning 99.3 per cent of the cars on line.

The carriers in four (Eastern, Allegheny, Southern and Central Western) out of the seven districts, reported reductions in the number of cars in need of repairs on August 15, compared with August 1, while there were slight increases reported in the other three districts.

Despite the shopmen's strike, there was a decrease of 2,394 bad order cars in the Eastern district on August 15, compared with July 1. The total for that district on August 15 was 106,181, or 17.9 per cent of the cars on line in that district, while on July 1 it was 108,575, or 18.3 per cent. The Southern and Central Western districts had only slight increases on August 15, compared with July 1. Small increases were reported in the other districts.

The number of bad-order cars and percentage of bad-order cars to cars on line on August 15 compared with July 1 follows:

Districts	August 15 Cars	August 15 Per Cent	July 1 Cars	July 1 Per Cent
Eastern	106,181	17.9	108,575	18.3
Allegheny	63,575	13.7	59,973	12.6
Pocahontas	13,056	13.4	10,694	10.7
Southern	51,086	17.2	50,953	17.8
North Western	44,231	13.7	39,055	12.3
Central Western	35,700	11.2	35,754	10.7
South Western	21,746	13.1	19,579	12.4
Total	335,575	14.8	324,583	14.3

The number of bad-order cars and percentage on August 1 follows:

Districts	Cars	August 1 Per Cent
Eastern	108,919	18.4
Allegheny	64,149	13.6
Pocahontas	12,541	13.0
Southern	53,762	18.6
North Western	43,140	13.3
Central Western	40,844	12.7
South Western	21,658	13.1
Total	345,013	15.3

Labor Day Rush Handled Without Difficulty

Shippers are continuing to report delays to fast freight traffic, which on most roads is not being moved according to schedule. The shop strikers' publicity is making much of delays in fast freight deliveries and pointing out that the food supplies are being endangered by the failure of the railways to operate their trains on schedule. The railway officers, however, point out that the delays are in no case serious and that in no wise is the movement of food supply in danger. They admit that the strike is unquestionably having some effect, but point out also that a great deal of the difficulty is due to the congestion resulting from increased traffic.

A real test of the effect of the strike was offered to the railways over the week-end in the form of a record-breaking holiday passenger traffic.

The Pennsylvania reported that the number of passenger trains moved to and from the Pennsylvania Station, New York City, on Saturday, September 2, was the largest in the history of this station—883 trains. This includes the business of the Long Island Railroad, which was very heavy. The number of coaches, parlor cars and baggage cars in

these trains was 6,587 and the estimated total number of passengers was 300,000.

Between Philadelphia and Atlantic City, the railroads carried their usual crowds; and, in addition, had to run all available ferry boats between Philadelphia and Camden because of the rush of automobiles returning from Atlantic City On Monday evening, automobiles entered the Pennsylvania ferry shed at the rate of 700 an hour. The Pennsylvania ran 12 boats and the Reading eight.

The Pennsylvania, reporting on New Jersey seashore travel, gives a total for the four-day period, September 1-4, to and from Atlantic City, Ocean City, Wildwood, Cape May and other points, of 189,000 persons, an increase over last year of 23,460, or 14 per cent.

During the same period between New York and Philadelphia, in both directions the total number of passengers was 162,226, an increase of 10,834, or 7 per cent, while between New York and northern New Jersey resorts the total was 59,065 passengers, an increase of 2,832, or 5 per cent.

The New York, New Haven & Hartford found it necessary to provide for the holiday traffic 335 extra coaches, 112 extra parlor and sleeping cars and 45 locomotives. The company's statement says that passenger trains were moved reasonably on time, and this in spite of two unusual and heavy rain storms. At the same time, the number of freight trains moved on Sunday and Monday totaled 34,663 cars, nearly 4,000 more than in the same period last year; freight business did not have to be delayed in order to operate the passenger trains. The mechanical departments, largely organized since the beginning of the strike on July 1, "functioned in a manner that would have been creditable to a group of older and more experienced men," the statement went on further to say.

An officer of the Boston & Maine, telling of the large number of extra trains between Boston and Portland, Maine, and elsewhere, said that summer camps, largely maintained for boys and girls, produced this year more than 25,000 passengers for the road. This camp business has grown up mostly within the past ten years. There are more than 300 such camps on the lines of the Boston & Maine and the Maine Central.

Baltimore & Ohio to Pay Bonuses

The Baltimore & Ohio announced on Monday that beginning with September 1 all skilled mechanics will be paid a bonus of $1 a day as compensation for the abnormal conditions under which they are working at the present time. The company plans to erect barracks for shopmen at Brunswick, Md.; Cumberland, Md., and Benwood, W. Va. At Grafton, W. Va., the company has bought a hotel for a similar purpose.

Eight Shopmen Burned in Pittsburgh Fire

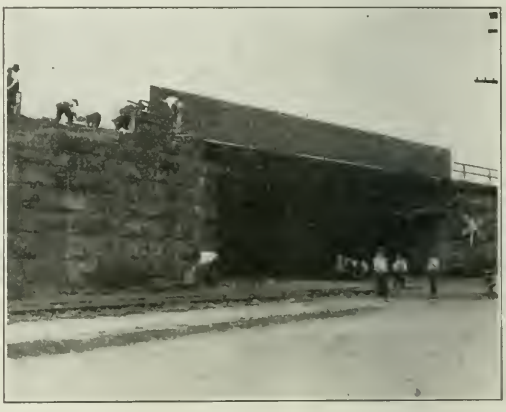
In a fire at Pittsburgh, Pa., on Sunday morning, September 3, eight shopmen, employees of the Pennsylvania Railroad, were burned to death and eleven others severely injured. The building, a structure 175 ft. by 300 ft., was a repair shop and commissary and was being used temporarily, in the second story, as lodging quarters for new employees engaged since the strike. The fire was discovered by a negro cook about 4 a.m. and spread rapidly. While police and others were doing their best to rescue the victims of the fire, a large crowd of men, said to be strikers, stood on a cliff overlooking the building and hurled stones at the injured and their rescuers until driven away by police. The loss sustained by the railroad is estimated as follows: Building, $50,000; supplies, $150,000; damage to an oil house, tracks and cars, $10,000.

A bridge of the Pennsylvania Railroad was dynamited at Wilmington, Del., on the night of August 30 and some damage done to the tracks, but none to the bridge. The bridge was not a main-track bridge, but was on a side track leading to the Pullman car shops.

Sentenced to Six Months

In the United States District Court at Nashville, Tenn., on August 30, G. E. Ryman, a striking shopman, was sentenced to six months' imprisonment and to pay a fine of $500 in court, Ryman having been found guilty, by a jury, of violating the injunction granted the Tennessee Central against striking employees. Ryman appealed and was released under a bond of $1,500, the court allowing 20 days in which the case might be appealed. On August 31, three men were fined $250 each in the same court for violating the injunction granted to the Nashville, Chattanooga & St. Louis. All three appealed and were released on bonds of $1,000 each. The men had attacked an employee of the road; Ryman had used incendiary language and had struck an employee who disputed him.

In the federal court at Lynchburg, Va., on September 4 an attachment was issued for the arrest of L. A. Taliaferro, a barber, of Clifton Forge, on the charge of conspiring with



P. & A. Photo

Workmen Repairing Pennsylvania Bridge at Wilmington, Del., After It Had Been Damaged by a Bomb

Chesapeake & Ohio strikers to annoy railroad employees. It is alleged that Taliaferro posted a notice in his shop which read: "Scabs not served here." A similar process was taken out against a man in Roanoke on the charge of intimidating Norfolk & Western employees.

Canadian Wages Reduced

The Board of Conciliation, at Ottawa, Ont., has recommended that the shopmen of the Canadian Railways, numbering 35,000, accept temporarily the reductions in wages which have been proposed by the railroad companies, ranging from five cents to nine cents an hour.

Pennsylvania to Enlist Co-operation of Shippers

Instructions to take immediate measures with a view to enlisting the co-operation of all shippers and receivers of freight, on the Pennsylvania Railroad System, in getting more work out of each coal car than was ever before thought possible, have been issued by General W. W. Atterbury, Vice-President in Charge of Operation. The appeal is based upon the urgency of the situation arising out of the coal shortage, and the approach of winter. General Atterbury has addressed the following directions jointly to the four Regional Vice-Presidents of the Pennsylvania System:

With the resumption of mining in both the bituminous and anthracite fields, the most essential work ahead on our Railroad is that of moving coal.

As a vital part of our plans, I wish each of you to take at once whatever steps are required to impress upon our patrons, in your respective regions, the urgency of the situation, and particularly, the absolute necessity for loading and unloading coal cars with the greatest possible promptness.

We are faced with the most serious coal shortage in the country's history. To avert or minimize widespread suffering and loss, we must make up as much of that shortage as possible before winter sets in.

Coal cars must be kept moving to and from the mines faster than ever before. We must get more service out of every car than has ever before been attempted. To make success possible, loading and unloading must be done in absolute minimum time and everyone using coal equipment must be made to realize the moral duty of releasing the cars as swiftly as possible, in order that they may be returned to the mines for more coal with the least possible delay.

I am confident that when the vital importance of this matter is made clear to our patrons, we shall receive their full support and co-operation.

Strike Developments in Chicago and the West

While the latest moves of the government in the strike situation have taken all the front page space during the past week, there have been buried in the inside pages innumerable reports of violence directed at the destruction of railroad property or the intimidation of those who are now working. Throughout western territory the bombing of railroad structures and tracks and the homes of loyal employees, the

Photo by International

A Derailment at Waukesha, Ill., Thought to Have Been Caused by Malicious Tampering with the Roadbed

attempted destruction of bridges by fire, the efforts to wreck trains, and the usual riotings have accompanied the ninth week of the shopmen's strike.

On August 31, a Pennsylvania bridge at Wilmington, Del., and bridges near Indianapolis, Ind., and Cincinnati, Ohio, were dynamited. Several attempts were made to wreck trains, although the property and personal damages were comparatively slight, at Waukesha, Wis. The derailment of a Chicago & North Western train resulted in the death of an employee and the injury of several others. A Big Four passenger train was derailed near Brownsville, Ind., and one woman passenger injured. The most serious wreck attributed to the part played by strikers was the wrecking of a St. Louis-San Francisco passenger train near Cape Girardeau, Mo., resulting in the loss of two lives and injuries to a number of the passengers. The train crashed through a damaged trestle.

Rioting, slugging and similar instances of violence were also reported during the past week at Augusta, Ga.; Sedalia, Mo.; Memphis, Tenn.; La Crosse, Wis.; Algiers, La.; Council Bluffs and Clinton, Iowa and Missoula, Mont. At Memphis, Tenn., a non-union shop worker was murdered as he was on his way to work in the St. Louis-San Francisco shops. At Cleveland, Ohio, one striker was killed as he attempted to take the life of a non-union worker in the vicinity of the New York Central shops.

A comparatively new form of violence was introduced into the strike with the burning of seven bridges on the St. Louis Southwestern between Texarkana and Stamps, Ark. A similar attempt was also made on the Atchison, Topeka & Santa Fe near Tecumseh, Okla.

A threatened walkout by train crews at Parsons, Kan., was averted when guards were removed from inside the Missouri, Kansas & Texas yards. Firemen refused for a time to move two trains on the Southern railway at Asheville, N. C., because of the altercation between a hostler and a guard, and Louisville & Nashville trainmen were taking a strike vote at Corbin, Ky., following alleged insults by guards.

The issuance of federal injunctions to restrain strikers or their sympathizers from interfering with the operation of trains has continued as have the arrest and conviction under previous injunctions of former shopmen.

Further Move Toward Ending Strike on 52 Roads Rumored

Associated Press dispatches on Wednesday were authority for a statement that a call for an immediate meeting of the policy committee of 90 in Chicago, probably on Monday, was sent out Wednesday night by John Scott, secretary of the striking railway shop crafts unions.

The telegraphic appeal was in code and was addressed to the regional general chairmen of the organization in all parts of the country. The meeting was called, it was intimated, to consider plans for a settlement of the strike on separate roads representing about one-third of the country's mileage. It followed reports of conferences between B. M. Jewell, head of the strikers, and rail executives in the East.

In discussing the meeting of the union Executive Committee, Mr. Scott said that it was hoped that the sessions would result in settlement with at least 52 Class I roads. He said that the expense entailed in assembling the strike leaders would not have made it worth while to issue a call unless there was a possibility of a settlement being reached.

The dispatches also quoted Secretary Scott as saying that seven representatives of the striking Federated Shop Crafts, were in Baltimore for a conference with railroad executives on a proposition to end the strike. Mr. Scott intimated that a proposal on which it was hoped the strike could be halted had been prepared, but he would not outline it. The conference, he is quoted as saying, was to have been kept secret.

The story that such secret conferences were to be held persisted in spite of denials by various executives in Chicago, by officers of the Baltimore & Ohio and by Thomas DeWitt Cuyler, chairman of the Association of Railway Executives.

A. F. of L. Executive Council Meets

Leaders of the American Federation of Labor, assembled in Atlantic City prior to the opening of the session of the executive council, scheduled for Saturday, gave every indication that it was their intention to have the Federation join in contesting in the courts the injunction against the shop unions. It is understood that leaders of the transportation brotherhoods will be asked to attend the meeting of the council to review their acts as mediators between the shopmen and the railroads. Feeling in the Federation is said to be most bitter against the transportation brotherhoods, which are not members of the Federation, because of their alleged lack of interest in the success of the shop strike.

Labor Board Concludes Hearing on Maintenance Wages

HEARINGS before the Railroad Labor Board on the demands of maintenance of way workers for the establishment of a "living wage" and a minimum rate of pay of 48 cents an hour were completed on September 1 with comparatively brief presentations by representatives of the eastern, southeastern and western carriers. Throughout the railroad testimony there runs a note of conciliation, the only extended defense put forth being directed at the living wage theories expounded by W. J. Lauck, Arthur Sturgis and J. C. Smock.

The testimony of the employees was abstracted in last week's *Railway Age*. That of the eastern and western roads follows:

Jacob Aronson Appears for Eastern Carriers

The cost of living has not increased sufficiently in the last three months to warrant any changes in the wages of maintenance of way employees on the eastern railroads, according to the presentation made before the Board by Jacob Aronson, counsel for the eastern carriers. Section laborers in the eastern territory, he said, are now receiving an average of 37.1 cents an hour, although the average for the United States is 32.7 cents under the decision of the Labor Board which became effective July 1. "This average rate for July, 1922," Mr. Aronson added, "is 123.5 per cent increase over the average hourly rate of 1915, leaving these classes of employees 33.7 per cent better off than they were in 1915, after making due allowance for the reduction in their wages on July 1.

"For section foremen, the monthly wage of $147.58 in July, 1922, represents an increase of 107.4 per cent over 1915. The purchasing power of the earnings in July, 1922, leaves these employees 24.3 per cent better off than they were in 1915.

"The average hourly rate of 62.1 cents in July, 1922, for mechanics included in maintenance of way service, is an increase of 121.8 per cent over 1915, leaving this class 32.9 per cent better off in purchasing power after making due allowance for the reduction in their wages on July 1."

The exhibits accompanying Mr. Aronson's testimony covered a total of 95,254 employees in the maintenance of way department and showed that the present rates of pay for these classes of employees on the railroads, compared favorably with rates prevailing in outside industries in eastern territory.

Counsel for the maintenance of way employees frequently referred to the recent increase of 20 per cent in wages granted by the United States Steel Corporation. Mr. Aronson drew attention to the fact that the hourly rate of pay of the steel corporation including the recent increase will be 36 cents an hour, whereas the present average hourly rate of maintenance of way employees is 37.1 cents. The average hourly rates of the railroads in the eastern territory are 123.5 per cent greater than in 1915 as compared with an 80 per cent increase in the average hourly rates paid by the steel corporation. Mr. Aronson emphasized also the fact that the steel corporation's prices have increased 17 per cent since February 1 this year, while frieght rates on the railroads were decreased 10 per cent by the recent ruling of the Interstate Commerce Commission.

The assertion that the average American family needs a definite minimum wage was attacked by Mr. Aronson on the broad general grounds that the average American family does not consist of five persons as arguments presented by labor witnesses indicate; that the average workman does not support a family of that size; that the grounds upon which such an assumption are based are wholly inaccurate, and finally, that there is no such thing as a standardized cost of living.

Instead of the average American family containing five persons dependent upon the wage earner Mr. Aronson showed with figures from the United States census for 1920 that the average family really is 4.4 persons regardless of age, and that there is actually an average of 1.4 dependent children for each of the 24,351,756 families in the United States. He said also that instead of only one male worker supporting a family of five, there are actually 1.36 male workers per family or a total of 33,059,793 for the 24,351,756 families.

American railroads, Mr. Aronson said, had approximately 1,658,000 employees in the last six months of 1921. Upon the theoretical basis of 1.36 male workers to a family, assumed by the labor witness there would be 1,213,235 families. Counting three children to the family, Mr. Aronson pointed out, would result in 3,639,705 children or 10.4 per cent of the children of the entire United States; 1,650,000 workers are about 5 per cent of the male workers of the country.

To construct wage schedules on these theories, Mr. Aronson declared, would require more money than all industries earn, and on the railroads would call for revenues beyond anything the public could stand. Reductions in living costs would be impossible in such conditions. "To compare living costs in different communities," Mr. Aronson said, "uniform bases must be used, but such comparisons could have no practical value. When this country adopts a principle that wages of all workers shall contain provisions for perhaps a desirable increase in the size of families, applicable alike to all employers and workers, we respectfully submit that some entirely different methods will have to be invoked for calculating wage schedules than are now being demanded."

J. W. Higgins Appears for Western Roads

That section men usually are nearest the line at which income circumscribes the standard of living and the belief that this might be overcome if wages were fixed with regard to local conditions, was frankly admitted by J. W. Higgins representing the western railroads.

This consideration for the difference in expenses in different localities, Mr. Higgins said, might well prove to be a satisfactory method for arriving at a just and reasonable wage. This, Mr. Higgins conceded, although denying that there had been any increase in the cost of living sufficient to warrant the advances demanded by the maintenance of way employees.

"Most of the employees in the maintenance of way department are so-called unskilled laborers," Mr. Higgins said. "This class of labor throughout the industrial world is the first to react to business conditions and their wage scales are the first to go up and the first to come down under pressure of economic influences. The Labor Board recognized this conditon in a former ruling (Decision 1074) when the majority opinion said: 'In this connection it must be remembered that the carriers are at liberty to pay any class of employees a higher wage than that fixed by this board whatever the so-called labor market compels, provided, as the Transportation Act states, that such wage does not result in increased rates to the public.'

"That the scale of wages paid in outside industries has a direct influence on the railroad employees cannot be denied. There is also a great variation in the wage scales for similar kinds of work in industries in various parts of the country showing that recognition is given to local influences, living costs, etc. In the wage hearings last April 1 urged the board to give careful consideration to the matter of fixing territorial wage scales that would comprehend the different conditions in various sections of the country and pointed out

that certain territorial and local differentials existed in wage rates prior to federal control, which would facilitate building up rates for each locality thinking the board would take as a basis the rates of pay for track laborers that were in effect on the western railroads in December 1917, and add thereto an amount sufficient to compensate for the changed cost of living since that time. This suggestion was advanced on the theory that pre-war rates were the result of natural influences and that the differentials prior to federal control were accordingly fairly well-established, both as between localities and as between different classes of employees."

Such a course is necessary, Mr. Higgins declared, if it is the intention of the board to restore the wage relationship that existed prior to the war. "We know that pre-war differentials which were so seriously disturbed during federal control," he continued, "due to war conditions, will never return so long as wage adjustments continue to be made on a flat basis of so many cents an hour or a day, regardless of local conditions.

"There has been no change in the attitude of the western railroads in the wage hearing last spring, Mr. Higgins said, with respect to varying wage rates in different localities, and subscribing to a minimum wage that would assure a subsistence of the worker and his family in health and reasonable comfort according to the cost of living fixed by the custom in respect to localities. While it does not appear to us that there have been changes of sufficient importance in the brief period since the last wage hearing to warrant a reduction of the wages fixed at that time, the western railroads are ready to co-operate with the board and the maintenance of way employees if and when conditions favor wage readjustment, or if in the judgment of the board this rehearing" shows that a change should be made.

Referring to the employees' requests for changes in working rules, Mr. Higgins declared that in the opinion of the western roads there had been no changes in the conditions of employment in the maintenance of way department that would warrant the granting of the change now requested.

Bituminous Coal Production Picks Up Rapidly

Problem in Soft Coal Fields is Now Largely One of Transportation—Some Coal Car Shortages

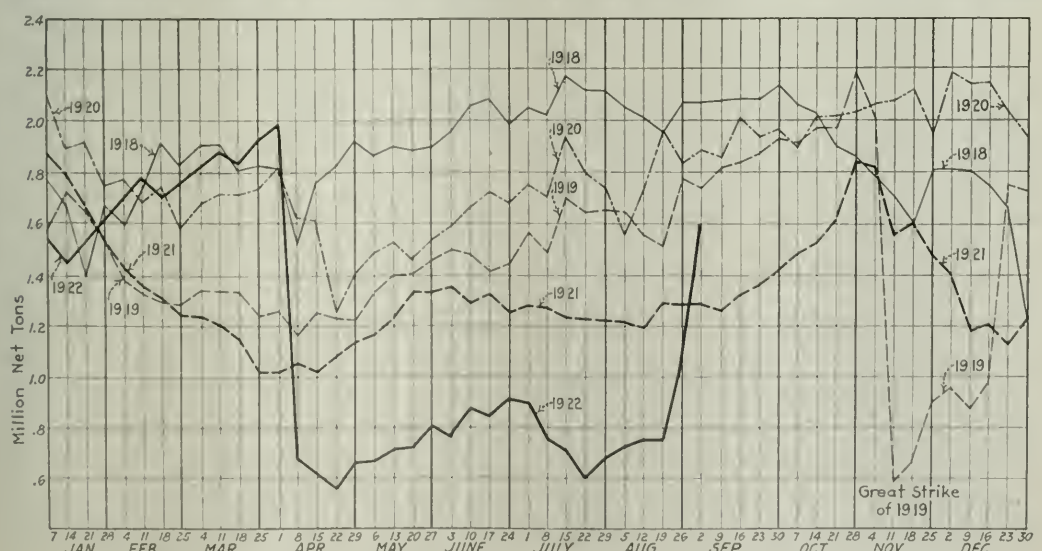
WASHINGTON, D. C.

SOFT COAL PRODUCTION shot upward almost as suddenly last week as five months ago it had plunged downward, when district after district accepted the Cleveland wage agreement and resumed work. Late returns for the week of August 21-26 indicate an output of 6,700,000 tons of bituminous coal and the week of August 28-September 2 will show 9,200,000 or possibly 9,700,000 tons, according to the Geological Survey bulletin. The anthracite mines, however, are still idle.

The rapid gain in output is indicated by the statement of cars loaded daily. Following a sharp increase on Friday and Saturday as coal began to flow in volume from the mines of Illinois and Indiana, last week opened with loadings of 30,054 cars on Monday. A decline to approximately 28,000 cars on Tuesday and Wednesday marked the first tightening of car supply. On Thursday additional shipments began from Western Pennsylvania, and loadings reached 29,027 cars.

	1st week	12th week	18th week	19th week	20th week	21st week	22nd week
Monday	11,445	15,311	15,102	16,229	15,703	18,601	30,054
Tuesday	11,019	16,622	11,416	13,729	13,032	17,801	28,153
Wednesday	11,437	17,032	12,447	13,368	12,531	18,524	28,211
Thursday	11,099*	16,432	12,380	13,277	13,521	19,388	29,027
Friday	11,296	16,073	12,669	13,539	13,718	22,882	.....
Saturday	8,888	13,993	12,405	11,009	13,524	23,070	.....

From the detailed statistics of shipments it is seen that this increase came almost exclusively from mines opening



Estimated Average Total Production Per Working Day Bituminous Coal Including Coal Coked

under the Cleveland agreement. The non-union districts of the Middle and Southern Appalachians were still limited by railroad disability and in spite of a slight increase in car supply produced only 65 per cent of the rate attained before the shopmen's strike.

Shortage of Coal Cars

"In fact complaints of lack of cars have already been received from the union districts of Eastern Ohio and Northern West Virginia," the bulletin says. "The limiting factor in production of bituminous coal has thus changed over night. A week ago it was the supply of mine labor; today it is transportation. The first response of the railroads to the demand for more service has been favorable, partly because they had a surplus of 112,000 empty coal cars when the union mines resumed work. Whether the roads can maintain the present rate of coal movement when the surplus of cars is exhausted remains to be seen.

"Even in the bituminous mines, the strike is not yet entirely over. Some thousands of men are still out in the non-union fields of Pennsylvania, particularly the Connellsville coke region, in the Georges Creek field, and in the union districts of West Virginia."

In few districts did operations controlled by the agreement begin shipping during the week of August 19. A number of mines in the Number 8, Cambridge, and other districts of Eastern and Northern Ohio were working on Friday and Saturday. In Southern Ohio, 59 mines out of a total of 458, were at work by the end of the week but only 17,000 tons were loaded. Shipments began also from a few mines in Pennsylvania, but from the other districts that have since gone to work no coal was obtained during the week of August 19.

In the districts hitherto at work little change occurred. Transportation service was on the whole less satisfactory in the non-union fields of the Middle Appalachians. Among the districts to report larger losses on account of railroad disability were Pocahontas, Tug River, Logan, Eastern Kentucky, Western Kentucky, and Alabama. In the Winding Gulf, New River and Kenova Thacker districts there was some improvement. The districts to report greatest loss through transportation were Harlan, Hazard and Winding Gulf.

Bituminous Production for 1922 to Date

The estimated production of bituminous for the calendar year to August 26 was 223,521,000 net tons as compared with 255,147,000 in the corresponding period of 1921.

Shipments of bituminous coal through Hampton Roads decreased in volume during the week ended August 26. Dumpings for the week of August 26 totaled 310,593 net tons, as against 334,974 tons the week before. Cargo coal for New England increased, whereas coal for other coastwise destinations, for export, and bunker decreased.

The result of the Federal Fuel Distributor's orders was a great increase in soft coal loaded into vessels at Lake Erie ports during the week ended August 27. According to reports from the Ore and Coal Exchange, a total of 258,598 tons was dumped as against 170,640 tons in the week preceding. Of the total 229,770 were cargo coal and 28,828 were vessel fuel. The rate of dumpings is 33 per cent of that in the corresponding week a year ago. The total quantity of cargo coal forwarded during the present lake season now stands at 4,904,994 tons but of this 883,659 tons has gone to destinations not ordinarily taking lake coal. The quantity sent to the regular lake markets is only 4,021,335 tons as against 16,150,110 in 1921 and 10,927,994 in 1920.

A steady increase in dumpings has continued during the week of August 28 September 2. The tonnage dumped on Monday, Tuesday and Wednesday was 74 per cent greater than on the corresponding days last week.

The all-rail movement of coal to New England through the six principal gateways over the Hudson river increased to 917 cars of bituminous coal and 226 cars of anthracite during the fourth week of August. In addition to this movement, eight cars of bituminous coal and one car of anthracite were forwarded through Rouses' Point. The total all-rail forwardings this year to August 26 amounted to 110,632 cars divided as follows: 50,560 cars of anthracite and 58,553 of bituminous coal through the principal gateways; 223 cars of anthracite and 1,296 of bituminous coal through Rouses' Point.

Shipments by Districts

In the following table the shipments from the coal-producing districts on each of the first three days of the week of August 28-September 2 are compared with the average daily shipments the previous week and in the week of highest production during the strike (June 19-24).

Shipments during the first half of the week were at a rate 47 per cent in excess of the daily average for the preceding

DAILY SHIPMENTS OF SOFT COAL FROM PRODUCING DISTRICTS

Net Tons, Assuming 50 Tons to the Car, Based Upon Records of Cars Loaded, as Reported by the Railroads to the American Railway Association

District	Average wk. ended June 24	Average wk. ended Aug. 26	Monday Aug. 28	Tuesday Aug. 29	Wed'sday Aug. 30
Central Pennsylvania	27,450	75,958	126,950	134,150	142,800
West. Pa., including Freeport	23,150	39,325	48,950	55,350	62,800
Greensburg-Westmoreland	27,476	39,425	39,250	41,500	44,500
Connellsville, & Som. Meyersdale	47,141	58,742	64,850	62,050	55,600
South Fork and Windber	2,833	8,042	13,700	14,650	15,300
Total Pennsylvania	128,050	221,492	293,700	307,700	321,000
Georges Creek, Upper Potomac and Cumberland-Piedmont	12,083	14,883	14,600	16,000	14,300
Fairmont & W.Va. Panhandle	16,050	87,191	109,660	97,250	88,550
Cal and Coke	8,483	8,858	7,550	5,850	7,950
Kanawha and Coal River	9,783	18,092	28,150	21,900	21,700
Logan	65,650	27,225	45,250	16,850	24,700
New River (C. & O. New River Div.)	31,425	19,367	28,450	16,850	19,750
Winding Gulf (Virginian)	24,585	17,383	26,650	20,550	18,850
Pocahontas and Tug River	94,166	71,067	106,100	73,350	70,250
Kenova Thacker	33,317	27,400	34,950	34,900	20,950
Total W. Va. and Md.	295,542	291,466	401,300	303,500	287,000
Eastern Kentucky	114,567	51,733	69,450	49,900	47,200
Western Kentucky	65,767	59,258	48,250	50,400	48,300
Tennessee	15,125	16,800	21,700	15,950	15,200
Clinch Valley and S.W. Va.	37,625	22,475	26,900	25,400	22,750
Alabama and Georgia	49,858	50,842	59,300	37,800	44,350
Ohio	18,358	94,408	122,200	126,950	123,000
Indiana-Illinois	2,858	79,308	315,350	331,000	342,800
Iowa, Mo., Kans., Okla., Ark. & Texas	13,502	19,675	35,100	47,050	51,300
Colorado	29,058	34,525	30,600	33,850	30,050
New Mexico	7,000	6,034	7,050	7,200	7,000
Utah	12,333	16,783	21,150	19,700	17,850
Wyoming, Mont. and N. Dak.	1,467	10,584	37,800	35,600	35,200
Washington	3,450	3,708	3,400	4,500	3,500
Michigan	.....	1,475	3,400	4,100	3,650
Total, East of Miss. River	727,750	889,257	1,361,550	1,252,700	1,255,250
Total, West of Miss. River	66,810	91,309	135,100	145,900	144,900
Grand total, bitum. shipped	794,560	980,566	1,496,650	1,398,600	1,400,150

week and 81 per cent over that for the week June 19-24.

The districts showing notably increased shipments were Central Pennsylvania where the daily rate is now about double that of the previous week; Western Pennsylvania where the increase is about 40 per cent; Ohio, about 33 per cent; Indiana-Illinois, about 300 per cent; and the Iowa-Missouri-Kansas-Oklahoma-Arkansas-Texas region, about 120 per cent. Increases at these rates can not be expected to continue. There are already indications in Eastern Ohio and Northern West Virginia that shipments will be checked by transportation difficulties on certain important roads.

Shipments in the Middle and Southern Appalachian regions averaged during the first half of the week about 10 per cent higher than the previous week. This was due to the large increase on Monday, after which on Tuesday and Wednesday shipments dropped off to less than the average for the preceding week and in some districts, to less than

shipments on corresponding days of that week. Shipments have declined most in the southernmost districts of West Virginia, in Eastern Kentucky, and Alabama. Mining in this region is suffering severely from transportation difficulties, and shipments are now at least 700,000 tons less per week than during June.

In Western Kentucky shipments on Monday will average about 15 per cent under the previous week, on account of transportation difficulties, and are below the rate attained prior to the shopmen's strike.

The Colorado output is declining on account of railroad difficulties. Other far western states show increased shipments.

Coal loading totaled 26,826 cars on Friday, September 1. This was a reduction of 2,201 cars compared with the preceding day, but 2,269 cars in excess of the average daily loadings for September last year, and 9,763 cars above the average daily loadings for August this year. The Eastern and Northwestern districts reported increases in the number of cars loaded with coal on Friday over the previous day, but small reductions were reported in coal loadings in the other districts compared with the day before.

Coal loadings on Saturday, September 2, totaled 25,157 cars. This was a decrease of 1,669, cars under the preceding day. Loadings on Saturday, however, are generally less than on other week days owing to a short day being observed at most mines. Coal shipments last Saturday, however, exceeded the daily average in September last year by 600 cars, and the daily average in August this year by 8,094 cars.

A total of 167,428 cars were loaded with coal during the week which ended on September 2. This was the largest number of cars loaded during any one week since the strike of miners began on April 1 last and also exceeded the preceding week by 49,616 cars.

Lake Movement of Coal

Details of the new program adopted for the expedition of the movement of coal to the upper Great Lakes region were given in a circular issued by the Federal Fuel Distributor as follows:

"Amendment No. 4 to Service Order No. 23 of the Interstate Commerce Commission transfers lake coal from Class 3 to Class 2 and covers all bituminous coal consigned to a pool, or pools, of lake cargo, or bunkerage coal, at any port on Lake Erie for trans-shipment by water to ports above Lake Erie. Pool coal will be consigned to the Ore & Coal Exchange at Lake Erie port, under the rules of the Ore & Coal Exchange, may not be so consigned until a permit has been issued by the Ore & Coal Exchange admitting the coal to the pools.

It is expected that since lake coal is in Class 2 priority of Amendment No. 4 to Service Order No. 23 transportation will be available to move a large part of the coal purchased by lake forwarders. However, if due to short car supply or other causes, the coal under purchase to the lakes is not forthcoming under Class 2 priority in quantities sufficient to meet the lake program it is expected that immediate steps will be taken to protect the deficiency in such movement. This deficiency protection will be effected by advancing from Class 2 into Class 1 enough of the lake tonnage purchased to produce the total tonnage which has been allotted for each week.

When it is ascertained by the joint representative of the Interstate Commerce Commission and the Federal Fuel Distributor at Cleveland how much additional coal it is necessary to move to lake under Class 1 priority in any given week, requests should be made by the lake forwarders through the Ore & Coal Exchange, properly supported by evidence of the purchase of the coal for the issuance of permits by the representative of the Interstate Commerce Commission at Cleveland to grant Class 1 priority for specific tonnages from specific operations in sufficient amount to bring the total movement up to desired amount within the current capacity of the carriers and the Lake Erie docks to handle. Coal shipped under such permits must be shipped within 10 days from date thereof."

The new program was put in operation on Monday, September 4, and it was hoped that 1,000,000 tons of coal might be started lakeward this week. Loadings for the lakes during the last week were estimated at 800,000 tons. Owing to the uncertainty of weather conditions during the month of November, which might seriously hamper the trans-shipment of coal at lake ports, it is deemed advisable to push the lake movement with all possible dispatch for the next few weeks. B. S. Robertson, of the Interstate Commerce Commission, has been designated as the joint representative of that organization and the federal fuel distributor at Cleveland.

Car Service Orders

The Interstate Commerce Commission on August 31 issued its Service Order 24, which directs all common carriers by railroad, west of the Mississippi river, to give priority and preference to the movement of food for human consumption, feed for live stock, perishable products, and fuel, and to the return of empty cars intended to be used for the transportation of those commodities.

A few days ago the commission granted an informal hearing to representatives from the Pacific Coast on their petition for preference and priority in the movement of empty refrigerator cars, primarily to take care of the fruit crop from that section.

This order is intended to insure the prompt movement of the commodities specified, and to expedite the movement of empty refrigerator, tank or other cars to originating territories.

When carriers find themselves currently unable promptly to transport all freight traffic offered them, the commission will expect the carriers to bring to its attention for appropriate action any instances which, in their opinion, are of such a character as to warrant any deviation from the general directions as to priority in movement.

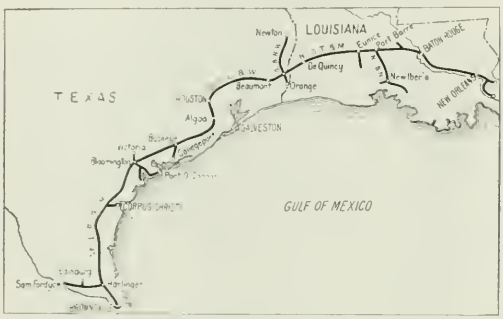
Open Top Cars

On September 1 the commission also issued Amendment 5 to Service Order No. 23, which permits the use of open top cars 42 inches or less in height for the movement of commodities other than coal. In this connection Commissioner Aitchison wrote a letter to R. C. Marshall, who had filed a petition on behalf of the Associated General Contractors for modification of Service Order No. 23 in order to allow a greater use of open top cars for building materials. Commissioner Aitchison says that under Service Order No. 23 approximately 62,000 open top cars less than 36 inches in height were exempted from being preferentially loaded with coal and Amendment 5 will release approximately 34,000 additional open top cars from this preferential loading. The commission feels that this will to a considerable extent relieve the construction interests as well as others primarily dependent upon the use of open top cars for the movement of their commodities. This action on the part of the commission, he says, should not be taken as its final word on the subject, but with the present and necessary demands for coal it does not feel that it can consistently go further at this time. It will continue to keep in daily touch with the situation and as soon as it feels that the situation warrants, action will be taken to relax the service order. Meanwhile, it asks to be kept informed of the general situation and of any exigencies which might require special attention.

Gulf Coast Lines Show Increasing Prosperity

System Serves as Distributor of Traffic to Gulf Ports—Is Realizing on Development in South Texas

THE NAME "GULF COAST LINES" is used to identify the railway system operated by the New Orleans, Texas & Mexico Railway Company and the latter's subsidiary companies, extending from New Orleans along the coast of the Gulf of Mexico to the Mexican border at Brownsville, Tex. The system was formerly a part of the old St. Louis & San Francisco organization and received a share of the unpleasant publicity surrounding the sins of the old Frisco management which culminated in the receivership in 1913. The Gulf Coast Lines were separated from the Frisco system in the receivership. The system—or rather the parent New Orleans, Texas & Mexico—was



The Gulf Coast Lines

reorganized, effective March 1, 1916, and has been under its present management since that time, except, of course, as concerns the federal control period.

Under the present management the history of the system has been one of gradually increasing prosperity, the extent of which would seem sufficient, it is believed, to justify the paying of rather more attention to the property than has on the whole been paid to it. The signs of this prosperity may be bodied in the statement that the Gulf Coast Lines earned for the government considerably more than their standard return. In the last four months of 1920, two of the constituent companies—the St. Louis, Brownsville & Mexico and the Beaumont, Sour Lake & Western—were included in the country's small list of roads which earned net railway operating income of more than 6 per cent upon their investment. The parent New Orleans, Texas & Mexico paid an initial dividend on its common stock in December, 1920. In 1921 it paid 6 per cent and it is now on a 6 per cent basis.

A Number of Related Corporations

The Gulf Coast Lines consist of a number of related corporate organizations controlled by the parent New Orleans, Texas & Mexico through stock ownership or lease. An additional feature is the proportionately large mileage of line operated under trackage rights, a factor of special importance because it is in this manner that the lines of the various individual companies are brought together to form a through route. The make-up of the system is in brief as follows:

The New Orleans, Texas & Mexico operates the lines in the state of Louisiana, including that part of the main line between Anchorage (opposite Baton Rouge) and DeQuincy. Access to New Orleans is secured by a special traffic and operating agreement with the Yazoo & Mississippi Valley, under which the latter company handles the traffic between Baton Rouge and the terminals at New Orleans on schedules, rates and practices prescribed by the New Orleans, Texas & Mexico in the same manner as if the latter operated its own line into New Orleans.

The Beaumont, Sour Lake & Western is controlled by ownership of all its capital stock. Its line is from Beaumont, Tex., to the outskirts of Houston and connection with the lines of the parent company is obtained by trackage rights on the Kansas City Southern between DeQuincy and Beaumont.

The St. Louis, Brownsville & Mexico, similarly controlled by ownership of all of its capital stock, owns the line from Algoa, Tex., south of Houston, to Brownsville with an important branch up the Rio Grande valley. The Gulf Coast Lines operate into Houston over the Houston Belt & Terminal, a half interest in which is owned by the St. L., B. & M. and the B. S. L. & W. Between Houston and Algoa trackage rights are used over the line of the Gulf, Colorado & Santa Fe.

The Orange & Northwestern, controlled by ownership of all its capital stock, operates a line between Orange, Tex., and Newton, Tex. The Louisana Southern is a leased line, the mileage of which is south of New Orleans.

The mileage as thus outlined, including branches, totals 1,015 of which 823 is owned, 99 is trackage rights and 93

Views on the Gulf Coast Lines in Southern Texas

represents the special arrangement with the Y & M V. In Gulf Coast Lines reports of operating statistics the latter 93 miles is not included and the statistics are figured on a mileage of 922.

The foregoing analysis does not, however, include the entire system. Another unit is the separately operated New Iberia & Northern, and a second, the San Benito & Rio Grande Valley, the earnings of both of which lines are reported separately.

Some Leading Features

The fact that the Gulf Coast Lines serve the coastal plain bordering the Gulf of Mexico is reflected in several interesting and important characteristics. The first is that the territory is a rich one which, further, has probably only seen the beginning of its ultimate development agriculturally or industrially. A second feature is that the system's lines cross at right angles the lines of nearly all the carriers which serve the Gulf ports. This does not mean that the Gulf Coast Lines do not meet competition from these other lines; as a matter of fact, they meet a great deal of competition. It does mean, however, that the Gulf Coast Lines are much in the nature of a distributing facility. Most of the various other lines serve individual ports. The Gulf Coast Lines have access in one way or another to them all, and this is one of the most important factors in the value of the system's location. The third important factor is that serving a comparatively flat country, as it does, the Gulf Coast Lines have no difficult grades. Its maximum grade is but 0.3 per cent. The result is a great assistance to economical operation—comparatively heavy train loading being secured with the use of small motive power units. It might be expected that a line lying so near the Gulf coast would be subjected to damage from the severe storms which are somewhat too frequent. It happens, however, that the lines are far enough from the coast to be given sufficient protection. A real handicap is the peculiar character of some of the rivers crossed, whereby these streams are narrow rivulets at dry seasons of the year and raging floods at other times. The Gulf Coast Lines, however, do not seem to have suffered as much on this score as some of the other lines serving this territory.

A Distributing Facility

The Gulf Coast Lines receive from connections considerably more traffic than they originate. In 1921, for instance, of a total of 2,914,784 revenue tons, 1,816,540 was received from connections. Some of this traffic received from connections is, of course, that consigned to Gulf Coast Lines' local stations. A larger proportion would be that received from the north and south lines for movement to other ports than those they themselves serve. Tonnage of this kind would be that, for example, delivered by the Kansas City Southern at DeQuincy, La., for delivery to New Orleans, etc. The density of traffic on the line east of Houston is greater than on that west. The movement is predominantly eastbound, which conditions show the importance of the traffic moving to New Orleans and received from the various connecting lines.

The traffic carried was divided in 1921 and 1920 as follows:

Products of	1921 Originating on line	1921 Received from connections	1920 Originating on line	1920 Received from connections
Agriculture	301,071	477,993	268,921	511,128
Animals	27,663	11,712	32,6[illegible]	22,339
Mines	275,622	609,001	271,919	964,589
Forests	332,210	226,654	42[illegible]	456,252
Mnfrers. and misc.	171,270	451,46[illegible]	141,58[illegible]	567,66[illegible]
Mdse.	47,406	[illegible]	69,0[illegible]	56,5[illegible]
Total	1,098,244	1,816,54[illegible]	[illegible]	[illegible]
Grand total	2,914,784		3,774,91[illegible]	

Agricultural Possibilities

The territory served by the Gulf Coast Lines is characterized primarily by its possibilities from the standpoint of agriculture. The road, it will be noted from the foregoing figures, originates also a large tonnage of products of forests. This traffic is derived from the area in eastern Texas and western Louisiana. There is a large area devoted to grazing, notably along the east shore of Texas. The cattle industry has been especially hard hit in the past two or three years; the herds are at present unusually large but the live stock tonnage has, in consequence, been unusually small. In normal times the cattle move to Fort Worth, being turned over to connecting carriers at Houston or other points. The agricultural territory is found in central Louisiana, west of Baton Rouge, and to a certain extent, at various other points along the greater part of the system's mileage. Some of the land remains to be brought into production either through irrigation or through drainage. There is a large area, notably in southern Texas, which has been held from cultivation because of the hesitancy of some of the owners to break up their large holdings for this purpose.

The Rio Grande Valley

The most striking development, however, is that which has been taking place in the Rio Grande valley in the extreme south, or the area lying along the main line to Brownsville and the branch from Harlingen to Sam Fordyce. The climate in this particular section is dry and crops can be raised only with irrigation. There have been a number of irrigation developments of imposing size, the purpose of which has been to bring the water up from the Rio Grande and distribute it to the higher levels bordering the river on the Texas side. The valley has a rich soil and with a proper water supply it has been able to derive advantage from the fact that it is able—being so far south—to bring vegetables into the northern markets one or two months before any other sizeable area in the country has begun to secure its crops. Thus the Gulf Coast Lines is called upon as early as January to move a large tonnage of cabbage, spinach, beets, etc., to northern markets such as Kansas City, Chicago and even New York. Further than that, it was recently discovered that the valley was especially suitable for citrous fruits. The visitor in the valley will see many groves—of from 5 to 25 acres, as a rule—of young orange, grape fruit or lemon trees. The fruit is of high grade and should become an increasingly important factor as the progress already started is continued. The territory in the Rio

GULF COAST LINES

Year	Average mileage operated	Revenue freight tons.	Net ton miles*	Total railway operating revenue	Total railway operating expenses	Net railway operating revenue	Net railway operating income	Operating ratio	Net tons per train*
1916	959	2,839,628	369,555,664	$6,410,377	$4,321,277	$2,089,100	$1,653,119	67.41	410
1917	920	3,555,975	413,433,820	6,661,229	4,193,326	2,467,903	2,082,971	62.95	467
†1918	920	2,619,393	405,333,134	8,013,713	5,776,515	2,237,199	1,932,868	71.90	501
†1919	920	2,828,399	476,062,390	9,206,554	7,347,019	1,859,535	1,202,738	79.42	567
†1920	922	3,774,917	725,557,275	13,435,216	11,129,562	2,305,683	1,686,956	82.84	635
1921	922	2,914,784	533,734,186	11,090,101	8,215,473	2,874,628	2,141,708	74.08	676
1922, 1st 6 mos.	922	1,988,987	259,527,000	5,102,678	3,527,300	1,575,378	1,243,209	69.13	625

*Including non-revenue freight. †U. S. Railroad Administration 1918, 1919, and Jan. and Feb., 1920.

Grande valley and in south Texas generally is building up rapidly and should become an increasingly valuable asset in Gulf Coast Lines operations.

At Brownsville, the Gulf Coast Lines connect with the line of the National Railways of Mexico from Matamoros to Monterey. The route into Mexico via Brownsville has possibilities which at present are not being realized because of Mexico's unstable condition. The Gulf Coast Lines operate through Pullman cars from Houston to Mexico City, Monterrey and Tampico and there is some interchange of freight.

Revenue Train Load of 628 Tons

The Gulf Coast Lines average revenue train load of 628 tons in 1921 was high considering the character of the traffic handled. It was, in fact, one of the highest figures reported by the roads in the southwestern region. It reflects primarily the fact that the worst grades on the Gulf Coast Lines are only of 0.3 per cent. The road uses comparatively small locomotives. Its more important power includes 5 Russian decapods and 20 Consolidations. The average tractive effort of its total of 49 road freight locomotives is

One of the Gulf Coast Lines River Crossings

only 33,347 lb. Smaller locomotives are used on the other lines south of Houston. East of Houston the method of operation is to start trains from that point with 2,500 tons and to pick up to 3,500 at DeQuincy.

The road has 85-lb. rail on its busier eastern end, although there is about 65 miles of 75-lb. rail still in track. West of Houston there is 75 or 80-lb. rail except to the south, where there is considerable mileage of 65-lb. rail. Shell and gravel ballast is used although there is some non-ballasted track in the south. Formerly cypress ties were used without tie plates. More recently the road is putting in treated pine and red oak ties. The system maintains shops at Kingsville, Tex. These have recently received an amount of new equipment and machinery but they are otherwise of a mediocre character.

In 1921 the Gulf Coast Lines had a traffic density of 538,573 revenue ton-miles per mile of line. In 1920 the figure was 725,879. It has already been noted that the traffic density is much greater east of Houston than west. The road secures an average haul on its revenue freight of 170 miles and its earnings per ton-mile in 1921 were 1.64 cents. Revenue car load in 1921 was 23.32 tons.

The Gulf Coast Lines in 1921 had a net railway operating income of $2,141,708. Excluding an item of $388,246 representing lap-overs from the guaranty period of 1920, the figure would have been $2,529,954. The size of these figures is indicated by the fact that the property had a standard return of only $1,061,001. It is interesting to observe that the latter figure has been exceeded in every year since 1916. In 1917 the property had a net railway operating income of $2,082,971; in 1918, of $1,932,868; in 1919, of $1,202,738, and in 1920, totaling $1,686,956.

The 1921 net was secured with a decrease as compared with 1920 of 13.1 per cent in freight revenues and of 17.5 per cent in total revenues. The decrease in operating expenses, however, was 26.2 per cent. In 1921 the property had an operating ratio of 74.08 per cent as compared with 82.84 in 1920. The 1921 ratio of transportation expenses to total revenues was 33.33; the 1920 ratio, 35.36 per cent.

Corporate Income Account Figures

The 1921 figure of net railway operating income, $2,529,954—excluding lap-over items from the 1920 guaranty period—was after the deduction of $32,441, debit balance for equipment rentals, and of $252,197, debit balance for joint facility rents. In 1920 the debit equipment rents balance was $582,126 and the debit joint facility rent balance, $320,694. That the Gulf Coast Lines should pay out more than they receive for freight car hire is due to its being a terminal road and it also reflects the cost of securing cars for the early perishable movement from the Rio Grande valley and other agricultural areas. Car supply would naturally be expected to be a problem under the circumstances. The debit joint facility balances indicate the cost to the Gulf Coast Lines for its large mileage of trackage rights.

The Gulf Coast Lines, as has already been noted, included in the 1921 income account a charge of $388,246, representing lap-overs from the guaranty period. After the deduction of this charge, the net railway operating income reported for the year was $2,141,708. Non-operating income was reported as $861,946, including an item of $721,033 "balance of rental received from the United States government for 1918, 1919 and 1920." The gross income was $3,391,901. The fixed charges were $1,190,387, of which $1,114,390 was interest on funded debt. The road used $890,848 for its 6 per cent dividends; $323,107 was appropriated for investment in physical property and the balance carried to profit and loss was $987,559 or, excluding the guaranty period lap-over item mentioned, it was $599,312. In 1920 the road carried to profit and loss a credit balance of $381,528 after appropriating $297,370 for dividends, and $694,210 for investment in physical property.

Just now, the Gulf Coast Lines are showing better figures than were shown in 1921. For the first six months of this year the property had a net railway operating income of $1,243,209, which total was $476,490 better than the figure for the first six months of 1921. This would seem to indicate that the 6 per cent dividends should again be handily earned this year as they were in 1921.

Forty-One 40-Ton Box Cars Rebuilt At North Little Rock Shops of the Missouri Pacific During August—Showing How Even Heavy Repair Work Is Progressing in Spite of Strike

General News Department

W. H. Woodin, president of the American Car & Foundry Company, New York, was appointed fuel administrator of the state of New York on September 5 by Governor Miller under the act of the extraordinary session of the Legislature. Mr. Woodin will serve without compensation and will succeed the Governor's advisory coal commission.

The Canadian National will soon inaugurate freight and passenger service on its branch line between Victoria, B. C., and Sooke Harbor. This line, which was originally constructed to tap large timber territory, has not been in operation since early in the World war. Plans are now under way for its reconstruction and it is expected that gasoline-driven passenger cars will be placed in operation by the last of this month.

The Engineering Institute of Canada held a general professional meeting at Winnipeg, Man., on September 5-7, with headquarters at the Fort Garry Hotel. The program on Tuesday included descriptions of the Winnipeg hydro-electric plant and the Manitoba Power Company's development at Great Falls. On the following day these plants were visited by special train. On Thursday papers were presented on the construction of the Moncton yard and engine facilities of the Canadian National by S. B. Wass and on automatic grain car unloaders for the Canadian National Railways at Port Arthur by Fred Newell.

The Pennsylvania Railroad and its employees took a prominent part in Atlantic City's annual pageant, this week, being under charge of the First Aid corps of the Atlantic division. The railroad company's police, leading, were followed by the bearers of the First Aid corps banner, the marshal and his aids, the Pennsylvania Railroad band of 40 pieces, from Philadelphia, and a float in the form of a huge rolling chair, pushed by six red-cap porters. The top of the float represented the upper portion of a day coach, on which were seated seven girls, all employees of the Atlantic division. The railroad was represented also by a male chorus of 45 voices, made up of employees of the car service department at Philadelphia, the Altoona band of 75 pieces, and the Altoona shops glee club, 75 voices. The Pavonia shops, near Camden, N. J., were closed all day September 7, and for the benefit of the shopmen and their families, a special train was run from Camden to Atlantic City and return. For the Altoona employees and their families, a special night train was run, leaving Altoona on September 6.

Roadmasters Postpone Convention

Owing to the unsettled conditions on the railways and the special demands which are being made upon the officers of the maintenance of way department, the executive committees of the Roadmasters and Maintenance of Way Association and of the Track Supply Association decided at a meeting held in Chicago on September 3 to postpone the convention and exhibit from September 19-21 to November 21-23. The convention will be held at the Hotel Statler, Cleveland.

New York State Opens Grain Barge Terminal

The New York State grain elevator at Gowanus Bay, Brooklyn, N. Y., is now ready for operation and receives grain from barges and delivers to barges or lighters. The opening of this State canal elevator was celebrated at the Gowanus Bay Terminal on the afternoon of September 1. 4,000 invitations having been sent out from the Department of Public Works. The principal speakers were Nathan L. Miller, Governor of New York, and Julius H. Barnes, President of the United States Chamber of Commerce. Mr. Barnes is one of the largest shippers of grain in the country, and operates a fleet of modern vessels on the canal. The elevator occupies a space of about 430 ft. long by 70 ft. wide, facing on the Henry Street slip. Water alongside the pier has been dredged to a depth of about 35 ft. so that any steamer arriving in New York can be accommodated. The elevator is of steel and concrete. It has 18 rows of bins, three in a row, making 54 bins, 20 ft. in diameter, with a capacity of 26,000 bushels each; 34 interspace bins and 38 outer bins. All the bins are 95 ft. deep and the total capacity is over 2,000,000 bushels.

Safety on the Pennsylvania

The Pennsylvania System operated throughout the year ended May 31, 1922, without a passenger being killed in train accident. The number of passengers carried totaled 152,000,000, approximately one-seventh of the passenger business of the railroads of the country. The Pennsylvania System embraces 27,000 miles of track, 271,000 freight cars, 8,000 passenger cars and 8,000 locomotives. The management will continue to do its utmost to maintain its record for safety, and, in turn, all persons who drive automobiles are earnestly requested to co-operate in the Careful Crossing Campaign by observing the following precautions before crossing tracks: 1. Slow down. 2. Shift into lower gear to prevent stalling on tracks. 3. Look in both directions. 4. Listen. 5. Do not try to beat a train over a crossing. Stop if train is approaching. 6. After a train has passed make sure that no others are approaching in either direction. 7. Be doubly careful at night and on strange roads.

Study Marine Borers in New York Harbor

The investigation of marine borers, which had its inception with the organization of the committee to study conditions in San Francisco bay, has been extended to New York harbor and adjacent waters under the general supervision of the National Research Council and a special committee of 40 members directly interested in the metropolitan area. This includes representation from the United States Army, the Bureau of Yards and Docks of the Navy, the Lighthouse Service and several departments of the City of New York, as well as representatives of the engineering departments of several railroads. The investigation covers the collecting of data, by means of a questionnaire, concerning the experiences of all owners of dock property, the placing and study of test pieces in the waters at various points, a biological survey and studies of water temperature, salinity, polution, etc. The investigations made thus far have disclosed the presence of live toredo and limnoria at a number of locations. The study is being supported by contributions of labor and funds from various properties interested and is carried on in co-operation with studies made by scientific departments of the federal government, the railroads, universities, etc.

Southern Pacific Asks Modification of Train Control Order

The Southern Pacific has filed a petition with the Interstate Commerce Commission for a modification of its automatic train control order, which requires installation on a full passenger division between Oakland, Calif., and Sacramento. The company asks to substitute for a part of this mileage that part of its main line between Oakland and Tracy via Port Costa, which is of substantially the same mileage and embraces 24 miles of the location designated by the commission between Oakland and Port Costa. At that point the lines diverge, one to Sacramento and the other through Tracy to Los Angeles. The location designated in the commission's order is entirely double track. The proposed substitute would consist of 24 miles of double track from Oakland to Port Costa and 57 miles of single track from Port Costa to Tracy. The petition states that the problems in applying the automatic train control to single track are far more complex than in the case of double track and the company desires to ex-

periment on both. The substitute location would include the busiest piece of double track on its line, and the combination of double track and single track, in the opinion of the company, would constitute the most useful test.

Ticket Scalping Prevalent on Pacific Coast

Professional ticket scalpers have become so numerous in California this summer because of the greatly reduced fares that the railroads have been forced to take drastic legal measure to rid the state of these unlawful agents. H. A. Koach of the Railway Ticket Protective Bureau with headquarters at Chicago, is now in Los Angeles in charge of this work. Three arrests were made last week and it is said that a number more are contemplated. Ticket scalpers, it appears, flourish in California better than elsewhere. They are to be found, it is said, profiting to the extent of $20 to $150 per day through their purchase of the return portions of tickets from the tourists who decide to remain on the Coast. Men and women alike are operating in this business.

Coastwide newspapers are co-operating with Mr. Koach in refusing to publish "blind advertisements" for the scalpers and, at the same time, are warning their readers that by purchasing fares in the illegal way they are violating the Interstate Commerce Act, and subjecting themselves to fine and imprisonment. Many innocent people this summer have been forced to surrender their scalped tickets and sustain the loss of that fare through their lack of knowledge of the law in this connection.

Wage Statistics for June

According to the Interstate Commerce Commission's monthly summary of wage statistics the number of employees reported by Class 1 railroads for the month of June, 1922, shows an increase of 57,186, or 3.5 percent, as compared with the number reported for the preceding month. This increase was distributed by groups as follows:

Executives, officials, and staff assistants	59
Profesional, clerical, and general	1,720
Maintenance of way and structures	23,893
Maintenance of equipment and stores	15,818
Transportation (other than train, engine, and yard)	4,856
Transportation (yardmasters, switch tenders, and hostlers)	292
Transportation (train and engine service)	10,538
Net increase	57,186

A comparison of the number of employees and their compensation, by months, for the period covered by the new classification follows:

Month.	Number of employees.	Total compensation.
July, 1921	1,634,872	$214,339,385
August, 1921 [1]	1,679,927	227,745,895
September, 1921 [1]	1,718,330	223,972,822
October, 1921 [1]	1,754,136	237,602,959
November, 1921 [1]	1,732,353	225,304,006
December, 1921 [1]	1,637,151	214,921,396
January, 1922 [1]	1,552,014	205,178,639
February, 1922 [1]	1,545,040	194,523,427
March, 1922 [1]	1,570,158	216,704,408
April, 1922	1,578,133	203,413,071
May, 1922	1,628,228	216,672,028
June, 1922	1,685,414	222,932,686

[1] Excludes Detroit, Toledo & Ironton.

Cape Charles Car Ferry Handles Record Traffic

The Pennsylvania Railroad reports that its car ferry between Norfolk, Va., and Cape Charles, 36 miles long, across the lower Chesapeake Bay, carried, in August, a total of 27,943 cars, the heaviest traffic ever handled over the Cape Charles route, and, it is believed, the greatest record for a freight car ferry of equal length anywhere in the world. The average movement was 901 cars a day. The high record northbound was made on August 20 (Sunday) when 620 cars were ferried from Norfolk to Cape Charles; on August 13th, there were 620 cars ferried, north-bound. The previous north-bound high record was on July 13, 1916, when 613 cars were carried across.

The high record south-bound was made on August 4th, when 592 cars were ferried from Cape Charles to Norfolk. The previous high record south-bound was on June 19, 1917, when 527 cars were carried, when 11 barges were in use. They averaged a little over two trips each and carried an average of 27 cars a trip. The average lay-over at Cape Charles for unloading and loading was 50½ minutes. In the first eight months of the present year this ferry has carried an average of 634 cars daily as compared with 519 cars daily for the eight months last year; 534 cars in 1920, and 601 in 1919.

Electric Trains May Be Run Over M. K. & T. Line

A contract is now in process of negotiation between the Missouri, Kansas & Texas and electric power interests which if consummated will furnish electric passenger service between Dallas and Denton, Texas, a distance of 48 miles.

It is proposed that the electrical interests shall lease the trackage rights and that electrification of the line will in no way interfere with the operation of freight trains on the line, nor with the operation of through passenger trains. Z. G. Hopkins, manager, Department of Public Relations, M. K. & T., states that at the present time no change is contemplated in the operation of M. K. & T. trains.

C. E. Calder, president of the Texas Power & Light Company and of the Dallas Power & Light Company, stated that a contract with the railroad for electrification would comply with an agreement made with the city of Dallas for the construction of an interurban line at least 30 miles in length which the Dallas Railway is under bond to build in order to fulfil the terms of an agreement entered into in connection with the granting of the franchises to the Strickland-Hobson interests in 1917. Electrification of the M. K. & T. from Dallas to Denton, according to Mr. Calder, will be an economic proposition from the standpoint of the railroad, as well as the electrical interests.

The railroad now operates six passenger trains on this line, two of which are night trains. It is the intention of the power company to run electric trains hourly. The cost of electrifying has been estimated at between $800,000 and $1,000,000.

British Columbia Advised to Scrap Its Railway

The above is the heading, in Canadian newspapers, of a press despatch from Victoria, B. C., dated September 1, summarizing a report made for the Provincial Government by a special investigator, J. B. Sullivan. We quote, in part:

"Unless the people of British Columbia are prepared to continue paying from two million to two and a half million dollars a year for ten years on the investment already made in the Pacific Great Eastern Railway, the whole system should be abandoned, says Mr. Sullivan. He strongly advises against extension of the line and urges abandonment of the section from Quesnel [the present northern terminus, 360 miles from Vancouver] to Prince George. He recommends abandonment of the line from Squamish to Clinton, 166 miles, and using the salvage money to build a line from Clinton to Ashcroft.

"Mr. Sullivan dismisses the possibility of handing the road over to a private concern as impracticable. None of the large companies would take it. The Government can do as many other railroads are doing—abandon the operation of steam trains for passengers and replace them by gas-driven motor cars. Other recommendations are: Cancellation of mail contracts on that section of the line where snow trouble occurs in the winter; passenger and freight rates must be raised to all the traffic will bear.

"W. P. Hinten and Col. J. S. Dennis, who also made an exhaustive investigation of the railway, made reports for the Government which, in the main, agree with Mr. Sullivan's recommendations."

Locomotive Loadings for Railway Bridges

A paper entitled "Locomotive Loadings for Railway Bridges" was presented by D. B. Steinman, consulting engineer and professor in charge of civil and mechanical engineering, College of the City of New York, at the regular meeting of the American Society of Civil Engineers on September 6. With the aid of lantern slides Mr. Steinman discussed fully the methods in working out a proposed new loading system based on the stress-producing effects of modern heavy locomotives. The discussion of the paper was generally favorable to the plan developed, the main objections cited being that the Cooper loading was, and had been for a long time, in active use, that there was an immense amount of tables, diagrams, calculations, etc., on hand based

on that loading and that all engineers connected with the problem were not of the opinion that a change was entirely necessary or advisable. C. E. Fowler, consulting engineer, New York, stated that the first thing to be done was to convince the A. R. E. A. that it wanted to co-operate in the matter of securing a substitute for the Cooper loading. The next step to be taken up, since the live load factor must be considered as important, was the standardization of locomotives at least along the line of axle spacings and the lightening of parts and farther if possible in order to reduce impact, etc., a plan now being followed by some roads to simplify the problem of the bridge engineer. Locomotive builders and others interested must work along similar lines before a composite loading can be secured that will last. He added that any plan developed should be made to harmonize with the ideas of the A. R. E. A. and the Engineering Institute of Canada. C. F. Loweth, chief engineer, Chicago, Milwaukee & St. Paul, stated that if exactness is to be secured all factors entering into bridge design must be considered thoroughly and among these of prime importance was the speed factor. In the past, designs were made on the basis of the heaviest locomotives but developments continued to upset these ideas. Locomotives have become heavier and heavier and the trend may continue. It also might reverse itself since transportation methods are also showing a tendency to change. There is also to be considered, the possible future use of the electric locomotive which is seldom double-headed and which generally gives a lesser impact.

Respirators and Masks for Tunnels and Industrial Uses

The development of a pocket canister or respirator which will largely alleviate the discomfort to which engine crews are subjected from the presence of sulphurous locomotive smoke when passing through railroad tunnels is announced by the United States Bureau of Mines in technical paper 292 by A. C. Fieldner and S. P. Kinney. The canisters, which fit conveniently into a coat pocket, are filled with an absorbent mixture of activated charcoal and soda lime, and contain filters of Turkish toweling. These small smoke respirators have had the hearty approval of the men who have used them and retain their effectiveness for months. They may be cheaply made and are a great improvement over the sponge respirators and handkerchiefs and towels now used by engineers and firemen when passing through unventilated tunnels.

The Bureau of Mines has also conducted tests to determine the efficacy of the army gas masks for use on locomotives in railroad tunnels. It was found that army gas masks, having canisters filled with charcoal and soda lime mixture and with a cotton pad filter, gave good protection against the smoke and irritant gases. One constituent of smoke, carbon monoxide, which is poisonous but tasteless and odorless, penetrates these canisters, but experience has proven and analyses taken during the tests showed that on moving trains the amount of carbon monoxide present was not enough to be dangerous.

Respirators of the "pig-snout" type containing wet sponges afford some relief by cooling the gases and absorbing some of the irritating constituents of smoke. Protection is not complete and most of the men will not bother with such respirators, preferring to tie handkerchiefs over the nose and mouth.

The bureau has sought to impress on the public the limitations of the Army gas mask and at the same time to develop special types of masks suitable for different industries or occupations, that will serve to protect the wearer from the gas hazards encountered in a particular field of work. The bureau has also done work on a universal mask that would serve to protect the wearer against all of the gases in air commonly met. A light weight form of this universal mask has been developed for the use of city firemen.

The charcoal and soda-lime filled canisters protect against certain acid gases and organic vapors. They should not be used in gasoline vapor; they afford no protection against ammonia, and none whatever against the carbon monoxide which may be found in products of combustion, and in producer gas, coal gas, water gas, and blast-furnace gas. The pocket canisters afford protection against the coarse smoke particles of locomotive smoke; but give very little protection against wood smoke, very fine dusts, and fumes or mists such as those of tin tetrachloride, silicon tetrachloride, or sulphur trioxide.

Commission and Court News

Interstate Commerce Commission

The commission has suspended from September 5 until January 3, 1923, the operation of schedules contained in a supplement to Agent P. A. Leland's tariff which propose to make inapplicable through rates on fresh fruits and vegetables from various producing points in Texas to northern and eastern points when routed from Houston to St. Louis via International & Great Northern, Texas & Pacific and Missouri Pacific.

Court News

Omission of Statutory Signals Bars Recovery From Negligent Truck Owner at Crossing

The Circuit Court of Appeals, Sixth Circuit, holds that the failure to comply with the statutory requirements of sounding whistle and ringing bell, Ohio Code §§ 8853, 8856, is negligence per se, barring recovery for damage to railroad equipment by collision with defendant's motor truck at a crossing.—Norfolk & Western v. Norton Iron Works, 279 Fed. 32.

Warning to Protect Goods Against Flood

The Michigan Supreme Court holds that where the carrier has warning of an oncoming flood, ample time after such warning to protect the shipment, and does not take reasonable precautions to protect it, he is not exonerated from liability on the principles laid down in what it calls the "delay" cases which were decided on the theory that the carrier could not reasonably have foreseen the danger, and that therefore the delay was not the proximate cause. In this case the goods had been placed in the freight-house after arrival at destination. It was held the carrier had ample warning of an oncoming flood to have protected the goods.—Ithaca Roller Mills v. Ann Arbor (Mich.), 186 N. W. 516.

Excessive Verdict Induced by Erroneous Instruction

For an injury causing the amputation, between the wrist and elbow, of the left arm of plaintiff, a brakeman, 30 years old, earning $200 a month, the Mississippi Supreme Court holds a verdict for $25,000 to be grossly excessive, and probably induced by an instruction granted the plaintiff which charged the jury that it might return a verdict in his favor "if it believed certain matters therein set forth to be true 'not to exceed $50,000, the amount sued for.' The jury should not have been so instructed, for $50,000 is more than double the amount for which a verdict should be upheld." The cause was reversed, on the question of damages only, unless the plaintiff entered a remittitur of $7,000.—Alabama & Vicksburg v. Dennis (Miss.), 91 So. 4.

Actions for Injury to Interstate Shipments Removable from State to Federal Courts

The Federal District Court for the Southern District of Texas, following G. H. & S. A. v. Wallace, 223 U. S. 481, 32 Sup. Ct. 205, holds that, while suits arising out of interstate shipments may be cognizable in the state court, they are also removable to the federal district court as matters of federal instance, when the jurisdictional amount ($3,000, exclusive of interest and costs) is involved. The action was under the Carmack Amendment for damage to goods in interstate transportation.—Nelms v. Davis, 277 Fed. 982.

This rule applies though the whole journey was made over the lines of a single carrier.—Nelms v. Davis, 277 Fed. 987.

The Florida East Coast has established an independent city ticket office in Jacksonville, Fla., at 231 West Forsyth street, and has withdrawn from the joint ticket office.

Foreign Railway News

Hope for the Orient in Mexico Seen in Contemplated Purchase by British

The British interests which own the Mexico Northwestern Railroad are negotiating for the purchase of the concession and that part of the Kansas City, Mexico & Orient Railroad which is situated in Mexico. It is stated that the transaction will be more in the nature of a merger of the two interests than an outright purchase. One completed link of the Kansas City, Mexico & Orient connects with the Mexican Northwestern at Chihuahua, and another connects with it at Minaca. If the deal is consummated it is planned to make it the through line across Mexico that was contemplated in the original plans. Along the route west of Minaca are a number of rich mining camps which are now beginning to show activity after several years stagnation. It is reported that the ore traffic alone would justify the building of the road.

South African Railways Ask Bids on Power Plant Equipment

LONDON.

Tenders are invited for the supply and erection in South Africa in connection with the electrification of the South African Railways and for use in the Maritzburg-Glencoe power house, of the undermentioned plant: coal handling plant, ash handling plant and circulating water plant. Specifications, blue prints and forms of tender for each of the above sections may be obtained from the office of the High Commissioner for the Union of South Africa, Trafalgar Square, London, W. C. 2 England. The charge for each specification is £5:5:0 for the first copy and £2:2:0 each for any further copies. Sums paid for any number of each specification up to three will be refunded on receipt of bona-fide tenders. Sealed tenders are to be addressed to the Secretary, Office of the High Commissioner for the Union of South Africa, Trafalgar Square, London, England, and to be delivered in duplicate not later than noon on Wednesday, October 18, 1922.

French Railways Show Improvement in 1922

Since the enactment of the French transportation law of 1921 there has, according to Economist Consul Westcott, Paris, been a widespread interest in the results of this legislation. For the first six months of 1922, according to data submitted by the Minister of Public Works, there has been a marked improvement in French railway finances, equipment, and safety of operation.

Improvement in the finances of the six trunk-line railways of France is indicated by an uninterrupted decrease in operating deficits since 1919. In 1920 that deficit approximated 3,000,000,000 francs; in 1921 it declined by 33 per cent to about 2,000,000,000 francs; and at the close of 1922 it will be further reduced by a probable 50 per cent to an estimated 1,000,000,000 francs. During the first six months of 1922 operating expenses decreased and receipts increased; the decline in the resulting operating ratio indicated increased operating efficiency in all departments. From January 1 to July 1, 1922, receipts were 200,000,000 francs greater than for the corresponding period of 1921. Receipts on the Nord and Est lines, traversing the devastated regions, were 40,000,000 francs greater than during the preceding half year. It is estimated that on December 31, 1922, total receipts of all roads will be 1,000,000,000 francs in excess of the 1921 operating income.

There has been consistent improvement in the operating equipment of all roads since the war. In July, 1914, rolling stock in poor condition and not used included 1,700 locomotives, 4,500 passenger coaches, and 15,000 freight cars; in December, 1919, this class of locomotives numbered 3,418, passenger coaches 13,800, and freight cars 59,300; by June, 1922, rolling stock out of commission for repairs had been reduced to 2,717 locomotives, 7,764 passenger coaches, and 49,134 freight cars.

Higher efficiency in repair work since the war, with resulting decrease in rolling stock out of commission, has been due mainly to the policy of having repair work done under contract by the machine shops of the country. Before the war such repairs were made in shops of the railway companies. During June, 1922, private corporations thoroughly overhauled 103 locomotives, 783 passenger coaches, and 10,220 freight cars. They did the work in 20 per cent less time and at a lower cost.

Safety of passengers and security of freight carried are the paramount considerations of the entire French railway system. That security is further insured through close supervision of the roads by the Railway Administration under direction of the Minister of Public Works. Two improvements now being introduced on all lines are important controlling factors in operating safety: (1) The "crocodile," an electrical apparatus installed in the locomotive cab, which automatically registers visually and audibly the semaphore signals along the line, thereby reducing to a minimum any possible failure by the engineer to observe the signal; (2) electric lighting of all passenger cars.

Precautionary measures already introduced have resulted in a marked decrease in the number of railway accidents and casualties. In 1913, when the various lines carried 541,342,165 passengers, there were 142 accidents, with 60 persons killed and 413 injured. In 1918, with about the same number of passengers carried, there were 379 killed and 1,435 injured. In 1921, with 665,000,000 passengers carried, there were 72 accidents, 137 killed, and 656 injured. During the first six months of 1922, with 335,000,000 passengers, 20 were killed and 166 injured.

Three Killed and Many Injured in British Railway Accident

On the morning of August 21 three persons were killed and 59 injured in an accident which occurred on the South Eastern & Chatham Railway at Milton Range, a "halt" (i. e. an unimportant station) near Gravesend, England. A workmen's train eastbound from London was discharging passengers who were crossing the westbound tracks when a light engine, westbound,

Photo by International

Scene of the Accident at Milton Range

ran into the crowd killing one man and injuring another severely. The light engine did not stop. This mishap delayed the train and allowed it to be overtaken by a following train which crashed into its rear end resulting in more casualties. A canal runs parallel to the railway at this point and many passengers on the standing train escaped injury by leaping into it when they saw the second train approaching. The second train for some unknown reason had left Gravesend in the face of a signal at stop against its movement.

Reinforced Concrete Ties in Belgium

LONDON

After examining many types of reinforced concrete ties, Monsieur R. Deprets, chief engineer of the Belgian State Railways, has gone on record as in favor of the two following types. The "Calot" tie is of the through type, reinforced with 10 rods of about ¾-in. diameter and having wooden cushions under either the chaired rail or the Vignoles rail. This tie weighs and costs more than a timber tie, and its weak point is reported to be the fastenings. The tie which Monsieur Deprets is inclined to favor is the "Vagneux," which consists of two blocks or "pots"

of reinforced concrete joined together transversely by either a steel joist or reinforced concrete tie. Both metal and wooden soleplates are used under flat footed rails on the Paris, Lyons & Mediterranean and the Nord railways on which lines this pattern has been tried. In this tie the fastening is more satisfactory, the holes for the screw spikes being formed in it, and bitumen then run in. It is hoped that this type of tie will be more economical than timber.

Dutch Market for American Ties

Railway tie exporters in the United States will be able to sell their products in the Netherlands only when they meet the prices of German, Polish, and Finnish exporters, according to Commerce Reports. Red pine, beech, and oak ties are used in the country, the first-named species predominating. The average annual consumption is about 1,000,000 ties of all species, from 600,000 to 700,000 being used for maintenance of way and about 300,000 for new construction.

The estimates of the Dutch railways for the calendar year 1923 have, for reasons of imperative economy, been limited to the requirements for maintenance of way, no allowance whatever being made for new construction. According to this estimate there will be required for the period mentioned 500,000 red-pine ties and 75,000 of beech and oak. The Dutch railways will have a large stock of ties on hand at the end of the current year, and the new purchases will be more than ordinarily limited. The contracts for the ties required in the 1923 estimate will be let privately some time toward the latter part of the year. The Dutch railways have in the past received offers of American ties, but these proposals have been of little interest by reason of the high price. At the present time the Dutch railways are able to secure ties at 3 florins per tie, c. i. f. Holland. This represents, in American currency, about $1.20.

Two standard types of ties are required by the Dutch railways. The dimensions of the first of these is 5 by 10 in. by 8 ft. 6½ in. An upper surface with a minimum of 7 in. in width is necessary. The other standard type differs from the first only in the requirement of a height of 6 in. instead of 5. Both types are required for main lines. A slightly smaller type of tie is used for local lines. This tie is 5 by 9 in. by 8 ft. 6½ in., with a minimum top width of 6 in.

So far as the quality of the tie is concerned, the Dutch railways require that they be of sound wood and appropriate for the purpose. The ties are purchased free from any preservative treatment and are creosoted by the Dutch railways at their creosoting plants at Dordrecht and Hilversum. There exists in the Netherlands no peculiar conditions which tend to affect the life of the tie. The country has a sea climate, but it is devoid of extreme humidity.

American exports desirous of dealing with the Dutch railways may do so directly; in fact, it is preferable that transactions be handled in this way rather than through agents or importers. Purchases of ties for the railways are made by the Chief Engineer of the Dutch Railways, Railway Building, Utrecht, Netherlands. There are no formalities connected with the letting of these contracts. The chief engineer of the railways receives proposals from bidders by letter or in any other suitable form, embracing all the necessary details and references. Bids are furthermore not advertised for, and the letting is usually made toward the latter part of the year, when the railways find that they have received bids at a satisfactory price, and which are deemed to be advantageous. It is incumbent upon tie exporters to be on the lookout for this letting. The ties are approved by the Dutch railways when delivered in the Netherlands and paid for within four to six weeks after approval.

The only ties which the Dutch railways have purchased from the United States in recent years were a quantity which was received from Savannah and Gulfport during the war, which purchase was made necessary by the exigencies of the then existing situation in Europe. A quantity of Douglas fir ties was likewise purchased, but owing to difficulties attendant upon delivery they were later resold in the United States.

P. & A. Photo

The Baldwin Locomotive Works' Exhibit at the Brazilian Exposition, Rio de Janeiro

The wheels turn but the train does not move. The scenery moves, however, carrying out perfectly the illusion of a moving train

China Notes

PEKING.

Proof copies of the sixth annual report on the Chinese Government Railways have been accessible to inquirers for several days. This report covers the calendar year 1920, and is appearing several months later than its counterpart during recent years. The revenues, expenses and income items for the combined lines reported are as follows (in round numbers):

Operating revenues	$91,444,000	Increase $8,400,000
Operating expenses	42,780,000	Increase 4,300,000
Net operating revenues	$48,664,000	Increase $4,100,000
Income debits (interest, etc.)	$11,223,000	Increase 900,000
Income credits (rents, etc.)	3,347,000	Increase 1,100,000
Net income debits	$7,876,000	Decrease $200,000
Credit balance for the year	$40,788,000	Increase $4,300,000

This increase of over 10 per cent in the credit balance for the year is explained to be fully genuine, for the revenue figures contain a considerably smaller amount of military transportation, service stores and material for other railways than did those for 1919, the year previous. The operating ratio is only fractionally higher than in 1919, being under 47. In gaging these figures, it must be remembered that the last four months of the year 1920 were famine months. This is apparent when the increase of agricultural tonnage is observed,—especially on the Peking-Mukden line,—together with a large increase in the average haul per ton for this class of traffic. During those months, the government lines were hauling in grain from their extremities to the central plain, a large movement having been encouraged by a reduction of rates to the extent of 25 per cent.

The effects of the famine are to be read also in the estimated revenues for 1921, which are given as $92,300,000, or barely a million more than the year before. This is the smallest increase during the seven years of uniform statistics. The decrease occurs principally in passenger traffic, famine refugees having been carried free,—and with them no doubt a considerable proportion which ordinarily paid third class fares. Military disturbances, however, must bear a considerable share of this blame, for the months of those troubles show the lowest dip in the graph showing by months the average daily revenue. This is particularly marked upon the Peking-Hankow line, whose southern end was dangerous territory for most of the summer.

The third and last section of the Shantung Railway was evacuated by the Japanese police forces on May 6, whereupon the Chinese police assumed responsibility. However, within the former leased area of Kiaochau, Japanese police remain, and will not be replaced by Chinese until the final handing over of the territory which is expected to take place sometime towards the end of the year.

The Chinese banking group, which was expected to be incorporated with the international consortium, if that institution

were to undertake anything in China, has justified the most pessimistic predictions of the "I told you so" band. About a year ago these columns contained the notice that this banking group had concluded a loan with the Ministry of Communications for the purchase of rolling stock. The amount of the loan was $6,000,000 silver and the banking group superintended the offering and the opening of the tenders under which the equipment was purchased. During the past few months the ministry has been in default on the payments for this equipment, and the banks immediately discontinued payments of installments due to manufacturers. Thus, instead of being a group financing equipment purchases, the Chinese consortium has merely been a device for collecting one more commission on the purchase.

Some speculation is still being indulged in as to the possibilities of activity in connection with the international consortium. Local papers spread the rumor that the consortium was being withdrawn at the time F. W. Stevens, the American representative, left for America. The purpose of this was evidently to secure a denial, which was immediately forthcoming. Now that Wu Pei-fu has undisputed control of Peking, it is thought that some fundamental re-organization may take place. Anything of the sort will require financing, and no one but foreign powers would be so foolish as to advance any money to a government so palpably bankrupt as that of China at present. Yet the followers of Wu Pei-fu are probably the most consistently anti-foreign of any. Wu has been very careless of obligations to foreign countries. A late event is that of seizing the airplanes near Peking, although assurances had been given to the British legation that these planes were to be used for commercial purposes only. The recent re-organization of the Ministry of Communications has seen some eleven special commissions abolished. These were manned largely by students returned from America and this has been construed by some to mean an expression of Wu's resentment of foreign influence. However, if it has any significance more than of the necessity for retrenchment, this action probably is the result of the predominance of Japanese returned students, the present vice-minister being one. The present cabinet is none of Wu's choosing. On the other hand, Wu has decreed the destruction of the old Chiaotung ("communications") clique, even though this deprives him of the best technical assistance. This will remove perhaps the most effective barrier to China's availing herself of the benefits of the consortium. The "communications" clique was the most persistent opponent of the consortium, although somewhat secretly so, for it was well understood that consortium terms would deprive its members of "easy pickings" in some cases, and of the chief executive positions in others. Probably the threatened "loss of face" was the most real obstacle to an approach by China to the consortium representatives. With this clique gone, an opportunity will be afforded for the testing of this theory.

On May 20 the Tenth China-Japan Through Traffic Conference closed. The conference passed nothing of more than routine importance. The principal subjects up for discussion were the questions of a through passenger train between Peking and Fusan and through goods traffic between the South Manchurian and the Peking-Mukden railways. To both of these proposals, which have been put forward by the Japanese at several preceding conferences, the Chinese delegates put up determined opposition on the ground that domestic through traffic, both passenger and goods, had not been carried far enough to warrant its extension to international trains or bills of lading. It is doubtful if this opposition will ever be removed, unless the passing years show the South Manchurian Railway to be an instrumentality of commerce rather than an arm of military penetration. The conference went off very pleasantly up to the farewell dinner tendered by the Japanese delegates, in response to the many functions tendered them by the Chinese. At this dinner a Japanese guest, described as partially intoxicated, made such remarks to the Chinese Minister of Communications, and other Chinese delegates, that the incident has become almost of diplomatic importance.

A modern application of the ancient battering-ram was made by the retreating soldiers of Chang Tso-lin. Intent upon making entrance to Peking either for safety or loot, they boarded a passenger train and with it rammed the city gates where the railway enters. The casualties were not large, because the engine driver applied the brakes and jumped, but the debris thoroughly clogged the opening. The wall guards quickly disarmed and plundered the battering forces.

Equipment and Supplies

Locomotives

THE ST. LOUIS-SAN FRANCISCO is inquiring for 35 Mikado and 15 Mountain type locomotives.

MITSUI & Co., New York City, is inquiring for one side tank locomotive for export to Japan. This locomotive is to have a total weight in working order of 55 tons.

THE PENNSYLVANIA has placed orders for 15 new locomotives for passenger service to be built by the company's forces at Altoona, and for 100 freight locomotives to be built by the Baldwin Locomotive Works.

THE TAVARES & GULF has ordered two Prairie type locomotives from the American Locomotive Company. These locomotives will have 16 in. by 24 in. cylinders and a total weight in working order of 110,000 lb.

THE NORFOLK & WESTERN has ordered through Gibbs & Hill, New York City, from the American Locomotive Company, 4 double-unit electric locomotives. These locomotives will have a total weight in working order of 750,000 lb.

THE VACUUM OIL COMPANY, New York City, has ordered one six-wheel tank locomotive from the American Locomotive Company. This locomotive will have 21 in. by 26 in. cylinders and a total weight in working order of 160,000 lb.

THE WHEELING STEEL CORPORATION, Wheeling, W. Va., has ordered one six-wheel tank locomotive from the American Locomotive Company. This locomotive will have cylinders with dimensions of 21 in. by 26 in. and a total weight in working order of 160,000 lb.

THE SUPERIOR PORTLAND CEMENT COMPANY, Congress, Wash., has ordered one four-wheel tank locomotive from the American Locomotive Company. This locomotive will have cylinders with dimensions of 12 in. by 18 in. and a total weight in working order of 53,000 lb.

THE LOUISVILLE & NASHVILLE, reported in the *Railway Age* of August 26 as having ordered 30 Mikado type locomotives, has ordered 12 additional Mikado locomotives from the American Locomotive Company. These locomotives will have 27 in. by 32 in. cylinders and a total weight in working order of 320,000 lb. This road ordered also 8 Mikado type locomotives from the Baldwin Locomotive Works.

THE CHICAGO & NORTH WESTERN, reported in the *Railway Age* of August 12 as inquiring for 40 Mikado type and 10 Pacific type locomotives, has ordered this equipment from the American Locomotive Company. The Mikados will have 27 in. by 32 in. cylinders and a total weight in working order of 307,000 lb., and the Pacifics will have 25 in. by 28 in. cylinders and a total weight in working order of 273,000 lb.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE, reported in the *Railway Age* of July 29 as inquiring for 5 Mikado and 2 Pacific type locomotives, has ordered 4 Mikado type and 3 Pacific type locomotives from the American Locomotive Company. The Mikado type will have 23 in. by 28 in. cylinders and a total weight in working order of 204,000 lb., and the Pacific type will have 28 in. by 30 in. cylinders and a total weight in working order of 237,000 lb.

THE MISSOURI-PACIFIC, reported in the *Railway Age* of September 2 as having ordered 25 Mikado type locomotives, has increased the order to 46 of the Mikado type and 4 of the Mountain type locomotives, all ordered from the American Locomotive Company. The Mikado type will have 27 in. by 32 in. cylinders and a total weight in working order of 320,000 lb., and the Mountain type will have 27 in. by 30 in. cylinders and a total weight in working order of 335,000 lb.

Freight Cars

THE ELGIN, JOLIET & EASTERN is inquiring for 240 to 500 gondola cars of 50 tons' capacity.

THE NORTHERN PACIFIC has ordered 1,000 [illegible] constructions from the Western Steel Car & Foundry Co.

THE TEXAS & PACIFIC has placed an order with the American Car & Foundry Company for 150, 10,000-gal. tank cars of 50 tons' capacity.

THE CZARNIKOW-RIONDA COMPANY, 112 Wall Street, New York City, has ordered 40 cane cars of 30 tons' capacity from the Magor Car Corporation.

THE ST. LOUIS-SAN FRANCISCO is inquiring for 1,500 steel frame, double hopper cars of 55 tons' capacity, 1,500 single sheathed box cars of 40 tons' capacity and 300 stock cars of 40 tons' capacity.

THE INDIANA GAS & COKE CO., reported in the *Railway Age* of August 19 as having ordered repairs from the General American Car Company to 50 hopper cars, is a mistake as the order went to the American Car & Foundry Co.

THE NEW YORK CENTRAL has let contracts for repairs to a total of 11,100 additional cars as follows:

New York Central

2,000 box, Ryan Car Company.
1,000 box, American Car & Foundry Company.
1,000 gondolas, American Car & Foundry Company.
2,000 box, Illinois Car & Manufacturing Company.
500 box, Buffalo Steel Car Company.
1,500 box, Streator Car Company.
400 gondolas, Steel Car Company.

Michigan Central

200 box, Streator Car Company.
1,000 box, Illinois Car & Manufacturing Company.

Toledo & Ohio Central

500 gondolas, Ralston Steel Car Company.

Cleveland, Cincinnati, Chicago & St. Louis

1,000 box, American Car & Foundry Company.

Passenger Cars

THE CHICAGO ELEVATED RAILWAYS contemplate the purchase of 100 steel passenger coaches.

THE TENNESSEE CENTRAL is inquiring for three combination mail and baggage cars and for six passenger coaches.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE has placed an order with the Pullman Company for 4 passenger coaches.

THE CHICAGO & EASTERN ILLINOIS, reported in the *Railway Age* of July 1 as contemplating the purchase of 17 baggage cars is now inquiring for 17, 70 ft. steel baggage cars.

Iron and Steel

THE LOUISIANA & ARKANSAS has ordered 1,200 tons of structural steel from the Virginia Bridge & Iron Company for its shops at Stamps, Ark.

Miscellaneous

THE SWEDISH STATE RAILWAYS has placed an order with S. K. F. of Sweden for anti-friction bearings on 176 passenger cars for heavy express service.

THE PENNSYLVANIA has placed contracts for a new floating elevator, and three steel grain barges for use at Girard Point elevator, Philadelphia, for the transfer of grain to vessels at other piers in the Delaware and Schuylkill rivers.

The new elevator will be built by the Pusey & Jones Company of Wilmington, Del. It will have a loading capacity of 13,000 bushels an hour, and will replace an old elevator, now in use, having a capacity of only 3,500 bushels an hour. The company has another elevator of 7,500 bushel hourly capacity. The three new barges have been ordered from the Sun Shipbuilding Company, of Chester, Pa. They will be of 40,000 bushels capacity each, and will replace smaller ones. When the new barges are received, the combined carrying capacity of all the Pennsylvania's grain barges will be 184,000 bushels.

Signaling

THE CANADIAN NATIONAL is installing automatic block signals between Cadorna, Que., and Chaudiere, 11 miles. The signals, style T-2, direct current, 25 signals—with other apparatus, have been furnished by the Union Switch & Signal Company.

THE DELAWARE & HUDSON has ordered from the Federal Signal Company a mechanical interlocking, 28 levers, to be installed at Schenevus, N. Y.; also an electric interlocking, 64 levers, for Mechaniesville, N. Y. The last mentioned is to be installed at the crossing of the Boston & Maine and the Delaware & Hudson and adjacent yard tracks.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company will replace the Goddard avenue viaduct at Argentine, Kan., with a steel and wood viaduct.

CHICAGO & NORTH WESTERN.—This company closes bids September 9 for 250 bunk houses 20 ft. by 72 ft. to be constructed along its lines.

CHICAGO UNION STATION.—This company, which was reported in the *Railway Age* of August 12 as calling for bids for the construction of a concrete trucking subway extending north of Harrison street, Chicago, has awarded the contract to the Underground Construction Company, Chicago.

ILLINOIS CENTRAL.—This company has awarded the contract for depressing the tracks from Twenty-fifth to Forty-third streets, and raising tracks from Forty-third to Forty-ninth streets, Chicago, to the States Contracting Company, Chicago. Two tracks will be completed this year. This work is in connection with the new terminal project.

LEHIGH & NEW ENGLAND.—This company has awarded a contract to the Tilghman Moyer Company, for the construction of a concrete and brick freight station at Allentown, Pa., to cost approximately $40,000.

MISSOURI PACIFIC.—This company closes bids September 13 for a passenger station 24 ft. by 100 ft. at Lake Village, Ark.

Trade Publications

WOOD PRESERVING TERMS.—The Protexol Corporation, New York, has recently issued an 86-page booklet by Ernest F. Hartman and E. F. Paddock, containing a large list of wood preserving terms and their definitions. Many terms which are of a technical nature have been included as well as the more strictly industrial ones. In addition, references have been given to facilitate further inquiry and study.

STEREOPHOTOGRAPHIC SURVEYING.—A large size illustrated booklet has been published in the English language by the N. V. Maatschappij voor Landopmeting, The Hague, Netherlands, describing terrestrial and aerial stereophotographic surveying and its applications. The text discusses the advantages of the method which permits of surveying difficult or inaccessible sections without rodmen, etc., and without going over it. It also describes the various classes of work for which it is applicable as well as the way in which the survey and the office work are conducted. The illustrations show results of actual surveys under difficult conditions.

AN AGRICULTURAL INSTRUCTION TRAIN, organized by the Provincial Department of Agriculture and the Canadian Pacific Railway in co-operation with the Federal Department of Agriculture, is making a tour of the province of Quebec, finishing up at Quebec on October 31. There will be numerous exhibits of vegetables, grains, grasses and fruits. Illustrated lectures on agricultural topics will be given at each stopping point.

Supply Trade News

The Illinois Car Manufacturing Company, Hammond, Ind., has purchased the American Nut Company of Columbus, Ohio. It is said that the acquired business will be moved to Hammond.

The National Lock Washer Company, Newark, N. J., is building a new two-story brick structure, 84 ft. by 40 ft., at the corner of Pennington and Hermon streets, the top floor of which will be used for office purposes and the ground floor for shipments. The company is also putting up a steel storage building 100 ft. by 60 ft. for additional storage purposes, and is also rearranging the equipment in its fabricating machine shop and making general improvements throughout the entire plant.

The American Flexible Bolt Company announces a complete reorganization with general offices at Zelienople, Pa. The reorganized company retains the original charter but has added additional working capital. There is also a complete change in the board of directors. **Stephen Robinson, Jr.,** is now president and in charge of sales; **H. T. Frauenheim,** vice-president; **Chas. A. Seley,** consulting engineer and district representative at Chicago; **J. A. Trainor,** Eastern district representative; **L. W. Widmeier,** Cleveland district representative; **W. S. Murrian & Co.,** Southern district representative; **E. F. Boyle,** Western district representative; **H. G. Doran & Co.,** Chicago, representative; **W. F. Heacock,** Chicago, representative. The plant management will be under the supervision of **L. Finegan,** formerly shop superintendent, Mt. Clare shops, Baltimore & Ohio. The purchasing will be handled by **Jas. F. McGann** at Zelienople, Pa.

Federal Trade Commission Opposes Steel Merger

The Federal Trade Commission on August 31 issued a formal complaint charging that the proposed merger of the Midvale, Republic and Inland steel companies would be an unfair method of competition in violation of the federal trade commission act. The companies are given 30 days to file answers, after which hearings will be held. The commission says that after preliminary inquiry it has reason to believe that the merger of these three competing companies will center the control of some 35 corporations in one group and eliminate competition, restrain trade and tend to create monopoly in iron and steel products in interstate commerce. The Department of Justice had previously made a favorable report on the proposed merger. Commissioner Van Fleet voted against the issue of the complaint.

Obituary

Thomas B. Bryson, vice-president and general manager of Holbrook, Cabot & Rollins, construction engineers, died at his home in New York City on September 5, at the age of 50.

Frederick W. Cooke, who was general manager of the Cooke Locomotive Works until 1914, died on August 30 at his summer home, Quogue, Long Island, at the age of 62. He was a graduate of Stevens Institute. His father, John Cooke, founder of the Cooke Locomotive Works, died in 1882, leaving the business to his three sons. They sold it in 1901 to the International Power Company, which later sold it to the American Locomotive Company.

Tourists from "the States" spend in Montreal between $30,000 and $40,000 a day, or approximately $6,000,000 for the six months from May to October, according to the secretary of the Automobile Club of Canada. For the province, he further states, the sum would be about $15,000,000, as Quebec and other points attract large crowds. In the principal hotels of Montreal it is estimated 75 per cent of the guests are from the United States.

Railway Financial News

Chesapeake & Ohio.—*Asks Authority to Issue Preferred Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue $12,558,500 of cumulative convertible 6½ per cent preferred stock plus an amount equal to 20 per cent of the par value of any additional common stock issued prior to September 2, 1922, in conversion of outstanding 5 per cent convertible 30-year gold bonds.

Chicago & Alton.—*Protective Committee for 3 Per Cent Bonds.*—A committee has been formed to look after the interests of the holders of the 3 per cent refunding bonds, due October 1, 1949. The members of the committee are: Charles A. Peabody (chairman), president of the Mutual Life Insurance Company of New York; Darwin P. Kingsley, president of the New York Life Insurance Company; John J. Mitchell, president of the Illinois Trust and Savings Bank, Chicago; W. A. Day, president of the Equitable Life Assurance Society; E. D. Duffield, president of the Prudential Insurance Company of America, and George E. Roosevelt, secretary of the Bank for Savings located in New York City.

There are $45,350,000 of the 3 per cent bonds outstanding. In case it should become advisable the committee will issue a call for the deposit of the bonds.

Mr. Peabody, chairman of the committee, said: "It is very unlikely that the 3 per cent refunding bonds will be at all affected by the position of the Chicago & Alton. The purpose of the committee, which represents more than one-half of the total issue of bonds, is to watch the situation and be ready in case any necessity should arise. In that event, of course, further notice will be given to the bondholders."

Chicago, Indianapolis & Louisville.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority for the issue of $725,000 of equipment trust certificates dated September 15, 1922, to be issued by the National Trust Company.

Leetonia.—*Authorized to Abandon Line.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of this company's line extending from a connection with the New York Central at Tiadaghton, Pa., in a southwesterly direction, 8.7 miles.

New York, Chicago & St. Louis.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority for the issue of $3,200,000 of equipment trust certificates dated September 1, 1922, and September 1, 1937, which certificates are to bear interest at 5, 5½ or 6 per cent.

Northern Pacific.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $4,500,000 of equipment trust certificates to be issued by the First National Bank of New York and sold at not less than 97½.

Ocala & Southwestern.—*Authorized to Abandon Line.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of this company's line from Ocala to Ray, Fla., 6 miles.

Sioux City Terminal.—*Authorized to Issue Stock.*—The Interstate Commerce Commission has authorized an issue of $100,000 of common stock for the purpose of partially reimbursing the Sioux City Stock Yard Company for advances made for additions and betterments and other purposes.

Texas & Pacific.—*Guaranty Certified.*—The Interstate Commission has certified the amount of this company's guaranty for the six months' period following federal control as $2,043,041, of which $298,041 was still to be paid.

Wheeling & Lake Erie.—*Annual Report.*—The annual report

issued this last week [illegible] was the following [illegible] for the year ended December 31, 1921

Railway operating revenues	[illegible]
Railway operating expenses	[illegible]
Net revenue from railway operations	[illegible]
Taxes accrued [illegible]	[illegible]
Operating income	[illegible]
Equipment rents, net	[illegible]
Joint facility rents	[illegible]
Interest and discount	[illegible]
Total deductions	$1,[illegible]
Corporate income for the year	$476,129

* Tentative additional accrual of "Compensation" for the guaranty period, (March 1, 1920, to August 31, 1920, inclusive) pending final settlement with Interstate Commerce Commission.

Railroad Administration Settlements

The Railroad Administration reports the following final settlements, and has paid out to or received from the several roads the following amounts:

Indianapolis Union	$76,000
Erie Terminals	[illegible]
Lake Superior Terminal & Transfer	[illegible]
The Mather Humane Stock Transportation Co.	175,000
Savannah River Terminal Co.	6,377
Bath & Hammondsport	19,500
Keokuk Union Depot Co.	6,300
Anderson Union Depot & Railroad Co.	7,700
Western Maryland paid Director General	500,000
Norfolk & Portsmouth Belt Line paid Director General	87,000
Short Lines	
Wisconsin & Northern	4,800
Montana Western	4,000
Owasco River	6,000

The payment of these claims on final settlement is largely made up of balance of compensation due, but includes all other disputed items as between the railroad companies and the Administration during the 26 months of federal control.

Dividends Declared

Beech Creek.—Fifty cents, quarterly, payable October 1 to holders of record September 15.

New York, Lackawanna & Western.—$1.25, quarterly, payable October 2 to holders of record September 14.

St. Joseph, South Bend & Southern.—Common, 1 per cent; preferred, 2½ per cent; both payable September 15 to holders of record September 11.

Trend of Railway Stock and Bond Prices

	Sept. 5	Last Week	Last Year
Average price of 20 representative railway stocks	73.07	73.09	56.08
Average price of 20 representative railway bonds	89.66	89.51	76.13

TIME FOR LABOR TO PURGE ITSELF.—The bold confession of a striker arrested in Chicago that he and several others, acting under instructions from union officials, entered into a conspiracy to wreck trains in Indiana and elsewhere, shows to what lengths such characters will go to accomplish their ends. As if to add insult to injury, the culprit is reported to have said, "What did we care how many we killed? We wanted to kill the fireman and engineer. The others wouldn't run trains if we killed a few engineers and a few firemen." While it would be manifestly unfair to thousands of other strikers to say that many are possessed of such a murderous spirit, it is not straining the point to say that such an attitude is altogether too common among members of labor organizations. Witness the cold-blooded, atrocious murders at Herrin, Ill. And this condition bids fair to continue so long as honest breadwinners permit themselves to be led by cowardly assassins. The men who toil have a perfect right to organize for mutual protection, but they should not permit themselves to be led into acts of violence at the behest of professional agitators who skulk in the background. When labor has purged itself of such leadership a better day will have dawned for unionism.—*Deseret Evening News, Salt Lake.*

Railway Officers

Executive

S. G. Lutz, vice-president of the Chicago & Alton with headquarters at Chicago, has been appointed chief traffic officer with the same headquarters. **A. P. Titus**, vice-president with headquarters at Chicago, has been appointed chief operating officer with the same headquarters.

Financial, Legal and Accounting

Frank Scott, vice-president and treasurer of the Grand Trunk, has resigned and **J. A. Yates**, assistant treasurer, has been elected to succeed him as treasurer. Mr. Scott's retirement is under the railway's superannuation regulations and comes after 44 years of service. He entered the service of the Grand Trunk in 1878 and in 1881 became chief clerk to the treasurer. Ten years later he was appointed secretary to the audit board and purchasing committee. In 1893 he was appointed assistant treasurer. In 1901 he was promoted to the position of treasurer of the company. In 1906 he became treasurer also of the Grand Trunk Pacific and in 1914 was elected a vice-president of the Grand Trunk System, in which capacity he was serving at the time of his retirement.

F. Scott

Traffic

L. R. Jones has been appointed assistant general freight agent of the Philadelphia & Reading with headquarters at Philadelphia, succeeding B. R. Boggs, resigned.

C. F. Moulton has been appointed general agent of the Denver & Rio Grande Western with headquarters at Ogden, Utah, succeeding W. B. Kenney, resigned.

J. T. Fitzgerald has been appointed superintendent of freight transportation of the Hocking Valley with headquarters at Columbus, Ohio, succeeding C. P. Torrey, deceased.

W. F. Lincoln, assistant general freight agent of the Union Pacific with headquarters at Los Angeles, Cal., has been promoted to general freight agent with the same headquarters succeeding T. M. Sloan, resigned.

J. L. Totten has been appointed assistant general freight agent of the Union Pacific with headquarters at Los Angeles, Cal., succeeding W. F. Lincoln, promoted to general freight agent succeeding T. M. Sloan resigned.

T. M. Sloan, general freight agent of the Union Pacific with headquarters at Los Angeles, has resigned. Mr. Sloan was born June 21, 1870, and entered railway service in 1885 as an agent and operator with the Chicago, Burlington & Quincy. Prior to his service in the Spanish American War in 1898, he was consecutively agent and operator on the Atlantic & Pacific and various other lines, and relief agent on the Santa Fe Pacific. From 1898 to 1921 he was agent and operator on the Santa Fe Pacific, and rate clerk, assistant general freight agent and general freight agent of the San

Pedro, Los Angeles & Salt Lake, and its successor the Los Angeles & Salt Lake. He has been general freight agent of the Union Pacific since November 1, 1921.

Mechanical

H. H Stephens, mechanical superintendent of the Southern lines of the Western district of the Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex., has been appointed superintendent of shops at Topeka, Kan., to succeed W. B. Deveny, deceased. **E. E. Machovec,** division master mechanic, with headquarters at Argentine, Kan., has been promoted to mechanical superintendent of the Southern lines of the Western district with headquarters at Amarillo, Tex., to succeed Mr. Stephens. **W. R. Harrison,** master mechanic with headquarters at Chanute, Kan., has been transferred to Argentine, Kan., in place of Mr. Machovec. **G. F. Tier,** general foreman at Emporia, Kan., has been promoted to master mechanic with headquarters at Chanute, in place of Mr. Harrison.

Engineering, Maintenance of Way and Signaling

E. M. Hastings, principal assistant engineer of the Richmond, Fredericksburg & Potomac, with headquarters at Richmond, Va., has been promoted to chief engineer. **C. E. Dare** has been promoted to engineer maintenance of way. Mr. Hastings entered railway service with the Baltimore & Ohio as a rodman and chainman in 1900, working during the summer of that year and the following one, and during the entire year of 1902. In 1903 he left the Baltimore & Ohio to enter the employ of the Richmond, Fredericksburg & Potomac as instrumentman, remaining in this position until 1906, when he was promoted to resident engineer. In 1920 he was promoted to principal assistant engineer in which capacity he continued until his recent promotion, effective August 15, to chief engineer.

Special

J. G. Hughes, land assistant in the valuation department of the Atchison, Topeka & Santa Fe with headquarters at Chicago, has been appointed assistant commissioner of taxes with headquarters at Topeka, Kan., succeeding E. T. Cartledge who resigned on account of ill health.

Walter S. Thompson has been appointed publicity agent of the Grand Trunk Railway System, reporting to the vice-president and general manager. Mr. Thompson has hitherto been attached to the general advertising department in the position of editor of the press bureau. Previous to joining the Grand Trunk in 1914, he was engaged in editorial work on newspapers in Canada, Great Britain, Australia and New Zealand.

Obituary

W. H. Richardson, general passenger agent of the Chicago & Eastern Illinois with headquarters at Chicago, died September 4.

W. A. Drake, assistant to the vice-president of the Atchison, Topeka & Santa Fe, with headquarters at Prescott, Ariz., whose death on August 19 was reported in the *Railway Age* of August 26, was born in 1848 at Franklin, N. Y. He took a course in civil engineering in the Delaware Institute and entered railroad service in 1868, with the New York & Oswego Midland railway, now the New York, Ontario & Western railway, with this company until the spring of 1871 he was consecutively, topographer, instrumentman and division and bridge engineer. From 1871 to 1876 he was engineer of the Rome, Watertown & Ogdensburg railroad. He was with the Syracuse, Geneva & Corning Railroad as contractor's engineer from 1876 to 1878. On this date he entered the employment of the Atchison, Topeka & Santa Fe and served as division engineer until 1879. From that date to 1882 he was locating and resident engineer of the Atlantic & Pacific Railroad. On the latter date he was promoted to chief engineer of that road and retained this position until 1885. When he was appointed assistant engineer of the Atchison, Topeka & Santa Fe in Kansas and Indian Territory. During the following year he was in charge of the Denver & Canon City extension of the same road. In 1888 he was appointed superintendent of the Western division and remained in this capacity until 1891, when he entered the private practice of civil engineering for a year. From 1892 to January, 1895, he was assistant chief engineer of the Santa Fe, Prescott & Phœnix railway. From the latter date to July 1, 1920, he served successively as chief engineer, general superintendent and chief engineer, and general manager of the same road now known as the Santa Fe, Prescott & Phœnix lines, Atchison, Topeka & Santa Fe. His next promotion was on July 1, 1920, when he was appointed assistant to the vice-president, the position he held at his death.

Will Nicholson, formerly general colonization agent of the Atchison, Topeka & Santa Fe and later of the Kansas City Southern, died suddenly from ptomaine poisoning on August 30. At the time of his death he was secretary of the Associated Almond Growers of Paso Robles, with headquarters in Chicago.

Henry G. Herbel, general attorney and interstate commerce counsel of the Missouri Pacific with headquarters at St. Louis, Mo., whose death on August 11, after an illness of less than a week, was reported in the *Railway Age* of August 26, was born September 27, 1857, at Affton, St. Louis county, Mo. He was graduated from Washington University, St. Louis, in 1879, after studying law at night. In 1876, while attending Washington University, he entered the service of the St. Louis, Iron Mountain & Southern as a clerk in the law department. He was promoted consecutively to the positions of chief clerk, assistant attorney, assistant to general solicitor and general attorney. More recently he was appointed interstate commerce counsel in addition to his position as general attorney. Mr. Herbel's entire railway service was with the St. Louis, Iron Mountain & Southern railroad and the Missouri Pacific.

H. G. Herbel

Construction has been resumed on the extension of the branch line of the National Railways of Mexico which runs from Monclova to Cuatro Cienegas, about 50 miles. The extension is to run to Sierra Mojada, about 100 miles. It will connect at that point with the Mexico Northern, which in turn connects with the El Paso-Chihuahua division of the National Railways of Mexico at Escalon. The importance of the new line lies in the fact that it will be the means of forming a new through railroad route across a broad scope of northern Mexico. On its route are important coal fields which are as yet undeveloped. The chief purpose of the Mexican government in undertaking the building of this extension at this time is to give employment.

The Paris Orleans Railway (France) has placed an order for 80 electric locomotives with the Société Oerlikon and the Société de Construction des Batignolles both of Paris; these locomotives are each for a one hour rating of 1,720 hp. The Société Oerlikon is to supply and erect the electrical equipment, while the Societé de Construction des Batignolles deals with the mechanical part. Except in the case of the five first locomotives, which will be completed at the Swiss works of the Ateliers de Construction Oerlikon, and will serve as models, the whole electrical equipment will be built in France, to the Oerlikon design, at the works of the Société Oerlikon. The locomotives are specially intended for freight trains and are to be capable of hauling a load up to 1,200 tons; they are, also to be suitable for passenger service, in which case a speed of about 68 miles per hour must be attainable.

EDITORIAL

Railway Age

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Getting Results from Shop Forces

Despite the fact that the railroads are rapidly filling the places of the strikers, it is probable that the heavy traffic of the next few months will have to be handled with a force of mechanics that is below normal both in number and in skill. This is certain to complicate the problem of providing sufficient motive power and will make it necessary to get the most ton-miles per mechanic both in the back shop and in the roundhouse. How can this be done? In the first place classified repairs should be made in a thorough and workmanlike manner and emphasis should be placed on the quality of the work rather than on the number of locomotives turned out of the shop. If a locomotive is properly overhauled, it can make a large mileage after repairs with little attention. If the work is slighted, it will require an excessive amount of minor repairs in the roundhouse and is likely to cause delays or failures on the road. It will be a good policy to try to move the traffic with the minimum number of locomotives by using the power intensively. This will avoid congestion in the roundhouses, which multiplies lost motion. Practically every road has certain classes of power that are troublesome to maintain. Wherever possible, such locomotives should be put in storage. The best results will be secured not by keeping the "weak sisters" in service and allowing them to slow up train movements, but by getting increased mileage out of the locomotives that are most powerful, most efficient and most easily maintained.

Watch Morale of Train Men

The interest and co-operation of train and engine service employees is particularly essential to the efficient operation of the railways during a period of traffic congestion, such as the one which we are now entering. There are a number of conditions existing on the railways at this time, however, which make the securing of this interest and co-operation extremely difficult. Perhaps the most important of these conditions is the tendency among all organized employees to be more or less sympathetic with the striking shopmen. Moreover, the delays resulting from heavy traffic and defective equipment tend to slow up the movement of freight trains and, where this goes very far, the basis of pay of train and engine men is changed from that of mileage to an hourly basis. This change removes the strongest incentive which is offered to train crews for expediting train movement. Even if delays due to equipment conditions and heavy traffic do not slow up service to the extent of putting train crews on hourly pay, the very fact that the delays occur in spite of the sincere efforts on the part of the men to move their trains tends to dishearten them and make them lose interest in "hitting the ball." The means of bolstering up the morale of the train men are well known to trainmasters, superintendents and other operating officers and it is not necessary that we should go into detail about them here. One of the most obvious means, of course, is mingling with the men, explaining to them the importance of their work in handling the heavy traffic and giving them a sympathetic hearing when they tell of conditions which make their work difficult. Another means is the removal, insofar as is possible, of conditions which tend to cause friction. On one road recently, an over-officious special guard shot a fireman on his way to work who objected to the guard's questioning as to the nature of the business which brought him on railroad property. All train men immediately walked out and returned only after all special guards had been removed from the property and soldiers substituted in their places. The company could not be blamed, of course, for attempting to safeguard its property, but where guards are necessary for this, they should be made to understand thoroughly that they are not to molest employees not on strike any more than is absolutely essential in the performance of their duties. With the existence of so many conditions which make it difficult to maintain the co-operation of train men it is important that their supervisory officers should be among them as much as possible. Trainmasters, for instance, are needed more sorely in the performance of their regular duties than they are at making light repairs and coupling up air hoses.

Turn-Around Service

Locomotive utilization is a matter which merits attention at any time, but it is of special importance under present conditions of peak traffic. Greater locomotive utilization in its simplest terms means more miles per locomotive-day and more tons per locomotive-mile. These are aims which are to be secured by many methods of efficient railroad operation. There are, however, two ideas which at present stand out above some of the others. One is that of running locomotives over more than one division, which plan of operation has already received considerable attention in these columns. The other is what is generally termed turn-around service, in which there is embodied the idea of having a freight train crew "double" the division and return to its starting point inside the 16-hour limit. The district, let us say, extends from *A* to *B*. The crew starting from *A* must move over the road and arrive at *B* in time so that it can take another train back to *A* inside of 16 hours. The district in question may be 75 miles long. The payment in that case would be on the basis of two one-way trips; namely, two days at the 100-mile minimum. Usually the crew lays over at its home terminal on alternate days. The advantage of this method of operation is primarily the incentive given the crew to move its train over the road and the adoption of turn-around service usually results in marked savings on this score. The crews further are returned to their home terminal, which is always an advantage. Locomotive utilization is considerably increased. As the idea is usually worked, the crew returns with the same locomotive, which means increased locomotive mileage. The fact that the locomotive is returned to a home terminal is no unimportant factor from the standpoint of locomotive maintenance. Of course, all roads do not have conditions which will permit a turn-around service, but there are nevertheless many districts, particularly those less than 100 miles, where it will prove advantageous. The testimony of those roads which have adopted the turn-around service is that it is difficult to understand why it is not followed more generally.

The *Railway Age* has emphasized the need of better shop machinery and equipment. Presumably in criticism of the policy, a master mechanic writes: "I think sometimes too much stress is laid on the necessity for purchasing new machinery, when the fact of the matter is that a great deal of the repairs to locomotives could be made as successfully with the machinery already on the ground. For example, a lathe or planer may be 30 or 40 years old and yet, if it is in good shape, do good work. . . . . In fact, all the ordinary light repair work in the usual run of railway machine shops can be done just as successfully with old machines as by purchasing new ones." We believe these statements are wrong as applied to nine cases out of ten and yet many shop officers agree, by inference at least, with the master mechanic that the old tools are good enough. This mistaken attitude, transmitted to the managements, is doubtless the real reason for small annual machine tool budgets and the fact that railroad shops as a rule are equipped with such a large proportion of obsolete, inefficient and costly-to-operate machine tools. There is just one case for which the master mechanic's first statement holds true. If the old lathe, for example, produces reasonably accurate work and is installed in a small roundhouse requiring only two or three turning operations a day, there would certainly be no excuse for installing a modern lathe. How many lathes 30 years old, however, are capable of even reasonably accurate work? How many shops or roundhouses are so small as not to have turning operations enough to keep one lathe busy eight hours a day? The master mechanic's error is in seeing the old lathe turn out passable work regularly and forgetting the excessive labor cost. Owing to the greater power and convenience of operation, a modern lathe can produce two or three times as much work in the same time and show a handsome saving over the increased carrying charges and power cost. In a specific case a modern boring mill worth $7,500 replaced an old machine worth $3,800, increasing the production three to one. The annual saving in labor offset all other charges and showed a profit, not of 15 per cent, but of *70 per cent* on the investment. (Railway Mechanical Engineer, September, 1921, Page 552.) Admitting the scarcity of funds for needed betterments, no railroad management is going to pass up such an opportunity if it has to borrow the money. The trouble is that many mechanical department officers themselves fail to appreciate the savings possible by improved shop machinery, and many of those who do see the possibilities fail to present them to the managements in a comprehensive, puncture-proof and convincing way.

Use of Antiquated Machinery Justified—Sometimes

The "Main Tracker"

IN THE DEVELOPMENT of its plan for the systematic movement of traffic through its terminals, the Baltimore & Ohio has created a term which should come into more general use.

We refer to the term "main tracker." As stated in an article which appeared in the issue of August 19, describing the system which has been perfected for the operation of terminals on this road, the term "main tracker" is applied to those trains which are made up and dispatched from a terminal for continuous movement to destination, or to a breaking-up yard, and which in their movement pass through intermediate yards and terminals intact. In the development of this plan many trains have been operated as "main trackers" for distances up to more than 600 miles without pulling a pin.

The classification of cars into trains for movement through adjacent terminals is not new; some roads have employed it for the handling of certain classes of fast freight traffic for years. It is, however, capable of much wider application. Its supervision cannot be left to local division officers for their conflicting interests may jeopardize the entire plan. Rather it must be administered from the standpoint of the system as a whole with a well laid plan for system supervision.

A yard is a necessary railway facility. It is, however, *auxiliary to* the line and is required only to prepare cars *for movement* economically. Cars earn money only when moving. This means line movement, while time spent in yards is lost revenue. The net earnings are therefore promoted by reducing yard operations to the minimum consistent with the necessity for the economical handling of the traffic.

What are the advantages of the "main tracker"? In the first place, it reduces the amount of switching to be done in intermediate terminals with little or no increase at the originating point. This permits a direct saving to be made in terminal operating costs. Less switching also reduces the amount of damage to equipment which again creates a saving. It requires less investment in yards and postpones additions to these facilities. It also expedites the movement of traffic, speeds up the delivery at destination and thereby increases the use of equipment.

At the present time, when the roads are facing the necessity for the adoption of every measure to reduce congestion (which is confined almost entirely to terminals) and to increase car mileage, the "main tracker" deserves special consideration.

Rates for the American Legion

ONE OF THE most difficult problems the passenger officials of the railways have had for some time has been that of making satisfactory rates for patriotic meetings such as those of the Grand Army of the Republic, the Spanish War Veterans and the American Legion. In past years when the prevailing passenger rate was two cents a mile it became the custom to make for gatherings of this kind a rate of one cent a mile. The prevailing passenger rate since 1920 has been 3.6 cents a mile. In 1921, owing to independent action taken by some railways, the old rate of one cent a mile was made for the meeting of the American Legion at Kansas City and for some other gatherings. The same rate was asked this year by the American Legion and the railways were strongly urged to grant it to this organization and also some others. It was argued that when large numbers of passengers were carried to and from a certain point at the same time a rate of one cent a mile would not necessarily be unremunerative, and that even if this would be the case the railways should be willing to stand some loss for the benefit of the men who made great sacrifices for the country during the late war.

The spokesmen of the railways pointed out, however, that the one-way rate of 1.8 cents for the round trip was relatively the exact equivalent of the one-cent rate which they formerly made. They also showed that it would not be possible for them to handle even such a large crowd as will attend the American Legion meeting at New Orleans next month at a rate of less than 1.8 cents a mile without incurring a substantial loss on the business, and that in making a rate of one fare for the round trip the railways are doing more for the ex-service men than any other class of business concerns in the country, since no other class of concerns makes them a half price for what they buy. It was also pointed out that if the railways should make a one-cent rate for the American Legion thousands of other organizations would contend that the railways would not have made this rate voluntarily if they had not thought it profitable and

would, therefore, have demanded that they also make it for these other organizations.

The result is it has been settled that the rate which will be given to the American Legion is one fare for the round trip; that is, 1.8 cents a mile. This rate is the lowest now made by the railways and is given only to a very few patriotic organizations, especially the Grand Army of the Republic and the American Legion. The rate now being made for large meetings of other kinds is one and one-half fare for the round trip, which figures out 2.7 cents a mile or 50 per cent higher than that made for the American Legion.

Developing Machinery and Neglecting Men

THE RADICALS who desire by direct action to overthrow existing political and industrial institutions and replace them with guild socialism or Sovietism have regarded developments in connection with the coal strike and the railway shop employees' strike with great complacency. They believe and preach that the existing civilization of western Europe and the United States contains the seeds of its own destruction. They believe "capitalistic" governments are so weak, and the working class inherently so strong, that the working class by united action through strikes, and the use of violence when necessary to win strikes, can overthrow existing governments, wrest all kinds of property from its owners and establish the dictatorship of the proletariat in both political and industrial affairs.

Developments in connection with these strikes will be construed by the radicals, and not unreasonably, as supporting these views. Never in the history of the United States did any strikes illustrate so forcibly at one and the same time the power of labor unionism and the weakness of government. The United Mine Workers of America has got such a grip on the coal mining industry that it was able to stop for almost five months virtually all production of anthracite and all production of bituminous coal outside of a few comparatively small areas. The railways are winning the shop employees' strike, but in this strike, as in that in the coal mines, the weakness of government has been strikingly exemplified. In respect to both strikes government officials have been vacillating and timid. They would not take strong measures to prevent or stop the strikes when such measures might have done good. They would not later keep their hands off and let the immediate parties fight the strikes out to a definite conclusion. They would not even so enforce the laws as to cause performance of the first duty of every civilized state—the prevention of personal violence and destruction of property. Men who have committed no crime except that of showing willingness to do the productive work without which the entire population would starve and freeze have had their homes and families threatened, have been assaulted, shot and massacred. Those who have done these things have gone unpunished.

Labor leaders of a certain kind and communists and bolshevists, may well regard these developments with satisfaction. Serious-minded men who do not desire to see our political and industrial civilization overthrown and America converted into a desert and a shambles like Russia, will not only regard them with misgivings, but will seek for and try to bring about alleviation or removal of their causes.

Ours is a civilization of machinery; and the greatest dangers that threaten it are largely due to the fact that most of its financial and industrial leaders think and act so much more intelligently about machinery than they do about men. The development of machinery has produced within the last one hundred years an industrial revolution so great that it has caused changes in the relations between men working together in industry exceeding all the changes of like kind of which there is any record since the record of man's economic activities began to be kept. Modern machinery, among all the effects it has had, has had two of vital importance. First, it has enormously increased man's capacity for producing comforts and luxuries, but increased still more his appetite for comforts and luxuries. Many workingmen now have comforts and luxuries which no king had up to a century ago. But the gap between what people have and what they want has been widened instead of narrowed. The spectacle of comfort and luxury did not make many people dissatisfied before the age of machinery because few people then had comforts, and exceedingly few had luxuries. Now so many have comforts and even luxuries that those who do not have them are greatly dissatisfied.

Second, the development of modern machinery has resulted in the creation of enormous industrial concerns employing not only thousands but hundreds of thousands of men, and the machinery has come between the owners and managers of these concerns on the one side and their employees on the other. This is strikingly true of most railroads. Most railway managers have come to think of operation and its results mainly or almost entirely in terms of machinery. How could it be otherwise? Operations are so vast that managers have to get information regarding operating results in statistical form, and practically all railway statistics, except those prepared for very special purposes, relate to *car, train* miles, tons per *car, train, locomotive* miles and other results of the performance of machines. The men who run these and other machines, and upon the efficiency of whose work the efficiency of the machine largely depends, are not kept in mind by the employer as he kept his men in mind when there were but few of them and he knew them personally and even worked beside them at the bench. It is literally true that the higher officers of most large concerns think hardly at all in terms of men except when the human element becomes refractory and hinders the smooth and efficient running of the machines.

If machinery has obscured the owners' and the managers' view of the employees, it has almost entirely cut off the employees' view of the owners and managers. What does the average railway employee know about the economics of the railroad business; about the efforts and sacrifices the stockholders and bondholders have made to get the money they have invested in railway securities; or about what the chairman, president and vice-presidents do to earn their so-called "fancy" salaries? He knows that he and other employees actually run all the machines. He is taught in his radical literature that he and other employees do all the really productive work; that the security owners and higher officers are merely parasites and vampires who live in affluence off the fruits of his labors; and he very seldom sees any evidence to the contrary. Is it any wonder, then, that, desiring like other people to get more comforts and luxuries, the average railway employee supports every movement which the leaders of his labor union tell him will enable him to increase his income at the cost of the security owners and higher officers?

The best brains of the railroads and other large industrial enterprises have been absorbed for years in improving the mechanical technique of plant construction, maintenance and operation. Has a railway officer shown that he knows just where a grade should be reduced, or heavier locomotives used, to secure maximum increases in train load with the minimum increase of capital investment? Has he shown he is master of the technique of so rearranging terminals and marshalling and directing the movement of locomotives and cars as to secure the maximum practicable increases in

locomotive miles and car miles per day? If so, he has stood a very good chance of advancement to the highest offices in railroad service, even though he has shown none of those qualities which enable a man to win the confidence, loyalty and co-operation of large numbers of other men.

Now, it would be very foolish to minimize the importance of the managers of large concerns being masters of the technique of their business, but it has long been becoming plain, and it never was so plain as it is today, that the exaggerated stress which has been and still is being placed upon the improvement of machinery and the operation of machinery is hindering increases in the efficiency of industry and actually threatening the destruction of our machine industrial civilization. The many great strikes which have occurred in recent years in countries with highly developed industrial systems, and the many more which have been barely averted both before and since the war, are signs too ominous to be disregarded.

Many business men irritably attribute them to the growth of labor unionism and to bad leadership of the unions. That is only part of the explanation. It does not explain why the employees of so many large concerns are following the leadership of the heads of labor unions instead of the leadership of the heads of these business concerns. The rest of the explanation is that many managers of large concerns who are masters of the machine technique of their businesses either have not tried to win the loyalty and co-operation of employees or have conspicuously failed in their efforts to do so.

If all managers of large concerns had failed equally in their efforts to win and hold the leadership of their employees the situation would appear hopeless. Fortunately that is not the case, and if there were not so many men who are unwilling to be taught by anybody's experience but their own we might hope that the methods of those who have been conspicuously successful in dealing with labor would be widely copied with most wholesome results.

The experience of those who have been most successful in dealing with labor in large concerns clearly indicates certain things. First, some of the very best brains in the business must be devoted almost solely to devising and carrying out plans for improving the relations between management and men, and the brains devoted to this task must be those of men who are sincerely anxious to promote the welfare of employees in every practicable way. Secondly, no effort should be spared to give to the employees the best working conditions and wages that the concern can reasonably afford to. Third, no effort should be spared to disseminate among the employees all the facts regarding the business required to nullify propaganda against it and its management carried on by labor union leaders or radicals. Fourth, the work of employees should be so firmly and thoroughly supervised that they will be required to do efficient work and at the same time it should be made clear to them why efficient work is in their own interest. Fifth, not the slightest timidity, but the greatest firmness and courage, should be shown in promptly resisting and even fighting to a finish every effort of the employees or their unions to get working conditions that unreasonably interfere with efficiency or wages that are excessive. Sixth, every reasonable inducement and opportunity should be offered to employees to become partners in the enterprise by buying its securities.

There are lamentably few large concerns in which all, or even most, of these things are done. There are lamentably few in which the man is patiently studied in the higher offices as much as the machine.

While many specific suggestions based upon experience can be made as to what should be done, one thing that is of vital importance is that financial and industrial leaders should awaken to the fact that our civilization of machinery, with all its potential power of securing increased production and greater material comfort and happiness for all classes of people, is threatening to destroy itself by exalting to excess the kind of ability that has matchless skill in the engineering of materials and machinery and largely ignoring the supreme need for developing and advancing to the highest positions the kind of ability that understands the *engineering of men.* There are many men in important positions in industry whose idea of dealing with labor is to placate it and many others whose idea is to fight it. There are some who see that merely placating or merely fighting labor will simply make bad conditions worse—that there are times when it should be placated and other times when it should be fought, but that most of the thought and energy devoted to dealing with it should be used in trying to bring about a better mutual understanding and closer co-operation.

All classes of people may well pray for speeding of the day when large enterprises will be dominated by more men who not only know the technique of their businesses, but who can compete successfully with the heads of labor unions for the leadership of their own men.

Two Kinds of Union Leadership

THOSE interested, which includes almost everybody, can as a result of recent developments draw conclusions as to what kind of leadership is best for railway employees. Several classes of railway employees had their wages reduced on July 1 under awards made by the Labor Board. Some of them were ordered by their leaders to strike. Some of them were kept at work by their leaders.

The men who were ordered to strike were, of course, those employed in the shops. Those who struck in obedience to the order of their leaders and are still out have lost ten weeks' wages. Those who struck and later returned to work lost their wages while they were out and also their seniority rights. The strike has been won by most of the railways. The facts show this, and the heads of the shop crafts unions tacitly admit it. Weeks ago they agreed to put the men back to work at the wages awarded by the Labor Board, subject to rehearings, provided the railways would take them back with their seniority rights unimpaired. The railways refused to do this.

The number of men employed in the shops has constantly increased. Recently the leaders of the national unions have evinced a willingness to make settlements with only part of the railways on the basis of all strikers on these railways being taken back and questions with respect to seniority rights being settled later by negotiations. Everybody knows what this means. It is an admission that the strike is irretrievably lost on most railways, and a virtual admission that in time it will be lost on all the others unless some settlement with these others is soon made. Thousands of the strikers have lost their former positions forever. They have lost many millions of dollars in wages while they have been out. The shop crafts unions on many railways have ceased to exist and no longer represent the shop employees on these roads.

These are the results of one kind of leadership—the kind that led the men out on strike against the decisions of a government body created by the public for the purpose of peacefully settling railway labor controversies.

Among the unions besides those of the shop crafts whose members had their wages reduced were the United Brotherhood of Maintenance of Way Employees, the Brotherhood of Railway and Steamship Clerks, and the Brotherhood of Railway Signalmen. Their leaders were as strongly opposed to the reductions of wages as the leaders of the shop crafts unions. They could have caused strikes also. The heads of

these unions, Messrs. Fitzgerald, Grable and Helt resisted all demands that they issue strike orders. They kept most of their men at work and the men have received their wages while the shop employees have been on strike. Their unions are still intact and their men retain all the rights and privileges they possessed before. The United Brotherhood of Maintenance of Way Employees already has been given a rehearing in its wage case, and the other unions mentioned soon will be. The unions whose members have stayed at work have not incurred public disapproval by striking against a decision of the Railroad Labor Board, or got themselves into trouble with the law by committing acts of violence.

There has been much criticism of the kind of leadership that some of the railway labor unions have had within recent years. It has been claimed that their members would fare better under leaders who were willing to submit their claims to arbitration and abide by the results than under leadership which opposed all arbitration and refused to accept arbitration decisions seemingly adverse to the employees, even when these were rendered by a body created by the public to render such decisions. Some of the railway employees whose wages were reduced on July 1 have had leaders who preferred to strike as a means of getting what they wanted, and some of them have had leaders who preferred peaceful methods of getting what they wanted. Can there be any doubt as to which kind of leadership has been best for the employees during recent troubled months?

It is to be hoped that railway employees of all classes will reflect carefully upon the developments which have occurred on the railways since July 1. If they do, there can be little doubt as to what kind of leadership they will decide will be best for them in future.

The Problem of Railway Power

THE RAILWAYS are in the midst of a transportation crisis similar in some respects to that of 1920, but different from it in other important respects. That of 1920 marked the end of a period of great business activity. The present one, unless all appearances are deceptive, marks the beginning of a period of great business activity. All the indications are that the available freight traffic will exceed the capacity of the railways for months and even years to come. With both the bituminous and anthracite mines opened and with the great shortage of coal it would seem that throughout the fall, winter and spring, and perhaps even later, they will be called upon to move more coal than they are capable of moving. The crops promise to be enormous. Traffic of other kinds already is moving in unprecedented volume, and indications are that it will continue to do so.

How well the problem presented will be solved will depend largely on the efficiency with which the railways are able to use their cars, and this in turn will depend largely upon the co-operation they can get from shippers and consignees. We discussed the problem of car service in an editorial in our issue of September 2 entitled "Some Things That Must Be Done."

In every crisis of this kind, however, there is presented a problem more important than that of car efficiency. This is the problem of locomotive efficiency. Experience over a long period beginning with the great congestion and car shortage which culminated in 1906 and 1907 has shown that the ability of each individual railway and of the railways as a whole to cope with the traffic depends more upon the amount, quality and condition of the locomotive power available than upon anything else. The great so-called "car shortages" in the past usually would have been better named if they had been called "locomotive shortages." In many cases there were enough and more than enough cars available, but empty and loaded cars accumulated and caused congestion because there were not enough locomotives to keep them moving, or because the locomotives available were not used with the greatest possible efficiency.

The statistics of the American Railway Association show clearly that a car shortage is coming rapidly. The number of surplus cars in condition for service decreased from 239,-160 on July 8 to 120,961 on August 25. Attention already has been called to this decline in the number of serviceable cars. It is ominous enough. But the decline in the number of surplus serviceable locomotives which is occurring is equally significant and little attention has been called to it. On July 1 the railways had stored 6,332 serviceable locomotives. On August 15 they had stored only 4,077 serviceable locomotives.

The effect of this decline in the locomotive surplus on the policy of some railways is shown by the recent increase in orders for new locomotives. In the early part of this year the railways placed relatively large orders for freight cars and only relatively small orders for locomotives. In the months of July and August, however, they ordered 573 locomotives as compared with only 432 in the entire first six months of the year. The increased attention which this indicates is being given to the problem of power is both significant and encouraging. Not enough attention is being given to it yet, however.

If the railways are to handle the very maximum traffic of which they are capable, not merely during the next few months but during the next year and the immediately succeeding years, it appears evident that they must do at least certain things with respect to their power.

First, they must spare no study or effort to secure the maximum utilization of the power available. This means not only putting forth every effort to put and keep it in repair, but also putting forth every effort to keep locomotives out of roundhouses and shops and out on the road where they can actually pull freight. Several railways already have made successful experiments with running locomotives over more than one division and operating through freight trains for long distances without breaking them up. The running of locomotives over more than one division has passed the experimental stage and the results which have been obtained show that it can be tried with highly beneficial results on many lines where it has not already been tried.

Secondly, the railroads should improve as many of their old locomotives by installing capacity increasing equipment as the conditions in their shops will permit. There are, of course, many railways whose shops are still crippled by the strike, but many others have sufficient forces to proceed not only with current locomotive repairs, but with the work of improving old locomotives.

Third, the orders for new locomotives should be increased. Many railways will find it much easier under present conditions to buy new locomotives than to repair or improve old ones. The builders are still able to turn out locomotives within a few months after they are ordered, and there is little or no room for doubt that not only for many months, but for years the railways will have plenty of use for any reasonable number of locomotives that may be ordered in the present year. The sooner they are ordered the sooner they will be available to relieve congestions and move the business. It should hardly be necessary to emphasize the importance of ordering locomotives that are fully equipped with the various modern devices that save fuel and increase capacity, in view of the present and prospective cost of fuel and the need for effecting the greatest possible economies in operation.

The transportation problem confronting the railways is and will continue to be largely a problem of power, and it cannot be recognized and dealt with as such too soon.

Canadian National Installs Grain Car Unloaders*

Essential Features of Equipment, Each Unit of Which Empties Six Cars Per Hour at Port Arthur

By F. Newell
Mechanical Engineer, Dominion Bridge Company, Ltd., Montreal, Que.

A successful box car unloader for grain must meet the following requirements:

(1) It must not damage the railway rolling stock, no matter how defective the condition of such rolling stock on arrival at the elevator.

(2) It must be designed to handle all types of box cars that may be received at the elevator.

(3) It must remove all grain from the car to the elevator pit without loss of grain and without hand labor.

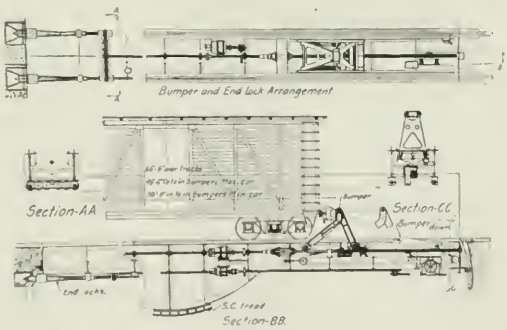
(4) It should have means of removing the grain door quickly and without damaging it.

(5) It must be made practically foolproof in operation, and safe and reliable under all conditions of operation.

(6) It must be sufficiently rapid and economical in operation to more than justify its first cost.

(7) It must be served by trackage that will permit rapid handling of cars to and from the unloader without interruption to the unloading process over long periods.

In order to get the grain out of the typical box car, the grain door has to be forced open, and if gravity is to be used, the car must be tilted either endways or sideways, or both. Therefore, as tilting operations must be performed to empty the car, the most ready way is to run the car on some form of rocking table or cradle provided with end bumpers to keep the car from rolling off, and also with some form of mechanical door opener which will open and carry the door clear of the flow of grain. If we consider the shape of a box car with its long length in comparison with its width, and with the door in the middle of its length, it will be seen that either

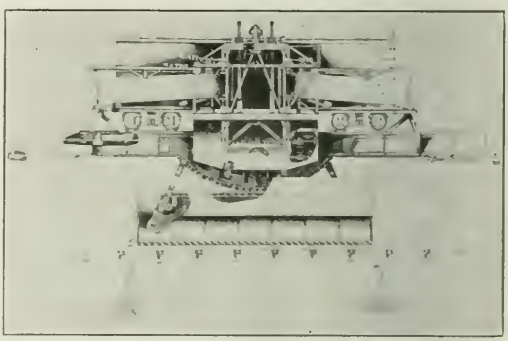


Details of the Car Tilting Device in Cradle

or both side and end tilt would have to be made many times to empty the car of all grain; consequently the cradle should be supplied with deflecting baffles which can be inserted in the car and avoid the side tilting operation, and an unnecessary number of end tilts.

Before designing the unloaders at Port Arthur the trunnion live roller, knife edge suspension, rope suspension and rolling types were considered. The relative advantages and disadvantages of side tilting, superelevation of the outer rail and the use of deflecting baffles without side tilt to the car were also considered.

The trunnion and knife edge suspension types are comparatively cheap in construction as far as first costs are concerned, but are liable to break down from wear and are difficult to repair in case of such failure. The lubrication of heavily loaded trunnions presents some difficulty, and the maintenance of lubrication during periods of rest also entails a large degree of uncertainty. Further, if the point of suspension is kept below the base of rail, in order to keep the supporting bracket clear of the flow of grain, the out-of-balance moment when tipping to an angle of 45 deg. causes a heavy peak torque on the operating mechanism, and a correspondingly large motor is required. On the other hand, if the point of suspension is placed above the base



A Sectional Elevation of the Car Unloader

of rail in order to reduce the out-of-balance moment, the supporting bracket will interfere with the flow of grain, unless special rotating hoppers are introduced, which in turn provide additional complication.

A high virtual axis of rotation can be obtained by using a live roller support and a curved track; this, however, introduces a complicated track support, together with all the disadvantages attendant on live rollers, and a complex number of parts. Also, the axis of rotation will remain fixed and a good distribution of grain in the receiving hopper will not be obtained.

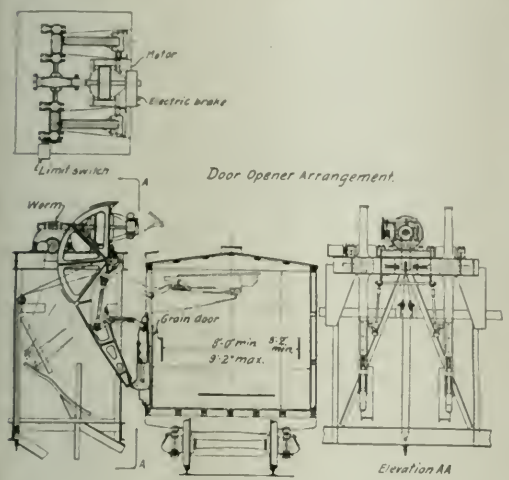
By side tilting the cradles or with a superelevation of the outer rail, it might be possible to do away with the deflecting baffles. This, however, causes serious side stresses in the cars, for which they are not designed, and it is doubtful if sufficient side tilt could be given to the car to obviate the necessity of hand sweeping to clean the car thoroughly after operations were completed on the unloader. By inserting deflecting baffles, an angle of slope of 30 deg. is made by the trough formed between the baffle and the floor of the car, when the car is tipped to 45 deg. and the baffle inserted at 45 deg. to the longitudinal axis of the car, whereas in the case of a 15 deg. side tilt the maximum angle of slope is only increased about 5 deg. and along a plane of about 33 deg. to the longitudinal axis of the car.

*Abstracted from a paper presented at the general professional meeting of the Engineering Institute of Canada at Winnipeg, Man., on September 7.

Under these conditions the grain is more likely to run down to the other end of the car than to flow out of the side door, as is required, with a minimum number of end tipping operations. The clearance required for side tilts also makes a wider spacing of trackage and housing necessary, and a consequent increased cost in construction.

Type Adopted for Port Arthur

The unloader adopted is of the rolling type, operated without side tilt but with deflecting baffles and an automatic door opener, which opens the grain door without damage and carries it clear of the outward flow of grain from the car. The rolling type was used because it is possible to obtain a higher virtual axis of rotation than with the trunnion type, and has not the possibility of breakdown and



The Door Opener

consequent delay which might occur with the use of live rollers or knife edge suspension. The higher virtual axis of rotation allows the unloader, whether empty or loaded with a full car of grain, to be in stable equilibrium. The point of support, moving in a horizontal plane in the direction of rotation, causes a less out-of-balance moment with a loaded car and a better distribution of grain in the receiving hopper than would obtain with the trunnion type.

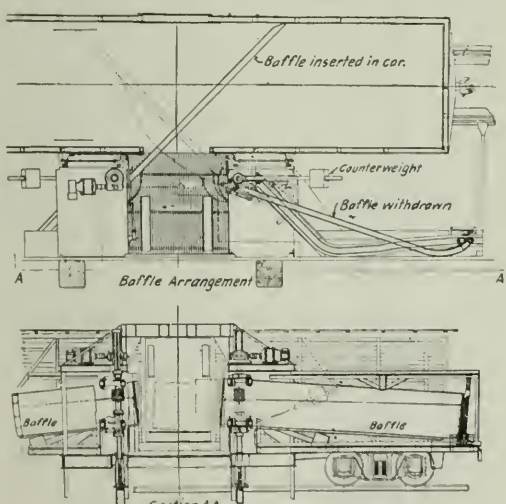
The prime function of an unloader is its ability to handle efficiently all sizes of box cars now in use, or contemplated in the near future, for the transportation of grain. In the design of the unloaders at Port Arthur, due consideration was given to (a) weight of all box cars and contents; (b) variation of length, width, and height of all box cars; (c) variation in elevation of floor of box cars, both when loaded and unloaded; (d) variation in width and height of grain doors. The result of a thorough consideration of all these points is that the unloaders have been built to cover all possible variations in the above mentioned features of box cars, with the possible exception of a few freak cars.

The unloaders consist of a heavy structural rocking cradle, capable of being tipped with its longitudinal axis at a maximum elevation of 45 deg. to the horizontal in either direction. This cradle carries the car of grain, and is provided with end locks to support the ends of the cradle definitely while cars are being taken on and off, and with collapsible end bumpers to bring the car to a central position on the cradle, clamp the car in this position, and take the total end thrust on the couplings of the car during the time the car is tilted at any angle to the horizontal in either direction. One side of the cradle is provided with heavy structural steel brackets which carry the door opening mechanism, two deflecting baffles, and baffle operating mechanism. Between these brackets and opposite the grain door is a deflecting hopper or chute to insure the grain being carried well into the centre of the receiving hopper. Steel gratings are provided to protect the chute and to cover all the open spaces around the unloader. Flexible deflectors are also provided to prevent any spillage of grain along the side of the walls of the car, or in any manner except into the receiving hopper. A closed operating cab from which all movements of the unloader are controlled is placed in a fixed position opposite the grain door, and at an elevation from which all movements of the grain can be observed.

The cradle consists of two heavily built web plate girders, the lower portions of which are formed at the centre into a circular tread which rests on steel cast tracks supported on a heavy concrete foundation. These girders are braced rigidly in a horizontal plane, and also at right angles to the axis to prevent side flexure, and to make them act together as a whole rigid tilting platform. They are designed to take a maximum loaded box car estimated to weigh 180,000 lb.; the girders being able to take this load with the horizontal axis tipped to 45 deg. from the horizontal in either direction. The girders are also designed to take a 380,000 lb. locomotive when in the horizontal position and with the end pins in place.

The Operating Machinery

The tipping machinery consists of a 75-hp. wound rotor motor, equipped with a full torque solenoid brake, driving



Baffles Deflect the Grain Toward the Doors

the main operating pinions through a worm and worm wheel, equalizing gear and bevel gears. Two pin-connected struts are fastened to the cradle, each having, respectively, a rotating axis at a point beyond each end of the circular tread. These struts are equipped with cast steel racks engaging the main operating pinions. The racks and struts are provided at the outer end with guides when in the lowered position, as at this time the yoke or carriage maintaining alinement between the pinion and the rack are at the upper end of the strut close to the connecting pins. The ends of the cradle are also guided by rollers at each end to assure an

alinement of the track rails after tipping operations are completed.

Four end locks are provided, each consisting of heavy steel pins, one at each corner of the cradle. The pins are pointed at the ends for easy entrance into the castings bedded in the concrete abutments, and are operated by a 5-hp. motor through a screw and spur gear. They are designed to take the weight of a loaded car or engine coming on or off the cradle and give a final alinement to the rail in both the horizontal and vertical direction. They are interlocked with the bumpers or car clamps so that they cannot be withdrawn until the car is centralized on the cradle, and in the reverse, the bumpers cannot be lowered until the end locks are driven home; thus preventing any accident due to the possibility of running a car or engine on or off the unloaders, excepting when the cradle is supported at the ends by the four interlocking pins.

The bumpers or car clamps are arranged so that the car does not have to be spotted in an exactly central position on the unloader, but can be pulled on the unloader into any position within two or three feet, and will be pushed into a central position by the bumpers. They are also designed so that practically any length of box car can be clamped in a central position on the cradle.

The clamps or bumpers at each end consist of two steel cast slides connected to a pair of tension and compression links capable of rising to the level of the car coupler and then traveling forward, forcing the car to a central position when the bumper at the other end will strike the coupler and clamp the car. The front slide, that is, the one nearest the transverse centre line of the unloader, is fastened to a wire rope coiled upon a drum, which is in turn clamped with a retarding torque sufficient to hold the slide in a fixed position. The rear slide, which is definitely operated by a screw, is, at the same time, lifting the tension and compression links to the required height. When this has occurred, the two slides come together and travel forward until the car is clamped at both ends. The slides are operated simultaneously at both ends by a single 10-hp. motor operating the screws and traveling nuts through a pair of spur gears.

In applying the clamping device to the couplers of the car, the component of the weight of the car and grain along the rails is taken on the coupler, which is designed for such loads. The bumpers were designed for a maximum load of 127,500 lb. and work very efficiently, allowing practically no end play when rocking the car.

When the car has been clamped in a central position and the ends locks are removed, an interlocking switch comes into operation, allowing the door opener to be operated, the cradle to be rotated, and the baffles to be inserted. The door-opening mechanism consists of two steel cast pressure arms, cast integrally with spur gear quadrants, pivotally mounted on trunnions and rotated by spur pinions from a common shaft driven through worm gearing by a 22-hp. motor. Means are provided for adjusting the width of the pressure arms to suit the varying width of door openings and are arranged so as to strike the door as close to the door posts as possible. When the pressure arms first touch the door, their lower ends are kept above the elevation of the highest car floor and are so arranged that a slight pressure on the door releases a telescopic arrangement at the bottom of the arms, allowing an extension to come down until it strikes the door sill. By this means the pressure is exerted over the total height of the door regardless of the elevation of the car floor and as close to the door posts as possible, thus avoiding any undue damage to the grain door. This, in itself, is quite an economy, as doors were invariably broken by the old hand method.

The opener enters the grain with an upward and inward movement, carrying the door above the grain toward the roof of the car and clear of the flow. The pressure of the grain against the door is released by the leakage of grain into the hopper, which occurs as soon as the smallest opening is effected, and the outward flow of grain allows an easy clearance space through which the door can be pushed. During this operation about ten per cent of the grain in the car is discharged into the hopper.

While the door is being held up inside the car by the opener, the cradle is tilted through an angle of about 20 deg. and about another 25 per cent of the grain is discharged into the hopper, the remainder running down toward the other end of the car. The baffles are arranged so that they are tilted with the car and cradle, and while the car is in this position the upper baffle is inserted into the car as far as possible without crowding on the grain. The car is now tilted to an angle of about 40 deg. in the other direction, when about another 50 per cent of the grain strikes the baffle and is discharged into the hopper. The baffle which is in the car, and which was in the upper position, is now in the lower and can be withdrawn easily. At the same time the other baffle, which is now in the upper position, can be inserted, and as only 15 per cent of the grain remains in the car, the baffle can be pushed forward over the floor of the car until the nose reaches the far side. The car is now tilted through the maximum angle in the other direction when the last remaining portion of the grain is emptied into the hopper and the cradle can be brought into the horizontal position and the baffle withdrawn.

The baffles consist of a pair of plated rectangular structural frames of right and left hand, having their faces at right angles to the floor of the car, and capable of being slid into the car so that the rectangular face, or the trace of the plane of the baffle, is at 45 deg. with the longitudinal axis of the car. As stated before, this gives a trough having an angle of slope of 30 deg., when the floor of the car is tilted to 45 deg. The grain will flow readily down this trough out of the car. A wire rope attached to the front end of each baffle, passes round a grooved operating drum and thence to the rear end of the baffle, so that the baffle can be pulled in or out of the car by rotating the drum. The rear end of the baffle is guided at its upper and lower ends in tracks having a setting and curvature specially designed to keep the overall width of the unloader down to a minimum; while the front end passes through a pivoted yoke so that the baffle is held in its correct location for any position in or out of the car.

At the time of entry, the baffle is at least three inches above the highest car floor, but as it is driven forward is lowered by a screw and nut until contact is made with the floor and the weight is relieved from the sliding nut, after which any further driving forward of the baffle only causes the sliding nut to travel up the shaft without altering the elevation of the yokes. The back end is flexibly retained in its tracks in such a manner that the lower edge of the baffle makes contact with the car floor along its entire length. To further prevent the escape of grain to the lower end of the car, a flexible canvas sealing strip is attached to the bottom edge.

To prevent the flow of grain from traveling too far down the baffles, along the baffle track, and out of the hopper, spring doors are provided to seal the entrance of the baffle and to close the opening when the baffle is fully withdrawn. Flexible, hand operated, deflecting baffles are arranged to prevent leakage of the grain along the sides of the car, and deflecting plates are provided under the car door to carry the grain well into the centre of the receiving hopper. Steel gratings are also provided to protect the fixed hopper and to cover all spaces around the unloader, as well as to catch any large foreign substances which might come out of the car with the grain.

Throughout the design of the unloader, the choice of type and the choice of method of operation were, to a large extent,

governed by the desire to obtain a maximum safety of operation, and particular attention was paid to features governing this requirement. The cradle is in stable equilibrium under all conditions of loading, so that if a breakage should occur in the tipping mechanism, the car and cradle will come to a horizontal position without damage. All power transmission is made through self locking worm or screw gearing, so that motion cannot take place unless it is so intended by the operator. The operations are electrically interlocked, so that they have to be carried out in proper sequence, and so ordered that damage cannot occur to either the car or the unloader. Limit switches are also provided, where necessary, for limiting the travel of each mechanism.

A completely closed operator's house is placed at a good elevation opposite to the car door, and is provided with glass windows so that the operator can, at all times, observe the process of unloading. The house contains the complete electrical control board, controllers, and resistances, so that the operations are under the direct control of the operator.

Time of Operation

The average time taken by the various operations in unloading a car of wheat is the time taken to remove the empty car and spot a loaded car on the unloader platform depends, in a large degree, on the trackage layout. At the Canadian National Railway's elevator this occupies about three minutes, and the results obtained by observation show that where wheat is being unloaded, and no delays in distribution occur, it is easily possible to unload at the rate of eight cars per hour. When unloading oats, the time of operation is about one minute longer, as the car requires at least one extra tipping of the cradle. Further, the time of operation over long periods of unloading is certain to be increased by delays incidental to distribution and other causes. Results, however, show that about 250 cars can be unloaded in a ten-hour day on four unloaders at the Canadian National Railway's elevator, or an average of six and one-quarter cars per unloader per hour.

The average rate of unloading in an elevator equipped with multiple pits and having a pair of power shovels at each pit is about one car per hour for a ten-hour day, while the unloader has an unloading capacity of at least six cars per hour over the same period. The average unloading staff in a house equipped with a number of pits is approximately two men per pit, while on one unloader, an operator, one attendant and two laborers, a total of four men, are required.

As one unloader will do the work of six hand pits, the saving of labor is represented by 12 men on the hand pits against four on the unloader, or eight men, and the monetary saving is in the same ratio, as the shovelers can be put on the unloaders as operators with very little training. Assuming a period of work during the year equivalent to the employment of the maximum staff for 200 days, the saving in labor will amount to 1,600 men-days. Assuming a rate of $5 per day, this would amount to a saving of $8,000 per year per unloader. There is also a further saving due to the grain doors being removed undamaged. Maintenance costs are smaller than for an equivalent number of power shovels. The labor turnover and the danger of tying up operation by strikes is naturally lessened on account of the very great improvement in working conditions. Power costs are rather less for one unloader than for six shovels. The initial cost of installation will, of course, depend upon conditions at different elevator sites, but will in many cases permit of a saving due to a less expensive trackage layout.

The question of the economy of installation in existing elevators is one which would have to be studied for each separate case by expert elevator engineers. The writer believes, however, that where a large volume of grain is handled a study of the question would be well worth while and that unloaders can be installed to advantage.

The unloaders were designed by the Dominion Bridge Company, Limited, in collaboration with C. D. Howe and Company, consulting engineers of Port Arthur, and were built and erected by the Dominion Bridge Company, Ltd.

Group Insurance for New Haven's Subordinate Officers

The New York, New Haven & Hartford has contracted with the Travelers Insurance Company of Hartford, Conn., for life and accident insurance for its officers below superintendent, to be paid for in about equal shares, half by the company and half by the insured individual; and has given all eligible persons until October 1 to accept the plan, which provides for group insurance at very low rates. At least three-fourths of the eligibles must join in the movement in order to make it effective, this being a requirement of the statute under which group insurance is authorized.

This offer of the company was announced by C. L. Bardo, general manager, at Niantic, Conn., a seashore resort, last Sunday, where a dinner was given by the company to the officers and their wives, followed by baseball and dancing. The scheme is confined to "supervisory and subordinate officials" in the transportation, mechanical and maintenance of way departments. In brief, it provides for life and accident insurance, without medical examination, to remain in force so long as the person insured remains in the employ of the company and pays his share of the premiums. If he leaves the employment, he may continue his insurance without medical examination by an arrangement with the insurance company. The insurance covers death, permanent and total disability, and dismemberment. The railroad will contribute approximately one-half of the cost "in appreciation of the loyalty of the company's supervisory forces and to show a helpful interest in matters involving the welfare of its employees and dependents."

The company has already paid the premium for the insurance, covering over 2,000 employees, up to October 1. About 1,000 of these men were present at Niantic, and next Sunday the plan will be similarly explained to another group of 1,000, at a second outing to be held there. It was necessary to have the outing in two sections in order that all might have an opportunity to attend, without leaving the railroad unprotected at any point.

In a circular explaining the plan, it is stated that the life insurance of employees whose pay is $150 a month or less (Class A) is $1,000; more than $150 and up to $200 (Class B) insurance $1,500; Class C, from $200 to $250, insurance $2,000; Class D, $250 to $300, insurance $2,500; Class E, more than $300, insurance $3,000. The principal sum of accident insurance in each case is the same as the amount of life insurance; thus the totals of the classes, with the monthly cost to the employee in each class are as follows: Class A $2,000, $0.75; Class B $3,000, $1.15; Class C $4,000, $1.50; Class D $5,000, $1.90; Class E $6,000, $2.25.

If an insured employee becomes wholly disabled by bodily injuries or by disease before he is 60 years old, no further premium will be collected and the amount of his life insurance will be paid to him, either in a lump sum or in yearly instalments extending over a series of years, up to 20 years, as chosen by him. Indemnity for loss of hands or feet or sight of eyes is adjusted as is customary in accident insurance policies. Premiums will be deducted from an employee's pay by the paymaster, saving the individual all care in connection with that detail. After October 1 employees can join only by submitting to the insurance company's regular medical examination.

The offer applies on the Central New England as well as on the New Haven road; insurance ceases when an individual leaves the employ of the company or when he ceases to pay his monthly premium.

Coal Bills Passed by Senate

WASHINGTON, D. C.

THE CUMMINS BILL, to restrain profiteering in coal by authorizing the Interstate Commerce Commission to issue priority orders in favor of or embargoes against interstate shipments of coal for which the owner has charged or the purchaser has offered what the commission considers to be an unreasonable price, was passed by the Senate on September 7 by a vote of 40 to 7, after it had been amended to limit the period during which it is to be effective to six months instead of a year and to provide that nothing in the bill "shall be construed as changing or amending the present law as to assigning cars for handling or transporting coal on contracts entered into prior to July 25, 1922, at not more than $2 per ton f.o.b. cars at mine."

The bill proposes to regulate coal prices indirectly through exercise of the powers to regulate the railroads and as described by Senator Cummins: "Broadly speaking, the immediate purpose is to prohibit a carrier from carrying coal which is sold at an exorbitant price," in the same way that the power to regulate commerce has been exercised in other laws to prohibit the interstate transportation of certain things held by Congress to be undesirable.

As the Winslow bill, intended to accomplish the same general purpose, as passed by the House a week before, contained numerous different provisions, the two bills were sent to conference.

The Borah bill to provide for the creation of a fact-finding commission, to be appointed by the President to make an investigation of the production, transportation and distribution of coal, was also passed by the Senate on September 8 after it had been amended to provide for a separate report on the anthracite industry. A similar bill had also been passed by the House. A strong effort was made to omit from the bill the direction to the commission to report on the advisability or wisdom of nationalizing the coal industry, or of government regulation, but the amendment for this purpose was defeated.

There was a protracted debate on the priority bill in the Senate, during which the bill was attacked by several, on the ground of opposition to price-fixing, on the ground that the price-fixing is indirect, and on constitutional grounds. Various senators who were obviously speaking from the standpoint of the coal operators or of interests that have contracts for coal at a low price, objected on the ground that it would divert coal from those contracts to other purposes and several attempts were made to amend the bill so as not to affect such contracts. Senator Kellogg obtained an amendment to include within the commission's jurisdiction for the purposes of the bill vessels suitable for the transportation of coal on the inland waters of the United States. Senator Sutherland of West Virginia and Senator Dial of South Carolina objected to the bill on the ground that it was intended to protect those who had not had the forethought to make contracts last spring. Senator Dial talked a good deal about some contracts which he and various cotton-mill owners had made at $1.90 a ton. When asked if a cotton mill should have preference over domestic consumers, he said that if the cotton mill employees are turned out of work they will perish by starvation and he "reckoned" it would be about as painful to perish in that way as to freeze to death.

In reply to the contention that certain mines claim they cannot get cars to deliver contract coal while others are able to get cars for coal which they sell at high prices, Senator Cummins pointed out that under the present law the priority given to certain classes of consumers may take cars away from certain mines but that that is done regardless of the price factor, while to undertake to protect contracts would also protect contracts made by speculators at unreasonable prices. He said, however, that he had no objection to the amendment as finally proposed by Senator Dial, after he had inserted the $2 limit, because it does not mean anything. "The commission now," he said, "has the authority to say that if coal is intended for a certain purpose, cars cannot be furnished for the transportation of that coal until the coal that is required for a more important purpose has been furnished."

Senator Sutherland, after a defense of the coal operators, said he supposed there may be operators who had contracted to sell their coal at $2 a ton who would welcome the interference of the Interstate Commerce Commission and the diversion of their product to some one who was willing to pay $4 or $5 a ton, if such prices should be fixed, rather than to ship their coal to the customers to whom they had contracted it at $2. Senator Cummins replied that if that were possible it would not be brought about by this bill, but by the existing law, and that it would not comport very accurately with the description which the senator from West Virginia had just been giving of the coal operators. He admitted, however, that if the coal were diverted by a priority order the operator would not be obliged to sell it at the contract price; he would only be required to sell it at a fair and reasonable price.

In arguing the constitutionality of the bill, Senator Cummins discussed at length the various Supreme Court decisions in cases in which it had sustained a prohibition against interstate transportation where "the use of interstate transportation was necessary to the accomplishment of harmful results." He said that the fact that the distortion of commerce resulting from unreasonable prices for coal is effected necessarily through the interstate transportation of the coal differentiates this bill from the child labor law cases, where the law was held unconstitutional by the Supreme Court on the ground that the mere fact that goods produced by child labor were intended for interstate transportation, does not make their production subject to federal control under the commerce power. The bill, he said, is directed entirely against the use of transportation. Senator Kellogg also made the point that interstate commerce is directly affected by the price of coal because the railroads are such large purchasers of coal.

Senator Reed of Pennsylvania said that the laws which the court had sustained dealt with the transportation of articles held to be evil in themselves, whereas the transportation of coal is not an evil and the charging of a high price is not interstate commerce.

The Senate bill differs from the House bill in that in it Congress declares the existence of the emergency, and the President is authorized to terminate it, while in the House bill the President is authorized to declare an emergency and so revive its provisions at any time prior to January 1, 1924. The Senate bill acts entirely upon common carriers, while the House bill is not so restricted. The House bill provides a penalty for soliciting, accepting or receiving any concession or discrimination in respect of car service, or for the procuring of priority orders by misrepresentation or misuse of priority orders.

The conferees representing the Senate and the House reached an agreement on Wednesday which represents a combination of the Senate and House bills. The period during which the act shall be in effect was changed to 12 months and the principle of the Senate bill that the act should apply only to interstate shipments was adopted. The conferees were expected to make their report on Thursday.

Separate Peace to End Strike on Some Roads

Strikers Give in on National Settlement and Seniority— Roads Operating 50,000 Miles to Accept

TERMS OF AGREEMENT for the settling of the shop employees' strike were agreed upon in Chicago this week by the heads of the policy committee of the shop crafts' unions and railways having about 55,000 miles of line. The exact list of railways which have signed the agreement has not been made public, but it is known to be with some important exceptions the 52 railways which made to the shop employees the proposition for settlement at the meeting in New York.

Following the meeting of the Association of Railway Executives on August 25, the list of railways which made the proposition at that time was given in the *Railway Age* for September 2, page 418. Among the railways which joined in the proposition at that time but which are known not to have signed the agreement made this week are the Chicago Bur-

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There May Be Some Good Arguments Against the Strike Injunction, But This Is Not One of Them

lington & Quincy, the Northern Pacific, the Erie, the Norfolk & Western, the Chesapeake & Ohio and the Chicago, Rock Island & Pacific. It is understood that at least one or two important lines which did not join in the proposition made in New York will sign the new agreement.

The list of roads that already have signed the statement has not been given out because the labor unions have authorized the heads of the labor organizations on the individual railways to present the plan to all of the individual railways for the purpose of getting as many railways as possible to accept it.

The Shopmen's Terms

The terms of settlement finally agreed upon are based upon the original plan offered by the 52 railways two weeks ago, although some important modifications have been made, for example the commission proposed in the plan adopted by the railways in New York to which was to be referred questions arising regarding relations of the men who returned to work to the strikers was to have been composed of representatives of the train service brotherhoods and the railways signing the agreement. Under the plan adopted at Chicago this commission will be composed of six representatives of the shop crafts' unions and six railway officers representing the roads signing the agreement. The text of the terms of settlement agreed upon in Chicago is in full as follows:

"First—In order to bring to an end the existing strike of employees upon the undersigned railroads and relieve the country from the adverse effects thereof and to expedite the movement of essential traffic the following memorandum of agreement is made upon the understanding which the parties hereto accept that the terms hereof shall be carried out by the officers of the companies and the representatives of the employees in a spirit of conciliation and sincere purpose to effect a genuine settlement of the matters in controversy referred to below. This paragraph does not apply to or include strikes in effect prior to July 1, 1922.

"Second—All men to return to work in positions of the class they originally held on June 30, 1922, and at that same point. As many of such men as possible are to be immediately put to work at present rates of pay, and all such employees who have been on strike to be put to work or under pay not later than thirty days after the signing of this agreement, except such men as have been proven guilty of acts of violence which in the opinion of the commission, hereinafter provided for, shall be sufficient cause for dismissal from service.

"Third—The relative standing as between themselves of men returning to work and men laid off, furloughed or on leave of absence, including general chairmen and others who were as of June 30, 1922, properly on leave of absence, will be restored as of June 30, 1922, and they will be called back to work in that order.

"Fourth—If a dispute arises as to relative standing of an employee or if any other controversy arises growing out of the strike that cannot be otherwise adjusted by the carrier and said employee or the duly authorized representatives thereof, the matter shall be referred by the organizations parties to this agreement, the employees or the carrier in the interest of any employees who may be aggrieved, to a commission to be established and constituted as hereinafter provided for final decision by a majority vote.

"Fifth—The commission referred to in Paragraph 4 hereof shall be composed of six representatives to be named by the chief officers of the organizations parties hereto and six railroad officers or representatives selected from and by the railroads agreeing hereto. This commission shall be constituted within fifteen days from the signing of this agreement and shall have jurisdiction to decide all cases that may properly be referred to into or before May 31, 1923, but not thereafter.

"Sixth—Inasmuch as this agreement is reached for the purpose of composing in a spirit of compromise this con-

troversy, all parties hereto agree that neither this settlement nor any decision of the commission above provided for, shall be used or cited in any controversy between these parties or between the railroad signing the same or any other class or classes of their employees in any other controversy that may hereafter arise.

"Seventh—Both parties pledge themselves that no intimidation nor oppression shall be practised or permitted against any of the employees who have remained at work or have taken service or as against those who resumed work under this understanding.

"Eighth—All suits at law now pending as the result of the strike to be withdrawn and cancelled by both parties."

National Settlement Plan Abandoned

It will be noted at once that the decision of the labor leaders to offer this plan of settlement to all the railways and to make settlements with the individual railways which will accept it involves final abandonment of their stand in favor of nothing but a national settlement. It will also be noted that the men will be put back to work without the restoration of their seniority rights and that all questions arising concerning the relations between the present employees in the shops and returning strikers are to be referred to the commission which the agreement creates.

This latest "peace" movement was hinted at, announced and denounced in the press for several weeks, alternately affirmed and denied by almost everyone concerned and only reached a tangible stage when the convening of the "policy" committee of the Federated Shop Crafts at Chicago and the presence of certain railway executives in Chicago immediately prior to this meeting left little doubt as to the existence of some sort of a plan for the partial settlement of the strike. However, even after it became generally known, all of those who might know something of the details refused to talk for publication with the result that many and varied rumors were circulated. There were so many "guesses" in the press as to the terms of the new plan, the whereabouts of the leaders of the negotiating factions and the railroads involved, that it was not until September 13 that reliable information was available.

Warfield Started Conference Which Brought Settlement

The conferences between a few railway executives and B. M. Jewell which resulted in the shop crafts' "separate peace" agreement were begun by S. Davies Warfield, president of the Seaboard Air Line, on September 2. In an interview given out on September 13, Mr. Warfield reviewed the negotiations as follows:

"At the meeting of the Association of Railway Executives, at which the resolution was passed breaking off negotiations for the settlement of the strike, I cast the four votes of the Seaboard Air Line against the resolution to leave a way open for direct contact with the shopcrafts leaders. It seemed to me unwise to close the door for the settlement of this strike at a time of great business and world-wide unrest. I was not convinced that the whole country must be made to suffer because of exaggerated views of the difficulties respecting new men who had accepted employment during a strike.

"After this meeting, negotiations continued between the brotherhood mediators and a small committee, headed by Daniel Willard, representing fifty-two railroads, the Seaboard being one. This failing in result, I was in position to meet and did meet Mr. Jewell the same day, and reopened negotiations directly with him and his associates. I urged dealing with individual roads, pointing out to Mr. Jewell that he could not defend a position based on declination to negotiate with railroads in position to settle on an acceptable basis simply because other railroads declined. Mr. Jewell stated he would consult his associates and decide whether they could proceed on the basis we discussed.

"Mr. Jewell, with two associates, met me in Baltimore on Sept. 2; we reached a tentative understanding. I then asked A. H. Smith, president of the New York Central Lines, if he would meet these gentlemen, and later communicated with Daniel Willard, president of the Baltimore & Ohio Railroad, who was out on his road. The presence of Mr. Smith, who came to Baltimore on two occasions, contributed largely to the result. After the conference with Mr. Jewell, and later with members of his Executive Council of Eight, an agreement was reached acceptable to the three railroads represented and to the shop crafts leaders. Other railroads, called over the telephones, tentatively agreed to go along on the same lines. The negotiations were closed on Sept. 5. Mr. Jewell called a meeting of the Policy Committee of the railway employees department to take action, Mr. Willard undertaking to present the conditions of settlement to a number of railroads. We found Mr. Jewell and his associates desirous of a fair and reasonable settlement of the existing differences.

Strained Relations Unfortunate

"Continued strained relations between the railroads and their employees is very unfortunate. If not permanently relieved, Government operation is likely to ultimately result. The newspapers announce that a cabinet officer, Mr. Hoover, and Interstate Commerce Commissioner Aitchison, in charge of car service, are to confer with the anthracite coal operators to determine with respect to priority orders to govern the transportation of coal. With labor troubles on the one hand, and on the other the government now largely directing railroad operation, the outcome is not encouraging. If the railroads cannot themselves settle disputes with their own employees and determine among themselves what is to be done in respect to the hauling of coal to care for the nation's needs without the necessity for the issuance of orders by a government agency, where will we finally land?

"Regional railroad labor boards should be properly and promptly established. A board should be named by each group of railroads that operate in each of the four rate-making districts into which the commission has divided the country; the men of each group of railroads also to organize boards to confer with the regional railroad boards. Negotiations could be successfully carried on and disputed questions settled if approached in good faith.

"The ill effects of this strike have not been confined to the railroads. Judge Gary made a 20 per cent increase in the wages of steel employees to prevent them from accepting employment with the railroads which were advertising for them. Having occasion to confer with officials of a number of car manufacturing companies now building cars for the railroads, I found that a number of shops were nearly closed down; in others, labor difficulties caused increases in wages from 20 per cent to 33 per cent to hold their men, many leaving to take employment in railroad shops. Column upon column of newspaper advertisements by railroads for men told the story. This could not continue without serious disruption for the industrial labor structure. A shortage of equipment through a continuance of the shop crafts strike has thus been augmented by the failure of car manufacturers to deliver cars because the railroads have been taking their men, an apt illustration of the 'vicious circle'"

Lull in Violence One of Week's Developments

Probably as a result of the insistent "peace" talk of the past week and the militant entry of the government into the controversy, there has been a lull in the violence which has heretofore characterized the strike. However, reports still continue to be made of the bombing of railroad property and workers' homes, the burning of bridges, the attempted wrecking of trains and numerous riots and similar disturbances directed at the intimidation of loyal or new employees.

Bombs or dynamite were used during the past week in attempts to destroy the track of the Chicago, Milwaukee & St. Paul near Perry, Ia., an Atchison, Topeka & Santa Fe bridge near Verdemont, Cal., a Southern Pacific train at Los Angeles and homes of two Missouri, Kansas & Texas shopmen at Parsons, Kan., two New York Central shopmen at Ashtabula, Ohio, and a Rock Island shop foreman at Valley Junction, Iowa.

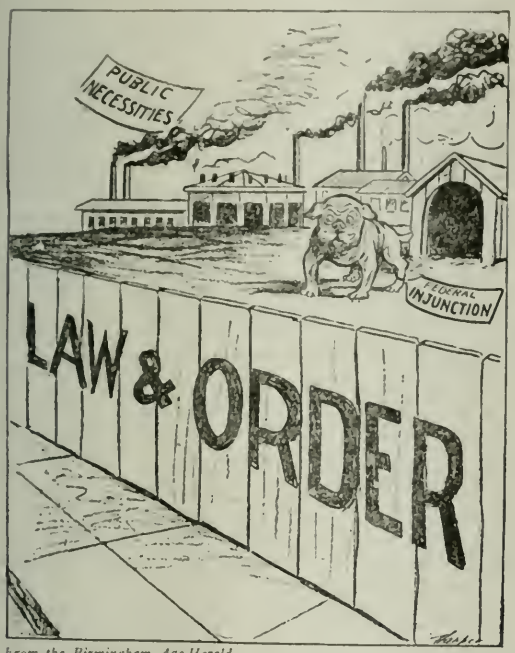
An attempt to wreck a train was likewise reported from St. Charles, Mo., on the Wabash.

The burning of bridges, a form of violence in particular favor with strikers and their sympathizers in the southwest, continued with reports of two instances of this character,

one on the Midland Valley at Bixby, Okla., and the other on the St. Louis-San Francisco at Altus, Okla.

Rioting in which loyal or new employees, railroad guards, strikers and strike sympathizers were involved were reported during the past week from Parsons, Kan., Chicago, Galesburg, Ill., Terre Haute, Ind., and Ft. Worth, Texas. At Parsons, Kan., it became necessary to call upon state troops to patrol railroad property following the disorders at that point and after an investigation disclosed that strikers had been hired as deputies.

With the granting of injunctions throughout the country restraining the strikers from interfering with the operation of trains, court actions have been numerous and in the



From the Birmingham Age-Herald

He'll Not Bite You, If You Stay on Your Side of the Fence

majority of cases unfavorable to the strikers involved. At Memphis, Tenn., four men were indicted by the grand jury for killing a Frisco employee and according to reports from that point have confessed to many other acts of violence in that territory. At Roodhouse, Ill., the scene of considerable trouble during the past three weeks, eight strikers were indicted by the grand jury for an alleged assault upon a Chicago & Alton roundhouse foreman at that point. At Oklahoma City federal operatives have announced an investigation of acts of violence in Oklahoma, particularly the destruction of bridges and other attempts to interfere with the operation of trains. In many cases former employees have been convicted of violations of federal injunctions and sentenced to prison terms.

Maliciously Derailed Says I. C. C. Report

The Interstate Commerce Commission has issued the report of its Bureau of Safety on the derailment at Gary, Ind. on the Michigan Central, August 20, when an American Express (merchandise) train was maliciously derailed, resulting in the death of the engineman and fireman. As heretofore reported, the cause was malicious removal of spikes, of which 30 had been withdrawn from the ties on the outside of the left rail. The spike holes were in no way distorted nor were the spikes bent. No evidence was found of any dragging equipment nor of any fault in the track nor the locomotive. No tools had been taken out of the trackmen's tool house although it is plain that the spikes had been drawn with a claw bar.

Dynamite Lehigh Valley Reservoir

A large reservoir of the Lehigh Valley Railroad near Packerton, Pa., was damaged by an explosion of dynamite on the night of September 6, and its contents, many millions of gallons of water, run off. The reservoir was one of ten acres extent, averaging 22 ft. in depth. The railroad police at once began searching for men suspected of having stored dynamite near the scene of the outrage.

Saving the Strikers "Spotless Record"

At Asheville, N. C., on September 9, three striking shopmen of the Southern Railway were each sentenced to seven years' imprisonment, having been found guilty of abducting one of the new employees, age 19, and beating him with whips. On September 8, in the Federal Court at Richmond, Va., two strikers, charged with violating the injunction against improper interference with new employees, were let off by Judge Groner, the judge saying that he "did not wish to mar the spotless record" which had thus far been maintained by the strikers in his district. But, he told the accused men to leave the state.

Sermon Alleged to Violate Injunction

A clergyman, pastor of a church at Quincy, Ind., is among the persons complained of in an application made before the court by the Chicago, Indianapolis & Louisville last week, naming alleged violators of the injunction against illegal encouragement of strikers. It is charged that the clergyman, in a sermon in his church, said that he was a union man and that no man had a right to take a job that a union man had vacated; also, that he told one of his congregation, who worked for the railroad company, that he ought not to do so.

Recruiting Continues

Railroad shop forces continue to increase, by the return of strikers to the service and by the employment of new men. Net gains by days are reported by the Association of Railway Executives as follows:

September 1	2,419	September 7	4,124
September 2	1,114	September 8	4,601
September 4	3,317	September 9	2,922
September 5	2,927	September 11	4,170
September 6	4,400		

The Strike Situation in Chicago and the West

Despite the widespread talk of peace in the shopmen's strike, conditions in the shops of the Western lines have continued to improve during the past week, both in the number of men at work and in the quantity and quality of the work turned out by the existing forces. A general picture of conditions on the western roads was painted by the Western Presidents' Committee on Public Relations of the Association of Railway Executives when it said on September 10:

The best evidence regarding the strike situation on the railways is afforded by the steady increase in the number of men employed in the shops and the large volume of business being moved.

The number of men employed in the shops of the western railways had increased on September 8 to 103,870, or 65 per cent of the number before the strike began. How steadily and rapidly the number of men at work has increased is shown by the following figures:

On August 1 the number of employees was 58,073, or 36.5 per cent of normal. On August 15 it was 76,886, or 49 per cent of normal; on September 1 it was 96,593, or 61 per cent of normal,

and since then the increase has been 7,283 men, making the present force 65 per cent of normal.

The volume of freight now being moved by the railways of the United States is approximately as large as in the same part of the year 1920, when it was the largest in the history of the country. The total carloads moved in the week ended August 26 was 890,838, which was 62,000 carloads larger than in the same week of 1921, and 38,487 more than in the first week of August. Since the week ended August 26 there has been such a large increase in the amount of coal moved that, as already stated, the total traffic now being handled is about equal to the record business of 1920.

On September 14 the Western Presidents' Committee on Public Relations called attention to the fact that "the number of carloads of freight moved for the week ended September 2 was only 9 per cent less than the largest number ever moved in any week in history which was in October, 1920," adding,

"The number of men employed in the shops of the western railroads on September 13 was 109,513 or 69.3 per cent of the number employed before the strike began. This was an increase of almost 5,643 men since September 8."

Embargoes Declared in East as Anthracite Mines Open

Congestion already developed, together with the prospect of much heavier traffic when anthracite mining, resumed this week, reaches normal, has resulted in embargoes on a number of Eastern roads. Of these the Lackawanna, the Lehigh Valley and the New York Central have placed restrictions only against traffic not ordinarily moving over their rails. Their embargoes are designed only to prevent diversion of traffic from other roads. The Baltimore & Ohio has embargoed all traffic received from connections and originating at points in the mining regions, excepting food, fuel and kindred commodities. Certain exceptions to the embargoes of the Baltimore & Ohio and the New York Central will be allowed under the "permit" system. The embargoes of the New York Central, the Lackawanna and the Lehigh Valley do not cover food or fuel except Pacific Coast perishables which do not under normal conditions move over their lines.

The Erie, however, has gone a step farther. It, too, has closed its lines to traffic diverted from other roads and, in addition, has embargoed Pacific Coast fruit and vegetables shipped after September 10 for points east of Hornell, N. Y. The Erie has practically a monopoly in the handling of this business to the New York market and, furthermore, receipts of fruit and vegetables from the Pacific Coast in this market are running in excess of 25 per cent of the total. Consequently, the prospective loss of these commodities has caused considerable concern in New York. The embargoes of the New York Central, the Lehigh Valley and the Lackawanna, as noted above, prevent the turning over of any of this business to them.

Endeavor to Get Pennsylvania to Take Over Traffic

The marketing of Pacific Coast perishables in New York is built up around the Erie's piers 20 and 21, North river. There the goods are unloaded and there they are auctioned off to buyers. The diversion of this traffic to the terminals of other roads would disrupt this market and, accordingly, the Erie has offered the use of these piers free of charge except for labor to any road which will take over this traffic. At a meeting on Wednesday afternoon between representatives of the Fruit and Produce Trade Association and officers of the Pennsylvania, this company expressed its desire to do everything in its power to handle the business. Definite details of just what the road could offer, however, were not decided upon and a committee from the railroad and the produce association was chosen to consider the matter again on Friday. Corporation Counsel O'Brien representing the City of New York, attended the Wednesday meeting.

There has been some adverse comment concerning the declaring of these embargoes, particularly that of the Erie against Pacific Coast perishables. City officials of New York have interested themselves in the matter and unless some other road will agree to take over this business it seems likely that shippers and produce dealers, aided perhaps by New York City officials, will lay their case before the Interstate Commerce Commission. Roads which handle this business from the Pacific Coast to Chicago, also, will doubtless be interested in whatever solution is arrived at.

The New York Central's Statement

The statement of the New York Central relative to its embargo follows:

The embargo is made necessary as a precaution against the overcrowding of our lines, yards and terminals by accumulations of freight due to abnormal diversion from connections unable to handle it, which roads already have embargoes in force. The "permit system," whereby shippers may apply to the freight traffic manager at Chicago or the general freight agent at New York and secure authorization for the movement of shipments, will give control calculated to afford the utmost protection to regular business and exclude temporary diversions which might cause congestion and, consequently, reduction of the very heavy tonnage handled promptly during the past 60 days.

The embargo covers all freight, carload and less than carload, originating beyond the rails of the New York Central System's roads, from connections at Clearfield, Pa.; Buffalo, N. Y.; East Buffalo, N. Y.; Gardenville, N. Y.; Black Rock, N. Y.; Suspension Bridge, N. Y.; from Niagara frontier stations or junction points west thereof, destined to points east via the New York Central Railroad. The various roads of the New York Central System, including the Boston & Albany Railroad, the Michigan Central Railroad, the Cleveland, Cincinnati, Chicago & St. Louis Railway, the Pittsburgh & Lake Erie, The Toledo & Ohio Central, the Indiana Harbor Belt Railroad, the Chicago Junction Railroad, and their constituent lines, are not affected in the loading of their regular business.

The exceptions to the embargo comprise: Food for human consumption, live stock, food for live stock, perishable products, coal, coke, fuel oil, petroleum products, railroad material, freight consigned to offices of the United States government, newsprint paper, fertilizer, food containers and shipments restricted by the embargo when they are covered by permits issued by W. A. Terry, freight traffic manager, Chicago, Ill., and G. C. Woodruff, general freight agent, New York City.

Shippers in territory served by the New York Central Lines, including New England, will appreciate that this embargo is for the protection of regular traffic which has been moved with promptness in increasing quantities during recent weeks and that the embargo is calculated to safeguard operation against disturbances or temporary heavy diversions from other roads.

Whatever may be the general opinion about these embargoes, there can be no doubt but that traffic conditions justify some such steps. The way perishable and live stock traffic is being handled may be taken as an index to general conditions and, according to information received from official sources, this business is not moving according to schedule—at least into New York City.

Anthracite Mining Resumed

The first trainload of anthracite coal to reach New York since the resumption of mining in the anthracite fields came into the Lehigh Valley's terminal at Perth Amboy, N. J., early Tuesday morning. The mine operators seem to be having some difficulty in reassembling their forces in spite of the termination of the strike. Many strikers, it is reported, have since the cessation of mining drifted into other lines of work and not a few have returned to their homes in Europe. Then, too, the mines and breakers have not been kept ready for instant use during the period of the strike and some days will be required before this condition ceases to be a retarding factor. It is not thought that maximum production of anthracite coal can be reached for a week or two.

Legal Battle Over "Daugherty Injunction" Opens

Shopmen Lose Fight to Have Restraining Order Dismissed—Government Attitude Unchanged

THE LEGAL BATTLE over the now-famous "Daugherty injunction" opened on September 11 in the courtroom of Federal Judge James H. Wilkerson at Chicago. The temporary injunction, granted to Attorney-General H. M. Daugherty on September 1, was continued by Judge Wilkerson for 10 days and the motion of Donald R. Richberg, counsel for B. M. Jewell, president of the Railroad Employees Department of the American Federation of Labor, that the temporary injunction be dismissed was denied. Attorney Richberg had attacked the legality of the government's action in seeking the restraining order and had directed many of his remarks at Attorney-General Daugherty, whom he charged with betraying the court.

While Judge Wilkerson did not pass finally upon the Richberg motion to dismiss the injunction, he did intimate that he did not intend to comply with this request. The language the judge used was that he was "not satisfied that the bill (the government petition) fails to state a ground for any relief." The judge indicated however that he would hear additional argument on the motion later.

In extending the temporary injunction for 10 days, Judge Wilkerson did not attempt to pass upon the merits of the contentions of either the government or the defendant. The injunction would have expired at midnight if he had not acted.

Following the denial of the union attorney's plea for dismissal, Blackburn Esterline, assistant solicitor-general, continued with the government's fight to make the temporary injunction permanent. He presented three documents to the court. One was Decision 1036 of the Railroad Labor Board. The second was a general history of the strike, and the third an affidavit from Chester J. McGuire, secretary to one of Attorney-General Daugherty's aids. The affidavit contained a series of depositions taken from secret agents employed by the government, each of which depicted the alleged connection between the strike of the shopmen and various acts of violence, including murder, arson and sabotage of railroad property.

In the depositions offered by the government attorneys in support of their request that the injunction order be made permanent, 18 cases of murder, 44 assaults, 17 derailments, dynamitings, and burning of bridges, together with a list of various acts of sabotage and depredation covering 26 pages were recited.

After Attorney Esterline's recital of the acts of violence, a motion to strike the affidavit from the records was made by Frank L. Mulholland, another attorney for the labor leaders named in the injunction. He characterized the affidavits as "mere rumors." Judge Wilkerson reserved his decision on the point until all the testimony had been given in support of the affidavit, adding that mere heresay was not regarded as evidence.

A letter signed by the Postmaster General was also introduced by Attorney Esterline in which it was stated that 953 mail trains had been withdrawn since the start of the strike and that mail service on 82,912 miles of railroad had been adversely affected.

Labor Attorney Argues for Dismissal of Injunction

Mr. Richberg submitted four points in support of his contention that the restraining order should be vacated. These were:

1. The government erroneously assumed the strikers violated law when they declined to abide by decisions of the Labor Board.
2. The open shop issue, cited as an important reason for seeking an injunction, is not one to be dealt with by the Department of Justice.
3. Federal courts have held that strikers have a right to attempt to recruit their ranks from among non-union workers.
4. The government failed to establish an unlawful conspiracy on the part of the strikers, as alleged in the injunction.

At the opening of the court's session Attorney Richberg was given permission to argue his motion for dismissal of the temporary injunction ahead of the government's petition for making the injunction permanent. He attacked the order as unconstitutional and unjustified, then made his speech denouncing the attorney-general.

After the court had ordered him to confine his remarks to the law in the case, Mr. Richberg proceeded to sketch his argument. Essentially, he said, the temporary injunction is based on the allegation that the officers of the shop crafts conspired to obstruct railroad transportation, and this allegation is based in turn on the presumption that the crafts are bound by law to obey the decisions of the Labor Board. Such a presumption, he said, is unjustified.

"Not only is there nothing to that effect in the Transportation Act, but if there were such a clause it would be unconstitutional," he continued. "Even if the Board's decisions were legally binding they could not be used to prevent the workers from withdrawing from service."

In support of this argument he quoted Senator Cummins, Representative Esch, and President Harding to the effect that "there is nothing of an anti-strike nature in this law."

Attorney Richberg called the court's attention to the public statement made by the attorney-general at the time of the temporary injunction, in which Mr. Daugherty asserted his purpose to fight "for the open shop."

"The attorney-general has no right to use the power of the government to fight 'for the open shop'," Mr. Richberg said. "Whether the open shop or the closed shop prevails is entirely outside the province of the attorney-general. It is a question which only the legislative branch of the government can pass on if it comes under the jurisdiction of the government at all."

The injunction fails to show, Mr. Richberg argued, that the shop crafts leaders conspired against the law. It simply calls their association "an unlawful combination," he said, without adducing proof. In fact, the combination is lawful, he continued, and not ground for court action.

Denying the existence of such a conspiracy by the railway unions and demanding that Judge Wilkerson vacate the injunction, Attorney Richberg built up his defense on the grounds that the government had failed to make a case against the unions, that the injunction is in violation of the Clayton Act and that it was obtained through misrepresentation for "ulterior and unlawful" motives.

Concerning the sabotage charges Attorney Richberg said, "The position of the shop crafts regarding vandalism or any acts of violence in connection with the strike has been repeatedly stated from time to time since the inception of the walkout. The railway unions have not only agreed that perpetrators of any violence in connection with the strike should be harshly punished but they also have sought to

co-operate with the proper authorities to prevent any illegal acts. The union leaders have time and again warned the membership against any lawlessness."

The usual number of legal citations were given by Attorney Richberg to sustain his contentions, the Clayton Act in particular being used frequently.

The first shot in the union's fight against the injunction came on September 9 when a motion to vacate the government's temporary restraining order against the shop crafts' union, so far as it applies to Mr. Jewell, and John Scott, secretary of the Federated Shop Crafts, was filed in United States District court. The action was begun by Attorney Richberg and was based on three general allegations, namely:

(1) That the complaint has not in and by its said bill made or stated such a case as entitled it in a court of equity to any relief against the defendants as to the matters contained in said bill, or any of said matters.

(2) That the relief prayed for in said bill, and granted in said restraining order, is that relief which, under the provisions of the act of Congress commonly known as the Clayton Act, no court of the United States, or judge, or the judges thereof, is permitted or empowered to grant.

(3) That relief was sought in said bill and was obtained in said restraining order for ulterior and unlawful purposes upon misrepresentation and suppressions of matters of fact and law, the disclosure of which was required by good faith.

Government Discloses Sabotage and Conspiracy Data to Be Used in Trial

Details of the government's sabotage and conspiracy charges against the striking shop crafts were made public in a statement given out on September 11, disclosing the line of the government's testimony in the affidavits which will be presented to Judge Wilkerson during the injunction hearing. The statement said in part:

Since the commencement of the present railroad strike acts of depredation have been committed in practically every state and judicial district in the United States. The efforts of the perpetrators are concentrated upon the two ends—destruction and intimidation. The means to attain these ends are almost indescribable. In fact, one must believe that anything suggested to the imagination of the vandals of their conspirators was immediately put into effect.

The venom of the participants in this strike has not ceased with ordinary assaults, bombing, dynamiting, wrecking of trains, or minor depredations, but has been in many instances satisfied only with the taking of human life.

At least 25 murders have been reported. Many have indirectly met their death or been fatally injured through strike causes, and these results were not confined solely to those opposing the views of the shopmen now on strike. Many were men, women, and children whose only purpose was to travel from one point to another, sometimes because of necessity and sometimes for pleasure, but always with no thought of entering into the controversy.

In or about Needles, Cal., on the Sante Fe system, twelve trains were abandoned in the desert. Hundreds of passengers, men, women, and children, some 90 years of age and some as young as one day, and many sick, were required to live in almost unbearable heat for periods varying from one to four days.

It has become necessary to appoint approximately 5,500 United States deputy marshals to assist in the protection of interstate commerce and the United States mails. Approximately 950 mail trains have had to be discontinued; several roads have been compelled to discontinue trains in order that coal orders might receive priority, and many roads have placed embargoes upon perishable products. During the trouble in northern and southern California, it is estimated $75,000,000 damage was caused by inability of the carriers to transport fruit ready for market.

Dynamiting, bombing, setting fire to railroad property and bridges are a few of the most dangerous means adopted against the railroad companies.

Many derailments have occurred. The general scheme adopted has been to remove spikes from the tracks, often on curves, causing them to spread when subject to the pressure of a train.

The throwing of sticks of dynamite and bombs have come to be more than daily occurrences. At least 100 sticks of dynamite have been used and over 30 bombs thrown. Many of these were not destined for railroad property, some being thrown at workers, and others have exploded on and about their homes and sleeping quarters.

Switches have been tampered with. Several times, with a clear track showing, trains have run into cars on sidings, blocking tracks and causing considerable damage.

It would be almost impossible to enumerate the various assaults which have been perpetrated. Whippings were resorted to in practically every instance where strikers were able to lay their hands upon those whom the railroads have secured to take their places. When they could not be apprehended, stones were thrown at them. Pepper was sometimes thrown in the faces of women accompanying them. Shots were fired, and other acts, equally as detestable, were indulged in. Tarrings and featherings are included in the list, and in many cases.

The statement specifically named a large number of instances of the character mentioned. Practically all of these outbreaks have been described in previous issues of the *Railway Age*.

When hearings were resumed the following day, Attorney Richberg said, "I request that the attorney-general be required to explain who gave out this statement. It is nothing short of criminal libel. If any ordinary citizens were to make public such a statement, they would be liable to prosecution for defamation of character. I think the attorney-general should explain."

There was no reply and finally Mr. Esterline proceeded with his case, offering evidence supporting the contention that the shopmen's strike is in effect a gigantic conspiracy against interstate commerce.

The Government's View of the Effect of the Shopmen's Strike

He read from reports by the secretary of agriculture purporting to show how the shopmen's strike had handicapped the transportation of the country's winter coal supplies and the bumper crops. In an affidavit which was read to the court, Secretary Wallace said that a questionnaire sent by the Department of Agriculture to 16,000 farmers and small-town retailers showed a coal famine in prospect as a consequence of the railroad strike. Farming sections generally have only one-fourth of the required supply of coal, the affidavit said, and crop movements have been hampered as well.

Shop statistics prepared by the Interstate Commerce Commission were then offered in evidence. These statistics showed that of 6,170 locomotives inspected by agents of the Commission in August 4,355 were defective and 465 were being operated in violation of safety regulations. Eighty-six accidents, through which four persons were killed and 94 injured, occurred in August because of bad-order equipment, according to the report. In July the Commission inspected 3,029 locomotives and found 2,383 of them defective, 165 to such an extent that their operation was in violation of law. Locomotive withdrawals in July were 3,608, the report showed and 7,506 locomotives were inactive throughout the month.

Supplementing these figures were more complete statistics from the American Railway Association. Bad-order freight cars increased in number through July and August as follows:

	No. cars	Per cent of total
July 1	325,583	14.3
July 15	342,079	15.1
August 1	345,013	15.2
August 15	335,575	14.8

Bad-order locomotives, the American Railway Association report showed, increased in number as follows:

	No. locos.	Per cent of total
July 1	13,896	22.5
July 15	15,347	24.7
August 1	17,569	28.5
August 15	18,698	30.3

After getting these figures before the court the government attorney began reading numerous affidavits from victims of strike violence.

Several days were consumed by Mr. Esterline in the reading of affidavits made by witnesses to various instances of

violence and sabotage. The indications at the time this is written are that the government will require at least a week and perhaps longer to present its case against the shop crafts leaders and that the legal controversy will continue for some time.

Administration Officially Taking No Part in Strike Settlement

WASHINGTON, D. C.

REPORTS THAT negotiations with individual roads were in progress were confirmed at the White House on Friday, when it was stated that while the administration was doing nothing officially, the President was aware of what was going on and would be glad to see results ensue. It was stated that the matter was in the hands of a good many people, including railroad people and the shop crafts leaders and that it would not be proper for the President to discuss the subject until after settlements were reached.

Attorney General Daugherty also issued the following statement:

The government is not a party to any negotiations between the railroads and the employees, if any are in progress. The suggestion that such negotiations would be interfered with by the temporary restraining order granted by Judge Wilkerson is in my judgment wholly unjustified.

The only concern of the government is industrial peace and the restoration of transportation. Any conference between the railroad executives and their former employees to adjust their grievances is in the interests of industrial peace and would not find any obstacle on the part of the government. The government would not contend that either party to the controversy was denied by the temporary restraining order, any right or opportunity to confer between themselves and to the possible terms of such settlement.

The government is not a partisan in this labor controversy. It champions neither the employers nor the employees; their differences are for them to adjust. The government is, however, vitally concerned in the restoration of industrial peace and any movement that seeks to adjust the unhappy differences between employers and employees will not only find no obstruction from the government but will have its sympathy.

Union Tries to Enjoin Daugherty Injunction

An unsuccessful effort to enjoin the enforcement of the temporary restraining order obtained at Chicago on September 1 by the attorney general was made in Washington on September 7 by the International Brotherhood of Electrical Workers, one of the striking shop crafts, James P. Noonan, its president, and Charles P. Ford, its secretary, who filed in the Supreme Court of the District of Columbia a petition for the issuance of an order restraining the United States attorney and the marshal for the district from serving the injunction issued by Judge Wilkerson at Chicago or from enforcing its provisions in any way to interfere with the holding of union meetings or the conduct of the strike. The petition asserted that the injunction had no effect outside the jurisdiction of the Chicago court and that Judge Wilkerson had no authority to issue it. Following a brief proceeding on Saturday morning Justice Bailey issued an order temporarily restraining the marshal from interfering with meetings of the union, which he had not attempted to do, or from doing anything outside the scope of the Chicago injunction, pending a hearing on Friday of this week on a motion filed by the government to dismiss the bill of complaint, but denied the order requested without prejudice to a renewal of the application after the Chicago hearing on Monday.

Messrs. Noonan and Ford were served with notice of the Chicago injunction shortly after they had filed their petition; and the district attorney in his motion denied the jurisdiction of the District Supreme Court to interfere with the service of an order from a federal court of competent jurisdiction. He also prevented the hearing, sought by the attorney for the union on Saturday morning, by asking for time to present his motion to dismiss, arguing that a full remedy was available to the plaintiffs in Chicago on Monday.

James S. Easby-Smith, who represented the union, made a lengthy argument in support of the application, saying that threats to interfere with the orderly meetings of the strikers had been alleged against Marshal Snyder as well as other acts claimed to be in excess of the scope of the injunction order, even if it were valid. The government's attorney argued that the bill of complaint alleged no fact showing that the district court for the northern district of Illinois was without jurisdiction to enter the order and that the District of Columbia Court was without jurisdiction to modify or review an order duly entered by that court.

The petition for a restraining order recited instructions issued by the union to its members to prevent disorderly acts and asserted that neither the union nor its members have, to the knowledge of the plaintiffs, committed any unlawful acts incident to the strike and if any such acts were committed they were contrary to the instructions. It asserted that the Chicago injunction was issued "without warrant or authority of law or equity" and that under it the marshal for the District of Columbia had threatened to prevent the holding of peaceable and lawful meetings of men on strike.

Impeachment Charges Referred to Committee

Representative Keller of Minnesota presented impeachment charges against Attorney General Daugherty in the House on September 11, demanding his removal from office for alleged infractions of the Constitution, apparently in connection with the injunction proceedings, by abridging freedom of speech, freedom of the press and the right of people peaceably to assemble, and by "using the funds of his office in the prosecution of individuals and organizations for certain lawful acts which, under the law, he was specifically forbidden to prosecute." A resolution which the Representative introduced was referred to the Judiciary Committee, which is expected not to take any immediate action.

A bill to abolish the Railroad Labor Board and create in its place a board of five members to be appointed by the President and also to penalize strikes and lockouts was introduced in the House on September 11 by Representative Hoch of Kansas. The bill would encourage voluntary settlement of disputes without resort to the board, but would give full power of determination to the board where disagreement threatens to disturb transportation.

On receipt of private advices from Chicago indicating the adoption of the so-called Willard-Jewell plan for individual settlements of the strike on certain roads, but before news has been received indicating the extent or the definiteness of the settlements, Secretary of Labor Davis gave out a statement on Wednesday afternoon, apparently based on the assumption that this meant the complete settlement of the strike. He said in part:

"American industry has overcome the last obstacle in the way of the greatest economic revival the nation has ever known. With the settlement of the strike of 400,000 railroad shop craftsmen assured, the whole industrial machinery of the country is ready for a forward movement unprecedented in our economic history. The disturbances in the bituminous and anthracite coal mining industries are in the past and the 600,000 miners are at work." The secretary did not state whether he meant that a partial settlement of the strike was sufficiently satisfactory or whether he meant that the strike was already over on a majority of the roads without any settlement.

THIRTY STEAM LOCOMOTIVES, valued at $278,167, were exported from the United States in May, 1922. Of these 21, valued at $206,107, went to Brazil.

The Public and the Coal Industry*

By Herbert Hoover
Secretary of Commerce

THE FAVORABLE progress of legislation for the creation of a National Coal Commission fully empowered to get to the bottom of the troubles in this industry is the first step in one of the most vital problems we have. I have been earnestly recommending such a commission for the last three years. There are two distinct lines of problems: the employer-employee relationship, and the economic reorganization of the industry.

The present relationship of employer and employee in the industry comprises a periodical national danger, because with national organization and national disagreement, it means national stoppage. Surely fair play can be obtained for employer and employee in our civilization without war on the public. We must discover the machinery by which fair play can be delivered to all sides. We must have continuity of production in this essential commodity under righteous conditions of employment if we are to maintain the welfare of the nation at all. Under freedom from the restraint of trade laws the workers' organizations have grown in strength, solidarity, and devotion; they have shown able leadership, whereas the organization of employers for the purpose of collective bargaining has been to a large degree destroyed by the action of these very laws. The recent agreement in the bituminous industry was determined by only 15 per cent of the employers.

The federal laws on conciliation have failed to obtain any results for peace. The organization of employers on a national basis is no remedy, for in such case, while collective bargaining might proceed more smoothly, the public could well take alarm that the costs of any bargain can be passed on to the consumer.

The public has rights as well as the employer and employee. It has a right to a continuous supply of its vital necessities and services upon terms fair to the employer and employee.

Aside from employee relationships, most of the economic demoralization lies in the bituminous, as distinguished from the anthracite, industry, and my discussion hereafter refers to bituminous alone. This industry, indeed, functions very badly. Some state glibly that it will work itself out if left alone. But it must be borne in mind that it has not been left alone in the past and the present situation is in large degree due to legislative interference. The control of combinations among operators without such restraint among employees, the rules of artificial car distribution, the state legislation of various sorts, and other acts have a great responsibility for the present condition. I am not here questioning the necessity of these measures, but their influence in the situation must not be overlooked and they must be either supplemented or amended by wise provisions, if we are to have coal peace.

There are 8,000 bituminous mines with an annual capacity of 850,000,000 tons, 300,000,000 capacity beyond our national needs. The over-capacity in the industry results not in the permanent closing of some mines but in the operation of all of them more or less intermittently. Thus the working personnel is held attached to each mine in daily hopes of employment. In the best year of their history the bituminous mines operated an average of only 249 days in the year, out of a possible 308, whereas in most years the average is about 210, as against about 295 days in England and over 300 days in Germany. Many bituminous mines are probably operating an average of less than 180 days in the year.

There are 2,500 too many bituminous mines and 200,000 too many people in the business. Investment in the industry is extremely speculative. Distribution costs are excessive. The operators vibrate between bankruptcy and high profits. And the public in ordinary times is paying far more for its coal than would be necessary from a stabilized industry. Labor is honeycombed with the worst of stimulants to unrest, insecurity of employment. At the same time, men who have the opportunity to work full time in regularly operating mines earn returns far above the average income of our most prosperous farmers and other workers.

The largest contributor to over-expansion of the industry is the almost regular biennial quarrel. Beyond this the non-union mines in the South, with a capacity of over 300,000,000 tons yearly, being able to secure a lower wage level than the union mines in the North, at times of sharp competition are enabled to under-sell northern coal, and are gradually causing the industry to migrate from the North to the South, with consequent over-equipment in the North.

Intermittent operation also arises in the chronic annual shortage of railway cars. A bad system of distribution of cars to mines by the railways contributes also. The fly-by-night operator has a right to demand his quota of cars in times of good demand and paralyzes the ability of the systematic mines to maintain regular operation. There is inadequate storage at points of consumption to take up slack from intermittent production. The marketing machinery itself creates intermittency because of the incessant shifting of contracts from one mine to another. Furthermore the high unit wage basis encourages absenteeism and thus at times an irregular supply of labor; there is a perpetual rain of small and local strikes, all directly and indirectly contributing to intermittent operation—for all of which the public pays.

Aside from relief from strikes and lockouts, there are proposals of practical remedies which should be investigated. For instance, an extra annual storage of 20 per cent of railway consumption would equalize the seasonal fluctuation. A system of car distribution that would not itself break into regular operation would help. Larger storage by public utilities would give greater security to the public.

A contributing remedy that will need the most earnest consideration is the possibility of permitting the cooperative system of marketing developed by the farmers to be applied by such mines as wish to adopt it. More accurate statistics of capacity, production, consumption stocks, and prices would greatly promote stability and would be in the true interest of the operators who are now blamed for much that is not their fault.

It has also been proposed, although I have doubt as to practicability, that there should be a penalty in higher wages for short-time employment. Proposals are also made for a basic wage with a participation in the realized price of coal.

Of dominant importance, however, is the fact that the whole employee and employer relationship requires reform. The instability of these employment relations themselves form a vicious circle of quarrels. The constant local violation of agreements, and the multitude of small strikes are themselves proofs that the industry needs better organization, and public participation with guarantees.

I recognize that, or anything that lends stability to the industry is opposed by a small minority of speculative operators who use the periodically disturbed production to reap a recurrent harvest. It would be opposed on the other side by some of the more narrow-minded labor leaders who seek to reduce the number of hours of actual labor to some minor fraction of the whole year. However, I believe that the constructive men on both sides are in full agreement that we must have a broader and better solution than results from the truces of the past few years. These periodic wars are symptoms of a disease. But before we treat this disease we must have a more accurate diagnosis.

*From an address before the Salesmen's Association of the American Chemical Industry, New York City, on September 12.

Dynamometer Tests of the Locomotive Booster

Severe Trials Demonstrate Reliability at Heavy Loads and High Speeds; Maximum Drawbar Pull 11,000 lb.

SINCE THE ADVENT of the locomotive booster, which was first applied early in 1919, numerous tests have been made in road service but up to this time little information has been available regarding the mechanical efficiency of the device or the power which it develops. While the results of actual operation can be studied best on the locomotive, it is necessary to test the booster independently if its performance as a machine is to be determined. With this in mind, the Franklin Railway Supply Company, New York, recently conducted a thorough dynamometer test of the latest type of booster. The purpose of the test, which was made under the direction of Dr. Harvey N. Davis, of

Fig. 1—The Test Plant, Showing Boiler (at left), Booster and Condenser

the Engineering School of Harvard University, was to determine accurately the ability of the booster to stand up satisfactorily under continuous heavy loading and operation at high speed, the power which the booster will deliver under varying conditions of speed and boiler pressure on a locomotive, the steam consumption per brake horsepower hour or drawbar pull under such conditions and the mechanical efficiency.

Description of the Booster Engine

The Type C-1 booster which was tested is a 10 in. by 12 in. double-acting two-cylinder engine with cranks set at 90 deg. Some of the important mechanical features of the design are as follows: The gear ratio between the booster engine shaft and the trailer axle is 14 to 36. The engine frame is designed to withstand the stresses imposed upon it with the minimum strain and the gear cover has been made an integral part of the casting. The bearings in the trailer axle boxes have been made larger and an oil tight case has been provided for the trailing axle gears, affording splash lubrication of these parts. The rocker design has been changed to relieve the bottom journals of all stress and stops have been so placed that the pitch circles of the gears are held in the proper relative position at all times. The engine case has been fitted with an oil tight cover which is easily removed and replaced. A new design of manifold for the live and exhaust steam has been applied at the rear of the cylinder with large cross section in the passages to reduce the steam velocity. A manifold has also been attached to the crank case to receive all air connections. The appearance of the booster is well illustrated in Fig. 1 which shows the machine connected to the dynamometer shaft with the cover of the crank case removed and the rear end elevated.

The Test Plant

The test equipment was designed especially for this test and for the routine test under load to which all boosters are subjected after assembling at the factory of the Poole Engineering & Machine Company, Baltimore, Md. The steam plant consists of a 250 hp. Heine boiler with a low temperature superheater and a feed water heater connected in parallel with and draining into the main condenser. The test bed carries a shaft and 18 in. gear, similar to a standard trailer axle gear, direct connected at one end to a prony brake. The steam pipe from the boiler to the test bed is fitted with a gage to show the inlet pressure and a thermometer to indicate the superheat, which ranged between 30 and 35 deg. F. in most of the tests. A second pressure gage is located about 30 ft. back from the inlet gage, the piping between duplicating that on a locomotive. Pressures read on this gage are called throttle pressures in the report and correspond to the boiler pressure on a locomotive.

The booster was operating on the test plant during four

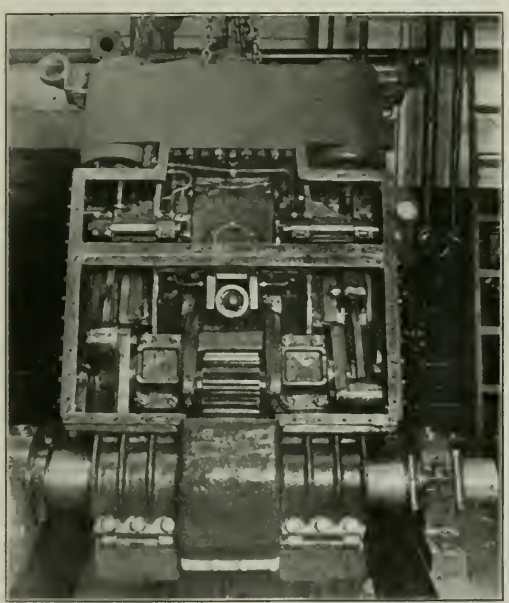


Fig. 2—Top View of the Booster, with Cover Removed

days under a wide variety of conditions ranging from stalling tests to high speed runs at 22 m.p.h. Some of the trials were made with the exhaust piped to the condenser to measure the steam consumption and others with the steam discharging to the atmosphere through 40 ft. of 4 in. pipe to duplicate roughly conditions on the locomotive. The tests represented an equivalent run of about 92 miles as of a 45 in. trailer wheel, most of which was made under heavy load.

During each of the tests the speed and boiler pressure were held as nearly constant as possible. Indicator cards were taken and records made of the speed, the brake load, steam pressure and temperature and steam consumption.

From the data thus obtained the details of the performance of the booster were determined as set forth in the following paragraphs.

Mechanical Efficiency

The mechanical efficiency of the booster, or the ratio of the power delivered at the rim of the trailer wheel to the power developed in the cylinders, is plotted in one of the curves on Fig. 3. It will be noted that it varies from 90 per cent at 6 m.p.h. to a maximum of 95 per cent at 14.5 m.p.h. dropping slightly at higher speeds. The mechanical efficiency of the booster does not change with the steam pressure over the limited range met with in practice.

These mechanical efficiencies seem very high but the explanation of the excellent results is to be found in the high efficiency of the gear arrangement, the effective lubrication and the unusually high mean effective pressure. A typical curve of the brake horsepower, which corresponds with the

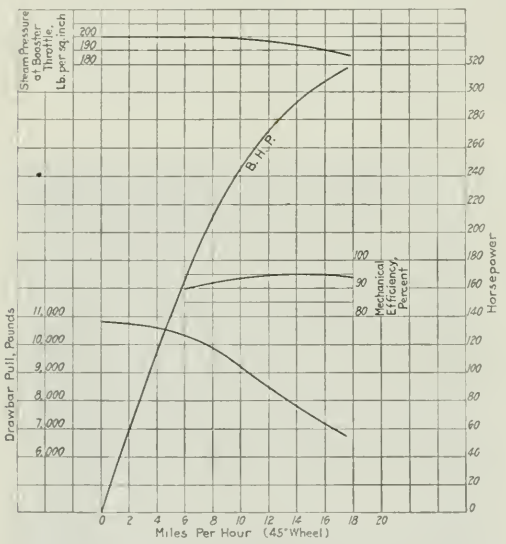


Fig. 3—Drawbar Pull, Horsepower and Efficiency of Locomotive Booster

power delivered at the trailer wheels, is also plotted in Fig. 3. The steam pressure dropped somewhat during this test and with a pressure of 186 lb. at the booster throttle at 17.8 m.p.h., 316 hp. was developed.

Tests showed that at any given speed with a given exhaust connection the brake horsepower is proportional to the gage pressure at the booster throttle but does not vary with superheat.

Drawbar Pull

A typical curve of the drawbar pull as obtained during the tests is shown in Fig. 3. For convenience in predicting the drawbar pull curve of the booster on any particular locomotive the chart of Fig. 4 has been plotted for speeds from 0 to 25 m.p.h. and boiler pressures from 140 lb. to 200 lb. gage.

In using this chart the pressure that can be maintained at various speeds by the boiler supplying the booster is estimated and the corresponding points are plotted on the chart, using the pressure lines as guides. A constant pressure equal to the boiler pressure of the locomotive can be realized over the entire speed range if the cut-off in the main locomotive cylinders is shortened enough at each speed to keep the steam consumption of the main cylinders and the booster cylinders within the limit of the capacity of the locomotive boiler. It will be noted that with 200 lb. pressure the type C-1 booster delivers a pull of 11,000 lb. at starting and at 20 miles an hour is still giving nearly 7,000 lb. at the drawbar.

Steam Consumption and Water Rate

To show the steam consumption of the booster under conditions identical with those plotted in Fig. 4, Fig. 5 has been

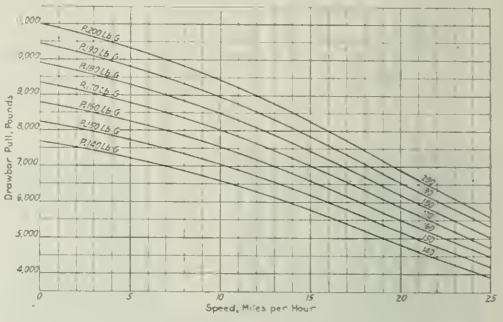


Fig. 4—Drawbar Pull Curves at Various Steam Pressures

drawn. The values given by this chart are based on superheat of 30 deg. F., the average value during the tests. The steam consumption is assumed to decrease about one per cent for each 6 deg. F. increase in throttle superheat. If saturated steam were used the consumption would be approximately five per cent greater than shown and if highly superheated steam were used, the values would be materially less.

The water rates as determined from the tests varied from 40.8 lb. to 43.4 lb. per brake horsepower hour. These rates

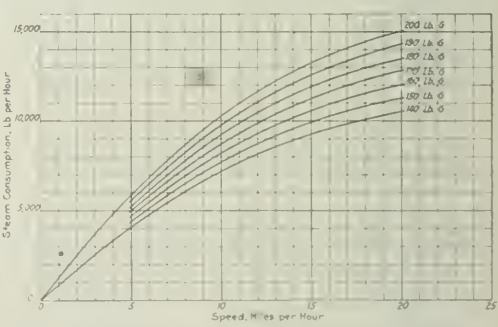


Fig. 5—Steam Consumption at Various Boiler Pressures

are, of course, subject to the same variation due to superheat as the steam consumption shown in Fig. 5.

Application to Operating Conditions

The manner in which the data obtained in the test can be used to determine the performance of the booster in actual service is illustrated in Fig. 6. This shows the increased hauling power and increased acceleration that can be obtained when the booster is applied to a Pacific type freight locomotive. In the chart the drawbar pull exerted by the locomotive or required to pull the train is plotted ver-

tically and the speed in miles per hour is plotted horizontally. The drawbar pull required for a 2 [illegible] ton freight train, averaging 40 tons per car, on level and on grades up to 0.8 per cent is shown in the series of dotted lines. The lower solid line shows the drawbar pull of the locomotive without the booster and the upper line the drawbar pull with the

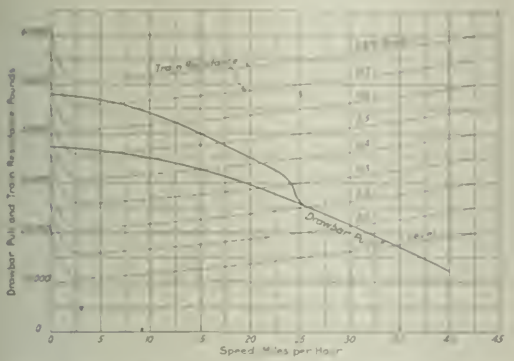


Fig. 6—Performance of Pacific Type Locomotive Hauling 2,500 Tons With and Without Booster

booster in operation, on the assumption that the booster is cut out at about 23 m.p.h.

Assuming the train is starting on level track it is evident that the locomotive without the booster can exert drawbar pull considerably greater than the train resistance. The difference between the drawbar pull of the locomotive and

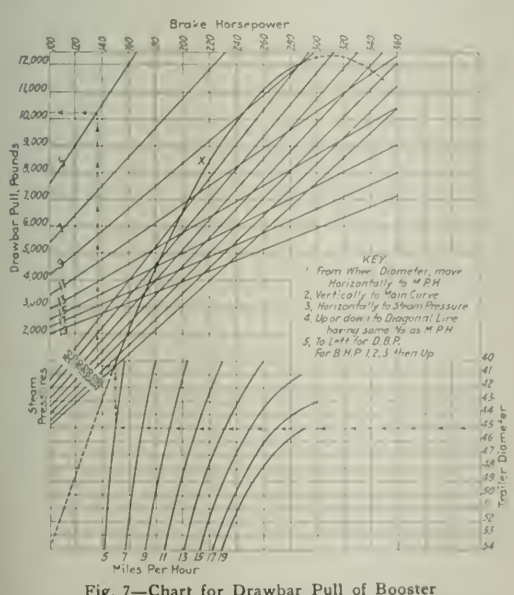


Fig. 7—Chart for Drawbar Pull of Booster

the resistance of the train is available for acceleration. With the booster still more power can be obtained for acceleration and the speed of the train will be increased more rapidly. As the speed increases the train resistance increases and the drawbar pull drops off until finally the drawbar pull just equals the train resistance. Under this condition no more acceleration will take place and the train will run at a constant speed of about 34 miles per hour on level track, as shown by the intersection of the drawbar pull and train resistance curves.

The pull required to start this tonnage on various grades is also plotted on this chart which shows the locomotive can only just start a train of this weight on a 0.3 per cent grade. With the booster the locomotive is able to start it on a 0.5 per cent grade and attain a speed of 17 m.p.h. If the booster is thrown out the speed of the train on this grade will drop back to 6 m.p.h. and if it stops the locomotive would be unable to start again without the aid of the booster.

The great advantage of the booster as shown by this chart is to enable the locomotive to make a grade of 0.7 per cent, while without the booster a train of this weight would stall the locomotive on a grade slightly more than 0.5 per cent. Even with a grade of 0.5 per cent, however, the booster offers the advantage of enabling the train to make a speed of 17

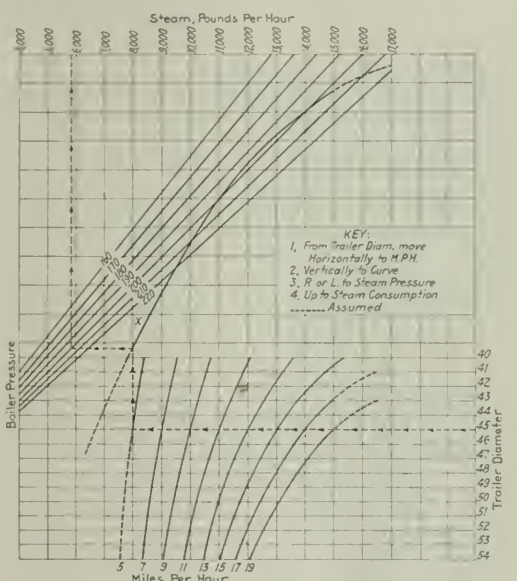


Fig. 8—Chart for Determining Steam Consumption of Booster

m.p.h. instead of only 6 m.p.h., thus saving over 64 per cent of the running time on the grade. With a grade of any appreciable length this saving in running time would be an important item, particularly near congested stations.

In order to enable engineers to predict the results that will be obtained under any given conditions, the curves shown on Fig. 7 have been developed. From these curves the tractive effort for any size wheel and any steam pressures can be determined, as it will be readily understood that these are the only two variables in the formula.

As an example of the use of the chart, assume that the tractive effort for a 45-in. wheel at 200 lb. boiler pressure is desired at speeds at from 5 to 13 miles an hour. The trailer wheel diameter is located at the right of the curves and the 45-in. point is used as the origin. The horizontal line is followed to the left until it crosses the speed curve that is desired, in this case five miles an hour. From the intersection of the horizontal line with this curve a vertical line is followed to the main brake horsepower curve, marked *X*. From this point a horizontal line is followed again

either to the left or right until it crosses the steam pressure curve desired, in this case 200 lb. Then a vertical line is followed, up or down, as the case may be, to the diagonal line in the upper set for the same speed, in this instance to the line marked 5, and moving horizontally from this point to the left, the drawbar pull at the given speed and boiler pressure can be read from the scale at the side. Similarly any desired figure can be obtained and the drawbar pull curve set up for any conditions.

Another factor of interest to engineers is the steam consumption for the booster. To enable this to be readily determined at various speeds, the chart shown in Fig. 8 has been developed. Having determined the wheel diameter and knowing the boiler pressure, the chart is used as follows:

From the point on the lower right hand margin corresponding to the trailer wheel diameter, a horizontal line is followed to the miles-per-hour curve, and thence moving vertically to the curve marked *X*. From this curve a horizontal line is followed to the steam pressure curves, and then moving vertically to the top of the chart the steam consumption in pounds per hour can be read from the scale. It will be seen from the examples given that a complete prediction of the performance of the booster can be made from these curves.

Terminal Relief by Direct Freight Delivery

Successful System Necessitates Complete Cooperation of Railroad, Shipper and Responsible Trucking Medium

THE SUBJECT of direct freight delivery or "store door" delivery was presented at the Society of Terminal Engineers, New York, on September 12, in the form of a series of independent talks on the various phases of the question. In one of these talks, the various methods of interchange and off-track freight handling now in use at St. Louis, Cincinnati and, by the Erie, at New York were discussed and analyzed. Considerable evidence was offered that the motor truck and demountable body forms an important and economic medium for the movement of freight in congested terminal districts. This subject was presented by W. W. Drinker, terminal engineer, Port of New York Authority, and is given here in abstract, followed by an abstract of the remarks of others taking part in the discussion.

The Port Authorities' Plan

The Port of New York Authority, after a year of study and conference with transportation, business and municipal interests as to the comprehensive plan of the Bi-State Commission, adopted the automatic electric system of that commission for the relief of Manhattan. Realizing, however, that a considerable period of time must elapse before that system could be installed and that in the meantime the situation would grow worse, they recommended the establishment of a motor truck service between the railroads of the port district and the island of Manhattan as a present relief.

This service is to utilize the principle of the container in order to avoid rehandlings of freight, leaving the motor truck free to perform the functions for which it was designed, *i. e.*, the rapid carrying of freight. It is to handle the carload and less than carload freight which is now handled at pier stations, and will utilize to the fullest extent possible the existing ferries to New Jersey and water routes for the railroads having long overland hauls in case the water routes prove, upon analysis, cheaper.

But where does the Port Authority come in? Why cannot each railroad establish such a service for itself? And rumors are abroad that several of them are contemplating such service very seriously. The answers are that a responsible medium between the railroads and the shippers is needed; that with a series of separate stations for each railroad the economies of full loads and short hauls are denied to the shipper; that street congestion will not be relieved and that there will be duplication of effort and destructive competition as to station facilities and service, which will deny full economies to the railroads. The Port Authority is an impartial public body which can assist and participate in the creation and operation of an impartial organization, without which the full economies of the motor container system can never be realized.

St. Louis System Reduces Congestion

There is nothing novel about the plan. It is, in itself, an evolution arising from conditions at St. Louis where the majority of the railroads are on one side of the Mississippi river and the bulk of the business on the other. Twenty railroads in the St. Louis-East St. Louis district handle less than carload freight. All the west side lines and four east side lines have freight stations only in St. Louis. Four east side lines have stations in both cities and nine east side lines have no freight stations in St. Louis; these nine together with the four east side lines having stations in both cities, handle their less carload freight in the off-track stations of the transfer companies which arose out of this situation shortly after 1916.

There are about 20 transfer companies whose charges between the east side freight houses and the west approach to Eads bridge are absorbed by the railroads but only three operate off-track freight stations and are recognized by the railroads in the application of rates. These transfer companies have become so popular that the Terminal Railroad Association, which formerly handled this business by rail to their Tenth St. station in St. Louis, no longer finds that station over-burdened but operates it at less than capacity. The Engineers Committee, St. Louis-East St. Louis railroad terminals, seem to regard this service as cheaper than switching for less carload freight in St. Louis.

The business of the three transfer companies is virtually a voluntary store-door delivery plus less than carload interchange between railroad stations. For freight handled at their off-track stations the railroads make them a certain allowance and the shipper must call for or deliver his wares. For freight which the shipper desires to receive or forward at his door, the railroads make the transfer companies a lesser allowance to a constructive delivery point on the west side of the river and the shipper pays to the transfer company an additional charge from the constructive point to the store-door although the same dray carries it between store and car door. In addition to the freight handling floor, the off-track stations have overhead warehousing facilities owned or controlled by the transfer companies. In the off-track stations freight is received from shippers and consolidated into dray loads for the individual railroads and inbound freight brought from the railroads by drays is delivered to trucks or wagons of consignees. These practices have all been confirmed by the Interstate Commerce Commission.

Additional off-track stations have been recommended by the Engineers Committee of the St. Louis East St. Louis railroad terminals in their 1922 report as a solution of part of the district's troubles.

Cincinnati Motor Terminals Method

Prior to 1917, eight railroads entering Cincinnati were suffering all the evils of trapcar interchange of less carload freight. This interchange business grew to a point where the station capacities were inadequate and relief was had from horse-drawn drays, 115 heavy drays and 225 trap cars being in daily service. To correct this evil it was necessary to establish an intensive trucking system. Research was had in several cities, among them St. Louis, where at the time of the study (1915) horse-drawn drays were still in service. From the dead wagon system, then in use, there developed the Motor Terminal Companies system of motor truck and demountable bodies with crane hoists for the transfer of the bodies to the chassis. This is essentially an interchange service whereas the St. Louis systems have an off-track station service in addition to less carload interchange.

The trapcars and horse-drawn drays, 225 and 115 respectively in number, have been replaced by 15 motor truck chasses, 225 demountable unit containers, 60 electric hoists and 13 hand hoists. It is said that the number of hoists could be materially diminished and the same service performed. Material savings resulted and the time of service was improved.

Motor Hauls in Miles Compared

The Erie in January, 1922, established a direct delivery and inland station business for handling part of its Manhattan business. Horse-drawn drays were used at first but they are gradually being replaced by tractors with "stake wagon" trailers. The system apparently has been modeled after the St. Louis system but it is expanding and proving successful from a traffic angle, and the Erie deserves credit for its initiative. Some of its lighterage freight is also handled in this way. The United States Trucking Corporation is the medium between shipper and railroad.

The St. Louis transfer companies handle 4,138 tons per day and the average haul is 1.5 miles. The Motor Terminals Company in Cincinnati handles 700 tons per day and the average haul is 3 miles. The U. S. Trucking Corporation's Erie off-track service handled at inland stations in May, 1922, approximately 450 tons per day with an average haul of 1.6 miles, one mile of which is ferried. The Port Authority's system is expected to handle ultimately 10,000 tons per day with an average haul of 3.8 miles, but it will have to start small and expand as did the others.

What System Will Minimize Costs?

From this point on the statements made are not meant to be conclusive but represent preliminary analysis on methods yet to be adopted or rejected by the Port Authority. They are in fact even in advance of proper checking by the staff.

For instance, the Baltimore & Ohio, the New York, New Haven & Hartford and possibly the New York Central have long hauls to Manhattan. What is the system of motor truck transportation which will minimize their costs? What is the relative cost of a motor truck and demountable body per mile overland and what, if chassis and container body are hauled by ferryboat or self-propelled float?

Taking the Motor Terminals Company's rental basis as representative of motor costs; the chassis and body cost $22 per 8-hr. day, or $0.0458 per minute; assume the speed to be as ascertained in Bi-State Commission's studies 6¾ miles per hour, this amounts to $0.4071 per mile which with the running rental of 50 cents per mile gives a total cost overland under power of $0.9071.

In comparison take the cost of a certain railroad ferryboat as recorded for 1911, $3.0912 per mile; expand it 60 per cent for increases in cost of labor and material and you have a total cost of $4.8279 per mile and adding $0.9481 for interest on first cost and depreciation of boat gives a total of $5.7760 per mile.

At the derived boat speed 9.4157 miles per hour the chassis and body rental standing idle on boat amount to $0.2918 per mile for one truck and container, or with 24 trucks, the ferryboat capacity, the idle rental cost is $7.0032 per mile, which plus $5.7760 per mile for boat expenses gives $12.7792 total; dividing this by 24 gives $0.5324 per mile for truck and container on ferryboat as compared with $0.9058 on land or 37.47 cents per mile saved in running time.

Using a derived time of 7 minutes per trip for despatching and receiving ferryboats and any delay you may assume for truck at ferry gates, one way, will give you the economic haul limits of trucks and containers on ferryboats.

Costs of Equipment Analyzed

There is another moot question pending, motor trucks and containers (either demountable or loose) or tractors and trailers. There is bitter fighting as to which is better. The Cincinnati system uses one, the Columbia Terminals Company in St. Louis the other. Let us take the Cincinnati equipment first cost for 16 five-ton motor trucks, 225 container bodies, 13 hand hoists and 60 electric cranes and an estimated first cost of a similar equipment of tractors (16) and trailers (225). The figures show an excess of 30 per cent for tractors and trailers in favor of motor trucks and demountable bodies. As to operating costs; assuming depreciation at 20 per cent on investment, interest on first cost at 8 per cent, operating expenses including gas, oil, tires, drivers, executives, chassis repairs and chassis tire renewals is nearly the same in each case; insurance on chassis the same; insurance on demountable bodies and hoists in the Cincinnati case at actual cost; insurance on semi-trailers at 5 per cent on investment; body maintenance in Cincinnati case the same as semi-trailer bodies; repairs on trailers running gear 5 cents per mile and yearly renewal of trailer tires gives a result showing tractor and trailer operation 100 per cent greater,—for the costs not common in both cases,—than motor truck and demountable body.

Other assumptions and other conditions may change these figures but as to that, the contract rates charged for service in Cincinnati, compared with St. Louis tariff rates, are of interest. The difference may be caused in part by traffic influence. The service rate between the railroads and Columbia Terminals depots varies from 4 to 12 cents per cwt. dependent on performance; whether all in St. Louis, all in East St. Louis or between St. Louis and East St. Louis. The Cincinnati contract rate for interchange is 5 cents per cwt. or $1.00 per ton.

All the rates at St. Louis whether for interchange or off-track stations are peppered with exceptions and the actual total tonnage of one railroad handled to off-track stations averaged $2.73 per ton or 13.65 cents per cwt. actually paid to the transfer company, and interchange averaged $1.80 per ton according to the St. Louis committee report. Of course the services are not comparable in off-track station work, as the Cincinnati system only handles interchange, but the railroad interchange rates are comparable, and there is room in a $2.73 rate per ton at off-track stations for considerable handling.

The question of tailboard space while not militating so strongly in St. Louis against the trailer as it would in Cincinnati, is very serious in any application to inland terminals in Manhattan, especially if existing warehouses are used temporarily. For instance, take a typical warehouse capable of handling as far as floor space is concerned, 600 tons per

day with demountable bodies (360 tons in and 240 tons out). Assuming 12½ minutes per ton for unloading or loading and 4.5 tons per trailer or container, with 21 doorways, 10 for inbound and 11 for outbound, trailers would occupy the inbound doorways 75 hours, merchants' wagons 75 hours, a total of 150 hours or 15 hours per doorway would be required. Trailers would occupy outbound doorways 50 hours, merchants' wagons 50 hours, a total of 100 hours of 9.1 hours per doorway. How would the warehouseman receive or forward his own goods? With demountable body containers not blocking a doorway for more than 1½ minutes, the inbound doors would only be occupied 7.7 hours each and the outbound doors 4⅔ hours each.

Erie's Proposed Container Plan Discussed

One suggested system has been roughly analyzed with much interest as applied to Manhattan freight. This consists of motor trucks and containers between terminals in Manhattan and a river front pier; transfer of containers only to carloads holding 60 containers single tier or 120 containers double tier, by means of a straight-line, traveling gantry crane; carfloat and containers self-propelled to a New Jersey pier; transfer by crane of containers to flat cars; flat cars and containers to transfer platform and freight from containers on platforms to standad cars for line haul or further consolidation.

This may be efficiency, but analyze it.

Take the crane transfer in Manhattan. If motor trucks unloaded containers to one float and went to another to receive containers approximately three hours would be required for the transfer. With three hours for transfer from float to flat cars in New Jersey, half an hour for floatage across the river, 10 minutes for truck travel and depot transfer of containers to chassis in Manhattan, 10 minutes for flat cars between New Jersey pier and transfer platforms and 10 minutes platform to standard cars, your average time per container on 60 containers forwarded west bound would be 5 hr. 30 min. between Manhattan terminal door and car floor.

But here are three speed rates and a perfect cycle does not seem possible unless you unload and reload one float simultaneously. Of course, if you get enough car floats you can work the other way, but try it and see at what cost for equipment and service. If this seems unreasonable, try a time study on unloading and loading a float simultaneously. Here the Manhattan gantry crane transfer would take approximately 5 hr. and (following through) the time for one container between terminal door in Manhattan and car floor in New Jersey would be (on a 60-container float) 8 hr. 30 min. Three to four hours is present practice and motor truck and container body service between Manhattan door and sealing of car door in New Jersey via ferry would take 35 min.

Other Discussion on the Subject

H. C. Snyder, general freight and passenger agent, New York terminal district, Erie Railroad, described the methods which that road has been using in the delivery of freight to consignees via motor trucks and ferries, stating that it was not strictly store door delivery as the term is customarily used but rather a method of direct delivery. This system was described on page 233 of the January 21, 1922, issue and page 826 of the April 1, 1922, issue of the *Railway Age*. He added that the present terminal allowances are far below the actual costs in the New York terminal districts and this has caused the eastern roads to carry a heavy burden. The result is that tonnage is being diverted gradually to other ports, such as Boston and Baltimore, where the terminal expense is considerably less. The method which has been adopted by the Erie is a step forward in a plan to handle the freight in a more economical manner, to relieve congestion and allow an expansion in the volume of business which may be handled. To date it had proved satisfactory and successful in operation.

W. S. Sims, special accountant, Pennsylvania Railroad, said that store door delivery as such, was a problem purely of the consignee or shipper, *i. e.*, they can have it any time that they want it by arranging with a responsible trucking company to make or take delivery with proper authority to sign receipts, etc. Direct delivery was an entirely different proposition, since it involves the cooperation of the railroad and the consignee. The latter must be willing to accept freight at any time that it is delivered to him. This brings up a difficult point since the average shipper or consignee is jealous of all the privileges accorded by the railroad under the present laws and regulations. To a large extent, the majority insist upon the full 48 hour free storage which actually amounts to nearly three days under the present system. Thus before direct delivery could be successfully effected the consignee must be compelled by law to accept delivery when made.

He stated that the net return on the railroad dollar had shrunk so low that if any additional terminal service was to be added to that now given, it would have to be paid for by the consignee. In other words, the railroads must be compensated for the expense of new facilities, which would amount to a considerable figure in and around New York. If there is any saving to be made, such savings cannot in justice be passed on entirely to the shipper or consignee; they must be cut or divided in some manner equitable to both parties. The propositions of store door or direct delivery will stand or fall on their economic positions. A factor to be considered is that the railroads are gradually being forced off the waterfront by the increasing rentals for piers. The problem was complicated by the necessity of evolving and simplifying methods of collecting charges, making out bills of lading, receipts and other papers in connection with the large number of freight classifications and rates which are now in common use. He added that the Pennsylvania was studying the question in detail, one of the plans under scrutiny being that of a secondary express service, *i. e.*, express service at terminal points with freight service on the line.

L. R. Gwyn, executive assistant to the president, American Express Company, expressed some surprise that store door delivery had not been adopted already in many places in this country if it was such a "cure-all" as many claimed. He recognized that the New York condition was an accentuated one which would, of its own necessity, better itself as time went along. He referred to the experience of the American Express Company which, in a way, was a modified and simplified form of store door delivery. Long years of use and training had accustomed consignees in this service to accept shipments promptly and pay the charges on delivery. Much difficulty and trouble was obviated by the fact that the drivers were trained to make out all papers and were responsible agents to the company. Even though there were fewer classifications in this service, he saw no reason why drivers could not be trained to handle the more complicated classification of railroad freight—an item which must be given serious consideration in store door or direct delivery systems. He brought up the question of what can be done with the shipper who does not want this service.

Col. C. Hine, Tabulating Machine Company, gave a short talk on the inconsistency of expecting the railways to carry the burden in this question of direct delivery by furnishing an extra service requiring additional investments and then passing the benefits on to the shipper. He called attention to the fact that the return of the railroads per man in service was less than one-half of that of the merchants in New York and while the railroads "turned over" their capital in a period of from three to four years, merchants in general "turned over" their capital in about one year, and in many cases several times in a year.

Indian Creek, Pa. (Alleghen Mountains) on the Baltimore & Ohio

Will Baltimore & Ohio Pay a Common Dividend?

Company Has Strengthened Its Position Through the Conservation of Income. Surplus Now Totals $39,116,290

The Baltimore & Ohio succeeded in 1921 in effecting a marked improvement in its earning power as compared with 1920 or with the period of federal control. This improvement is evidenced in a net railway operating income or, as the recently issued annual report expresses it, "net income from property used in transportation service," of $21,853,546. This compared with a deficit after rentals in 1920 of $4,427,019; with a net earned for the government in 1918 of only about $7,000,000 and in 1919 of only about $5,000,000. The actual increase over 1920 was $26,280,565. This improvement, as great as it was, did not succeed in restoring the Baltimore & Ohio to a pre-war earnings basis. It could hardly have been expected to have done so under the conditions of industrial depression which governed during 1921. The 1921 net fell about $6,000,000 short of equalling the standard return for operations during federal control—and the standard return figure of $28,031,146 furnishes about as good a measure of pre-war earnings as any. It is likely, however, that a pre-war basis of earnings will be reached during 1922. The Baltimore & Ohio, even with a large part of its coal tonnage lacking, has been reporting some very favorable monthly earnings.

The increase in net railway operating income for 1921 over 1920—as noted, $26,280,565—was secured in spite of a decrease in revenue tons of 29.81 per cent; and in revenue ton-miles of 32.17 per cent. The decrease in freight revenues was 14.39 per cent and in total revenues, 14.37 per cent. Actually the 1921 operating revenues were $198,622,373, a decrease from 1920 amounting to $33,322,071. The cut in operating expenses, however, was $59,942,283. The 1921 operating expenses, totaling $166,457,024, were 26.48 per cent less than those for 1920. To secure this result expenses were cut very severely—possibly too severely. The cut in expenses for maintenance of way was 25.53 per cent; in maintenance of equipment, 34.47 per cent, and in transportation, 24.89 per cent. By means of these cuts the 1921 operating ratio was brought down to 83.81 per cent as compared with 97.61 per cent in 1920. Transportation expenses in 1921 were 43.04 per cent of total operating revenues.

The reduction in expenses for maintenance of way and equipment was sufficiently severe as to indicate deferred maintenance. That this was the case is admitted by the Baltimore & Ohio management and it was so admitted by the management a year ago. It was explained that the cut was rather in the refinements than in anything else and that

Baltimore & Ohio Coal Train

Sixty-three steel hopper cars (55 tons capacity) loaded with 3,351 tons of coal. Gross weight of cars and contents 4,586 tons. Mikado engine, weight 284,500 lb. Tractive effort 55,000 lb.

nothing was omitted which might in any way prove detrimental to safety or efficient operation. The Baltimore & Ohio was, however, no exception in 1921 in the matter of cutting maintenance expenses; it was merely a bit more willing than some of the other roads to admit that this was its policy.

The Baltimore & Ohio suffered rather severely from federal control, for reasons which have already been given in these columns. Its sharp recovery in 1921, however, showed that the conditions were but temporary and that they could be remedied without undue difficulty under more normal B. & O. conditions. That this is appreciated by the management is indicated in the following paragraph in the annual report:

"The reduction in cost of operation and the improved standard of service accomplished during the year covered by this report were both due in large measure to the loyal and efficient efforts of the officers and employees. The board wishes to record its appreciation of their efforts. Their continued helpful co-operation in improving the service and efficiency of the company is earnestly desired."

1921 Improvement Not Reflected in Corporate Net

Because of the complications embodied in reporting standard return and guaranty the improvement which the Baltimore & Ohio made in 1921 is not reflected in its corporate income account. The 1921 corporate net after fixed charges was $6,388,891, or $856,589 less than the figure of $7,245,481 reported for 1920. The 1920 income account shows a "net income from property used in transportation service" of $26,434,295, this being $4,580,749 above the 1921 figure of $21,853,546 previously mentioned. The 1920 figure includes, of course, standard return for two months and guaranty for six which accrued to the road and compensated in part for the deficit after rentals which showed in the 1920 results. On the other hand, 1921 "other corporate income" of $10,120,824 ($4,720,966 greater than in 1920) includes amounts relating to the guaranty period chargeable to the government. The Baltimore & Ohio's four per cent preferred dividends of $2,354,529 were paid from surplus account, which on December 31, 1921, had a credit balance of $39,116,290.

Perhaps the most encouraging feature in the report, although not particularly commented upon or referred to by the company, is the strengthening of its surplus account through the conservation of income. Under the company's ten-year secured bonds, it obligated itself to reserve and apply to additions and betterments, or retirement of debt, $3,500,000 per annum, but with the suspension of dividend payments upon its common stock for the past several years, much more than this has been added annually to the surplus account, which shows a credit balance at December 31, 1921, of $39,116,290. The extent to which the company's income has been applied towards improvement of the property is indicated by the fact that notwithstanding there was expended on the property by the government during federal control for additions and betterments, $23,000,000, only $9,000,000 of these improvements have been funded through a ten-year secured note with the United States Railroad Administration.

The Possibility of 1922 Dividends on the Common

A factor of much interest in connection with the Baltimore & Ohio at present, is, of course, the question of whether or not the company may in this year resume dividend payments upon its common stock. Baltimore & Ohio common stock dividends ceased in the second half of 1919. Disbursements in that year totaled only two per cent. This cessation of dividends followed uninterrupted payments for more than 18 years, beginning in 1900. From 1900 to 1906 the rate was 4 per cent; from 1907 to 1914, it was 6 per cent and from 1915 to 1918, 5 per cent. In 1918 it was made 4 per cent. A reason why the resumption of dividends may commend itself to the directors of the company is that this step will apparently be necessary in order that Baltimore & Ohio bonds may continue to be legal investments for savings banks and trust funds in the state of New York and in some other states having laws similar to those of New York. This factor is of importance because of its possible effect on the refinancing which the company will be called upon to do in 1925 in connection with its four issues of bonds maturing in that year, totaling a principal amount of approximately $130,000,000. The question of the legality of investment in railroad securities was complicated by federal control but an opinion has been expressed by the attorney-general of New York State that any Baltimore & Ohio bond now rated as a legal investment will continue to be such during 1922. This has been generally accepted as implying that if no dividends are paid in 1922, the bonds will be removed from the legal class and similarly that if a rate of 4 per cent is resumed on the common this year, they will not be so removed. There is also a proviso that if a lapse should occur the bonds would fail to have a legal status until the dividend has been restored and maintained for a period of five years. However, while important, the investments by savings banks are not a controlling factor and it may be that the appeal to general investors would be greater if the company continued for a time to conserve its income and so continue to improve its reserves and credit position.

The two most important issues included in the total of $130,000,000 are the $74,910,025, 3½ per cent prior lien bonds issued in 1898 and maturing July 1, 1925, and the $44,991,390 Southwestern Division bonds, paying also 3½ per cent, issued on January 1, 1899, and maturing also on July 1, 1925. It is not necessary at this time to examine the possible means of refunding or extending these and the other issues involved. The important matter at present is the steps that may be taken to maintain them as legal investments.

Another interesting factor is that the present issues have a rate of 3½ per cent. No one would care to make a guess as to whether they can be refunded in 1925 at that rate. Under present conditions it does not look as if they could be. The possibility is offered, at any rate, that B. & O. interest charges may be further increased. This is a problem which has confronted Baltimore & Ohio for some time and especially in the past two years. In 1920 this was because of refunding government indebtedness arising out of federal control and in 1921 because of equipment trusts. The B. & O.'s interest charges in 1921 were $22,534,069; in 1919, they were $19,640,622 or $2,893,447 less. A favorable feature exists, however, in the fact that there is but a small amount of refunding of bonds to be done this year, in 1923 or in 1924.

Favorable Earnings in 1922

Under the circumstances relating to the possibility of a dividend on the common stock this year, it is not unnatural that Baltimore & Ohio earnings statements should be given no small amount of attention. Interest in these statements is also, of course, intensified by the remarkable recovery which took place in net railway operating income in 1921. Fortunately this improvement has been continued into the present year. Even though the road was deprived from April 1 on of the better part of its coal traffic—bituminous coal makes up about 48 per cent of the total revenue tonnage—the net railway operating income so far this year has been considerably ahead of last year's.

The July statement showed the effect of the railway shopmen's strike. The Baltimore & Ohio did not start to fill the places of its strikers as soon as some of the other roads did. It held off while it was trying to make some sort of a separate agreement with its shopmen. The effect of this policy—which unfortunately did not secure at once the de-

sired results—was evidenced in the July net, but it remains to be seen whether in the course of several months it was better for the company to be patient and to ultimately resume operations with its old, trained forces rather than undertake to replace them and train new forces. The end of the coal strike and a heavy fall movement of commodities in general should readily make up, however, for what was lost in July. The net railway operating income for the month was $1,225,067 as compared with $2,026,782 in July last year. In each of the three previous months—those of the coal strike—the net railway operating income exceeded $2,500,000. In March, when coal was moving in anticipation of the strike, the figure was $3,081,212. For the seven months the report shows a net railway operating income of $15,805,362, as compared with a figure of $9,657,246 for the first seven months of 1921, an increase of $6,148,116.

It is interesting to observe that even with reduced coal loadings for April, May, June and July and also with reduced rates on many commodities, the freight revenues for the first seven months of this year were in excess of those for the same period of last year. The freight revenues of $89,676,196 for these months this year exceeded those of last year by $1,268,830. Expenses similarly continue less, those for the first seven months of this year totaling $89,244,692, or $7,792,546 less than those for the same period of last year. Under the present trying conditions, it is difficult to predict very far ahead, but it would appear on the whole as if in 1922 the Baltimore & Ohio should come through a great deal better than it did in 1921—even with the improvement which took place in 1921.

The Baltimore & Ohio's expenditures for additions and betterments to equipment in 1921 showed a net charge of $7,067,405. There were added 50 locomotives and 2,059 freight cars, and retirements included 5 locomotives, 2,400 freight train cars and 24 passenger cars. It will be remembered that during the latter part of the year large purchases were made of freight car bodies for the purpose of car rehabilitation. Additions and betterments to road, totaled $3,518,124. This included enlargement of yards, etc., at Locust Point, Baltimore; a new bridge across the Miami at Lawrenceburg, Ind., was placed in service October 1, 1921, and there was considerable work done in the way of renewing and strengthening of a number of other bridges. Automatic block signals were installed on 12 miles of double track between Callery Junction, Pa., and Wildwood

Freight Car Loading

WASHINGTON, D. C.

THE NUMBER of cars loaded with revenue freight during the week ended on September 2 was 931,598, the largest reported for any previous week in eleven months and an increase of 40,760 cars over the previous week. Moreover, the increase was not all attributable to the increased coal movement following the more general resumption of bituminous mining, as the increase in coal loading over the previous week was only 38,457 cars.

The loading for the week of September 2 represents an increase of 100,310 cars as compared with the corresponding week of 1921, and a decrease of only 30,035 cars under the corresponding week of 1920, when 961,633 cars were loaded. It was also 91½ per cent of the total for the record week of October 15, 1920, when 1,018,539 cars were loaded. Coal loading had not yet reached normal proportions, although the coal loading for the week was 149,487 cars as compared with 111,030 during the week before. The coal loading was 5,099 cars less than for the corresponding week of last year and 49,513 cars below the corresponding week of 1920.

As compared with the previous week there were decreases in grain and grain products, livestock, coke, forest products and ore, but there was an increase of 3,350 cars in merchandise, l. c. l., and of 3,943 cars in miscellaneous freight.

Only the Southwestern district showed a reduction as compared with the corresponding week of last year.

The percentage of open top car requirements filled during the week of August 26 was 86, the same as the week before. In the corresponding week of 1920 only 49 per cent of the open top cars required were furnished. The total requirements for the week were 392,030, of which 338,785 were furnished and 284,703 were loaded.

The freight car surplus is rapidly dwindling. For the period from August 15 to 23 it averaged 120,961, a reduction of 12,292 cars as compared with August 8-15. This included 96,405 coal cars and 8,237 box cars. On the other hand, there were shortages amounting to 43,519 cars, of which 27,195 were box cars and 8,175 were coal cars. For the period from August 23 to 31 there was a further decrease in the surplus to 70,455, including 3,850 box cars and 54,566 coal cars. The shortage amounted to 58,670, including 35,819 box cars and 13,835 coal cars.

The Car Service Division has compiled charts showing the weekly variation in the loading of merchandise and mis-

REVENUE FREIGHT LOADED. SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, SEPTEMBER 2, 1922.

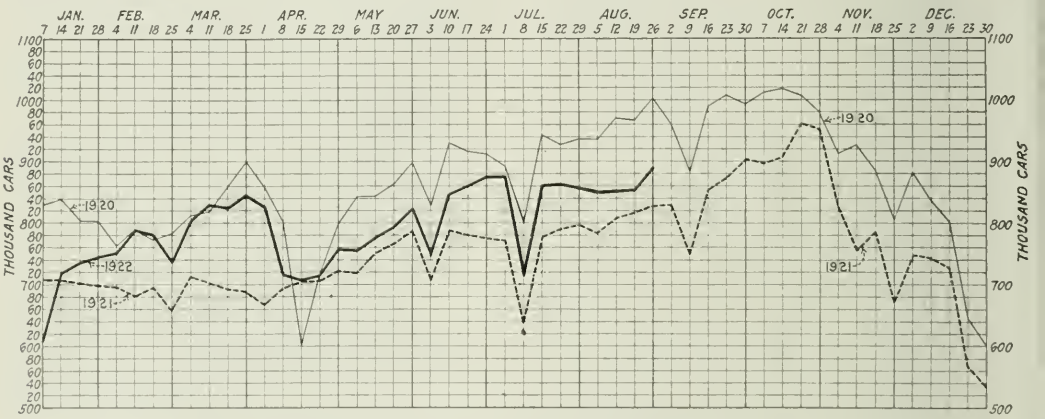
Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year, 1922	Total revenue freight loaded: Corresponding year, 1921	Total revenue freight loaded: Corresponding year, 1920
Eastern	1922	8,779	3,340	32,614	1,241	5,695	6,729	66,489	111,327	226,214	.....	.....
	1921	8,083	2,874	43,384	1,156	4,423	2,929	59,567	79,314	.....	201,680	238,461
Allegheny	1922	3,117	3,145	42,730	4,560	2,989	10,602	49,892	79,380	196,415	.....	.....
	1921	3,051	2,969	43,659	2,218	2,479	5,970	46,296	59,676	.....	166,318	201,622
Pocahontas	1922	221	281	20,900	216	1,089	22	4,863	2,465	30,057	.....	.....
	1921	149	268	14,647	88	1,117	3	4,661	3,685	.....	24,618	35,921
Southern	1922	3,732	2,347	21,502	779	18,327	1,017	35,545	34,095	117,344	.....	.....
	1921	3,649	1,881	20,723	452	14,854	271	37,148	33,845	.....	112,773	128,428
Northwestern	1922	19,853	8,167	6,510	984	15,487	41,306	30,100	36,903	159,310	.....	.....
	1921	20,067	6,484	8,853	459	10,536	20,614	28,995	33,995	.....	130,003	161,167
Central Western	1922	13,763	11,606	18,729	469	7,924	2,186	31,614	54,028	140,319	.....	.....
	1921	19,263	10,091	18,486	150	5,927	763	31,020	45,217	.....	130,917	133,650
Southwestern	1922	4,554	2,961	6,502	140	7,195	492	15,047	25,048	61,939	.....	.....
	1921	6,067	2,706	4,834	209	6,463	745	16,160	27,795	.....	64,979	62,384
Total Western Dists.	1922	38,170	22,734	31,741	1,593	30,606	43,984	76,761	115,979	361,568	.....	.....
	1921	45,397	19,281	32,173	818	22,926	22,122	76,175	107,007	.....	325,899	357,201
Total all roads	1922	54,019	31,847	149,487	8,389	58,706	62,354	233,550	333,246	931,598	.....	.....
	1921	60,279	27,273	154,586	4,732	45,799	31,245	223,847	283,527	.....	831,288	.....
	1920	42,573	29,048	199,000	14,674	62,229	77,804	205,839	330,466	.....	.....	961,633
Increase compared	1921	.....	4,574	.....	3,657	12,907	31,109	9,703	49,719	100,310	.....	.....
Decrease compared	1921	6,260	.....	5,099	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1920	11,446	2,799	.....	.....	.....	.....	27,711	2,780	.....	.....	.....
Decrease compared	1920	.....	.....	49,513	6,285	3,523	15,450	.....	.....	30,035	.....	.....
Sept. 2	1922	54,019	31,847	149,487	8,389	58,706	62,354	233,550	333,246	931,598	831,288	961,633
Aug. 26	1922	54,562	32,046	111,030	8,390	60,466	65,041	230,000	329,303	890,838	828,883	1,001,308
Aug. 19	1922	55,893	29,756	81,959	8,201	57,934	67,201	229,925	325,350	856,219	815,147	968,103
Aug. 12	1922	57,567	28,370	84,559	8,420	56,163	69,197	230,652	317,652	852,580	808,269	971,269
Aug. 5	1922	58,512	26,507	79,246	8,442	55,898	66,218	229,287	327,241	851,351	786,178	935,730

Compiled by Car Service Division, American Railway Association.

cellaneous freight for the years 1920 and 1921 and for 1922 to date. While most other commodities show heavier total loading in 1920 than in 1922, merchandise and miscellaneous freight has been running well over 1920 since the first week of April, and has been in excess of 1921 during the entire year.

The circular charts show a distribution of this class of loading between the different railroad districts for the period January 1 to August 19 in each of the last three years. The total number of cars loaded to date this year exceeds any of the two previous years. The Eastern and Allegheny districts amounting to 50.1 per cent of the total traffic in 1922, show an increase over 1920, while all other districts indicate a decrease.

Dumpings of coal at the lower lake ports for last week amounted to approximately 600,000 tons, with 9,380 cars reported at lake ports on Saturday morning, according to a statement by the fuel committee. As coal was not moving to the lakes under the normal No. 2 classification in sufficient quantities to make up the Fuel Distributor's program, priority No. 1 orders were issued on Saturday directing lake-



Revenue Freight Car Loadings Up to August 26, 1922

ward a sufficient tonnage of coal to insure the attainment of the full lake program for this week. These priority authorizations are being placed with a view to causing the least possible disturbance to the normal movement of coal. Difficulties experienced in the unloading of iron ore from boats at lower lake ports have been solved, and there is now no shortage of vessels for the transportation of coal to Lake Superior docks.

The fuel distributor has found it necessary to issue Priority No. 2 orders for the movement of a limited tonnage of coal necessary to keep some non-essential industries in the Southeast from closing. Authorization for the movement of 10,000 tons of coal from Norton, Virginia, to the State Fuel Administration of South Carolina has been given. Representations are being made from time to time that industries will be compelled to close unless given certificates of priority which will aid them in obtaining fuel supplies. These cases are being considered on their individual merits, under a general policy of issuing priority authorizations only where real emergency needs cannot be provided for by other means.

The Interstate Commerce Commission has announced a hearing to be held on September 21 on a petition filed by the National Association of Sand and Gravel Producers for a modification of Service Orders 23 and 24 to provide that after the most essential requirements for coal cars are taken care of, under the higher classes of the priority list, the available open top cars should then be distributed on an equal basis to all shippers requiring such cars, on the ground that shippers of sand and gravel are just as much entitled to cars for their products as manufacturers are to cars for fuel.

A total of 158,010 cars were loaded with coal last week, the week which ended on September 9, according to reports received by the Association of Railway Executives. This was a decrease of 9,418 cars compared with the preceding week, but had it not been for the observance of Labor Day, loadings last week would have exceeded the week before and been the largest since April 1 last when the miners' strike began. On Labor Day, only 10,021 cars were loaded, compared with 30,054 cars on the preceding Monday. Except for Labor Day the average daily loading last week was approximately 29,600 cars, while the average for the week before was only 27,900 cars.

On the basis of the number of cars loaded with coal, production last week was approximately 8,700,000 tons, compared with approximately 9,250,000 tons the week before.

Coal loadings on Friday, September 8, totaled 28,487 cars and on Saturday 27,527 cars, 960 cars less than the preceding day, but 2,370 cars above the previous Saturday. Loadings on Saturday, however, are generally lower than other week days owing to a short day being observed at most mines.

With the American Relief Administration in Russia—While Bolshevik Soldiers Were Saying That Cameras Were Not Allowed an American Woman Snapped This Picture —Vechrova Yards, Near Moscow.

Functions of Department of Purchases and Stores*

Great Possibilities in Securing a Better Control Over the Expenditures for Materials

By H. C. Pearce
Director of Purchases and Stores, Chesapeake & Ohio

THE PURPOSE OF THE division of purchases and stores is to provide needed materials for the construction, operation and maintenance of the property; to have accurate knowledge of what is available, the quality best suited for the purpose for which it is to be used, the time when the material will be needed, the proper storage and distribution, and proper accounting for same. These six general divisions include all the details of prices, freights, inspection, storage, handling, etc., down to and including the disposition of the salvage. The magnitude of the work can best be visualized by the fact that our Class 1 American railroads expend more than 1,250,000,000 for materials and supplies per annum, not including new equipment, made up of over 60,000 individual items, scattered over approximately 232,000 miles of railroad.

Value of the Budget System

The budget system must be installed before any thorough or comprehensive expenditures can be carried on in an economical manner. An organization responsible for the expenditure of millions of dollars annually must first be capable of viewing the problem with knowledge that the money necessary will be available when the liabilities become due. Compare the amount of detail and practical knowledge necessary for the handling and accounting of this sum of money by our treasury and accounting departments and realize, if you can, how much more organization is required properly to safeguard this amount of money in the form of materials scattered over thousands of miles of railroad and you have at least a fair general idea of the inadequacy of the organizations now handling this work.

Railroad executives have viewed this problem in the past through the eyes of the using departments, and when the question of expense, as reflected by the payroll, came to their notice, their first thought was to turn the work over to the using department, with the idea that they could show a reduction in the payroll, when, as a matter of truth, the work must be done by others with less experience and knowledge, at higher rates of pay, or not done at all. The latter was usually the result.

Supply officers as a rule were not men of large vision or broad experience and did not have the knowledge or strength necessary to do the things they know should be done. To carry on work of such magnitude, it must be apparent to any one that has studied the facts that it must be controlled by an officer of strength of character and great energy and force, and the organization must be sufficient to care for each detail and record it properly so that exact knowledge may be had at all times. Supply officers, with few exceptions, have in the past accepted the situation as they found it, recognizing that it was better to keep their positions and satisfy or obtain favor with their superiors than it was to stand for principles. The results of such understanding, or lack of understanding, develops the fact that there are with rare exceptions no standard forms of comparison or standard methods, the purpose having been to muddle everything up as much as possible to prevent comparisons. Accounting officers were more interested in the appearance of the records than in the condition and control of the stock; their conception of the value of the stores department was their ability to obtain reports required on certain dates and an inventory of the assets, as reflected in neatly typed pages and summaries of figures, without thought of responsibility as to correctness of these figures other than the calculations. This work alone has been a terrific drain on the resources of supply officers. The using departments are only interested in the actual amount of material charged to specific work; the amount of material on hand has no interest to them, as under our system of accounting, nothing is charged until it is actually reported as used by the department that uses it.

These fundamental facts have prevented owners of railroad securities and executives realizing the tremendous investment they have, knowledge of what these investments are worth, and little or no knowledge of what the real cost of doing the work was. The principle underlying the accounting for materials is that nothing shall be charged to an account or piece of work until it is actually used. This is entirely wrong, regardless of the reasons for the plan. The fact remains that every account and every piece of work should bear not only the actual cost of labor and material, but all the costs incidental thereto, which should include losses due to faulty design, wrong estimates, errors in ordering, changes, delays in doing the work and all other causes incidental thereto. The plan that should be adopted under the budget system is that all material delivered to the work shall be charged to the account or work for which it was ordered. Whatever remains after completion shall be surveyed and credit allowed for its actual value. If this were done and the monthly budget system carried out as it is being rapidly developed, the using departments would be—as they should—responsible for every dollar which they order, and it would be shown at the end of the month just what they have expended. This one thing would do more to overcome the enormous quantities of materials which have been acquired on our railroads, which have either been held in suspense or become obsolete, than any other one thing, and without any added expense.

A Financial Problem

The purchases on our railroads generally have been in the hands of honest, intelligent men, but they have lacked breadth of view and knowledge of details, which has seriously impaired their work. Lack of proper records which should be such as to enable them to know accurately daily the liabilities they were incurring, records of comparison with previous months and previous years, specifications which will enable them to develop the market and procure competition, have always tremendously handicapped the railroad purchasing agent. Probably no other department of a railroad is so dependent upon the accumulation of details as the service of supply. It is made up of details, and they must be accurately recorded each day, in simple and accurate form, in order to bring about proper control.

If I were asked what were the outstanding faults of the service of supply as a whole, I would say *price* and *payroll* comparison. They have been the curse of the supply de-

*Abstract of paper read before the New York Railroad Club, Friday, September 15, 1922.

partment. They have stunted the development of supply officers. They have stultified the ambitious and capable man. They have appealed to the selfish and self-seeking man, and in every way have been most harmful. The same thing has handicapped the railway executive. What encouragement is there for a railway executive, no matter how convinced he is of what is necessary in order to establish a strong, practical and capable organization, when the first questions his brother executives ask him are, "What are you paying your chief supply officer"; "What is the cost of operating your supply department"; "What are your average monthly issues"; or having his officers constantly dinging into his ears, "This is all very nice, but we have to pay for it out of our appropriation—it all goes into our operating expenses." Until this work can be raised to the point where there will be constantly staring the executives of our railroads in the face the fact that they have hundreds of thousands of dollars tied up in unused materials, costing not less than 25 per cent. per annum to maintain, representing monies which should be in the property or in the treasury, this organization will never be placed on the proper basis or perform the real service for which it is intended, and for this reason I repeat that the problem is a financial rather than an operating one.

Many splendid businesses have been wrecked by injudicious buying. I am a strong believer in the plan known as the "Thorne" system, introduced by the late W. V. S. Thorne, and carried out most successfully on the Harriman lines. The plan is simple, the first requirement being to definitely determine what is the most desirable material to purchase, based on service, source of supply and price. This having been definitely determined, a running agreement is made for the requirements, subject to cancellation by either party giving a stated period of notice. This insures a fixed source of supply, the quality of materials best suited for the requirements, and enables the manufacturer to produce it at the lowest cost. It eliminates the expense and delay of sending out inquiries, receiving proposals, tabulating bids, etc. Each day's delay between the time the need develops and the delivery is made represents a loss, either in interest or a loss through lack of delivery.

More Specifications Needed

Broadly speaking, all materials should be bought to specifications. I know it will be contended that this is not always practicable. Manufacturers' agents who wish to sell some special brand, or mechanics and others who prefer to criticise the quality of something rather than write a specification, will not approve the plan. Our technical officers should be able and should be required to put their knowledge of what is required into a specification. Three factors should be taken into consideration in preparing a specification: (a) the service required, (b) the source of supply, (c) the cost. If representatives of each of these factors—i. e., the user, the manufacturer and the buyer, were consulted in their preparation, 90 per cent. of the materials used on our railroads could be covered by practical and economical specifications. Specifications without test are worthless and how is any buyer to know what he is getting unless the material is inspected and tested, and how can it be tested unless it is built to a specification? It is the only practical plan either for the manufacturer or buyer. I had hoped that the American Railway Association would adopt minimum specifications. With minimum specifications the manufacturers have a base to work to; any railroads or service requiring something better than the minimum specification can procure it at the lowest cost because there is a base. It is the only way to obtain necessary and honest competition. Because railroads have not followed generally the plan of buying material to specifications in competition is one of the reasons why we have the Clayton Act. I further believe that it is mandatory for public carriers to offer every responsible manufacturer an opportunity to bid on its requirements, and this cannot be carried out in a practical manner without practical specifications and tests.

The engineer of tests should report to the chief supply officer for the reason that it is desirable that materials should be arranged for in advance of the need. The engineer of tests on our railroads should be investigating and reporting on the requirements, source of supply, conditions and facilities of manufacturers at all times. If this were done as it should be there would be very little inspection required at destination, and none of the long, tedious and expensive delays in receiving materials that fail to conform to the specifications being held up by long and many times useless correspondence.

It will be said that the engineer of tests should be independent or report to the using department, on the ground that they are responsible for the kind of material to be used. My answer to this question is that the using departments are responsible for the specifications and the supply department is responsible for furnishing material to the specifications.

Distribution of Material

Material has no value either to the railways as capital or to the using department as service until it reaches the points where it is needed to be used. It is essential, therefore, to determine upon methods which will best enable the railway company to conserve its assets and make them available when wanted in the least possible time. Material must be first assembled and maintained at as few points as possible for distribution, for the reason that it represents money, which must be as closely guarded and conserved as if it were in the bank. Desirability of this is based principally upon the following facts:

(1) Generally there is only one place where there is sufficient organization for thorough check, test and care of materials;

(2) Materials can be inventoried more readily when centralized;

(3) By restricting the number of places where stocks are carried a smaller fixed investment will be found sufficient to adequately protect the needs of all departments.

The shops, representing the largest users of classes, if not values, must first be considered, and a practical plan is for the stores department to deliver the materials to the users in the shops. This keeps high priced mechanics at their work and their machines in operation during a period which otherwise would cause them to be absent procuring needed materials, and it enables the supervisory forces to keep in touch with the progress of the work and the actual needs of the mechanics. The shop delivery system assures accuracy in accounting by requiring that all material orders be revised and the proper description entered thereon. It provides the means for obtaining an order for all material issued; enables store department employees to observe the use of materials by coming in personal contact with the men who are actually using it; it provides a method by which they can intelligently anticipate and provide for the needs and satisfy themselves that the material will be utilized as intended. It results in delivering materials to points required in less time than other systems now in effect and at less expense; insures an opportunity for locating and returning to stock materials drawn for use and not applied; it insures proper supervision over the manufacture of materials and the return of the finished or repaired product to the stores when completed; it encourages the use of serviceable second-hand and repaired material in lieu of new and by co-operation provides for the disposition of shop worn material in proper sequence, thus avoiding the inadvertent disarrangement of stock.

The supply train serves the same purpose for the line that

the store delivery does for the shops and in precisely the same way. It places the representative of the supply department in personal contact with the users on the line; it places the storehouse at the disposal of the men; it establishes the closest relations between the two, which, when coupled with a thorough inspection by the supervisory officers, as it should, furnishes the ideal method of distributing material on the line

This system is in use by many large railway systems of the country. The reason why the supply train has not been generally adopted is due to the fact that there has not been a sufficiently broad conception of what the service of supply should embrace. The supply, or what is commonly called the stores department, is looked upon as merely a depot where supplies should be procured when ordered, and the storekeeper in charge merely as the man who hands them over the counter. It has occurred to few that the service of supply must be based on broad enough lines so that its agents should know what is actually needed, what gives the best service for the purpose, and have means at their disposal whereby they can come in personal contact with the users on the ground. The supply department is responsible not merely for having materials, but also the quantity and quality, and must also dispose and market the salvage.

Reclamation

Reclamation in its broadest sense has been generally misrepresented and largely misunderstood. Reclamation means making useful that which has been discarded. The fundamental principle underlying reclamation is that nothing must be reclaimed that will not be needed for future use or that cannot be reclaimed at a saving, and in order to guard against losses or incorrect conclusions an accurate record must be kept covering each operation, from which a monthly statement should be compiled showing the net results (savings or loss) on each item of material reclaimed.

There is one feature of this work which operating and maintenance officers seem to lose sight of, and that is, that the supply department has not taken over any of the functions of the maintenance department in salvaging materials; they have taken over this work after the using departments have finished with it. The using departments are expected and should be required to get the utmost service out of their materials and tools and not permit them to be turned over as scrap to be salvaged until they have performed their full service. The following outstanding features of this work must appeal to all practical men:

(1) That the supply department is organized for the purpose of supplying materials, and the reclaiming of materials is one of its sources of supply;

(2) That the work of dismantling, disposing and sale of all materials, including released equipment, is one of the duties of the supply department;

(3) That this work can be done more economically in conjunction with the handling and marketing of scrap, of which it is a part.

Railway Storehouse Not a Reservoir

All primary accounting should be done at points where the materials are issued. In no other place can basic accounting be done as economically and accurately. All materials must be received and checked by the storekeeper. The same material must be priced and either invoiced to the using department or charged direct to the primary accounts. In no other way can the storekeeper keep control of the stock and control his business. The supply officer is the fiscal agent of the company. The money invested in material is enormous. Every dollar invested unnecessarily in materials is unliquid and unworking capital. The railway storehouse is not a reservoir, but a bank. Material is not junk, but cash, and must be as safely guarded and controlled as cash.

There is an unlimited field for practical reform in our accounting system, which can only meet the full possibilities when our railroad executives realize that decentralization must take place and the records made complete on the ground.

What Has Been Done on the C. & O.

Probably the property with which I am connected is a fair example of many large-earning, reasonably well-managed properties, and its material conditions were probably not out of line with the majority of railways. The stock on hand April 30, 1921, was $15,830,416. On June 30, 1922, the stock on hand was $8,591,088. No unusual work was performed. On the contrary maintenance was greatly curtailed during the first half of the year 1921. No additional facilities were provided, and only applied common sense was required to accomplish this, but it was necessary to have men who knew what to do at the time. It was not sufficient to have well-meaning, honest men that were willing to learn.

The first step was to find out what we had and where it was. This was accomplished by starting men out over the line taking lists of everything that was on hand, on rough pencil sheets, being careful to give accurate description and location. These sheets were forwarded daily to a central location where they were transcribed on to cards. The cards were arranged alphabetically. All requisitions were sent to a central location, checked against these cards and the material transferred.

This was merely a bridge until a permanent organization could be built. Where storehouses or platforms were not available, ground was leveled off and rough timbers laid down, the material sorted and every piece marked or stencilled. After it was all segregated and marked, it was listed in books by classes. From these books a master book was built up which contained every item on the road, properly described. We were then in position to discontinue the monthly inventories and card indexes and start in with basic records. The next move was to consolidate the material at as few places as possible. Everything that was not used at a particular point was consolidated at the principal shops and a general store established, leaving only a 30 or 40 days' supply at local points. We continued the monthly inventory and transfer cards for the maintenance of way material until arrangements could be made to handle it in the same manner. We procured an appropriation covering the expense of work trains sufficient to pick up and assemble the maintenance of way material in the same manner, but the shop crafts' strike on July 1 prevented us from carrying out the plan, which will be taken up as soon as the strike is over.

I merely mention these simple things to illustrate what anyone can do, no matter what the condition of the material is, or lack of organization. We had absolutely nothing; neither organization, storehouse facilities nor records; only the confidence and support of our president.

Owners of railroad securities and executives have quite recently passed through a period which has opened their eyes to the need of better control of their expenditures for materials. If this experience has not shown them that something was radically wrong with their supply department, nothing can be said or written that will be likely to have any effect.

Unless the chief executive of a railroad is in entire sympathy with such an organization and has the courage to select and support the man whom he places in control, nothing lasting or substantial can be obtained. Reforms must begin at the top. The real responsibility rests with the chief executive, who must first satisfy himself that the need exists, select the man whom he believes capable of organizing the department (because it is almost entirely a matter of organization), give him support, and he will be satisfied with the results.

Coal Production

WASHINGTON, D. C.

INSTEAD OF THE 9,400,000 tons suggested by the first reports, final returns on soft coal production show only 9,142,000 tons in the week ended September 2, according to the weekly bulletin of the Geological Survey. The record of the week was awaited with interest as an indication of the supply to be expected after general resumption of mining under the Cleveland agreement. In the week of September 4-9, because of the Labor Day holiday, the output can hardly exceed 8,700,000 tons.

Production of anthracite, though expected shortly, has not yet been resumed.

The trend of output, day by day, is shown by the statement of cars of bituminous coal loaded. The early promise, as indicated by loadings of 30,662 cars on Monday, August 28, was not fully borne out by the reports of Friday and Saturday, when loadings dropped to 27,040 and 25,517 cars, respectively. On Labor Day 10,021 cars were loaded by the non-union mines, confirming the experience of other years that the day counts for a third of an ordinary working day. The double holiday on Sunday and Monday increased the number of empty cars available for placement on Tuesday and on that day 33,085 cars were loaded, the largest number on any day since last March. On Wednesday, however, loadings dropped to 30,652 cars and on Thursday to 28,238 cars. These returns suggest a total output for the week of between 8,300,000 and 8,700,000 tons.

	1st Week	18th Week	19th Week	20th Week	21st Week	22d Week	23d Week
Monday	11,445	15,102	16,229	15,703	18,601	30,662	10,021
Tuesday	11,019	11,446	13,729	13,032	17,801	28,197	33,085
Wednesday	11,437	12,447	13,368	12,531	18,524	28,641	30,652
Thursday	11,090	12,380	13,277	13,521	19,388	28,637	28,238
Friday	11,296	12,669	13,539	13,718	22,882	27,040	.....
Saturday	8,888	12,405	11,009	13,524	23,070	25,517	.....

"The limiting factor in the supply of soft coal has now become transportation," the bulletin says. "It is true that some thousands of miners are still on strike, notably in the Connellsville and Kanawha districts, but the tonnage offered for shipment by the other mines at work will absorb the available transportation facilities. The demand for coal is active and prices are high. Under such conditions coal is offered for shipment up to the limit of the ability of the railroads to transport it.

"The present rate of production is 9,600,000 tons a week. In the corresponding period of 1920 the average was 11,750,000 tons; in 1919, 11,340,000 tons; and in 1918, about 12,800,000 tons. The present rate of soft coal movement, even with priority in use of open-top cars, is therefore 25 per cent below 1918, 15 per cent below 1919, and 18 per cent below 1920.

"The Cleveland agreement itself was concluded on August 15 and 16. By Saturday of that week it had been accepted by the majority of operators in Ohio, Fairmont and Michigan, and in part of Central Pennsylvania, and by that time coal was beginning to move from these mines.

"The following week (August 21-26) was marked by a series of local wage conferences, and by the acceptance of the Cleveland settlement in district after district. In rapid succession agreements were signed in the Kanawha and Michigan section of West Virginia, in Montana, Illinois, Indiana, Wyoming, the Southwest Interstate Field, and Central Pennsylvania. Before the week ended only Washington and Pittsburgh of the strongly organized districts had failed to reach an agreement.

"In the meantime output in the non-union fields of the Middle and Southern Appalachians continued to be limited by transportation. The mines in the Logan district alleged a loss of 73.4 per cent of full time capacity on account of transportation. In the Winding Gulf field the loss was 63.7 per cent, and in Northeastern Kentucky 56.0 per cent. Transportation difficulties were most acute in the Hazard and Harlan districts, where losses of 71.5 and 89.6 per cent were reported. There was, however, a slight improvement in car service as compared with the week preceding."

The all-rail movement of coal to New England during the week ended September 2 comprised shipments of 1,232 cars of bituminous coal and 151 of anthracite over the six principal Hudson river crossings and 19 cars of bituminous coal through Rouses Point. The aggregate, 1,402 cars; was an increase of 259 cars, or nearly 23 per cent, over the preceding week. The total all-rail forwardings this year to September 2 amounted to 112,025 cars divided as follows: 50,710 cars of anthracite and 59,777 cars of bituminous coal through the principal gateways and 223 cars of anthracite and 1,315 of bituminous coal through Rouses Point.

Under the Federal Fuel Distributor's orders directing coal to Lake Erie ports total shipments during the week ended September 2 increased 79 per cent, and according to reports from the Ore and Coal Exchange a total of 463,242 tons was dumped as against 258,598 tons in the week preceding. Of the total, 432,281 tons were cargo coal and 30,961 tons were vessel fuel. The present rate of dumpings was 79 per cent of that in the corresponding week a year ago. The total quantity of cargo coal forwarded during the present lake season now stands at 5,337,275 tons as gone to destinations not ordinarily taking lake coal. The quantity sent to the regular lake markets is only 4,441,043 tons as against 16,216,834 in 1921, and 11,346,697 in 1920.

Shipments of bituminous coal through Hampton Roads increased in volume during the week ended September 2. Dumpings for the week of September 2 totaled 369,685 net tons, as against 310,593 tons the week before. Cargo coal for export decreased, whereas coal for New England and other coastwise destinations and bunker coal increased.

After the Sunday and Monday holiday total shipments on Tuesday were the largest recorded for the period since April 1. On the next day they were less, but were higher than on any preceding Wednesday. Aggregate shipments during the first half of last week, considering Labor Day equivalent, as usual, to about three-tenths of a full day, were at the rate of 1,600,000 tons a day. This rate exceeded by 15 per cent and 65 per cent, respectively, the daily averages for the preceding week and for the week before that.

Pennsylvania districts showed continued increase on Wednesday. In northern West Virginia, Ohio, Indiana, and Illinois, the rapidly rising rate of shipments was checked by transportation difficulties.

In the non-union districts of southern West Virginia, Virginia, Kentucky, and Alabama shipments have declined generally, but the Logan, Pocahontas-Tug River, and parts of Eastern Kentucky shipments increased this week although still far behind the high rate attained late in June.

In the region immediately west of the Mississippi river shipments have increased regularly from day to day and on Wednesday, September 6, were higher than previously reported this season.

The Colorado coal fields early last week shipped at about the rate of the week before, which was less than previous weeks. Marked increases were shown last week in Utah and New Mexico, whereas in Washington there was a decrease as compared with the week before.

Lake coal now being loaded is moving almost entirely under its natural Class 2 movement and with only a very limited application of the No. 1 priorities. A problem in the transportation of lake coal has arisen because of delays in the unloading at lower lake ports of cargoes of iron ore from the northern ranges from boats which carry coal on their return trips to Lake Superior ports. This delay in unloading ore boats which has been occasioned by deficiencies in the railroad car supply, will be obviated, it is hoped, by the issuance of special permits for the use of cars to transport iron ore.

It is probable that arrangements will have to be devised to insure at least a partial supply of anthracite for the upper

DAILY SHIPMENTS OF SOFT COAL FROM PRODUCING DISTRICTS

Net tons, assuming 50 tons to the car, based upon records of cars loaded, as reported by the railroads to the American Railway Association

District	Average wk ended Aug 26	Average wk ended Sept [illegible]	Monday Sept. 4	Tuesday Sept 5	Wednesday Sept 6
Central Pennsylvania	75,9[illegible]	141,[illegible]	15,[illegible]	[illegible]	16[illegible]
Western Pa including Freeport	39,325	[illegible]1,[illegible]2	6[illegible]	[illegible] 150	133,[illegible]
Greensburg Westmoreland	39,425	44,225	[illegible]1,30[illegible]	49,[illegible]	52,250
Connellsville & Somerset Meyersdale	58,742	59,75[illegible]	39,400	67,75[illegible]	69,300
South Fork nad Windber.	8,042	14,842	3,5[illegible]	17,750	17,250
Total Pennsylvania	221,492	321,314	86,000	383,300	435,500
Georges Creek, Upper Potomac and Cumberland-Piedmont	14,883	15,017	3,650	12,500	13,350
Fairmont & W. Va. Panhandle	87,191	100,383	12,700	155,900	115,300
Coal and Coke	8,858	6,217	9,000	7,850	7,[illegible]50
Kanawha and Coal River	18,092	20,750	13,700	20,9[illegible]	13,[illegible]50
Logan	27,225	26,708	28,900	11,600	35,100
New River (C & O. New River Div.)	19,367	18,642	16,300	30,500	[illegible]1,450
Winding Gulf (Virginian)	17,383	18,825	13,350	16,600	16,700
Pocahontas and Tug River	71,067	67,583	75,900	31,950	6[illegible],550
Kenova Thacker	27,400	26,308	35,150	30,600	22,700
Total W Va and Md	291,466	300,433	209,250	318,400	307,650
Eastern Kentucky	51,733	51,467	67,600	47,650	50,300
Western Kentucky	59,258	42,975	2,600	61,450	44,050
Tennessee	16,800	14,492	13,850	17,100	15,900
Clinch Val. & S. W. Va	22,475	21,433	30,050	22,550	17,300
Alabama and Georgia	50,842	44,166	44,300	50,250	46,800
Ohio	94,408	115,508	2,500	156,250	130,000
Indiana-Illinois	79,308	330,008	50	401,950	345,950
Iowa, Mo., Kans., Okla., Ark and Texas	19,675	51,508	1,750	67,950	69,750
Colorado	34,525	29,167	5,400	28,200	29,250
New Mexico	6,034	7,225	7,450	7,650	10,300
Utah	16,783	16,458	12,300	18,850	26,050
Wyoming, Mont. & N D.	10,584	40,151	0	54,400	53,000
Washington	3,708	3,983	0	3,800	2,400
Michigan	1,475	3,892	[illegible]	3,750	3,650
Total, East of Mississippi River	889,257	1,245,708	456,200	1,462,650	1,397,100
Total, West of Mississippi River	91,309	148,492	26,900	180,850	191,050
Grand total, bituminous shipped	980,566	1,394,200	483,100	1,643,500	1,588,150

lake region. In normal seasons between 3,000,000 and 4,000,000 tons of anthracite are shipped to upper lake territory, the great bulk of which goes by the water route through Buffalo, N. Y., and Erie, Pa. It is hardly possible at this juncture to supply the lake region with its normal anthracite requirements, but it is hoped that a considerable percentage, perhaps 50 per cent of the normal supply may be provided. In the consideration of the lake anthracite problem, the demands of the Eastern and Northeastern regions for hard coal have to be taken into account.

Fuel Distributor Spencer is still receiving a large number of urgent requests for coal. These requests come to a considerable extent from the southeastern states, notably Mississippi, eastern Tennessee and North and South Carolina. Artificial gas manufacturing companies in the northern states continue to ask assistance in obtaining coal for gas making purposes. The State Fuel Administration of Massachusetts has informed the Fuel Distributor that it will require no

Secretary Hoover, of the Department of Commerce, and

further supplies of emergency coal.

Fuel Distributor Spencer conferred with members of the Pennsylvania Fuel Commission and representatives of the anthracite producers in Philadelphia on September 7 with a view to assuring an equitable and expeditious distribution of hard coal supplies, when available.

The railway fuel situation last week was reported as apparently much easier, and railroads generally, with the exception of certain lines in the southeastern part of the country, are obtaining coal supplies. The Fuel Committee is endeavoring to take care of the needs of certain short-line railways in the Southeast.

The Federal Fuel Distributor is at present issuing very few priority orders for the movement of coal. The policy at present being pursued is to limit the use of No. 1 priority orders to cases of keen emergency and then to apply the priority only against coal under contract.

A conference has been called by the President's Fuel Committee, in co-operation with the United States Chamber of Commerce, to be held in Washington on Friday, September 15, to be comprised of business, industrial railway and public utility representatives, to consider various measures in amelioration of the coal situation. The conference will consider specifically the organization of a voluntary campaign of—

(a) Measures for expedition of coal movement.

(b) Measures for restraint on accumulation of unnecessary coal stocks by business and industrial consumers.

(c) Measures for placing upon the public market some part of the production of the mines normally producing for certain industries.

(d) Other methods for expediting return of the coal situation to normal.

The co-operation of the responsible coal operators will also be requested, the general purpose of the movement being that prices may be quickly readjusted downward, the householder and small consumer immediately supplied, and the coal situation returned to normal.

Julius Barnes, of Washington, and Alexander Legge, of Chicago, are acting for the United States Chamber of Commerce. The invitations to the conference have been issued by Secretary Hoover of the Department of Commerce on behalf of Fuel Distributor Spencer, Commissioner Aitchison of the Interstate Commerce Commission and Dr. Foster Bain, director of the Bureau of Mines, representing the Department of the Interior.

Except for seven different days in March, more cars were loaded with coal on Monday, September 11, than on any one day this year, either before or after the coal miners' strike began on April 1. Loading on Monday totaled 35,808 cars. This exceeded the previous record loading since the miners' strike began by 2,723 cars, that record having been made on September 5, when the total was 33,085 cars.

Coal loadings on Monday were equivalent to a weekly production of approximately 11,800,000 tons and exceeded the average daily loading in September last year by 11,251 cars, and the daily average for August this year by 18,745 cars.

FORTY-SIX LOCOMOTIVES, valued at $783,000, were exported from the United States during June. Of these 25 went to Argentina.

EXPORTS of freight cars in May totaled 490, valued at $998,076. Passenger cars exported numbered 8, valued at $11,237. Of the freight cars, 400, valued at $880,000, went to Argentina.

Photo by Ewing Galloway, N. Y.

Transvaal Express Leaving Laurenço Marques, Portuguese East Africa

General News Department

The Western Railway Club has postponed its September meeting and will hold its next regular meeting in October.

The Telegraph & Telephone Section of the American Railway Association, W. A. Fairbanks, secretary, announces that the annual meeting of the Section, scheduled for September 19, 20 and 21, has been indefinitely postponed.

Graysonia, Nashville & Ashdown is the name of the successor to that part of the Memphis, Dallas & Gulf which extends from Ashdown, Ark., on the Kansas City Southern and the Frisco Northeast to Shawmut, on the Missouri Pacific, about 60 miles. The new company is preparing to rebuild the line. It is planned to use motor cars for passenger, express and baggage service. C. M. Conway, of Texarkana, Ark., heretofore general agent, has been elected president and general manager of the new company.

Henry Ford professes to believe that the members of the Interstate Commerce Commission are only pawns in the hands of New York financial interests. In a statement given out at Detroit last Wednesday he declared that by its control of empty coal cars the Commission aids the coal profiteers. He said, as quoted in the dispatches:

"The same interests who own the public utilities, railroads and mines are using the commission as part of their scheme to fleece the public. If this commission ever was useful, it now has outlived its usefulness. If the Government had desired, it easily could have stepped in and given the public all the coal it needed. Why should it let the Labor Board set the wages for the railroad crafts so far below a living wage that they would strike? Why should the I. C. C. permit the Louisville & Nashville to carry a $70,000,000 surplus and keep an insufficient one-track road serving the most productive coal fields. The commission should have insisted that the L. & N. build adequate facilities into the heart of this great coal region. With a wonderful opportunity for public service, the I. C. C. widely misses the mark."

Northern Pacific Sued by Strikers

Former Northern Pacific shopmen at Pasco, Wash., 28 in number, have filed suits against that railroad for $1,000 each, as damages for alleged refusal of the company to employ them. After the strike was declared the railroad management decided to build a fence around the shops at Pasco, and a contract for building the fence was let to a construction concern. The 28 idle shopmen applied for work on this job but were rejected.

Freight Loss and Damage Payments in May

Figures compiled by the freight claim division of the American Railway Association show that the total charged to loss and damage by the railroads of the country in May, 1922, was $4,258,941 as compared to $8,333,320 for the same month in 1921, a decrease of 48.9 per cent. For the five months ended May 31 the total charged to loss and damage was $23,414,363, as compared with $47,388,357 for the same period last year, or a decrease of 50.6 per cent.

Burlington 72 Years Old This Month

On September 2 the Chicago, Burlington & Quincy completed its seventy-second year of service. Under the name of the Aurora Branch railroad, with tracks extending from Aurora, Ill., to Turner Junction (West Chicago), a distance of 12 miles, it began serving the public on September 2, 1850. At that time its equipment consisted of one locomotive, one passenger coach and two combination baggage and freight cars. The road was built to meet local requirements and the promoters of the Aurora road harbored no idea of extending their line beyond the boundaries of Illinois. However, during the years following the management took advantage of the opportunities presented to build a large transportation system until today the Burlington has 9,389 miles of line, 1,955 locomotives, 1,389 passenger cars and 72,131 freight cars and employs more than 50,000 officers and employees.

Automatic Train Control on C. & N. W.

The Chicago & North Western has contracted with the General Railway Signal Company, Rochester, N. Y., for an installation of automatic train control between West Chicago, Ill., and Elgin. [West Chicago is 30 miles west of Chicago and Elgin is 12 miles north of West Chicago.] The line to be equipped has some double track and some single, with both mechanical and electric interlocking plants. The intermittent induction type will be used, with speed control.

T. and T. Convention Postponed

The annual convention of the Telegraph and Telephone section of the American Railway Association, which was scheduled to be held at Colorado Springs, Colo., on September 19-21, has been indefinitely postponed according to a notice issued on September 6 by Chairman W. H. Hall and Secretary W. A. Fairbanks. The notice reads as follows:

"Owing to the present conditions the Committee of Direction has decided that it is advisable to postpone the fall session (annual meeting) of the Telegraph and Telephone section."

New Union on M. & St. L.

The shop employees of the Minneapolis & St. Louis have organized a new union under the leadership of W. A. Liehl, who has been elected president. "We have formed this association at the suggestion of the wage board," Mr. Liehl said. "We have a set of officers who can be dealt with and, in a diplomatic way can settle disputes, thus avoiding friction and strikes. Our organization will extend to all the shops of the road. I believe that 75 per cent of the striking shopmen who are out did not go out of their own free will; and they fear the torrent of abuse they would get if they went back to work."

New Cars in 1922

The railroads of the United States, in the seven months from January 1 to August 1 this year, had 25,763 more new freight cars, either ordered and under construction or installed in actual service, than during the entire year of 1921, according to a statement issued by the Association of Railway Executives; seven months this year, 95,199 cars; 12 months of 1921 a total of 69,436.

Of the total ordered or installed this year, 41,405 were coal cars and 39,612 were box cars. The railroads are also augmenting their supply of refrigerator cars. On August 1, 3,870 had actually been installed and placed in service, while 6,428 more had been ordered.

Labor Board Again Rules Against Contracting

Several decisions directed against the practice of contracting on various railroads were handed down by the Labor Board on September 11 and subsequent days. These decisions, involving the Erie; the New York Central; the San Antonio, Uvalde & Gulf; the Great Northern; the Chicago and North Western; the Cincinnati, Indianapolis & Western; the Chicago, Milwaukee & St. Paul and the Chicago Great Western, follow, practically word for word, the Board's ruling in the Indian Harbor Belt case described in full in the *Railway Age* of May 13, page 1111.

In every case the practice complained of by the employees had been discontinued before or soon after the strike of shopmen began on July 1. At the Board's inquiry on June 31 into the strike

situation all of the roads involved in the decision except the Erie, announced the discontinuance of the practice of contracting or made a promise to do so as soon as possible.

Safety on the Southern

The Southern Railway announces that since March 1, 1920, the end of federal control, it has had the comfort of being able to record, month by month, that no passenger has lost his life by accident while on one of its trains. During these thirty months the company's trains carried passengers equivalent in number to nearly half the population of the United States. On the other hand, during the same period, there has been a steadily growing toll of fatal accidents at highway crossings on this company's lines. For three periods of two years each the records show:

	Railroad Passengers Killed on Trains	Automobile Passengers Killed in Road Crossings
1912-1913	7	7
1913-1914	8	10
1921-1922	0	58

Attention is called to the fact that from a social standpoint the driver of an automobile has the same duty of taking all needed precautions as has the railroad company.

Canadian Engineers Meet at Winnipeg

The Engineering Institute of Canada held its thirty-sixth annual professional meeting at Winnipeg, Man., on September 5-7, with approximately 200 members in attendance. J. G. Sullivan, consulting engineer, Winnipeg, and formerly chief engineer of the Canadian Pacific, Western lines, presided. The first day was devoted to the presentation and discussion of papers describing the hydro-electric plants in the vicinity of Winnipeg which were visited on the following day. On Thursday separate meetings were held for the civil, geological and mechanical sections of the society. Among the papers of interest to railway men which were presented before the society on Thursday was one by S. B. Wass, terminal engineer, Canadian National, on the Construction of the Moncton Yard and Engine Facilities, which was abstracted in the *Railway Age* of September 9, page 463. Following this a paper was presented on Automatic Grain Car Unloaders for the Canadian National Railways at Port Arthur by Fred Newell, mechanical engineer, Dominion Bridge Company, Ltd., Montreal, which is reprinted on another page in this issue. Professor T. Thorvaldson of Saskatchewan University, presented a paper on the Disintegration of Concrete of Alkaline Ground Waters in which he described the extensive investigations which are now under way to determine means of arresting and overcoming the attacks on railway and other structures.

Railway Earnings for July

The railroads of the United States had a net operating income in July amounting to $69,239,000, equal to a return on an annual basis, of 4.04 per cent on their tentative valuation. In June the net operating income was $76,594,000, or 4.79 per cent.

The railroads fell short by $29,332,800 of a return of 5¾ per cent, the figure fixed by the Interstate Commerce Commission in its recent rate decision.

Operating revenues in July totaled $443,183,000, a decrease of 4.3 per cent below July last year; operating expenses $340,725,800, or 6.1 per cent under 1921.

For the first seven months this year the railroads had a net operating income of $418,271,000, compared with $214,713,400 during the same period last year; an annual rate of 4.3o per cent, compared with 2.24 per cent in the first seven months last year. Operating revenues for the first seven months in 1922 amounted to $3,054,531,000, a decrease of 2.6 per cent under the same period last year, while operating expenses totaled $2,419,602,000, or 11.2 per cent decrease.

The carriers in the Eastern district had a net operating income in July of $24,165,400, compared with $31,054,370 in July last year; in the Southern district $6,479,000, compared with $4,703,000, and in the Western district $38,594,500, compared with $33,560,800.

Despite the strikes of coal miners and shopmen, loading of revenue freight in July increased 10 per cent over the same month last year. Coal loading during the same month, however, was approximately 48 per cent under July, 1921 but loading of all commodities other than coal increased nearly 24 per cent. Measured in net ton miles, there was a decrease in freight traffic of approximately 4½ per cent under July last year.

The tabulations as to earnings are based on the reports of 197 Class 1 railroads representing a total mileage of 235,221 miles. There were formerly 201 Class 1 roads but because of the consolidation of reports by a number of railroads with subsidiary lines which heretofore had been classified separately, the number of Class 1 roads named in the reports is now 197.

National Association of Railway Commissioners

The thirty-fourth annual convention of the National Association of Railway and Utilities Commissioners will be held at Hotel Tuller, Detroit, Mich., beginning on Tuesday, November 14, the date having been changed from September 26 by action of the executive committee. The call for the convention, signed by Carl D. Jackson of Wisconsin, president of the association; James B. Walker of New York, secretary, and H. G. Taylor, of Nebraska, chairman of the executive committee, says that the tendency of the federal government to encroach on the powers of the states must be checked, and every state is earnestly urged to send as many delegates as possible.

Chairman C. C. McChord of the Interstate Commerce Commission will address the convention on Tuesday afternoon and will tell what has been done and what is proposed in the direction of co-operation between the federal commission and state commissions. Possible changes in the Transportation Act will be discussed by W. H. Newton of Minnesota and H. G. Taylor of Nebraska.

On Wednesday morning, the regulation of telephones will be discussed and on Thursday morning other public utilities will be the subject with addresses by executives of the different interests, who have been invited by the association. These addresses will deal with gas, electric light and power.

Hon. E. V. Kuykendall, of Washington, will present the report of the new standing committee on Motor Vehicle Transportation. Washington is one of the states which has taken the lead in regulating motor vehicles. Reports are expected from all of the standing committees.

The address of Secretary James B. Walker is 49 Lafayette street, New York City.

A Committee on Public Relations

The Long Island Railroad announces the appointment of a Committee on Public Relations, which, in the words of President Ralph Peters, has been established for the purpose of opening up as many channels as possible between the management of the road and the people patronizing it, with the end in view that patrons may have a closer idea of the company's problems and the officers have a closer idea of the problems of the people. In addressing the members of the committee at their first meeting, Mr. Peters said:

"The road must expand its activities and keep its patrons better informed about railroad problems. Public opinion may be depended upon to be actuated by justice and good sense if the people are well informed. Employees need a liberal education; they need information that will give them courage to speak for the company. The committee is expected to supply officers and employees with the facts which will enable them to speak authoritatively and clearly, not only on matters pertaining to the Long Island road but as well on railroad problems generally."

In the "creed" which has been prepared for the committee we read: "Any employee can do *as* told; *all* employees will do *when* told; but the most valuable employee is the one who gives off-duty thought to the problems with which he has to deal." Announcement has been made that a member of the committee or a representative will attend meetings held in any town on Long Island to discuss all matters affecting train service, civic improvements and general railroad subjects. Chambers of Commerce, Boards of Trade and other organizations can make special arrangements by addressing the Chairman, P. H. Woodward (general passenger agent), Pennsylvania Station, New York City. Other members of the committee are C. D. Baker, general superintendent; J. F. Keany, general solicitor; C. L. Addison, assistant to the president; Donald Wilson, general freight agent and George Flatow, Publicity Agent.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1922

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Akron, Canton & Youngstown	July	170	$174,819	$1,222	$183,942	$26,317	$20,258	$6,241	$53,983	$8,091	$114,890	62.50	$69,052	$58,052	$25,545	$50,887
	7 mos.	170	1,193,149	9,444	1,255,566	134,117	131,482	40,295	338,250	60,642	704,373	56.10	551,183	482,096	296,112	49,758
Alabama & Vicksburg	July	141	108,047	67,630	193,048	45,431	21,834	8,725	93,609	11,990	183,577	95.10	9,471	—6,947	2,021	24,872
	7 mos.	141	1,248,975	396,684	1,768,138	322,455	334,225	62,426	662,320	83,095	1,477,501	83.60	290,637	149,557	177,916	—92,750
Vicksburg, Shreveport & Pac	July	171	138,787	95,912	256,073	54,159	30,328	9,616	113,452	16,929	226,777	88.60	29,296	11,947	6,975	60,637
	7 mos.	171	1,353,279	635,281	2,137,389	406,848	330,785	72,237	834,650	97,335	1,757,192	82.20	380,197	243,559	188,356	115,579
Ann Arbor	July	293	333,241	51,412	410,579	59,093	79,435	10,564	193,694	18,765	361,591	88.10	48,988	26,453	10,873	43,245
	7 mos.	293	2,406,015	299,588	2,823,654	346,387	488,220	66,969	1,257,406	101,741	2,262,818	80.10	560,836	412,166	266,255	56,070
Atchison, Topeka & Santa Fe	July	8,855	10,514,515	4,105,254	15,767,202	2,851,622	2,532,753	253,232	4,648,927	336,890	10,562,083	67.00	5,205,119	4,213,204	4,370,320	6,010,029
	7 mos.	8,856	65,993,495	24,796,582	99,169,530	17,726,443	23,268,684	1,826,012	31,940,208	2,342,969	77,002,077	77.60	22,167,453	14,969,694	15,893,110	21,051,305
Gulf, Colorado & Santa Fe	July	1,907	1,411,826	401,920	1,943,272	303,828	302,277	41,671	581,477	62,965	1,291,126	66.40	652,146	568,888	508,201	1,112,427
	7 mos.	1,907	8,824,463	2,241,038	11,937,548	2,699,796	2,996,429	293,753	4,070,737	472,269	10,527,510	88.20	1,410,038	929,398	482,069	2,894,234
Panhandle & Santa Fe	July	857	456,342	136,047	642,132	164,593	139,670	7,079	206,998	17,545	535,456	83.40	106,666	83,731	55,498	353,556
	7 mos.	857	3,056,940	780,657	4,113,128	1,093,166	1,283,773	48,371	1,398,134	130,881	3,947,448	96.00	165,680	5,317	—210,667	548,673
Atlanta & West Point	July	93	103,561	77,946	207,431	32,397	42,170	8,798	75,852	9,905	172,219	83.00	35,212	22,860	17,427	18,146
	7 mos.	93	679,307	487,096	1,354,663	173,482	291,061	54,603	528,467	71,673	1,146,012	84.60	208,651	135,009	85,956	39,173
Western of Alabama	July	133	120,517	72,986	216,665	30,469	32,964	9,022	70,937	9,963	156,058	72.00	60,607	44,795	45,297	27,495
	7 mos.	133	803,989	444,209	1,411,397	179,254	311,819	59,319	469,669	75,178	1,118,013	79.20	293,384	223,342	225,631	82,837
Atlanta, Birmingham & Atlantic	July	639	242,853	53,508	323,061	58,581	80,962	21,546	161,574	17,318	340,046	105.25	—16,985	—30,995	—43,420	—143,464
	7 mos.	639	1,740,166	245,280	2,165,907	409,584	612,733	148,641	1,110,516	112,363	2,394,451	110.55	— 228,544	—331,698	—418,226	—1,164,282
Atlantic Coast Line	July	4,922	2,956,044	1,125,462	4,494,338	695,797	874,127	110,778	1,901,153	147,252	3,748,654	83.40	745,684	468,749	538,405	—51,981
	7 mos.	4,922	28,661,535	9,583,281	41,589,918	4,793,537	7,925,444	753,287	14,989,103	973,255	29,666,171	—71.30	11,923,747	10,033,583	9,383,759	3,118,477
Charleston & Western Carol	July	342	183,914	41,285	238,807	39,056	39,660	6,278	100,512	6,443	191,949	80.40	46,858	35,857	29,028	—7,658
	7 mos.	342	1,604,494	257,817	1,963,283	312,656	263,480	46,404	791,534	45,223	1,459,297	74.30	503,986	426,362	364,278	—209,808
Baltimore & Ohio	July	5,235	10,350,382	2,310,138	13,944,023	1,900,361	2,295,630	297,558	6,483,637	447,833	11,545,768	82.80	2,398,255	1,663,646	1,225,067	2,026,782
	7 mos.	5,235	89,676,196	15,220,346	112,623,182	13,604,630	24,673,525	2,082,748	44,544,502	3,315,541	89,244,692	79.20	23,378,490	18,360,922	15,805,362	9,657,246
Balt & Ohio Chic Term	July	91			246,065	27,929	17,190	1,860	138,492	11,049	202,300	72.20	43,755	—7,633	108,057	70,433
	7 mos.	91			1,723,489	249,072	204,894	13,322	952,650	72,467	1,532,211	88.8	201,278	—132,726	675,588	231,981
Staten Isl. Rapid Transit	July	23	69,029	147,895	256,842	49,515	32,955	1,812	132,096	13,256	229,637	89.40	27,205	9,047	—4,753	5,231
	7 mos.	23	545,329	710,388	1,408,650	350,384	216,970	13,527	814,718	95,524	1,491,123	105.90	—82,473	—203,177	—298,978	—195,112
Bangor & Aroostook	July	625	318,116	67,290	406,574	140,960	90,183	2,937	130,713	17,604	434,099	94.50	—27,485	—5,956	18,569	—53,004
	7 mos.	625	4,219,804	516,529	4,894,961	849,097	854,707	27,632	1,324,579	136,774	3,109,801	65.40	1,695,160	1,330,286	1,371,694	302,420
Belt Ry Co. of Chicago	July	32			445,914	38,749	25,021	2,549	201,172	9,510	277,001	63.10	168,913	135,535	133,155	134,059
	7 mos.	32			3,336,640	316,270	340,664	14,758	1,463,199	68,976	2,203,867	66.10	1,132,773	887,112	962,139	937,768
Bessemer & Lake Erie	July	225	1,364,389	35,896	1,427,097	140,720	375,195	13,475	425,664	25,886	987,191	69.20	439,906	407,770	409,943	494,789
	7 mos.	225	5,733,319	212,473	6,091,746	777,349	2,141,930	107,419	2,038,533	179,249	5,280,289	86.70	811,457	582,881	775,561	412,233
Bingham & Garfield	July	34	20,079	1	20,416	15,117	3,320	1,449	4,966	4,223	29,128	142.30	—8,663	—12,872	2,017	—32,122
	7 mos.	34	101,537	7	102,845	116,427	24,426	9,407	33,484	29,350	213,443	207.50	— 110,598	—148,874	—75,069	—147,519
Boston & Maine	July	2,287	3,544,985	2,219,095	6,519,313	983,942	966,899	48,265	2,779,497	199,506	5,005,946	76.80	1,513,367	1,301,751	1,044,869	6,465
	7 mos.	2,287	27,136,104	12,517,832	44,368,076	6,797,069	8,187,470	383,239	20,338,600	1,529,302	37,408,745	84.30	6,959,331	5,584,450	3,811,960	—4,491,850
Brooklyn Eastern Dist. Term	July	9	114,215		121,905	6,215	17,857		47,705	5,229	77,006	63.20	44,899	38,207	38,207	25,356
	7 mos.	9	864,854		919,325	39,415	130,186	1,294	346,953	34,275	552,123	60.10	367,202	321,939	321,939	171,793
Buffalo & Susquehanna	July	253	44,171	4,762	52,331	32,735	21,521	2,089	30,148	8,654	95,147	181.80	—42,816	—46,066	—41,570	—16,320
	7 mos.	253	714,584	41,290	784,078	217,485	256,645	15,260	296,160	63,709	849,259	108.30	—65,181	—87,968	17,069	—67,170
Buffalo, Rochester & Pittsburg	July	589	657,711	147,148	881,194	226,908	368,521	24,113	429,419	37,819	1,088,968	123.60	—207,774	—242,983	—190,631	53,921
	7 mos.	589	6,497,893	932,582	7,824,152	1,139,142	2,887,311	128,581	3,144,428	265,828	7,580,472	96.90	243,680	—5,831	215,868	387,024
Canadian Pacific (Lines in Me.)	July	233	82,748	35,359	132,721	31,284	32,455	4,347	77,355	4,542	156,483	113.40	—17,762	33,762	37,616	51,602
	7 mos.	231	1,292,771	237,093	1,641,225	247,596	305,051	30,165	788,795	76,742	1,398,349	85.20	242,876	130,876	45,765	—55,698
Carolina, Clinchfield & Ohio	July	295	565,465	45,641	624,292	73,389	72,348	21,433	159,605	19,084	345,504	55.30	278,788	238,757	321,048	245,968
	7 mos.	295	4,139,635	265,690	4,487,547	520,220	972,105	163,475	1,111,344	132,511	2,897,065	64.60	1,590,482	1,309,963	1,827,464	1,208,687
Central of Georgia	July	1,920	1,286,868	476,977	1,935,648	272,661	342,545	66,236	757,867	75,569	1,520,458	78.60	415,190	315,012	337,387	261,126
	7 mos.	1,917	8,594,354	2,871,355	12,683,645	1,694,886	2,418,119	462,595	4,937,877	522,508	10,080,159	79.50	2,603,486	1,966,322	2,085,224	358,334
Central of New Jersey	July	688	2,298,785	1,110,121	3,686,157	518,928	874,315	34,907	1,737,978	107,758	3,292,288	89.30	393,869	125,412	78,089	1,098,407
	7 mos.	688	19,787,958	5,270,703	26,886,137	3,057,058	7,460,479	237,033	11,424,547	734,113	23,030,123	85.70	3,856,014	2,026,651	1,759,811	4,171,917
Central Vermont	July	532	383,024	103,057	560,874	119,703	62,179	12,628	265,009	19,675	480,774	85.70	80,100	62,524	37,710	—108,618
	7 mos.	532	2,866,467	673,503	3,952,223	618,493	675,795	86,081	2,017,262	168,087	3,576,032	90.50	376,191	252,283	58,720	—974,175
Chesapeake & Ohio	July	2,547	5,094,564	985,581	6,474,773	913,225	955,417	83,433	2,367,590	149,520	4,508,532	69.60	1,966,241	1,697,987	1,690,589	1,534,566
	7 mos.	2,547	42,368,003	5,897,989	50,647,632	6,016,784	12,206,851	539,975	17,746,845	1,115,576	37,781,924	74.60	12,865,708	10,986,269	11,335,246	6,575,884
Chicago & Alton	July	1,050	1,093,882	550,557	1,866,110	326,609	482,300	48,827	834,723	55,789	1,761,392	94.60	99,718	24,570	—60,489	103,714
	7 mos.	1,050	11,148,779	3,531,588	15,973,782	1,941,686	4,360,500	386,581	6,274,831	402,787	13,445,339	84.10	2,548,453	2,021,173	1,093,595	58,889
Chicago & Eastern Illinois	July	945	1,244,584	493,905	1,788,702	246,386	361,856	49,124	823,722	69,674	1,559,076	87.20	229,626	129,499	101,790	275,136
	7 mos.	945	10,083,899	2,605,829	13,691,856	1,613,007	3,498,910	302,370	5,700,335	467,104	11,658,030	85.10	2,033,826	1,420,379	1,221,267	—105,186
Chicago & North Western	July	8,402	8,449,278	2,816,150	12,680,808	1,745,232	1,358,660	182,073	5,032,946	307,850	8,681,515	68.50	3,999,293	3,267,840	3,296,288	1,955,965
	7 mos.	8,402	54,512,833	17,074,068	80,341,437	10,522,558	15,896,565	1,072,964	35,240,864	2,174,558	65,388,984	81.40	14,952,453	9,824,268	9,627,691	—1,611,090
Chic., Burlington & Quincy	July	9,193	8,590,467	2,826,568	12,668,638	1,783,612	1,891,052	225,803	5,187,402	360,628	9,503,423	75.40	3,105,215	2,189,930	1,969,740	3,159,256
	7 mos.	9,193	63,283,350	15,794,271	87,244,590	11,289,002	17,867,096	1,330,097	32,700,411	2,426,540	66,227,317	75.90	21,017,273	14,575,993	13,638,812	13,831,646
Chicago, Great Western	July	1,496	1,373,622	382,102	1,915,134	439,031	230,792	62,494	762,202	53,120	1,561,571	81.50	353,563	274,806	136,916	244,596
	7 mos.	1,496	9,588,160	2,442,039	13,238,278	2,091,717	3,020,870	452,722	5,714,432	393,734	11,766,908	88.90	1,471,370	902,873	— 11,533	528,743
Chicago, Ind. & Louisville	July	654	839,211	240,067	1,210,744	134,455	205,188	34,966	482,277	34,772	904,024	74.70	306,720	240,699	136,814	93,751
	7 mos.	654	6,376,712	1,770,416	8,968,660	953,867	1,925,674	229,804	3,355,455	247,886	6,802,293	75.80	2,166,367	1,720,688	1,004,950	92,973

REVENUES AND EXPENSES OF RAILWAYS

Month of July and Seven Months of Calendar Year 1922—Continued

Name of road.		Average mileage operated during period.	Operating revenues—Freight.	Operating revenues—Passenger.	Operating revenues—Total (inc. misc.)	Operating expenses—Maintenance of—Way and structures.	Operating expenses—Maintenance of—Equipment.	Operating expenses—Traffic.	Operating expenses—Transportation.	Operating expenses—General.	Operating expenses—Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Chicago, Milw'k & St. Paul	July	11,030	$8,987,051	$2,232,604	$12,694,329	$1,919,243	$1,241,753	$189,857	$5,443,701	$303,955	$9,162,348	72.20	$3,531,981	$2,693,101	$2,334,534	$1,021,668
	7 mos.	11,030	61,102,179	13,638,098	83,851,104	11,155,614	20,663,240	1,303,675	35,870,843	2,280,666	71,707,222	85.50	12,143,882	6,483,526	3,951,689	—1,794,056
Chicago, Peoria & St. Louis	July	246	144,254	16,719	173,047	26,324	11,294	4,478	93,890	11,267	147,253	85.10	25,794	16,264	—17,195	—6,765
	7 mos.	246	1,091,490	132,494	1,306,232	210,034	262,718	30,897	758,415	75,164	1,337,[illegible]	102.40	—30,996	—97,623	—265,295	—388,[illegible]
Chicago River & Indiana	July	38	......	......	562,303	54,019	54,076	1,177	203,162	10,195	322,629	57.38	239,674	195,103	268,154	....
	7 mos.	38	......	......	1,354,566	142,014	136,146	1,910	519,081	18,378	817,529	60.35	537,037	433,599	613,633	....
Chicago, Rock Isl. & Pac	July	7,661	6,907,637	2,374,844	10,030,565	1,215,235	906,514	193,966	4,262,329	207,654	6,851,712	68.30	3,178,853	2,633,418	2,[illegible]36,951	1,811,522
	7 mos.	7,661	46,109,851	15,015,036	66,084,247	8,455,996	13,568,465	1,256,050	28,110,825	1,605,563	53,296,304	80.70	12,787,943	9,049,8[illegible]	7,208,077	6,324,946
Chic., Rock Isl. & Gulf	July	461	426,995	34,971	538,486	85,918	37,846	12,584	202,382	13,048	352,832	65.50	185,654	174,481	149,[illegible]64	146,[illegible]5
	7 mos.	461	2,432,475	537,660	3,254,546	472,593	524,521	95,150	1,457,769	97,061	2,652,365	81.[illegible]	602,181	520,946	3[illegible]9,[illegible]	521,8[illegible]9
Chic., St. P., Minn. & Omaha	July	1,749	1,635,918	518,176	2,323,273	327,733	226,129	34,549	1,003,964	71,533	1,672,582	72.00	650,690	520,711	477,383	39[illegible]93
	7 mos.	1,749	10,733,499	3,520,084	15,379,723	1,954,030	2,787,451	232,981	7,165,915	506,116	12,711,942	82.70	2,667,781	1,745,783	1,5[illegible]7,759	—376,3[illegible]8
Cin., Indianapolis & Western	July	347	275,004	44,427	341,742	44,312	59,607	11,434	149,562	20,163	287,090	84.00	54,652	[illegible]	1[illegible],379	—35,446
	7 mos.	347	1,912,392	338,782	2,385,326	300,314	517,015	79,630	1,063,070	139,400	2,116,176	88.70	269,150	166,760	11,148	—5[illegible]
Colorado & Southern	July	1,099	842,652	234,694	1,177,750	175,714	135,765	14,195	391,329	43,597	771,055	65.50	4[illegible]6,695	340,330	[illegible]5,17[illegible]	76,[illegible]4
	7 mos.	1,099	5,579,964	1,108,688	7,237,716	957,039	1,515,184	91,861	2,662,231	312,105	5,591,530	77.30	1,646,186	1,18[illegible]	[illegible]76,51[illegible]	8[illegible]41
Ft. Worth & Denver City	July	456	480,211	244,301	769,152	55,035	79,895	12,444	261,369	32,379	447,738	58.[illegible]0	3[illegible]1,414	[illegible]2,176	[illegible]	37[illegible]6
	7 mos.	456	3,562,059	1,246,203	5,131,295	441,709	904,340	82,705	1,689,836	251,149	3,399,347	66.20	1,731,948	1,445,5[illegible]0	1,4[illegible],440	1,7[illegible]1
Wichita Valley	July	256	59,908	24,716	90,991	14,919	6,094	45	39,554	1,314	61,567	67.70	29,4[illegible]4	[illegible]1,970	10,6[illegible]1	4[illegible]
	7 mos.	256	461,736	151,215	662,436	142,735	53,332	324	288,025	10,367	491,390	74.20	171,[illegible]46	1[illegible]9,0[illegible]5	[illegible]36	151,[illegible]4
Columbus & Greenville	July	167	105,839	25,304	135,824	30,652	3,735	3,520	42,939	9,672	90,510	66.60	45,314	39,814	[illegible]7,1[illegible]	—48,[illegible]
	7 mos.	2[illegible]8	618,905	187,868	850,483	193,350	85,425	23,699	325,592	60,564	688,577	81.00	161,905	1[illegible].435	44,165	3[illegible]74
Delaware & Hudson	July	887	1,612,428	375,166	2,220,960	406,484	470,207	42,178	1,073,016	148,618	2,175,646	98.00	45,316	—4[illegible]963	—57,[illegible]9	1,[illegible],[illegible]31
	7 mos.	887	17,052,850	1,987,878	21,087,392	3,290,205	5,382,499	304,474	8,702,005	1,436,190	19,072,347	90.40	2,015,045	1,3[illegible]8,[illegible]5[illegible]	1,4[illegible]7,[illegible]4	3,767,51[illegible]
Dela., Lackawanna & Western	July	994	3,405,978	1,371,770	5,549,408	785,747	1,100,325	116,969	2,494,488	154,872	4,716,393	85.00	833,015	4[illegible]5,7[illegible]7	5[illegible]9,4[illegible]	1,8[illegible]4,618
	7 mos.	994	28,480,184	7,805,954	41,432,216	4,719,635	8,730,608	785,960	17,947,540	1,114,267	33,661,940	81.[illegible]0	7,770,276	4,8[illegible]0,407	5,[illegible]5,490	6,497,114
Denver & Rio Grande Western	July	2,593	1,939,083	718,548	2,902,572	444,026	288,237	40,052	881,704	83,233	1,802,764	62.10	1,099,808	932,484	9[illegible],779	3[illegible]70
	7 mos.	2,593	12,863,014	3,129,109	17,358,783	2,505,559	3,393,136	316,927	5,772,481	583,968	12,892,138	74.30	4,466,645	3,359,633	3,615,93[illegible]	1,508,[illegible]2
Denver & Salt Lake	July	255	26,229	12,438	43,758	62,387	20,673	901	20,611	5,859	110,431	252.40	—66,673	—75,69[illegible]	—75,154	44,[illegible]13
	7 mos.	255	454,297	97,007	599,581	275,441	173,451	6,620	233,268	42,342	731,124	121.90	—131,543	—194,572	—172,3[illegible]4	—14[illegible]6
Detroit & Mackinac	July	385	127,345	39,048	180,802	28,084	48,237	2,066	58,800	4,855	141,889	78.50	38,913	30,130	27,766	[illegible]6,3[illegible]3
	7 mos.	385	712,770	204,541	996,113	182,603	354,943	15,841	403,406	37,925	994,048	99.80	2,065	—70,292	—81,574	—[illegible]4,3[illegible]4
Detroit & Toledo Shore Line	July	61	217,591	......	220,335	21,699	24,861	3,084	64,020	5,918	119,582	54.30	100,753	86,753	39,[illegible]36	86,14[illegible]
	7 mos.	61	2,010,683	......	2,029,466	196,276	149,786	15,575	549,724	48,984	960,345	47.30	1,069,1[illegible]1	971,061	53[illegible],[illegible]07	174,3[illegible]4
Detroit, Toledo & Ironton	July	454	802,234	10,681	823,979	166,376	192,408	5,373	269,485	23,201	656,843	79.70	167,136	154,416	16,167	144,552
	7 mos.	454	5,160,394	67,783	5,301,902	774,372	1,127,014	39,400	1,735,915	133,079	3,809,364	71.80	1,492,541	1,404,337	6[illegible]9,151	334,634
Duluth & Iron Range	July	281	1,235,534	17,462	1,339,057	143,993	81,717	1,142	255,104	15,090	497,872	37.20	841,185	752,9[illegible]4	756,833	4[illegible]4,959
	7 mos.	281	3,129,560	110,454	3,515,606	615,240	633,977	8,250	1,045,438	116,010	2,420,049	68.80	1,095,557	845,586	860,8[illegible]1	—102,665
Duluth, Missabe & Northern	July	307	2,521,388	37,134	2,736,716	212,017	108,648	3,954	423,824	18,858	769,227	28.10	1,967,489	1,763,945	1,762,813	1,[illegible]03,315
	7 mos.	306	5,848,205	269,670	6,581,450	1,098,522	913,071	22,397	1,628,477	137,790	3,812,490	57.90	[illegible],768,960	1,965,391	1,948,591	1,131,400
Duluth, South Shore & Atlantic	July	591	279,934	104,109	435,227	56,040	31,027	6,980	185,747	11,172	296,799	68.20	138,428	105,4[illegible]8	101,[illegible]27	[illegible]
	7 mos.	591	1,578,318	583,747	2,400,008	424,946	436,466	46,594	1,289,222	80,479	2,314,712	96.40	85,296	—133,974	—156,845	—502,0[illegible]0
Duluth, Winnipeg & Pacific	July	178	140,957	20,116	166,318	43,351	52,917	3,129	82,528	4,922	186,847	112.30	—20,529	—28,334	—32,394	—46,246
	7 mos.	178	964,751	135,161	1,138,982	202,141	290,207	31,249	516,382	38,248	1,078,263	94.60	60,779	—1,2[illegible]7	—19,067	—19,096
Elgin, Joliet & Eastern	July	459	1,494,872	6	1,732,637	139,463	87,405	14,691	601,252	32,888	934,848	53.90	797,789	709,456	582,969	181,380
	7 mos.	459	10,943,098	28	12,239,872	985,172	2,239,928	86,939	3,762,385	238,976	7,311,744	59.70	4,928,128	4,316,635	3,460,135	1,506,196
El Paso & Southwestern	July	1,139	982,879	168,449	1,210,875	141,006	136,046	28,283	275,115	88,290	677,720	56.00	533,155	437,165	389,280	184,574
	7 mos.	1,139	4,867,778	1,141,492	6,420,271	1,076,742	1,014,160	195,940	1,702,906	335,571	4,380,032	68.20	2,040,239	1,367,748	1,1[illegible]9,473	644,704
Erie	July	2,039	4,980,633	1,357,751	7,029,170	1,052,555	2,413,445	141,041	3,497,272	292,948	7,426,535	105.70	—397,365	—689,640	—555,181	553,222
	7 mos.	2,039	39,658,935	7,607,495	51,464,476	5,645,994	15,119,384	948,084	23,067,318	1,996,239	47,055,925	91.40	4,408,551	2,503,900	3,444,727	3,042,098
Chicago & Erie	July	269	664,191	79,084	824,559	115,129	145,308	19,512	372,726	34,493	688,223	83.50	136,336	81,321	—187,152	—580,537
	7 mos.	269	5,480,730	391,132	6,317,333	686,564	960,240	136,887	2,777,843	240,038	4,803,018	76.00	1,514,315	1,141,010	—780,249	—2,706,115
New Jersey & New York	July	45	15,338	114,075	134,253	19,265	19,235	1,435	69,162	3,123	112,218	83.60	22,035	19,035	—8,678	—[illegible]
	7 mos.	45	135,011	695,135	863,001	104,601	126,943	9,404	474,876	23,268	739,089	85.60	123,912	102,690	—75,858	—103,614
N. Y., Susquehanna & Western	July	135	227,747	68,865	333,801	59,350	45,117	3,634	214,476	10,592	333,167	99.80	634	—24,903	—37,716	—51
	7 mos.	135	1,582,206	425,111	2,308,850	321,389	386,986	25,161	1,333,796	67,735	2,135,193	92.50	173,657	—3,252	—94,943	—45,918
Florida East Coast	July	764	424,748	189,029	715,519	168,350	131,044	8,441	285,393	31,747	628,409	87.80	87,110	24,113	913	—145,468
	7 mos.	764	5,151,268	2,596,950	8,780,757	1,192,254	1,313,251	96,337	2,593,774	190,697	5,467,040	62.30	3,313,717	2,884,811	2,514,101	1,454,614
Ft. Smith & Western	July	249	100,613	26,063	135,343	27,346	20,670	4,393	45,403	7,012	105,510	77.90	29,833	23,739	16,770	—16,096
	7 mos.	249	649,591	151,894	865,951	175,443	167,117	33,468	318,628	48,342	748,465	86.40	117,486	76,343	17,653	—117,968
Galveston Wharf	July	13	......	......	86,561	40,536	2,276	781	19,774	3,117	81,019	93.60	5,542	—10,321	—9,857	151,816
	7 mos.	13	......	......	793,415	385,994	27,865	5,687	190,702	24,985	752,402	94.80	41,013	—78,932	—78,383	605,617
Georgia	July	328	282,772	107,405	420,476	41,502	45,230	21,018	204,676	20,161	332,841	79.20	87,635	80,361	76,297	20,293
	7 mos.	328	1,912,904	662,849	2,788,210	278,412	465,860	137,269	1,354,918	134,009	2,371,999	85.10	416,211	365,761	378,409	—46,216
Georgia & Florida	July	405	83,903	14,690	105,919	17,232	14,443	7,212	44,453	6,303	89,857	84.80	16,062	9,765	241	—22,187
	7 mos.	405	633,560	84,327	771,023	119,889	120,551	57,236	309,780	44,742	653,694	83.50	117,329	73,172	19,897	—171,513
Grand Trunk Western	July	347	1,323,160	215,280	1,622,368	197,465	289,601	34,846	484,050	51,054	1,063,248	65.50	559,120	485,831	295,204	—68,760
	7 mos.	347	7,344,105	1,077,661	8,966,001	844,597	1,932,634	196,421	3,764,124	351,890	7,133,320	79.60	1,832,681	1,371,788	25,720	—932,080
Atlantic & St. Lawrence	July	166	113,046	44,844	184,171	84,476	16,331	3,730	97,101	10,838	216,130	117.40	—31,959	—48,868	—93,438	—156,863
	7 mos.	166	1,180,950	240,899	1,549,070	322,842	236,153	30,922	879,622	83,123	1,566,813	101.10	—17,743	—136,096	—588,525	—760,859

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues			Operating expenses					Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
			Freight.	Passenger.	Total (inc. misc.)	Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.					
Chic. Det. & Can. Gr. Tr. Jct.	July	59	$164,851	$11,158	$197,112	$7,765	$10,366	$4,601	$57,741	$3,493	$83,965	42.60	$113,147	$99,774	$71,763	—$9,299
	7 mos.	59	1,150,189	65,500	1,321,488	90,185	87,090	24,977	454,008	25,751	681,920	51.60	639,568	578,649	438,612	170,452
Det. Gr Haven & Milw'k.	July	189	433,916	44,721	513,194	50,907	41,786	11,092	190,579	16,528	311,199	60.60	201,995	198,269	122,811	77,497
	7 mos.	189	2,557,655	282,600	3,049,199	295,947	321,477	61,355	1,449,399	118,347	2,249,075	73.80	800,124	757,273	294,752	—490,319
Great Northern	July	8,262	6,570,677	1,536,897	9,015,381	1,344,626	744,504	141,590	3,262,919	205,787	5,742,980	63.70	3,272,401	2,498,322	2,409,924	1,073,147
	7 mos.	8,264	38,020,333	8,282,058	51,745,576	7,504,353	9,897,605	974,810	21,284,637	1,490,209	41,523,659	80.20	10,221,917	5,778,025	6,449,503	—538,012
Green Bay & Western	July	262	94,209	14,868	118,420	25,359	9,854	2,505	48,637	2,497	88,852	75.00	29,568	21,568	16,812	7,069
	7 mos.	262	626,439	119,254	805,115	151,053	122,039	16,929	302,349	18,736	611,083	75.90	194,032	138,032	107,235	78,864
Gulf Coast Lines	July	922	545,710	159,088	757,067	132,887	101,743	25,787	232,022	35,368	524,867	69.30	232,200	192,775	194,755	134,961
	7 mos.	922	4,410,636	1,058,239	5,859,745	948,787	935,028	185,246	1,644,232	248,301	4,052,167	69.57	1,807,578	1,542,253	1,437,964	901,679
Gulf & Ship Island	July	307	189,068	48,681	252,429	40,511	32,030	9,110	80,994	11,745	174,773	69.20	77,656	59,089	58,631	32,316
	7 mos.	307	1,315,324	268,884	1,690,213	303,757	255,765	54,216	513,661	81,281	1,211,169	71.70	479,044	353,263	318,474	88,488
Gulf, Mobile & Northern	July	436	285,791	33,043	333,352	54,695	40,590	15,974	130,703	14,185	255,333	76.60	78,019	60,389	44,202	5,337
	7 mos.	436	2,246,646	240,848	2,592,363	389,107	414,894	97,620	890,737	108,753	1,891,906	73.00	700,457	579,380	477,017	—65,633
Hocking Valley	July	348	704,690	90,292	894,179	120,984	224,694	12,028	338,153	30,293	726,104	81.20	168,075	81,161	116,769	227,380
	7 mos.	348	6,034,080	581,437	7,244,589	730,015	1,551,241	83,179	2,451,459	217,658	5,023,149	69.30	2,221,440	1,588,933	1,655,247	—252,984
Illinois Central	July	4,784	9,086,680	1,986,905	11,869,898	1,775,179	2,836,936	209,080	4,432,690	304,283	9,581,843	80.70	2,288,055	1,564,821	1,662,591	1,740,991
	7 mos.	4,784	62,370,031	13,297,214	81,643,019	10,300,340	18,386,624	1,325,953	29,930,067	2,171,276	62,424,591	76.50	19,218,428	12,576,596	13,019,671	10,819,955
Yazoo & Miss. Valley	July	1,381	955,133	333,830	1,367,427	344,380	277,114	88,927	572,979	46,301	1,264,867	92.50	102,560	14,278	14,317	—35,956
	7 mos.	1,381	7,338,794	2,121,467	10,096,046	2,378,038	1,986,737	183,935	4,248,585	344,712	9,128,318	90.40	967,728	138,440	128,597	113,317
International & Gr. Northern	July	1,159	629,685	228,236	949,357	175,529	106,843	26,628	472,754	44,121	831,052	87.50	118,305	83,963	69,299	95,867
	7 mos.	1,159	5,441,618	1,409,490	7,691,026	1,112,422	1,417,763	185,582	3,406,747	332,238	6,495,750	85.30	1,195,276	957,547	609,741	—328,091
Kans. City, Mex. & Orient	July	272	94,242	10,477	112,810	29,038	10,720	4,994	42,161	5,841	112,754	100.60	56	—8,264	—10,500	—1,477
	7 mos.	272	647,675	72,657	778,123	179,114	185,147	33,058	427,081	45,540	869,940	111.80	—91,817	—150,083	—149,652	—266,087
Kans. City Mex. & Orient of Tex.	July	465	99,893	7,704	113,573	16,224	9,537	5,044	57,488	6,116	94,409	83.10	19,164	13,164	175	—11,574
	7 mos.	465	727,757	73,320	853,809	177,448	245,801	33,221	521,661	45,628	1,023,159	119.80	—169,350	—211,661	—308,488	—484,784
Kansas City Southern	July	767	1,033,502	169,415	1,338,419	202,383	222,644	35,007	483,340	69,033	1,012,031	75.60	326,388	231,625	199,855	412,999
	7 mos.	767	7,941,033	1,132,542	10,070,936	1,308,828	1,942,193	255,554	3,658,989	483,184	7,642,741	75.90	2,428,195	1,747,402	1,674,797	2,483,967
Texarkana & Ft. Smith	July	81	139,412	14,848	167,939	15,065	32,829	5,327	52,280	9,480	115,072	68.50	52,867	42,004	25,674	38,255
	7 mos.	81	946,346	101,151	1,145,799	127,633	176,158	35,074	347,554	60,776	746,331	65.10	399,468	327,007	215,365	181,805
Kansas, Oklahoma & Gulf	July	314	189,674	12,719	212,589	44,626	13,098	5,478	88,107	10,347	161,526	76.00	51,063	41,484	25,436	28,634
	7 mos.	314	1,407,658	85,536	1,554,203	304,676	163,237	38,541	573,543	69,608	1,150,681	74.00	403,522	334,062	252,853	—90,788
Lake Superior & Ishpeming	July	33	190,296	49	228,659	19,546	6,906	240	36,520	2,526	65,738	28.70	162,921	156,244	158,461	—12,105
	7 mos.	33	398,729	521	476,340	137,442	65,203	1,497	112,258	18,155	334,555	70.20	141,785	101,971	105,567	—275,684
Lake Terminal	July	13	.....	.....	78,760	8,101	8,503	.....	42,679	1,538	60,821	77.20	17,939	13,702	14,891	22,619
	7 mos.	13	.....	.....	630,319	66,363	66,215	.....	287,796	11,142	431,516	68.50	198,803	156,547	216,932	35,719
Lehigh & Hudson River	July	96	135,936	3,712	150,057	23,164	25,560	1,459	68,201	8,264	126,648	84.40	23,409	8,571	—6,013	64,101
	7 mos.	96	1,253,153	25,737	1,350,293	191,826	248,119	10,386	562,994	53,367	1,066,647	79.00	283,646	189,440	66,045	249,998
Lehigh & New England	July	235	222,796	1,652	230,268	82,464	18,863	24,253	104,434	15,879	245,684	106.70	—15,416	—22,061	—12,376	86,807
	7 mos.	236	2,152,206	13,543	2,217,843	341,234	761,279	171,841	819,628	115,656	2,109,992	95.10	108,641	39,125	122,888	503,487
Lehigh Valley	July	1,334	3,380,721	707,394	4,452,269	620,812	1,023,880	112,916	2,278,249	133,608	4,185,775	94.00	266,494	76,524	20,866	760,439
	7 mos.	1,334	28,941,396	3,871,325	35,393,490	3,909,438	10,009,202	737,561	16,223,305	960,074	32,009,295	90.40	3,393,195	1,959,544	1,657,706	84,092
Los Angeles & Salt Lake	July	1,137	1,016,052	467,843	1,635,502	307,122	261,835	58,625	504,981	45,687	1,231,480	75.30	404,022	291,816	257,827	45,977
	7 mos.	1,141	7,116,552	2,981,197	11,085,506	2,355,757	2,361,275	336,903	3,651,202	300,793	9,320,708	84.10	1,764,798	991,108	708,324	768,772
Louisiana & Arkansas	July	302	248,453	36,123	292,921	67,997	12,960	9,217	84,338	7,706	181,771	62.10	111,150	91,718	90,259	2,931
	7 mos.	302	1,614,514	231,963	1,926,205	376,301	292,413	54,114	597,605	57,445	1,373,995	71.30	552,210	416,480	402,335	111,617
Louisiana Ry. & Nav. Co.	July	343	220,024	32,736	266,999	53,146	12,414	11,639	104,003	12,304	193,431	72.40	73,568	57,482	34,256	60,324
	7 mos.	343	1,570,508	207,892	1,874,990	435,029	298,275	73,811	768,585	82,801	1,657,675	88.40	217,315	102,976	—65,521	73,123
Louisville & Nashville	July	5,038	6,864,206	2,042,273	9,576,857	1,298,617	2,525,199	210,170	3,624,810	213,435	7,914,462	82.60	1,662,395	1,259,216	1,312,463	869,369
	7 mos.	5,038	54,612,222	12,612,198	71,626,982	10,110,361	17,337,840	1,465,807	26,949,844	1,615,700	57,769,930	80.70	13,857,052	11,071,140	11,151,909	—1,719,844
Louisville, Henderson & St. Louis.	July	199	193,364	63,016	276,139	45,170	15,487	5,791	97,228	7,940	171,616	62.10	104,523	81,793	59,635	18,633
	7 mos.	199	1,289,370	403,450	1,807,527	355,144	256,575	43,108	618,087	58,316	1,331,230	73.60	476,297	401,024	299,263	89,815
Maine Central	July	1,194	1,003,155	485,503	1,626,151	227,019	181,687	17,129	704,379	44,472	1,233,917	75.90	392,234	304,560	335,417	5,791
	7 mos.	1,194	8,327,630	2,549,968	11,752,876	1,884,690	2,300,890	94,173	5,134,098	326,470	9,755,465	83.00	1,997,411	1,313,867	1,309,296	—775,880
Midland Valley	July	383	272,376	72,760	367,041	57,889	45,000	5,362	111,405	15,452	236,621	64.50	130,420	114,520	95,268	70,204
	7 mos.	383	2,054,668	481,669	2,648,940	372,651	313,871	33,731	784,337	103,428	1,599,514	60.40	1,049,426	950,868	800,038	328,640
Minneapolis & St. Louis	July	1,649	961,098	147,936	1,190,174	166,621	88,575	22,436	542,963	38,401	858,918	72.20	331,256	257,892	195,258	—129,552
	7 mos.	1,649	7,110,327	1,073,168	8,660,092	1,236,380	1,613,039	168,807	4,055,450	281,868	7,353,923	84.90	1,306,169	849,487	447,842	—813,205
Minn., St. Paul & S. S. Marie	July	4,383	3,063,610	797,269	4,262,422	565,910	274,680	58,896	1,426,877	101,076	2,447,529	57.40	1,814,893	1,563,406	1,527,363	325,614
	7 mos.	4,383	17,203,008	4,024,589	23,517,350	3,645,441	4,193,326	413,448	10,454,479	727,518	19,484,131	82.90	4,033,219	2,255,358	2,037,685	2,560,985
Mississippi Central	July	258	83,031	19,313	107,121	22,739	13,375	6,184	42,260	7,411	91,969	85.80	15,152	9,092	18,683	—32,985
	7 mos.	259	702,058	112,177	846,862	129,218	225,440	39,581	287,822	49,107	731,168	86.30	115,694	71,962	73,431	—94,401
Missouri, Kansas & Texas	July	1,670	1,842,513	464,886	2,590,094	298,386	366,688	37,396	791,822	86,084	1,589,199	61.40	1,000,895	802,487	880,714	743,706
	7 mos.	1,670	12,361,095	3,280,384	17,289,059	1,800,187	3,288,541	319,130	5,034,597	646,837	11,139,262	64.46	6,149,797	4,919,644	5,296,303	2,883,641
Mo., Kans. & Tex of Tex	July	1,717	988,416	407,500	1,567,979	326,624	159,157	35,386	665,287	65,064	1,209,815	77.20	358,164	305,954	140,062	588,152
	7 mos.	1,717	7,549,501	2,950,773	11,576,829	1,834,745	1,552,350	286,189	4,637,299	544,560	8,834,212	76.30	2,742,617	2,378,800	1,195,218	1,099,455
Wichita Falls & Northwestern	July	329	97,486	25,828	136,052	30,423	13,013	745	51,586	6,617	102,232	75.10	33,820	22,960	3,487	164,367
	7 mos.	329	596,180	156,602	819,734	189,736	132,643	6,396	365,225	62,287	754,036	92.00	65,698	—18,299	—131,679	178,109
Missouri Pacific	July	7,342	5,552,368	1,542,215	7,763,726	1,497,294	901,143	178,954	3,193,188	247,555	6,036,964	77.80	1,726,762	1,367,661	1,064,652	798,175
	7 mos.	7,330	41,755,504	9,601,472	56,288,162	9,846,835	11,574,725	1,092,439	22,641,336	1,840,187	47,173,485	83.80	9,114,677	6,496,831	4,444,900	2,869,694

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues — Freight.	Passenger.	Total (inc. misc.)	Operating expenses — Maintenance of — Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Mobile & Ohio	July	1,165	$1,110,122	$150,461	$1,330,495	$156,022	$257,012	$43,242	$523,560	$45,547	$1,025,940	77.11	$304,555	$250,493	$187,369	—$21,651
	7 mos.	1,165	8,385,503	968,110	9,853,369	1,206,672	1,958,989	316,489	3,791,540	336,712	7,617,868	77.30	2,235,501	1,834,922	1,457,019	230,670
Monongahela	July	106	106,343	26,550	136,204	32,498	27,684	2,497	51,619	9,846	124,144	91.10	12,060	3,896	—26,877	44,1[illegible]4
	7 mos.	106	1,636,745	200,860	1,867,168	267,401	290,679	10,675	502,920	66,277	1,137,952	60.90	729,216	673,052	414,352	—28,419
Monongahela Connecting	July	7	....	....	132,817	19,315	28,032	505	72,230	5,079	124,961	94.09	7,856	5,554	—39[illegible]	9,[illegible]51
	7 mos.	7	....	....	965,802	109,132	160,729	3,719	417,263	51,712	742,555	76.88	223,247	207,874	192,998	74,[illegible]71
Montour	July	56	15,038	593	16,932	20,319	16,393	933	10,936	6,153	54,734	323.30	—37,802	—40,156	—38,487	[illegible]
	7 mos.	56	352,752	5,196	364,938	112,994	175,427	6,889	123,772	43,262	452,344	126.70	—97,406	—114,885	—43,[illegible]51	—141,4[illegible]7
Nashville, Chatt. & St. Louis	July	1,258	1,303,167	423,443	1,844,764	295,635	372,481	61,589	720,769	58,812	1,511,229	81.90	333,535	297,945	36[illegible],578	[illegible]
	7 mos.	1,258	8,494,290	2,620,332	11,988,200	1,935,638	3,126,950	482,818	4,674,832	404,482	10,657,324	88.90	1,330,876	1,072,584	1,35[illegible],658	69,[illegible]
Nevada Northern	July	165	53,901	5,699	62,641	10,203	6,165	392	9,950	4,097	30,807	49.30	[illegible]	15,717	[illegible]	[illegible]
	7 mos.	165	191,309	28,592	248,791	63,007	24,527	3,041	54,097	20,848	166,020	66.70	82,771	39,96[illegible]	[illegible]	[illegible]
Newburgh & South Shore	July	7	....	....	147,837	8,961	35,561	....	71,434	3,4[illegible]	119,380	80.70	[illegible]8,4[illegible]7	13,[illegible]	[illegible]	[illegible]
	7 mos.	7	....	....	1,145,333	66,561	241,211	....	448,005	24,981	780,758	68.20	364,575	[illegible]	[illegible]	14[illegible]
New Orleans Great Northern	July	274	163,074	47,287	218,620	26,426	21,192	5,960	64,173	9,731	127,123	58.10	91,4[illegible]7	76,1[illegible]7	[illegible]	[illegible]
	7 mos.	274	1,171,707	254,322	1,486,069	226,929	231,731	35,894	466,875	70,969	1,034,630	69.60	451,4[illegible]9	34[illegible]7	[illegible]	[illegible]
New York Central	July	6,098	15,669,030	8,840,232	27,934,312	3,205,047	7,093,516	323,731	10,703,180	725,298	22,4[illegible]8,328	80.[illegible]0	5,5[illegible]5,[illegible]84	3,836,5[illegible]	[illegible]	[illegible]
	7 mos.	6,098	113,319,580	50,452,297	186,492,095	21,538,894	47,061,212	2,194,789	67,631,568	5,350,867	146,06[illegible],865	78.30	40,42[illegible]	[illegible],[illegible]39,545	[illegible]	[illegible]
Cincinnati Northern	July	244	201,583	17,396	227,305	58,709	32,652	5,316	98,368	9,045	203,896	89.60	23,[illegible]	11[illegible]4	—14,[illegible]57	[illegible]
	7 mos.	244	1,831,328	105,541	1,977,816	396,690	344,598	35,468	667,296	58,498	1,501,[illegible]19	75.90	476,5[illegible]7	361,[illegible]76	211,1[illegible]4	[illegible]
Cleve., Cin., Chic. & St. Louis	July	2,411	4,397,218	1,458,378	6,346,848	806,549	1,164,895	121,606	2,676,727	180,579	5,006,798	78.90	1,340,050	1,[illegible]845	7[illegible]	757,[illegible]14
	7 mos.	2,411	34,401,368	9,156,760	47,176,486	5,306,947	8,801,560	780,165	17,605,304	1,199,135	34,0[illegible]8,027	72.[illegible]0	13,138,45[illegible]	10,2[illegible]4,6[illegible]	9,[illegible]	3,4[illegible]3,[illegible]17
Indiana Harbor Belt	July	119	....	....	790,844	100,554	88,335	3,715	264,516	17,885	475,005	60.10	315,[illegible]	2[illegible]0	1[illegible]971	[illegible]1,[illegible]13
	7 mos.	119	....	....	5,429,666	659,163	507,671	27,481	2,121,552	134,494	3,450,361	63.60	1,979,305	1,706,995	1,186,152	—[illegible]6,[illegible]67
Kanawha & Michigan	July	176	170,139	41,407	224,021	68,102	77,579	6,117	97,797	11,164	260,757	116.40	—36,736	—6[illegible],6[illegible]2	—1,[illegible]	68,266
	7 mos.	176	1,384,453	305,880	1,784,563	431,802	697,024	31,880	726,191	76,698	1,963,158	110.00	—178,595	—368,516	—301,666	115,[illegible]15
Lake Erie & Western	July	Included in the New York, Chicago & St. Louis report.														
	7 mos.	Under contract effective July 1, 1922. Approved by I. C. C. in Finance Docket No. 2,471.														
Michigan Central	July	1,862	4,140,484	1,973,932	6,716,232	730,689	1,346,099	103,522	2,374,476	133,919	4,765,713	71.0[illegible]	1,950,519	1,599,883	1,3[illegible]4,075	1,51[illegible]
	7 mos.	1,862	29,434,887	16,402,099	44,153,981	4,729,291	9,383,729	638,868	15,544,396	998,065	31,762,576	71.90	12,391,405	9,8[illegible]2,979	9,118,561	6,3[illegible],266
Pittsburgh & Lake Erie	July	227	1,726,853	260,233	1,952,871	310,133	710,743	19,113	747,922	56,481	1,846,548	94.50	106,323	76,646	153,504	24,169
	7 mos.	227	11,768,970	1,510,322	13,753,077	1,775,994	6,550,541	134,618	4,787,444	437,176	13,699,580	99.60	53,497	—457,818	[illegible]9,8[illegible]2	1,313,483
Toledo & Ohio Central	July	503	318,369	64,182	419,354	109,482	180,745	11,285	235,039	25,835	565,319	134.80	—145,965	—197,625	—178,6[illegible]1	158,731
	7 mos.	503	3,473,712	479,727	4,104,275	855,094	1,363,052	76,318	1,890,811	175,070	4,380,163	106.70	—275,888	—657,709	—58[illegible],[illegible]43	584,08[illegible]
New York, Chic. & St. Louis	July	1,242	2,816,804	203,118	3,145,617	462,761	445,736	77,715	1,205,924	117,306	2,316,362	73.60	829,255	662,674	637,166	375,1[illegible]7
	7 mos.	1,242	16,143,688	758,428	17,365,187	1,826,695	3,025,558	426,537	6,314,846	606,993	12,232,929	70.40	5,135,258	4,[illegible]33,978	4,049,414	2,39[illegible],[illegible]70
N. Y., New Haven & Hartford	July	1,985	4,877,923	4,526,237	10,476,218	1,620,320	2,288,369	55,923	4,095,406	292,436	8,472,191	80.90	2,004,027	1,618,152	1,094,3[illegible]1	485,256
	7 mos.	1,986	33,289,389	27,439,795	68,323,945	9,383,423	13,770,204	383,522	27,986,860	2,023,197	54,543,507	89.80	13,780,438	11,075,161	7,989,877	—4,251,487
Central New England	July	301	367,018	18,856	408,261	132,374	41,917	4,063	173,890	9,446	361,690	88.60	46,571	24,241	2[illegible],07[illegible]	14[illegible],377
	7 mos.	301	3,589,261	134,887	3,919,511	784,049	564,556	29,530	1,384,409	79,200	2,840,820	72.50	1,078,691	920,412	590,912	68[illegible],346
New York, Ontario & Western	July	569	284,378	673,589	1,161,445	173,213	104,560	16,873	490,190	31,081	815,917	70.30	345,528	307,508	271,625	528,461
	7 mos.	569	3,873,061	1,709,551	6,752,713	934,299	1,186,716	105,751	3,232,356	210,627	5,669,749	84.00	1,082,964	815,951	511,644	7[illegible]6,063
Norfolk & Western	July	2,237	6,478,149	838,757	7,563,344	1,340,832	1,192,813	83,425	2,382,695	134,158	4,943,348	65.40	2,619,996	2,019,522	2,126,625	1,666,532
	7 mos.	2,237	46,785,406	4,959,377	53,574,695	6,764,496	11,645,418	543,080	15,757,976	1,036,739	35,828,645	66.90	17,746,050	14,291,008	15,701,167	6,013,918
Norfolk Southern	July	930	485,631	155,935	672,139	102,344	107,930	21,653	273,049	29,538	535,175	79.60	136,964	104,532	94,613	99,685
	7 mos.	930	3,786,084	829,862	4,872,364	714,154	794,088	153,697	2,039,246	211,855	3,916,051	80.40	956,313	743,100	566,118	261,975
Northern Pacific	July	6,631	5,658,181	1,603,650	7,986,391	1,230,523	1,042,413	168,941	2,825,499	203,799	5,587,399	70.00	2,398,992	1,672,350	1,874,314	974,88[illegible]
	7 mos.	6,647	36,273,001	9,000,559	49,908,495	7,432,426	12,087,563	997,669	19,627,835	1,522,565	42,296,297	84.80	7,612,199	2,5[illegible]5,602	4,592,553	—860,776
Northwestern Pacific	July	496	370,529	336,451	794,030	68,849	76,106	7,731	276,876	14,817	445,858	56.20	348,172	299,014	281,619	[illegible]85,340
	7 mos.	503	2,240,305	1,552,247	4,351,415	752,111	505,404	49,457	1,740,207	102,107	3,157,542	72.60	1,983,873	864,215	770,59[illegible]	825,664
Pennsylvania	July	10,290	32,384,628	12,318,131	49,220,147	7,838,172	11,862,920	597,340	20,040,691	1,338,250	42,556,283	86.50	6,663,864	3,876,392	3,145,433	4,539,18[illegible]
	7 mos.	10,290	231,763,758	79,939,977	341,028,437	41,593,619	87,395,122	3,990,026	128,965,298	9,309,015	276,509,097	81.10	64,519,340	49,959,19[illegible]	45,085,071	14,801,978
Balti., Chesa. & Atlantic	July	87	132,074	68,070	207,466	14,208	26,674	3,019	101,995	3,378	149,274	71.90	58,192	46,499	45,759	64,323
	7 mos.	87	604,548	235,407	874,768	92,202	260,045	13,275	508,542	25,731	899,800	102.90	—25,032	—47,573	—45,620	—31,7[illegible]8
Cumberland Valley & Mont	July	33	45,023	5,529	53,309	11,899	13,692	1,237	30,356	3,111	60,295	113.10	—6,986	—12,564	16,985	83,199
	7 mos.	33	442,237	40,616	506,627	66,204	120,846	6,619	213,371	18,673	425,713	84.00	80,914	52,787	20,604	293,[illegible]3
Cin., Lebanon & Northern	July	76	73,236	10,827	90,876	28,829	16,540	1,825	59,449	2,118	108,761	119.70	—17,885	—25,076	—27,065	—40,436
	7 mos.	76	493,999	57,674	609,987	116,160	113,032	12,335	388,986	15,943	646,456	106.00	—36,469	—84,653	—76,574	—199,615
Grand Rapids & Ind.	July	Included in Pennsylvania.														
	7 mos.	...	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Long Island	July	398	625,253	2,474,686	3,365,343	248,168	295,462	23,885	1,233,550	53,437	1,881,125	55.90	1,484,218	1,190,045	1,133,378	1,034,751
	7 mos.	398	4,950,615	10,847,018	17,329,772	1,861,726	2,796,003	122,064	7,545,617	399,120	12,858,440	74.20	4,471,332	3,574,565	3,114,401	964,31[illegible]
Md., Dela. & Virginia	July	82	79,962	56,086	139,242	12,607	22,760	2,504	81,788	2,259	121,918	87.60	17,324	11,969	10,411	—1,133
	7 mos.	82	433,259	167,472	622,742	64,653	144,497	9,454	421,259	16,866	706,729	113.50	—83,987	—94,396	—103,561	—75,405

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures.	Maintenance of—Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
N. Y., Phila. & Norfolk	July	122	$709,031	$101,349	$864,883	$58,943	$177,230	$7,525	$357,020	$13,806	$663,702	72.10	$241,181	$209,251	$165,397	—$16,445
	7 mos.	122	3,466,756	540,433	4,348,268	399,680	1,114,169	52,926	2,130,822	96,707	3,855,160	88.70	493,108	369,340	218,911	—525,471
Peoria, Chicago & St Louis	July	...	Included in Pennsylvania.													
	7 mos.	...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Jersey & Seashore	July	359	454,093	1,125,009	1,695,476	181,924	202,018	16,856	638,066	27,537	1,080,005	63.70	615,471	410,581	376,434	505,193
	7 mos.	359	2,681,348	4,141,023	7,421,416	1,108,886	1,405,703	106,405	3,416,591	183,787	6,303,133	84.90	1,118,283	718,589	587,141	39,203
Peoria & Pekin Union	July	19	9,623	3,273	126,576	14,423	6,233	413	64,556	8,571	94,196	74.42	32,380	17,380	44,198	26,545
	7 mos.	19	84,214	26,091	1,017,630	180,029	108,481	1,498	431,573	63,398	784,979	77.14	232,651	131,151	295,966	60,629
Pere Marquette	July	2,212	2,147,410	548,212	3,019,982	408,353	642,441	54,771	1,075,195	99,588	2,293,680	75.60	736,302	591,891	527,563	845,211
	7 mos.	2,219	16,408,719	2,876,442	21,227,958	2,466,411	4,381,115	367,270	8,202,331	730,807	16,198,692	76.30	5,029,266	4,003,149	3,154,247	2,409,677
Philadelphia & Reading	July	1,127	3,934,131	847,149	5,158,369	714,073	1,641,064	66,183	2,296,883	148,494	4,872,867	94.50	285,502	74,125	—192,512	1,203,077
	7 mos.	1,127	35,491,190	5,594,044	43,418,488	5,225,546	11,995,446	432,231	16,211,019	1,038,591	34,935,001	80.50	8,483,487	7,044,573	5,390,276	3,901,337
Atlantic City	July	176	132,949	555,023	703,465	66,438	49,105	16,869	313,643	4,415	450,303	64.00	253,162	233,504	166,482	266,262
	7 mos.	176	850,109	1,662,857	2,578,434	418,348	224,242	47,229	1,444,730	34,195	2,167,453	84.10	410,981	270,153	33,999	—56,953
Perkiomen	July	41	119,456	11,841	132,493	8,679	4,463	106	46,942	1,257	61,471	46.40	71,022	66,151	57,341	37,660
	7 mos.	41	637,183	56,183	717,951	50,992	29,792	755	311,768	6,609	400,172	55.70	317,779	280,528	237,714	319,924
Port Reading	July	21	56,951	.....	78,049	20,263	52,647	229	37,727	2,994	113,800	145.90	—35,811	—50,564	—75,020	—27,570
	7 mos.	21	739,482	.....	1,076,889	139,077	100,325	1,603	371,007	13,434	625,444	58.10	451,445	347,392	—7,769	94,811
Pittsburg & Shawmut	July	102	44,758	3,323	49,323	26,936	20,749	2,378	26,292	6,455	76,810	155.70	—27,487	—35,260	—21,528	—2,363
	7 mos.	102	512,467	37,012	559,390	183,528	248,678	11,448	193,408	48,600	685,662	122.60	—126,272	—134,792	—58,393	65,172
Pittsburg & West Virginia	July	85	177,061	7,434	212,790	44,676	32,881	4,053	51,600	16,200	158,784	74.60	54,006	26,437	51,149	—197,128
	7 mos.	85	1,330,253	61,571	1,603,933	308,609	434,821	25,147	381,713	110,830	1,221,904	76.20	382,029	198,549	429,919	—133,023
Pittsburg, Shawmut & Northern	July	210	52,521	5,039	61,140	27,469	66,857	1,131	31,726	5,416	132,606	216.90	—71,466	—73,676	—77,622	—19,872
	7 mos.	210	517,151	45,688	585,030	134,192	322,000	11,299	265,227	47,661	780,415	133.40	—195,385	—210,929	—217,227	—145,306
Quincy, Omaha & Kansas City	July	252	36,665	23,061	69,468	26,199	8,531	829	36,976	2,109	77,307	111.30	—7,839	—11,763	—17,525	—38,535
	7 mos.	252	374,385	165,155	600,155	207,736	106,298	5,605	290,887	16,459	625,519	104.20	—25,364	—52,894	—86,182	—135,147
Richmond, Fred. & Potomac	July	117	451,132	266,129	835,263	97,714	72,179	8,860	281,003	28,186	502,517	60.20	332,746	279,760	252,206	174,446
	7 mos.	117	3,181,064	2,054,020	6,242,898	708,188	820,234	56,891	2,175,048	186,042	4,087,748	65.50	2,155,150	1,807,281	1,463,050	659,753
Rutland	July	415	222,437	143,007	482,092	89,282	64,721	7,865	208,855	11,666	384,083	79.70	98,009	76,726	80,030	43,906
	7 mos.	415	1,751,049	819,325	3,223,053	633,004	618,927	57,548	1,482,745	91,142	2,893,642	89.80	329,411	182,288	209,370	43,635
St. Louis-San Francisco	July	4,760	4,575,862	1,716,447	6,747,227	943,551	1,344,647	89,685	2,330,767	207,724	4,894,270	72.50	1,852,957	1,522,985	1,357,118	1,541,949
	7 mos.	4,760	32,369,972	10,482,566	46,167,646	6,735,145	8,847,224	594,282	16,530,891	1,335,040	33,877,133	73.40	12,290,513	9,936,486	9,826,074	9,412,306
Ft. Worth & Rio Grande	July	235	69,520	32,032	110,333	33,565	17,540	2,618	45,124	5,732	104,581	94.80	5,752	2,238	—5,390	9,051
	7 mos.	235	434,389	199,948	705,385	308,060	149,639	19,186	346,466	40,297	861,431	1,221	—156,046	—182,587	—220,840	—220,350
St. Louis, San Fran. & Texas	July	134	136,858	16,641	158,678	30,240	22,062	3,775	54,239	7,034	117,350	73.90	41,328	39,464	15,707	27,437
	7 mos.	134	790,073	105,250	939,504	216,789	166,306	26,031	405,087	48,122	861,472	91.70	78,032	64,186	—83,818	—333,095
St. Louis Southwestern	July	968	1,127,153	139,893	1,326,660	131,512	145,870	43,031	421,224	53,776	800,886	60.40	525,774	446,729	439,534	356,111
	7 mos.	968	8,361,190	905,206	9,677,898	1,362,126	1,448,652	301,425	2,614,950	376,642	6,141,319	63.50	3,536,579	3,082,132	2,868,627	2,594,762
St. Louis Southwestern of Texas	July	807	462,071	98,001	601,677	139,264	110,145	20,103	302,422	33,068	603,080	100.20	—1,403	—25,741	—7,521	—52,688
	7 mos.	807	3,169,270	608,939	4,039,871	1,282,487	1,074,891	139,330	2,109,079	217,159	4,815,527	119.20	—775,650	—944,455	—886,606	—322,496
San Antonio & Aransas Pass	July	739	315,525	88,410	430,591	78,430	56,127	9,250	181,931	24,472	349,884	81.20	80,707	66,432	60,298	81,447
	7 mos.	739	2,252,533	461,500	2,914,380	642,913	745,809	66,235	1,388,968	185,606	3,025,465	103.80	—111,685	—209,951	—292,093	—280,026
San Antonio, Uvalde & Gulf	July	317	72,781	18,597	97,023	14,978	7,985	2,749	32,820	7,288	65,828	67.80	31,105	28,211	13,965	23,917
	7 mos.	317	427,152	118,480	611,505	99,712	81,252	19,756	238,356	45,480	483,311	79.00	128,194	107,285	29,329	60,459
Seaboard Air Line	July	3,563	2,152,120	662,389	3,210,196	414,780	373,264	130,784	1,372,954	1,170,281	2,487,129	77.48	723,067	547,205	325,958	4,881
	7 mos.	3,563	17,823,413	5,189,455	25,636,703	2,865,859	4,207,205	866,028	10,566,173	1,085,395	20,215,953	78.86	5,420,750	4,212,238	2,356,995	647,664
Southern	July	6,971	6,373,503	2,714,552	9,920,459	1,412,327	1,789,337	204,657	4,098,832	297,011	7,885,255	79.50	2,035,204	1,538,150	1,201,190	1,163,008
	7 mos.	6,971	49,707,323	16,831,706	71,915,915	10,233,883	13,151,411	1,471,067	28,515,581	2,243,227	56,164,347	78.10	15,751,568	12,450,909	10,078,616	3,306,956
Alabama Gr Southern	July	318	276,952	172,229	484,920	81,193	169,461	20,645	225,421	23,332	525,281	108.30	—40,461	—86,925	—106,572	105,320
	7 mos.	318	3,901,552	1,034,115	5,196,387	594,135	1,070,834	128,053	1,996,433	173,050	4,000,892	97.00	1,195,495	890,302	884,042	349,986
Ga., N. O. & Tex. Pacific	July	338	707,910	280,849	1,057,519	171,842	248,643	32,388	417,895	39,211	917,369	86.70	140,150	61,176	—50,867	247,273
	7 mos.	338	7,853,337	1,870,816	10,176,770	1,131,277	2,633,220	198,522	3,551,199	295,031	7,885,967	77.50	2,290,803	1,781,468	1,535,137	1,624,186
Georgia, Southern & Fl	July	402	232,413	97,181	355,287	53,584	62,337	9,185	167,409	11,139	306,669	86.30	48,618	28,856	11,599	—50,799
	7 mos.	402	1,832,098	696,724	2,726,291	433,645	471,500	62,301	1,184,207	85,266	2,259,375	82.90	466,916	343,732	198,839	—557,015
New Orleans & Northeastern	July	207	147,693	79,451	271,108	69,476	93,341	9,297	144,266	15,605	335,155	123.60	—64,057	—100,418	—122,666	—12,366
	7 mos.	207	2,501,925	544,650	3,391,932	489,073	732,554	75,257	1,515,140	121,115	2,957,513	87.20	434,419	164,642	111,293	—177,000
Northern Alabama	July	110	119,294	11,784	133,669	21,316	4,360	1,245	50,774	2,770	80,465	60.20	53,204	49,210	14,385	—13,166
	7 mos.	110	667,478	77,828	762,601	123,224	38,422	9,271	291,686	21,140	483,738	63.40	278,863	250,507	84,483	—67,684
Southern Pacific	July	7,119	10,507,301	3,965,486	15,952,904	1,979,665	2,225,884	273,037	5,445,514	441,792	10,653,151	66.80	5,299,453	3,962,361	3,718,166	3,335,974
	7 mos.	7,118	64,169,659	25,379,127	99,158,214	13,596,607	17,288,868	1,640,905	34,456,319	2,998,710	71,883,985	72.50	27,274,229	17,811,249	17,190,950	16,683,183

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals	Net after rentals 1921
Arizona Eastern	July	382	$258,147	$25,975	$300,453	$47,420	$31,001	$4,124	$91,879	$18,963	$194,257	64.70	$106,196	$82,180	$64,914	—$154
	7 mos.	382	1,529,667	199,310	1,794,521	220,639	196,760	22,347	517,146	131,605	1,093,489	60.93	701,032	534,[illegible]	434,017	17,783
Atlantic S. S. Lines	July	...	786,769	49,685	884,691	12,307	201,135	20,919	549,997	29,331	813,689	92.00	71,002	[illegible]	58,980	—190,[illegible]
	7 mos.	...	5,839,221	352,482	6,519,819	84,556	1,184,012	133,978	3,761,123	186,218	5,349,887	82.10	1,169,932	1,082,407	1,085,112	18,925
Gal., Harris. & San Ant.	July	1,379	1,155,171	368,274	1,604,657	344,183	272,155	34,256	689,186	72,166	1,425,251	88.80	179,406	1[illegible]6,719	93,435	3[illegible]867
	7 mos.	1,379	8,808,869	2,602,009	12,110,823	2,305,697	2,400,911	258,638	4,856,549	506,784	10,391,072	85.80	1,719,751	1,[illegible]58,068	1,045,645	861,06[illegible]
Houston & Texas Central	July	923	729,609	274,550	1,072,628	214,400	229,668	23,442	377,151	42,081	884,278	82.40	188,3[illegible]	143,278	117,759	[illegible]
	7 mos.	923	5,441,203	2,008,934	7,976,854	1,491,509	1,591,732	165,707	2,533,211	293,331	6,459,467	81.00	1,517,367	1,209,098	981,645	[illegible]
Houston, East & West Texas	July	191	223,111	47,225	282,467	56,474	55,348	3,407	100,191	7,906	2[illegible]2,818	78.90	59,649	5[illegible],862	37,734	[illegible]
	7 mos.	191	1,333,447	282,469	1,695,480	352,395	351,433	23,655	692,198	56,986	1,4[illegible]9,124	86.60	2[illegible]6,356	1[illegible]1,248	89,887	[illegible]
Louisiana Western	July	207	170,002	88,000	278,533	61,296	55,605	8,837	92,205	16,990	238,8[illegible]3	85.80	[illegible]	7,[illegible]15	16,1[illegible]	[illegible]
	7 mos.	207	1,615,376	605,544	2,386,726	458,618	456,748	62,335	714,642	124,472	1,844,[illegible]61	77.30	541,76[illegible]	[illegible]	[illegible]	[illegible]
Morgan's L. & T. R. R. & S. S. Co.	July	400	344,506	153,677	542,509	133,922	169,174	15,388	246,734	31,058	601,034	110.[illegible]	—58,5[illegible]	—1[illegible]4,[illegible]26	—11[illegible]	[illegible]
	7 mos.	400	2,981,565	1,050,229	4,392,725	977,986	1,026,481	113,896	1,836,522	233,887	4,221,[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Tex. & New Orleans	July	507	436,366	151,601	625,022	140,474	217,885	9,464	306,233	24,206	712,910	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7 mos.	507	3,597,797	1,074,571	4,971,682	996,683	1,301,302	75,198	1,966,004	180,486	4,555,912	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Spokane International	July	165	71,213	15,638	92,172	13,950	8,790	2,356	31,834	5,530	63,[illegible]59	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7 mos.	165	521,743	81,047	633,506	99,167	55,374	20,054	239,[illegible]05	41,864	[illegible]	72.[illegible]	[illegible]	11[illegible]	[illegible]	[illegible]
Spokane, Portland & Seattle	July	549	393,297	180,629	635,392	62,205	71,350	13,553	203,646	20,118	[illegible]80,549	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7 mos.	549	2,701,962	968,230	4,025,500	374,214	591,172	72,450	1,367,356	139,068	2,60[illegible],[illegible]16	[illegible]	[illegible]	[illegible]41	7[illegible]164	[illegible]
Tennessee Central	July	2[illegible]2	111,379	47,767	170,180	32,750	10,578	6,027	82,554	10,703	14[illegible],61[illegible]	81.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	7 mos.	2[illegible]2	979,315	283,611	1,363,911	238,508	211,791	37,959	705,274	81,990	1,[illegible]75,4[illegible]3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Term. R. R. Assn. of St. Louis	July	37	. . .	....	354,553	88,465	37,282	982	116,034	3,911	250,057	70.[illegible]	[illegible]	44,[illegible]	[illegible]	[illegible]
	7 mos.	37	. . .	....	2,638,408	537,619	256,677	7,6[illegible]6	855,581	41,438	1,726,259	[illegible]40	[illegible],149	[illegible]	1,146,[illegible]4	[illegible]
East St. L. Connecting	July	1	....	....	160,552	13,793	7,841	279	55,900	2,231	80,041	[illegible]	[illegible]	7[illegible],4[illegible]4	[illegible]	[illegible]
	7 mos.	1	....	....	1,171,718	91,964	51,311	2,219	397,445	18,826	561,765	47.[illegible]0	[illegible]	[illegible]	[illegible]	[illegible]
St. L. Merchants' Bridge Term.	July	9	....	....	[illegible]61,410	43,240	31,842	867	132,887	4,316	213,152	81.50	[illegible]	[illegible]	[illegible]	[illegible]
	7 mos.	9	....	....	2,042,956	283,389	186,320	6,784	983,872	32,223	1,492,5[illegible]8	73.1[illegible]	550,[illegible]8	416,5[illegible]	[illegible]	777,[illegible]
St. Louis Transfer	July	6	....	....	57,260	10,954	4,953	161	33,188	1,431	50,687	8[illegible].50	6,573	[illegible]	—1,[illegible]29	34,791
	7 mos.	6	....		427,834	70,262	30,693	1,284	230,864	11,757	344,860	80.60	[illegible]	[illegible]	[illegible]	243,[illegible]51
Texas & Pacific	July	1,952	1,530,572	615,465	2,313,990	412,060	332,467	54,470	875,060	81,566	1,771,774	76.60	542,216	44[illegible]6	388,011	614,6[illegible]
	7 mos.	1,952	11,329,437	4,057,616	16,684,795	3,094,429	3,217,719	335,687	6,428,774	642,935	13,861,458	83.10	2,823,337	[illegible]46,256	1,5[illegible]8,317	1,433,8[illegible]
Toledo, Peoria & Western	July	247	76,820	41,237	131,199	23,620	25,843	3,149	75,212	8,014	135,838	103.50	—4,639	—1[illegible]	—12,484	—74,55[illegible]
	7 mos.	247	534,703	313,285	922,423	162,487	238,485	20,386	480,521	54,787	956,594	103.70	—34,171	—111,627	—132,56[illegible]	—322,8[illegible]3
Toledo, St. Louis & Western	July	454	827,290	39,932	907,968	121,727	129,479	21,280	279,344	19,570	571,375	62.90	336,593	[illegible]8,591	238,150	110,972
	7 mos.	454	5,348,632	194,257	5,814,225	725,265	951,281	150,713	1,862,688	175,648	3,865,570	66.50	1,948,655	1,617,584	1,423,201	492,078
Trinity & Brazos Valley	July	368	131,994	20,028	158,098	46,245	22,629	3,021	48,646	14,335	134,876	85.30	23,222	16,213	—1,104	37,369
	7 mos.	368	1,528,746	144,384	1,738,156	427,945	360,248	22,560	636,126	85,571	1,528,440	87.90	209,716	160,572	—148,577	—61,242
Ulster & Delaware	July	128	53,793	117,030	209,437	23,460	13,613	5,893	100,542	9,976	153,854	73.50	55,583	49,580	45,581	75,655
	7 mos.	128	411,304	274,912	922,964	139,451	142,101	20,680	465,131	56,771	828,014	89.70	94,960	52,691	[illegible]5,678	—57,936
Union	July	45	......	......	1,168,898	85,543	172,755	169	415,120	7,684	681,271	58.30	487,627	472,542	545,354	183,285
	7 mos.	45	......	......	6,240,165	503,682	1,265,817	1,664	2,506,026	49,807	4,326,996	69.30	1,913,169	1,817,594	2,224,512	1,030,784
Union Pacific	July	3,707	5,702,425	1,597,779	8,096,096	1,306,101	1,197,617	162,076	2,363,439	281,612	5,512,790	68.10	2,583,306	1,988,259	1,979,080	2,148,395
	7 mos.	3,683	38,577,580	9,766,284	53,498,279	6,249,315	11,385,590	989,398	15,862,723	2,153,843	37,778,042	70.60	15,720,237	11,694,325	11,532,079	12,302,080
Oregon Short Line	July	2,359	1,851,293	538,505	2,592,961	538,983	352,184	43,564	901,562	95,591	2,006,515	77.40	586,446	307,394	292,983	102,566
	7 mos.	2,359	14,419,384	3,106,429	18,973,550	3,046,606	3,746,578	320,281	6,117,550	815,357	14,459,405	76.20	4,514,145	2,580,213	2,450,431	1,083,370
Oreg.-Wash. R. R. & Nav.	July	2,237	1,480,650	543,864	2,274,756	528,572	371,729	66,798	992,958	126,079	2,116,196	93.00	158,560	—22,471	—96,900	—148,806
	7 mos.	2,226	10,382,905	3,193,695	14,973,483	3,311,593	2,875,633	424,020	6,748,292	875,673	14,431,419	96.40	542,064	—726,535	—1,259,694	—891,313
St. Joseph & Gr. Island	July	258	189,313	24,924	233,676	63,670	30,033	2,779	107,566	11,674	215,722	92.30	17,954	1,765	8,579	—21,470
	7 mos.	258	1,451,654	177,450	1,739,296	322,000	324,133	17,922	772,761	83,849	1,520,660	87.40	218,636	94,002	30,536	—92,7[illegible]8
Utah	July	102	159,133	544	160,449	31,889	29,039	321	35,795	4,439	101,338	63.20	59,111	52,968	37,964	—35,51[illegible]
	7 mos.	102	905,042	5,151	920,980	140,031	244,894	2,482	207,448	33,428	628,138	68.20	292,842	247,844	161,953	—65,850
Virginian	July	526	1,227,140	75,846	1,415,114	166,143	261,506	11,867	407,207	32,744	878,562	62.10	536,552	406,019	404,219	484,2[illegible]4
	7 mos.	526	10,678,321	452,986	11,900,312	1,278,972	2,765,071	81,308	2,610,215	219,788	6,952,971	58.40	4,947,341	4,164,902	4,237,441	3,401,5[illegible]4
Wabash	July	2,472	3,430,408	813,634	4,643,216	770,742	517,165	114,399	2,093,329	144,914	3,661,199	78.90	982,017	781,464	532,868	237,9[illegible]8
	7 mos.	2,472	25,645,164	5,241,526	33,273,800	4,708,637	6,318,780	810,758	14,063,589	1,062,101	27,130,307	81.50	6,143,493	4,808,010	2,963,305	1,128,17[illegible]
Western Maryland	July	804	1,050,597	104,195	1,251,617	154,411	261,488	38,504	439,961	44,123	962,247	76.80	289,370	249,370	260,085	256,249
	7 mos.	804	8,250,871	540,931	9,495,656	1,208,051	1,926,331	233,832	3,346,135	316,476	7,179,236	75.60	2,316,420	2,006,420	1,822,559	1,720,742
Western Pacific	July	1,045	775,351	252,307	1,102,840	193,617	171,478	34,813	392,613	35,756	853,436	77.40	249,414	173,155	172,327	78,258
	7 mos.	1,043	4,445,916	1,300,743	6,193,081	1,088,978	1,147,496	226,803	2,439,914	265,791	5,308,727	85.70	884,354	289,378	457,038	426,861
Wheeling & Lake Erie	July	511	984,507	80,281	1,182,134	200,370	208,341	25,320	438,099	32,429	908,594	76.90	273,540	164,980	121,982	318,907
	7 mos.	511	6,918,383	497,882	8,005,064	1,198,323	1,605,903	128,985	2,811,976	237,378	6,007,530	75.00	1,997,534	1,201,872	1,054,123	769,130

Employees as Solicitors

Solicitation of business, both freight and passenger, by employees in all departments, has now become such a regular thing on the lines of the Southern Pacific (Pacific System) that a permanent record is to be kept, with a "score board" showing the standing of the different divisions. If an employee gives a tip resulting in a freight shipment (less than a car-load) he is given ten points; for a car-load, 50 points; and one who gets the promise of all future business of a certain firm receives an award of 100 points. A local one-way ticket means one point; round trip, two points; through tickets to the East, five points; round trip, ten.

The first score board reads as follows:

Divisions	Points August	Total to date
Los Angeles	1435	1977
General offices	1075	1516
Tucson	760	837
Coast	408	503
Western	119	197
San Joaquin	71	176
Stockton	9	139
Salt Lake	24	85
Sacramento	....	10
Shasta	10	10
Portland	3	3

The bulletin issued by the company gives a long list of names of men in all departments who have secured business; also names of several women, one of whom got six car loads of freight from Phoenix, Ariz., to San Francisco.

Reading at Work on Camden Terminal

Details of the plans for the new Camden terminal of the Philadelphia & Reading Railway, which, it is expected, will be ready for the 1923 summer season, have just been announced by the company. Work on the new terminal was begun several months ago and has now reached the stage of driving the piles and dredging the river for ferry slips. In the new terminal extensive additions to the company's ferry and track facilities will be provided to handle the growing seashore traffic.

The plans call for a two-story structure of steel frame and brick with stone trimmings on a concrete foundation built on piles. It will house the ferry slips, a train shed, a concourse, waiting rooms for men and women, a restaurant, and the offices of the Delaware River Ferry Company and of the seashore lines of the Philadelphia & Reading.

The river front end of the building, which will be built of copper, will house four modern electrically operated ferry slips. The spaces between the ferry slips will be used for the men and women's waiting rooms, for offices, and for the restaurant, all of which will be built of brick with stone trimming.

The concourse will be 328 feet long and 105 feet wide. It will lead directly to the train shed which will contain ten tracks for use in the company's regular service and four additional tracks for use at times when travel is especially heavy. All these tracks will be gated and practically all of them will be long enough to accommodate trains of fourteen cars. The train platforms will be built of concrete with butterfly shelters.

On the land side of the building the main entrance will be from Mechanic street. The plans for this part of the structure call for a two-story office building 115 feet long by 42 feet wide. On the first floor of this building will be the lobby, the ticket office, and facilities for handling express. The second floor will be occupied by the offices of the Reading's seashore lines. At the opposite end of the concourse from that occupied by the office building will be a brick power house used to generate the power necessary in the operation of the terminal.

Driveways leading into the terminal will be laid out, each of them wide enough to accommodate four lines of vehicles. There will be separate driveways for baggage and express. Adjoining the terminal proper will be a large storage yard for cars and a railroad Y. M. C. A. building for the use of trainmen.

The construction of the new terminal and the laying of the necessary tracks between it and the present Reading's seashore lines will require considerable filling in and the construction of several bridges. The relaying of the tracks also will eliminate the number of grade crossings existing on the present lines.

Provisions have been made in the plans, also, for the adaptation of the new terminal to the use of double-deck ferryboats should this become necessary.

Traffic News

The Northern Pacific has restored the 20 branch line trains in Montana and Minnesota which were cancelled on July 20, to conserve coal. It is expected that other branch line trains, west of Paradise, Mont., will also soon be restored. The St. Louis Southwestern has announced its intention to reinstate 12 of its passenger trains in Texas which were discontinued on August 6, because of the coal shortage.

The Interstate Commerce Commission has issued Foreign Commerce Order No. 5, cancelling Foreign Commerce Order No. 2 issued on January 12, designating points on the railroad lines at which information relative to the handling of export shipments by common carriers by water in foreign commerce are required to be maintained and from which through bills of lading to foreign destinations in connection with ocean carriers whose vessels are registered under the laws of the United States to points in non-adjacent foreign countries are to be issued. This order is issued in accordance with Section 25 of the interstate commerce act.

The Public Service Commission of Indiana, acting in behalf of shippers of that state, opposes the approval by the Interstate Commerce Commission of reductions in freight rates from New York to the Pacific coast proposed by the Southern Pacific. The change will place New York shippers on an equal basis with competitors as far west as the Mississippi river on shipments to the Pacific coast. The proposed reductions are on 175 articles, including board, various kinds of paper, plumbers' goods, earthenware and stoneware, pumps and sprayers, certain agricultural implements, clay and clay products, tile roofing, bottles, jars, glass, bars and bent iron, wire fencing, nails and stoves.

Traffic Statistics for First Half of 1922

The number of ton miles of revenue freight handled by the railroads of the country during the first six months of 1922 was 152,435,057,000, as compared with 146,832,606,000 in the corresponding period of 1921, according to the monthly bulletin of traffic statistics issued by the Interstate Commerce Commission. Although the volume of freight increased, the freight revenue decreased from $1,863,986,628 to $1,859,121,583, and the average revenue per ton miles decreased from 1.269 cents to 1.22 cents. The revenue passenger miles totaled 16,487,117,000, as compared with 18,382,451,000 last year. The passenger revenues decreased from $574,734,980 to $502,763,758 and the average revenue per passenger mile decreased from 3.127 cents to 3.049 cents.

New Grain Rate Case

The Public Utilities Commission of Kansas has filed with the Interstate Commerce Commission a complaint against all carriers in the Western rate group, asking for a reduction of rates on grain, grain products and hay between points in the Western group. The complaint recites the increase in rates on the commodities mentioned in Ex Parte 74, the reduction required in the Western grain rate case effective December 27, 1921, and the general reduction in rates required in the reduced rate case, 1922, which was effective July 1. It is then alleged that the reductions ordered in the Western grain rate case "were for the purpose of removing injustices and to establish a proper level and relationship as between commodities, and the level and relationship which was established has been seriously disturbed by the decision of the commission in 'Reduced Rates' by the exception from this decision of grain, grain products and hay, carload rates between points in the Western group resulting in unreasonable and unjustly discriminatory interstate rates." It is also alleged that considering prevailing production costs and farm and market values of the commodities involved the existing interstate rates are prohibitory and operate to the serious disadvantage of the shippers of these commodities and are unjust and unreasonable, unjustly discriminatory and unduly prejudicial. The Kansas commission will press for an early hearing, and has invited the cooperation of other commissions in the Western group.

Commission and Court News

Interstate Commerce Commission

The Commission has vacated its order in the Nevada intrastate rate case in which it ordered the rates increased to correspond with the increase made in interstate rates, the Public Service Commission of Nevada having vacated its order which prescribed lower rates.

United States Supreme Court

Southern Pacific Control of Central Pacific Severed

The case of the United States vs. Southern Pacific was reported in the *Railway Age* of June 3, page 1256. The government was sustained in its plea for severance of the control of the Central Pacific by the Southern Pacific, as in violation of the Sherman Act, the Supreme Court's decision reverses the decree of the federal district court for the District of Utah (239 Fed. 958). In the course of its opinion, the Supreme Court said that considered collectively, the cases of Northern Securities Co. vs. United States, 193 U. S. 197, 327; United States vs. Union Pacific, 226 U. S. 61, and United States vs. Reading Co., 253 U. S. 26, 57, 58, 59, had established that "one system of railroad transportation cannot acquire another, nor a substantial and vital part thereof, when the effect of such acquisition is to suppress, or materially reduce the free and normal flow of competition in the channels of interstate trade." The defendants contended that the suit was barred by laches on the part of the government in failing to institute it earlier; but the court was unable to discover that laches existed. The stock acquisition complained of was in 1899. In 1901 the Union Pacific acquired control of the Southern Pacific by purchase of sufficient stock to accomplish that purpose. The Union Pacific case was begun in 1908, and a final decree reached in 1913, and in 1914 this suit was begun. United States vs. Southern Pacific. Opinion by Mr. Justice Day. Mr. Justice McKenna dissented in separate opinion. Justices McReynolds and Brandeis took no part in the decision. Decided May 29, 1922.

What Is Employment in Interstate Commerce?

In proceedings by a railroad employee under the California Workmen's Compensation Act, in which the State Commission awarded relief which award was reversed by the District Court of Appeal, the Supreme Court of the United States had before it, on certiorari, the question whether redress for injuries received while working in the general repair shops of the company upon a locomotive which had been employed in interstate commerce and which was destined to be so employed again must be sought through the Workmen's Compensation Act or the Federal Employers' Liability Act.

The state and federal decisions applying the jurisdictional test are diverse, and the court below pointed out that the Supreme Court had fixed no rule by which the conflict could be resolved, but had remitted the decision of each case to its particular facts. The Supreme Court says, of its decisions on the point, that "a precise ruling, one that enables an instant and undisputed application, has not been attempted to be laid down. . . . We refrain from a review of our cases. They pronounce a test and illustrate it. We are called upon to apply it to the present controversy. . . . We are brought to a consideration of degrees. There may be only a placement upon a sidetrack or there may be a definite withdrawal from service and placement in new relations. The locomotive in the present case was placed in the shop for general repairs on December 19, 1918. On February 25, 1919, after work upon it, it was given a trial and it was placed in service on March 4, 1919. The accident occurred on February 1 of that year, the engine at the time being nearly stripped and dismantled. It was not interrupted in an interstate haul to be repaired and go on. Judgment reversed and cause remanded. Industrial Accident Commission of California vs. Payne. Opinion by Mr. Justice McKenna. Decided May 29, 1922.

Foreign Railway News

Complete Details of Large Construction Program of South African Railways Obtainable in New York

As has previously been announced in the *Railway Age*, the South African Railways are planning to undertake at an early date the construction of some 850 miles of new line. This work will involve, of course, extensive purchases of track and construction material. The National Bank of South Africa, 44 Beaver Street, New York City, has the detailed prospectus which the government has prepared to cover this work, and all of the projects contemplated are therein described in detail. This company, which is the fiscal agent of the government of the Union of South Africa, will be glad to allow any American manufacturer who is interested in furnishing any of the material needed to inspect this prospectus at its New York office.

French Railway Orders Control Equipment for 120 Electric Locomotives

An order covering the complete control equipment for 120 electric locomotives, now under construction, has been received by the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., from the Paris-Orleans Railway of France as part of an electrification contract amounting to approximately $8,000,000.

The Paris-Orleans Railway, which is one of the largest systems in France operating over 5,000 route miles of track, is electrifying 125 miles of its main line between Paris and Vierzon. This is the first of an extensive program laid out by the Paris-Orleans for the electrification of its lines.

The complete order of control equipment will be manufactured in the United States and shipment of this order will commence in January, 1923, and extend to December, 1924.

China Notes

PEKING.

The political situation continues to dominate everything in China. None of the military movements which it was supposed two months ago were to be determining factors in the march of events have proved to be decisive. In the South, Sun Yat Sen is staging a "come back" by means of the navy after it was supposed that he had been eliminated by Chen Chung Ming, the friend of Wu Pei Fu. In the North, Wu Pei Fu has been influenced to withdraw his forces from the Manchuria border leaving Chang Tso Lin in possession of the Peking-Mukden rolling stock and much of the Salt Gabelle revenue. Wu's nominal chief, Tsao Kun, is connected by marriage with Chang Tso Lin and is negotiating for the complete recognition of Chang with restoration of honors, and for a mandate of censure to apply to Wu equally with Chang for precipitating the late hostilities. Midway between North and South, Wu's forces are harassed in Honan by heavily armed banditry under the direction of the late Tuchun of the province, and in Kiangsi by adherents of Sun Yat Sen. Parliament is expected to convene in three days, whereat the log-rolling for the election of a regular president to succeed acting-president Li Yuan Hung is expected to occupy much of the autumn period. It is said that the present minister of communications has now secured the support of Tsao Kun and is likely to remain in office indefinitely, although still actively opposed by the old "Chiaotung" (communications) clique.

Passenger service has been restored almost to normal. Express trains are running as usual to Shanghai and to Hankow. The week-end special to Peitaiho beach, which during the past four years has been a regular feature of the summer season has not been resumed.

Tsao Kun's forces continue to collect the revenue of the Peking-Hankow line. His representatives have offered to permit this to go to the ministry of communications providing the ministry can advance a million dollars and continue to contribute $800,000 monthly. The line earns only about $1,800,000

a month under normal conditions of which about $800,000 is required for operating expenses. After paying the military's $800,000 only $200,000 would be left, which is about one-third of the amount necessary to repay instalments due on mortgage bonds and interest charges.

Just what diplomatic moves are going to be made as a result of Chang Tso Lin's seizing of the Peking-Mukden rolling stock is a matter of considerable importance. The British and Chinese corporation, which is trustee for the bondholders who hold the mortgage on the property and the revenue of the Peking-Mukden, have gone through the preliminary formalities of demanding of the ministry of communications the restoration of the line, of invoking the aid of the British legation, which in turn has repeated the demand to the Chinese foreign office, all of which are helpless. The British see clearly that if a Chinese military freebooter once "gets away" with a seizure of British pledged property, in this way, it will be only a short time before their whole vast interests in China are lost, as all of them are valuable and highly revenue producing. At the same time, to land forces and recover the possession of this property is more apt to stir up all China against them than it is to secure the friendship of the Peking government, whose battle they fight and whose position they save. Incidentally, the Japanese have a second mortgage upon a portion of this line, and as an invasion of Manchuria would be required, and in spite of the Washington conference, when it comes to Manchuria there is still a "sphere of influence" in China—it is quite likely that the Japanese government would be displeased with any such movement unless the British should yield to the Japanese a voice in the management of the Peking-Mukden line. Hence the British have every reason for giving the Chinese plenty of time for working out a solution in their own way.

Announcement has just been made of a traffic agreement between the Chinese Eastern Railway and the South Manchurian Railway by which rates are reduced on the Chinese Eastern from Harbin to Changchun on the route to Dairen and raised on the section from Harbin toward Vladivostock. Also, a rebate of $3.55 per ton is to be paid the Chinese Eastern by the South Manchurian for beans delivered at Dairen if originated west of Harbin. The effect of this will be to divert the entire bean trade of Manchuria from Vladivostock to Dairen and a considerable portion of all other kinds of traffic originating west of Harbin. This all goes toward confirming the impression that now Japan really means to withdraw her troops from Siberia. It is stated, and as frequently denied, that the gage from Harbin to Changchun will be narrowed from the Russian 5 ft. to the Japanese 4 ft. 8½ in., so that through trains will be run from Harbin to Dairen. If at the same time the Japanese could work out an arrangement with the British by which that portion of the Peking-Mukden north of the Great Wall were also handed over to Japanese management, the economic conquest of Manchuria would be practically complete.

The Ministry of Communications has made public a summary of its financial obligations as follows:

Domestic—	
Short term loans and advances	$11,864,654.23
Redeemable bonds	11,320,000.00
Overdrawn bank accounts	706,938.03
Pledged for the redemption of private railways	38,326,880.68
	$62,218,472.94
Foreign—	
Loans contracted by the ministry	$63,235,547.72
Loans contracted by subordinate departments	72,776,913.58
Obligations upon the railways and telegraphs	298,367,008.00
Loans made by the ministry of finance secured on the property and revenues of the railways and telegraphs, but for which the ministry of finance is responsible	106,200,000.00
	$540,579,469.30
Grand total	$602,797,942.24

This tabulation omits several millions due on current accounts for which creditors are pressing for settlement. Much of the above total bears interest rates of nine to twelve per cent, but the long term loans at present rates of exchange work out to a little over four per cent. But the upshot is that some $36,000,000 a year is required for interest payments, omitting entirely the large repayments which are now falling due. The railways last year had a total net revenue of some $41,000,000 of which perhaps $33,000,000 was cash applicable to purposes of this kind. Telegraphs barely pay their way, but the postal department makes a small surplus, which under its foreign co-director general it devotes to betterments of the service. Hence the ministry of communications no longer has credit.

Equipment and Supplies

Locomotives

THE DULUTH & IRON RANGE is inquiring for 8 Mikado type locomotives.

THE VIRGINIAN RAILWAY contemplates buying some heavy type Mallet locomotives.

THE CHICAGO, BURLINGTON & QUINCY contemplates buying about 50 locomotives.

THE ATCHISON, TOPEKA & SANTA FE is contemplating the purchase of 100 locomotives.

THE NEW YORK CENTRAL has ordered 100 locomotives from the American Locomotive Company.

THE CHESAPEAKE & OHIO is negotiating for the purchase of 50 compound Mallet type locomotives.

THE WESTERN MARYLAND has ordered 10 Consolidation type locomotives from the Baldwin Locomotive Works.

THE NORFOLK & WESTERN is inquiring for from 20 to 40 Mallet type locomotives and 12 Mountain type locomotives.

THE TEXAS & PACIFIC is inquiring for 8 Pacific type locomotives and is considering the purchase of 8 switch engines.

THE NORTHERN PACIFIC is contemplating the purchase of a large number of locomotives, the number of which is still undetermined.

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for 10, 2-10-2 type locomotives, and contemplate buying 30 Mikado type and 10 Mountain type locomotives.

THE ST. LOUIS-SAN FRANCISCO, reported in the *Railway Age* of September 9 as inquiring for 35 Mikado and 15 Mountain type locomotives, has ordered this equipment from the Baldwin Locomotive Works.

Freight Cars

THE UNION PACIFIC is inquiring for 50 caboose cars.

THE WESTERN PACIFIC is inquiring for 100 gondola cars.

THE ATLANTIC COAST LINE is inquiring for 2,000 box cars of 40 tons' capacity.

THE WABASH is inquiring for repairs to 300 stock cars, 250 automobile cars and 500 box cars.

THE BETHLEHEM-CHILE IRON MINES COMPANY is now inquiring for 20, 50-ton special hopper ore cars.

THE PITTSBURGH, SHAWMUT & NORTHERN is inquiring for 200 stock cars of 30 tons' capacity and 50 box cars of 40 tons' capacity.

THE SCHENECTADY VARNISH COMPANY, Schenectady, N. Y., has ordered one tank car of 8,000 gallons capacity from the Standard Tank Car Company.

THE CENTRAL OF GEORGIA, reported in the *Railway Age* of August 19 as inquiring for 100 cars of 40 tons' capacity, has ordered this equipment from the Virginia Bridge & Iron Company.

THE GREAT NORTHERN is inquiring for 100 tank cars, new or second hand, of 12,000 gal. or less capacity for carrying fuel oil. The company is also considering the question of leasing 100 tank cars.

THE NEW YORK, NEW HAVEN & HARTFORD, reported in the *Railway Age* of September 2 as inquiring for 6 caboose cars, has ordered this equipment from the Keith Car & Manufacturing Company.

THE CINCINNATI, INDIANAPOLIS & WESTERN, reported in the *Railway Age* of September 2 as inquiring for 300 high side gondola cars of 50 tons' capacity, has ordered this equipment from the Pullman Company.

THE ST. LOUIS-SAN FRANCISCO, reported in the *Railway Age* of September 2 as inquiring for 500 hopper car bodies of 50 tons' capacity, has ordered 1,000 of 55 tons' capacity from the American Car & Foundry Company.

THE ILLINOIS CENTRAL, reported in the *Railway Age* of August 19 as inquiring for 75 caboose cars, has ordered this equipment from the American Car & Foundry Company. The cars are to have steel underframes and are to have a capacity of 30,000 lb.

THE WEST VIRGINIAN PULP & PAPER COMPANY, New York City, reported in the *Railway Age* of August 12 as inquiring for 10 steel underframe box cars, has ordered these cars from the Western Steel Car & Foundry Company. The cars are to have a capacity of 80,000 lb.

Passenger Cars

THE ALASKAN ENGINEERING COMMISSION, Seattle, Wash., is inquiring for two baggage cars.

THE UNITED STATES BUREAU OF MINES has ordered 2 rescue cars from the American Car & Foundry Company.

THE LONG ISLAND contemplates inquiring soon for 90 steel passenger coaches, 80 of the cars are for electric service and 10 for steam service.

THE GRAYSONIA, NASHVILLE & ASHDOWN, successor in part to the Memphis, Dallas & Gulf, contemplates the purchase of passenger, express and baggage motor car equipment.

THE ATLANTIC COAST LINE, reported in the *Railway Age* of June 10 as having ordered 20 express cars and 10 coaches from the Bethlehem Shipbuilding Corporation, Harlan plant, has increased its order to 25 steel express cars and to 25 steel coaches.

THE TENNESSEE CENTRAL, reported in the *Railway Age* of September 9 as inquiring for 3 combination mail and baggage cars and 6 passenger coaches, has ordered 3 combination mail and baggage cars, 3 combination coaches and 3 steel coaches from the Bethlehem Shipbuilding Corporation, Harlan plant.

Iron and Steel

THE WABASH is inquiring for 20,000 tons of 90-lb. rails.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 8,000 tons of rail from the Illinois Steel Company.

THE LOUISIANA RAILWAY & NAVIGATION COMPANY has ordered 3,000 tons of rail from the Tennessee Coal, Iron & Railroad Company.

THE UNITED STATES STEEL CORPORATION announces an increase in the price of standard steel rail from $40 to $43 a ton, to become effective on October 1.

THE SOUTH MANCHURIAN RAILWAY ordered recently through a New York City export house 700 tons of tie plates from the U. S. Steel Products Corporation.

THE IMPERIAL JAPANESE GOVERNMENT RAILWAYS received bids recently through export houses in New York City for 4,800 tons of 60 lb. rail and 218 tons of splice bars.

Machinery and Tools

THE GRAND TRUNK is inquiring for one flanging machine and one Nazel hammer.

THE ATCHISON, TOPEKA & SANTA FE has ordered a 10-ton hand power crane from the Whiting Corporation.

THE GENERAL ELECTRIC COMPANY, Schenectady, N. Y., is inquiring for four, 5-ft. radial drills, also for one, 6-ft. radial drill.

THE ILLINOIS CENTRAL, reported in the *Railway Age* of June 10 as inquiring for a large list of machine tools, has completed negotiations for $250,000 worth, exclusive of motors.

THE CHICAGO, BURLINGTON & QUINCY has placed an order with the Whiting Corporation for two 125-ton electric overhead traveling cranes, one 125-ton hoist and one auxiliary 15-ton hoist.

THE CHICAGO, BURLINGTON & QUINCY is about to place orders for overhead electric traveling cranes for its shops at Denver, Colo., and for two gantry cranes for use in its scrap yard at Aurora, Ill.

THE PENNSYLVANIA is inquiring for 4 double trolley overhead traveling cranes and for 8 single trolley overhead traveling cranes, to include 2 of 250 tons' capacity, 2 of 60 tons', 2 of 25 tons' and 6 of 15 tons'.

THE UNION PACIFIC, reported in the *Railway Age* of July 8 as having issued a machine inquiry comprising 73 items, has now placed orders with various companies for approximately $200,000 worth of machine tools.

THE CHICAGO, BURLINGTON & QUINCY, reported in the *Railway Age* of July 8 as having issued a machine inquiry comprising 117 items, is expected to place orders this week for a large number of the machine tools. This company has two lists before the trade, one comprising 117 items mentioned above, and another including 78 items for shops at various points on the system.

Miscellaneous

THE IMPERIAL JAPANESE GOVERNMENT RAILWAYS requested bids through expert houses in New York City, on 32,900 couplers for freight cars. The bids were wanted on September 15, at Tokio, Japan.

THE UNION PACIFIC received bids until September 15 for its requirements for one year beginning on the above date for incandescent lamp bulbs aggregating approximately $150,000 in net value.

THE NEW YORK CENTRAL is asking for bids until 12 o'clock noon September 26, for cast iron car wheels for car and locomotive service and track material, including switch points, frogs, switches, guard rails, etc.

THE PITTSBURGH & LAKE ERIE will receive bids until 12 o'clock noon September 26, at Pittsburgh, Pa., for its three months' requirements of car, engine truck, and driving wheel axles, Portland cement, stove pipe iron, pickled sheet steel, galvanized sheet iron, wire nails, wire rope, steel billets, bars, shapes and plates, boiler tubes, annealed copper wire, insulated wire, annealed iron wire, tinned iron wire, and soft steel wire.

THE NORFOLK & WESTERN will receive bids until 12 o'clock noon September 27, at Roanoke, Va., for its requirements from October 1 to December 31, 1922, of couplers and repair parts, also for locomotive tires and for brake shoes. Bids are also wanted on 2,000 tons of steel plates, shapes and bars. Separate bids are wanted for its requirements of brake shoes from October 1, 1922, for a period of six months and from the same date for a period of twelve months.

Signaling

THE MISSOURI, KANSAS & TEXAS in connection with the construction of its new freight yard at Dennison, Texas, is installing 12 signals; 8 Style S three-position semaphores and 4 color-light signals. The material is furnished by the Union Switch & Signal Company.

THE TYRONE DIVISION of the Pennsylvania Railroad reports having passed through the shopmen's strike without the loss of a single man. This division connects with the Main Line at Tyrone, Pa. Its lines aggregate 279 miles in length, and it employs 1,720 men. General Manager C. S. Krick has sent congratulations to the superintendent on "the wonderful loyalty displayed by the men in remaining at work during the trying days of the strike, particularly when men on the adjacent divisions left their work in considerable numbers and exerted every effort to induce the employees of the Tyrone division to join them. You and your subordinates evidently have created and maintained among your employees that old-time feeling of loyalty and affection for the company and its interests that has done so much to make the Pennsylvania Railroad what it is today."

Supply Trade News

The Economy Fuse & Manufacturing Company, Chicago, Ill., has moved its Detroit sales offices from the Majestic building in that city to the First National Bank building.

The American Brake Shoe & Foundry Company, New York, has bought 17 acres of land at Portsmouth, Va., where it is proposed to erect a new plant in the near future for the manufacture of brake shoes.

The Norwalk Iron Works Company, South Norwalk, Conn., has been consolidated with the Automatic Carbonic Machine Company of Peoria, Ill. The plant and equipment of the latter company has been moved to South Norwalk.

H. M. Aubrey, manager of the packing department of the Union Asbestos & Rubber Company, Chicago, has been appointed sales representative of that company in charge of the recently opened New York Office, 30 Church street, New York City.

The Ramapo Iron Works with plants at Hillburn and Niagara Falls, N. Y., and Niagara Falls, Ontario, and the Ajax Forge Company of Chicago with plants at Chicago and Superior, Wis., have been consolidated under the name of the Ramapo-Ajax Corporation, with J. B. Strong as president and headquarters at Hillburn. The control of the new company will be held by the American Brake Shoe & Foundry Company, New York.

Obituary

John H. Flagler, who organized the National Tube Company and served as its president until it was merged with the United States Steel Corporation, died on September 8 at his country home in Greenwich, Conn.

From the Indianapolis News

Out Again

Railway Construction

Atchison, Topeka & Santa Fe.—This company will construct an underground crossing with 80 ft. girders on concrete abutments at Britton, Okla. This company will also construct a subway with steel superstructure under two tracks at Twenty-third street, Oklahoma City, Okla.

Chicago, Burlington & Quincy.—This company has awarded contracts to the following companies: Home Builders' Association, Wichita, Kan., for a power house at Alliance, Neb.; Jones Engineering Company, Omaha, Neb., for an addition to the power house at Lincoln, Neb.; G. A. Johnson & Sons, Chicago, for a passenger station at Elsberry, Mo., which inquiry was reported in the *Railway Age* of August 5; W. G. Zitterell, Webster City, Iowa, for a freight house at Ziegler Junction, Ill., which inquiry was reported in the *Railway Age* of August 26; G. A. Johnson & Sons, Chicago, for a freight house at Aurora, Ill.

Chicago Union Station.—This company will close bids on September 18 for the construction of concrete track slabs and track drainage system for the north approach tracks, the installation of fibre conduit for high and low tension leads between Washington and Lake streets and the excavation for permanent station tracks between Van Buren and Harrison streets.

Illinois Central.—This company has awarded a contract to Ellington Miller Company, Chicago, for remodeling the freight house with new concrete paved transfer platform at Indianapolis, Ind., to cost $45,000.

Illinois Central.—This company, which was reported in the *Railway Age* of August 5 as calling for bids for the rebuilding of 12 water treating plants, has awarded the contract for the four at Dunlap, Iowa and Manchester, and at La Salle, Ill., and Scales Mound to the International Filter Company, Chicago.

Jefferson Southwestern.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a line from a connection with the Chicago & Eastern Illinois near Mt. Vernon, Ill., to a connection with the Chicago, Burlington & Quincy, 3 miles south of Waltonville, Ill., 14.5 miles.

Kansas, Oklahoma & Gulf.—This company is preparing plans for the extension of approximately 6½ miles of its lines from Baxter Springs, Kan., to a connection with the Joplin branch of the Missouri, Kansas & Texas.

Michigan Central.—This company has awarded a contract to Ellington Miller Company, Chicago, for a three-story office building 60 ft. by 75 ft. at Detroit, Mich., to cost approximately $80,000.

Pennsylvania.—This company is receiving bids for the construction of the substructure of an overhead bridge at Josephine, Pa., Cresson division, Black Lick branch, State Highway Route No. 68. The approximate quantities are as follows: 1,050 cu. yd. foundation excavation; 430 cu. yd. foundation masonry; and 975 cu. yd. neat masonry. The work is in charge of George Nauman, assistant to chief engineer, Pittsburgh, Pa.

Southern Pacific.—This company will construct extensions to its sidings at Crystal Lake, Cal., Cisco and Troy at a cost of approximately $250,000 and involving considerable rock excavation. This company will also double track its line across the Techachapi mountains at a cost of approximately $1,000,000. It will also enlarge the tunnels along this line and reline them with concrete at a cost of $2,800,000. The work on two of these, Tunnel 25 at San Ferando, Cal., and Tunnel 26 at Hasson will cost $1,800,000. Electrically operated turntables 100 ft. long will be installed at Ashland, Ore., Siskiyou, and Dunsmuir, Cal., and San Luis Obispo, at a total cost of about $200,000. This company will also relay 300 miles of track with new 90-lb. rail at a cost of $4,500,000, renew 2,400,000 ties at a cost of $4,500,000 and apply 1,000,000 cu. yd. of crushed rock and slag ballast at a cost of $2,500,000. This company also contemplates grade reductions and double tracking on the Central Pacific portions of the system.

Annual Report

The Baltimore and Ohio Railroad Company

Baltimore, Md., June 1922.

To the Stockholders of The Baltimore and Ohio Railroad Company:

The President and Directors of the Company submit herewith report of the affairs of the Company for the year ended December 31st, 1921. While this is the ninety-sixth report published by the Company, it in fact covers the operations of the Company for its ninety-[illegible] year, [illegible] the previous reports having been for an overlapping [illegible] to the fiscal year.

OPERATIONS OF THE YEAR.

During the entire year of 1921 the transportation property of the Company was operated solely by the Company on its own account and upon its own responsibility, the first whole year so operated since 1917. The property was operated by the Director General of Railroads under Federal control from January 1st, 1918, to February 29th, 1920, and by the Company under the guaranty provisions of the Transportation Act of 1920, from March 1st to August 31st, 1920.

The business depression which began in the fall of 1920, continued throughout the year, resulting in a very marked decline in the traffic handled. While the loss of revenue due to the decline in the volume of traffic was partly offset by the increase in rates and charges made effective August 26th, 1920, the total revenues were less than anticipated because of the numerous rate reductions made throughout the year 1921 on certain commodities, particularly those relating to agriculture, building operations, road construction, etc., such as grain and grain products, lumber, iron ore, sand, gravel, coal, etc., which commodities constitute a large portion of the Company's traffic. In these circumstances it became necessary to curtail the expenses to the lowest point consistent with safe and efficient operation. The reduction in revenues was in part offset by reduction in wages authorized by the United States Railroad Labor Board and made effective July 1st, 1921, and also by some decrease in the prices of material and fuel.

PROPERTY OPERATED.

The mileage of the properties operated by The Baltimore and Ohio Railroad Company, excluding separately operated subsidiaries, is shown in Table 14, and may be summarized as follows, viz.

	First Main Track.	Total all Tracks.
Miles owned and operated	4,956.06	9,786.97
Miles leased and operated	150.11	344.53
Total miles owned, leased and operated	5,106.17	10,131.50
Miles of trackage rights over which the Company operates	81.01	162.17
Total miles over which the Company operates	5,187.18	10,293.67

There was an increase of 31.99 miles of first main track during the year 1921, due principally to the inclusion in the Company's operations of the mileage of the Little Kanawha Railroad Company and the Belington and Northern Railroad Company, which companies had been separately operated prior to January 1st, 1921.

The equipment of the properties embraced in the above mileage is shown in detail in Table 18, page 30, and consists of:

2,683 Locomotives.
94,932 Freight Train Cars.
1,300 Passenger Train Cars.
2,633 Work Train Cars and other Work Equipment.
167 Tug Boats, Car Floats and other Floating Equipment.
Miscellaneous Equipment of various kinds.

The total investment of the Company in property used in and held for transportation service, excluding investments in separately operated properties, is $707,032,851.36, and is shown in Table 2, page 14. The operations of the property embraced in this investment produce the Net Railway Operating Income as defined by the Transportation Act of 1920.

The income accounts of six subsidiary companies, with mileage of 218.34 miles, are shown separately. The net profit or loss of these subsidiaries and other separately operated properties is absorbed and transferred to the income account of the parent company through the medium of the accounts "Separately Operated Properties"—Profit or Loss—as the case may be, so that the Corporate Income Account as shown in Table 1, comprises the net income of the entire Baltimore and Ohio System.

The total first main track mileage operated by the Company and its separately operated subsidiaries is 5,405.52 miles.

RAILWAY OPERATING INCOME.

Railway Operating Income as defined by the Transportation Act of 1920 is shown in Table 5.

As before stated, the results shown for the year 1921 are from operations conducted wholly by the Company for its own account. During the year 1920, Net Income from Property used in Transportation Service included compensation accrued under the contract with the Director General of Railroads for January and February, 1920; guaranty accrued under the terms of the Transportation Act of 1920 for the period March 1st to August 31st, 1920; and railway operating income for the period September 1st to December 31st, 1920. For this reason the items comprising Net Income from Property used in Transportation Service for 1921, as shown in Table 1, are not comparable with those for 1920. However, for comparative purposes there is shown in Table 5, railway operating results for the years 1920 and 1921.

Referring to Table 5, it will be seen that freight revenues for 1921, in comparison with 1920, decreased $26,289,416.31, or 14.39 per cent., reflecting in part the decline in industrial activity which began in the fall of 1920, and continued throughout the year 1921. The extent of the decline in freight traffic may also be measured by the revenue tons carried, which for the year 1921 amounted to 71,536,702 tons, compared with 101,924,520 tons in 1920, a decrease of 29.81 per cent. As a further indication of the extent of the decline in business, it may be mentioned that the revenue tons carried one mile, decreased from 20,932,667,112 tons in 1920, to 14,198,727,702 tons in 1921, or 32.17 per cent., due to a shorter average haul as well as a lesser volume of tonnage. Table 15, shows the decline in tonnage by commodities, and in comparison with the year 1920 indicates a decrease of 12.40 per cent in products of agriculture, 30.44 per cent in products of mines, 31.05 per cent. in products of forest, and 34.58 per cent. in manufactures and miscellaneous. Freight traffic statistics may be found in Tables 11 and 12.

Passenger earnings for 1921 decreased $1,852,336.30, or 5.94 per cent. below 1920. There were 4,325,427, or 17.06 per cent fewer passengers carried, and 167,795,712, or 15.83 per cent. fewer passengers carried one mile per mile of road in 1921, when compared with 1920. Passenger traffic statistics may be found in Tables 13 and 14.

Mail revenue for the year shows a decrease under 1920 of $1,579,954.08, which is due wholly to the inclusion in the figures for 1920 of $2,104,680.97 above the revenues of that year representing additional allowances by the Government for services rendered in the years 1916 to 1919, so that if this additional allowance is eliminated in the comparison of 1921 with 1920, there is an actual increase in favor of 1921 of $524,726.89, or 23.50 per cent.

Express revenue decreased $2,571,758.43, or 55.17 per cent., part of which is due to the downward trend of business and part to the revision of the divisions established by the Director General of Railroads, and which remained in effect throughout the first eight months of 1920. Other revenues, including switching, storage, demurrage, etc., decreased $1,028,605.41, or 11.36 per cent., also due to the falling off in business activities.

Total operating revenues for the year were $198,622,372.81, of which 78.75 per cent was from freight, 14.77 per cent from passenger, 1.39 per cent. from mail, 1.05 per cent. from express, and 4.04 per cent from all other revenues. The decrease in gross revenue for the year compared with 1920, was $33,322,070.53, or 14.37 per cent.

Maintenance of way and structures expenses during 1921, were $24,617,808.24, a decrease as compared with 1920 of $8,441,474.61, or 25.53 per cent, and Maintenance of Equipment expenses for the year were $45,129,-

TABLE 1.

CORPORATE INCOME AND SURPLUS ACCOUNTS.

Year Ended December 31, 1921, in Comparison with Year Ended December 31, 1920.

(Excluding Operations of Federal Control Under Director General.)

THE BALTIMORE AND OHIO RAILROAD COMPANY

Corporate Income Account.	Year 1921.	Year 1920.	Increase or Decrease.
Average Miles Operated	5,187.18	5,155.19	31.99
Railway Operating Revenues:			
Freight	$156,421,212.45		
Passenger	29,331,034.36		
Mail	2,757,398.27		
Express	2,089,844.92		
Other Transportation Revenue	2,970,932.93		
Miscellaneous Revenue	5,051,949.88		
Total Railway Operating Revenues	$198,622,372.81		
Railway Operating Expenses:			
Maintenance of Way and Structures	$24,617,808.24		
Maintenance of Equipment	45,129,857.14		
Traffic	3,301,677.46		
Transportation	85,481,386.51		
Miscellaneous Operations	1,579,430.69		
General	6,385,386.01		
Transportation for Investment Credit	*38,522.18		
Total Railway Operating Expenses	$166,457,024.47		
Net Revenue from Railway Operations	$32,165,348.34		
Ratio of Operating Expenses to Operating Revenues	83.81%		
Other Operating Charges:			
Railway Tax Accruals	$7,236,726.44		
Uncollectible Railway Revenues	41,638.62		
Equipment Rents—Net Debit	2,097,724.08		
Joint Facility Rents—Net Debit	935,713.12		
Total Other Operating Charges	$10,311,802.26		
Net Income from Property used in Transportation Service	$21,853,546.08	$26,434,295.24	*$4,580,749.16
Other Corporate Income:			
Income from Lease of Road	$17,427.43	$18,284.46	*$857.03
Miscellaneous Rent Income	1,088,161.15	967,170.02	120,991.13
Miscellaneous Nonoperating Physical Property	144,667.31	122,711.00	21,956.31
Separately Operated Properties—Profit	446,926.91	441,807.81	5,119.10
Dividend Income	1,907,299.00	1,887,629.50	19,669.50
Income from Funded Securities	1,665,521.20	1,610,651.85	54,869.35
Income from Unfunded Securities and Accounts	489,644.78	288,359.95	201,284.83
Income from Sinking and Other Reserve Funds	70,272.55	51,404.50	18,868.05
Miscellaneous Income	4,290,903.80	11,839.45	4,279,064.35
Total Other Corporate Income	$10,120,824.13	$5,399,858.54	$4,720,965.59
Gross Corporate Income	$31,974,370.21	$31,834,153.78	$140,216.43
Deductions from Gross Corporate Income			
Rent for Leased Roads	$329,770.23	$340,760.41	*$10,990.18
Miscellaneous Rents	479,547.62	475,978.61	3,569.01
Miscellaneous Tax Accruals	246,974.35	297,707.09	*50,732.74
Separately Operated Properties—Loss	1,287,425.00	737,097.83	550,327.17
Interest on Funded Debt	22,534,069.45	21,960,591.49	573,477.96
Interest on Unfunded debt	583,148.26	200,667.31	382,480.95
Miscellaneous Income Charges	124,544.03	575,870.34	*451,326.31
Total Deductions from Gross Corporate Income	$25,585,478.94	$24,588,673.08	$996,805.86
Net Corporate Income	$6,388,891.27	$7,245,480.70	*$856,589.43

During the year 1920, Net Income from Property used in Transportation Service included compensation accrued under the contract with the Director General of Railroads for January and February, 1920; Guaranty accrued under the terms of the Transportation Act of 1920 for the period March 1st to August 31st, 1920; and railway operating income for the period September 1st to December 31st, 1920. For this reason the items comprising Net Income from Property used in Transportation Service for 1921 are not comparable with those for 1920. However, for comparative purposes there is shown in Table 5, railway operating results for the years 1920 and 1921.

*Indicates decrease.

857.14, a decrease when compared with the previous year of $23,742,958.52, or 34.47 per cent. Total maintenance charges for the year were $69,747,665.38, and constituted 41.90 per cent. of all operating expenses and 35.12 per cent. of all operating revenues.

Transportation expenses for the year were $85,481,386.51, a decrease as compared with 1920 of $28,322,722.65, or 24.89 per cent. and comprised 51.35 per cent. of total operating expenses and 43.04 per cent. of total operating revenues.

All other expenses for the year were $11,227,972.58, an increase over 1920 of $564,872.43, or 5.30 per cent. and were 6.75 per cent. of total expenses and 5.65 per cent. of total revenues. This increase is largely due to increase in traffic expenses, occasioned principally by the re-establishment and expansion of agencies at various important points off the line of road.

Total operating expenses for 1921 were $166,457,024.47, a decrease under 1920 of $59,942,283.38, or 26.48 per cent., compared with a decrease in operating revenues of $33,322,070.53, or 14.37 per cent. The ratio of operating expenses to operating revenues was 83.81 per cent. in 1921, and 97.61 per cent. in 1920, a decrease of 13.80 per cent.

CORPORATE INCOME AND SURPLUS.

The income and surplus accounts of the Company will be found in Table 1, and it will be seen that the net income for 1921 from property used in transportation service, or "Net Railway Operating Income" as it is defined in the Transportation Act, was $21,853,546.08, equivalent to 3.09 per cent. on the investment in property devoted to transportation service, or about one-half of the return contemplated by the Act which permitted a return of six per cent. as reasonable. There was a decrease in net railway operating income as compared with 1920 of $4,580,749.16, but of this amount $2,648,358.01 is due to setting up in 1921 reserves in the operating accounts to provide for lapover items pertaining to the guaranty period and chargeable to the United States under the Transportation Act of 1920, resulting in a corresponding increase in Other Corporate Income.

Other Corporate Income for the year is shown as $10,120,824.13, an increase over 1920 of $4,720,965.59. This large increase is due principally to the inclusion as income, under instructions of the Interstate Commerce Commission, of amounts found to relate to the guaranty period and chargeable to the United States under the Transporation Act of 1920.

Deductions from Gross Corporate Income aggregated $25,585,478.94, an increase over 1920 of $996,805.86, made up of increases in interest on funded and unfunded debt, and losses incurred by separately operated properties, which were also affected by the general decline in business.

From the Net Corporate Income for the year of $6,388,891.27, shown in the Corporate Surplus Account, there was appropriated $3,500,000.00 in accordance with the provisions of the $35,000,000.00 loan agreement of July, 1919, and applied in the retirement at maturity of outstanding long term debt.

Dividends on the Preferred Stock of the Company at the customary rate of four per cent. per annum were declared during the year.

SETTLEMENTS WITH THE UNITED STATES.

Settlement with the Director General of Railroads for use of the property during Federal control has not been completed. The Company's claims have been presented and final action is expected within a short time..

Final settlement has not as yet been effected with the Government for the operations of the property during the guaranty period, March 1st, to

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TABLE 2. GENERAL BALANCE SHEET. YEAR ENDED DECEMBER 31, 1921.

ASSETS.

					Comparison with December 31, 1920.
INVESTMENT IN PROPERTY USED IN TRANSPORTATION SERVICE:					
Investment in Property Directly Owned:					
Road			$248,071,127.35		
Equipment			157,783,123.64		
				$405,854,250.99	
Investment in Subsidiary Companies Operated as Constituent Parts of the Company				288,759,972.74	
Investment in Miscellaneous Physical Property Held for Transportation Purposes				4,447,415.13	
Investment in Improvements to Leased Railway Property				1,530,012.50	
Investment in Perpetual Leaseholds—Capitalized (per contra)				6,441,200.00	
Total Property Investment as related to Railway Operating Income				$707,032,851.36	I $10,895,871.92
OTHER INVESTMENTS:					
Investment in Subsidiary and Affiliated Companies Separately Operated:	PLEDGED.	UNPLEDGED.	TOTAL.		
Stocks	$8,600,423.73	$3,491,845.61	$12,092,269.34		
Bonds	25,800,000.00	1,347,501.00	37,147,501.00		
Miscellaneous		5,731,869.54	5,731,869.54		
Total	$44,400,423.73	$10,571,216.15		$54,971,639.88	
Investment in Other Miscellaneous Physical Property				4,339,131.58	
Investment in Sinking Funds:					
Securities of Carrier's Own Issue			$166,000.00		
Other Assets			2,441.14	168,441.14	
Deposits in Lieu of Mortgage Property Sold				28,263.00	
Investment in Other Companies:	PLEDGED.	UNPLEDGED.	TOTAL.		
Stocks	$21,936,187.96	$596,133.32	$22,532,321.28		
Bonds	217,000.00	611,971.47	828,971.47		
Miscellaneous		1,054,477.98	1,054,477.98		
Total	$22,153,187.96	$2,262,582.77		24,415,770.73	
Total Other Investments				$83,923,246.33	I $534,535.28
Grand Total of all Investments				$790,956,097.69	I $11,430,407.20
CURRENT ASSETS:					
Cash				$12,000,561.13	
Special Deposits				32,716.39	
Loans and Bills Receivable				107,378.60	
Traffic and Car Service Balances Receivable				17,992,783.60	
Net Balances Receivable from Agents and Conductors				5,334,451.64	
Miscellaneous Accounts Receivable				11,886,734.33	
Materials and Supplies				23,588,295.91	
Rents Receivable				23,620.82	
Total Current Assets				$70,966,544.42	D $14,101,901.92
DEFERRED ASSETS					
Working Fund Advances				$103,489.96	
Insurance Funds:					
Securities of Carrier's Own Issue			$436,000.00		
Other Assets			608,443.86	1,044,443.86	
Other Deferred Assets				249,011.71	
United States Government Transportation Act of 1920				9,371,575.43	
United States Railroad Administration				73,484,373.93	
Total Deferred Assets				$84,252,894.89	D $3,432,222.06
UNADJUSTED DEBITS					
Rents and Insurance Premiums Paid in Advance				$39,155.26	
Other Unadjusted Debits (interdepartmental accounts in process of adjustment)				2,138,885.13	
Total Unadjusted Debits				$2,178,040.39	D $1,785,495.58
SECURITIES OF CARRIER'S OWN ISSUE—UNPLEDGED:					
Stocks				$1,508,738.51	
Bonds				7,736,755.00	
Total Securities of Carrier's Own Issue—Unpledged				$9,245,493.51	D $1,099,220.00
SECURITIES OF CARRIER'S OWN ISSUE—PLEDGED:					
Washington Branch Stock (per contra)				$1,650,000.00	
Bonds				53,755,550.00	
Total Securities of Carrier's Own Issue—Pledged				$55,405,550.00	I $8,251,000.00
Grand Total				$1,013,004,620.90	D $7,347,430.36

I Indicates increase. D Indicates decrease.

August 31st, 1920, under the Transportation Act of 1920. Claims for the amount due have been filed with the Interstate Commerce Commission and action by that body is awaited.

ADDITIONS AND BETTERMENTS TO ROAD

Expenditures for additions and betterments during the year 1921 amounted to $3,518,123.91, and are shown in Table 4 grouped substantially according to the Interstate Commerce Commission classification for expenditures for road. A summarization of the more important work undertaken or completed during the year 1921 follows:

The work of rearranging and enlarging the freight yards and tracks at Locust Point, Baltimore, Md., to accommodate increasing movement of development, was completed during the year.

An extension of the Aster Branch was placed in operation during the year, and further extensions of this branch are in progress.

The Norton Branch was relocated and extended.

The new bridge crossing the Miami River at Lawrenceville, Indiana, was completed and placed in service October 1st, 1921, thus eliminating the necessity of detouring traffic over foreign lines for about ten miles, made necessary by the destruction of the old bridge by an ice gorge in February, 1918.

After the acquisition of the Bridge Company of Foxburg, referred to in the report of last year, the work of renewing the three main spans of the bridge over the Allegheny River at Foxburg, Penna., was immediately undertaken. This work was completed in 1921.

The renewal and strengthening of bridges is being carried forward according to a carefully arranged schedule, designed to preserve safe conditions and gradually to extend the operating limits of the heavier class of motive power. During the year 1921, work was completed on spans 14 and 15 of the Benwood Bridge over the Ohio River at Wheeling, W. Va. Work was also completed on the bridge at Conemaugh, Pa., on four bridges on the Wheeling, Pittsburgh and Baltimore Branches, and on the bridge structures at Lookout Avenue, Butler, Pa., and Miami Street, Toledo, Ohio. Reconstruction of several bridges on the Parkersburg Branch is now under way, and work is also in progress on bridges at West Junction, O., Painesville, O., Elyria, O., Washington, Pa., West Alexandria, Pa., Lumbrook, Del., and Mitchell, Indiana.

Automatic signal protection was installed on 11.50 miles of double track between Callery Junction and Wildwood, Pa., and controlled manual block was installed between Camden and Mt. Royal Stations Baltimore, Md. Additional train and crossing signals were installed at various points.

Interstate Income Account and Surplus Account

Year Ended December 31, 1921, in Comparison with the Year Ended December 31, 1920

(Excluding Operations of Federal Manager under Director General)

Corporate Surplus Account

Profit and Loss Account:			
Credit Balance Dec. 31, 1920			$21,114,992.58
Net Corporate Income for year 1921		$6,886,817.27	
Miscellaneous Adjustments—Net Credit		30,816.99	6,719,778.26
Total			$27,914,667.15
Appropriations during year 1921			
Income applied to Sinking and Other Reserve Funds		$148,736.15	
Income applied in redemption of funded debt outstanding		1,500,000.00	
Dividends on Pfd. Stock at 4 per cent per annum		854,529.14	6,003,087.29
Credit Balance Dec. 31, 1921			$21,911,582.56
Additions to Property Through Income and Surplus:			
Credit Balance Dec. 31, 1920	$12,611,649.22		
Income applied in redemption of funded debt outstanding	3,500,000.00		
Miscellaneous	924,617.22	4,424,617.22	
Credit Balance Dec. 31, 1921			17,036,266.44
Sinking Fund Reserves			168,441.14
Total Corporate Surplus, Credit Balance Dec. 31, 1921			$39,116,290.14

TABLE 2 Concluded. General Balance Sheet. Year Ended December 31, 1921.

LIABILITIES.

	Outstanding.	Held by or for Company.	Total Issued.	Comparison with December 31, 1920.
Stock				
Capital Stock				
Common Stock	$151,945,548.54	$371,919.46	$152,317,468.00	
Preferred Stock	58,863,180.95	1,136,819.05	60,000,000.00	
Separate Stock—Washington Branch (per contra)	.....	1,650,000.00	1,650,000.00	
Total Capital Stock	$210,808,729.49	$3,158,738.51	$213,967,468.00	
Long Term Debt:				
Funded Debt Unmatured				
Equipment Obligations	$38,989,674.70	.....	$38,989,674.70	
Mortgage Bonds	298,454,835.00	$56,820,395.00	355,275,230.00	
Collateral Trust Bonds	93,976,590.00	5,273,910.00	99,250,500.00	
Miscellaneous Obligations	80,065,684.52	.....	80,065,684.52	
Total Long Term Debt	$511,486,784.22	$62,094,305.00	$573,581,089.22	I $12,826,711.25
Capital Stock and Funded Debt of Leased Lines (per contra):				
Dayton and Michigan R. R. Co., Common Stock	$2,396,950.00	$5,000.00	$2,401,950.00	
Dayton and Michigan R. R. Co., Preferred Stock	1,211,250.00	.....	1,211,250.00	
Dayton and Michigan R. R. Co., First Mortgage Bonds	2,728,000.00	.....	2,728,000.00	
Home Avenue R'y Co., Capital Stock	100,000.00	.....	100,000.00	
Total Capitalized Leaseholds	$6,436,200.00	$5,000.00	$6,441,200.00	.....
Total Capital Obligations and Capitalized Leaseholds	$728,731,713.71	$65,258,043.51	$793,989,757.22	I $12,826,711.25
Current Liabilities:				
Loans and Bills Payable			$3,000,000.00	
Traffic and Car Service Balances Payable			10,707,214.76	
Audited Account and Wages Payable			11,828,409.69	
Miscellaneous Accounts Payable			7,525,029.74	
Interest Matured Unpaid			3,682,998.38	
Dividends Matured Unpaid			64,510.23	
Funded Debt Matured Unpaid			8,000.00	
Unmatured Dividends Declared			1,177,263.62	
Unmatured Interest Accrued			3,675,604.12	
Unmatured Rents Accrued			22,647.51	
Other Current Liabilities			62,079.35	
Total Current Liabilities			$41,753,757.40	D $14,509,995.13
Deferred Liabilities:				
Liability for Provident Funds			$3,245,178.16	
Other Deferred Liabilities			1,220,204.03	
United States Railroad Administration			84,344,796.13	
Total Deferred Liabilities			$88,810,178.32	D $5,188,478.49
Unadjusted Credits:				
Tax Liability			$1,529,780.27	
Insurance Reserve			1,044,443.86	
Operating Reserves			5,595,178.93	
Accrued Depreciation—Equipment			38,949,494.82	
Other Unadjusted Credits (Interdepartmental accounts in process of adjustment)			2,215,739.94	
Total Unadjusted Credits			$49,334,637.82	I $824,650.68
Corporate Surplus:				
Additions to Property Through Income and Surplus			$17,036,266.44	
Sinking Fund Reserves			168,441.14	
Profit and Loss:				
Balance			21,911,582.56	
Total Corporate Surplus			$39,116,290.14	I $5,309,681.33
Grand Total			$1,013,004,620.90	D $737,430.36

I indicates increase. D indicates decrease.

The following securities bear the endorsement of The Baltimore and Ohio Railroad Company, jointly with other Companies, viz.: Kentucky and Indiana Terminal Railroad Company, 1st Mortgage Sterling Bonds, $6,282,780.60; Richmond-Washington Company, 1st Mortgage Bonds $10,000,000.00; Washington Terminal Company, 1st Mortgage Bonds, $12,000,000.00. The Company, through its subsidiary, The Toledo and Cincinnati Railroad Company, guarantees $2,728,000.00 Consolidated First Mortgage Bonds of The Dayton and Michigan Railroad Company. The Company guarantees $2,427,600.00 notes of the Morgantown and Kingwood Railroad Company, given in payment of equipment allocated by the Director General of Railroads.

The above General Balance Sheet presents an accurate statement of the accounts of the Company as of December 31, 1921.

J. J. EKIN, *Comptroller.*

ADDITIONS AND BETTERMENTS TO EQUIPMENT.

The total equipment owned by the Company and in service at December 31st, 1921, together with equipment of constituent companies operated as Baltimore and Ohio Railroad Company, is shown in Table 18.

The total ledger value of equipment held in the name of the Company on December 31st, 1920, was			$150,715,718.98
During the year 1921 there were added 59 locomotives, 2,059 freight train cars and 23 pieces of other equipment, costing	$9,003,833.31		
During the same period there were retired from service and written out of the investment account, 5 locomotives, 2,400 freight train cars, 24 passenger cars, and 420 pieces of other equipment, having a ledger value of	$1,854,818.09		
There were reductions in value, incident to change of class of equipment, of	81,610.56		
		1,936,428.65	
			7,067,404.66
Total ledger value of equipment held in the name of the Company on December 31st, 1921			$157,783,123.64

SUBSIDIARY COMPANIES AND OPERATIONS.

Beginning January 1st, 1921, the operations of the Little Kanawha and Belington and Northern Railroad Companies, which had therefore been separately operated, were included in the operations of the parent company.

Income accounts for the year 1921 for the several separately operated railroad properties will be found in Table 20. The result of the operations of these properties was a net deficit of $687,564.96, which was met by a charge against the income of the parent Company, so that the net income as stated in Table 1, reflects the final results of operations of all companies owned and operated.

RELIEF DEPARTMENT—PENSIONS.

Statements showing the operations of the Relief and Savings Features of the Relief Department will be found in Table 17.

The payments to retired employes constitute a special roll and are contributed by the Company from month to month. The total number of retired employes carried on the pension rolls in 1921 was 1,181, and the pensions paid during the year amounted to $380,013.60. There was an increase of 79 pensioners and $27,623.10 in pensions paid during the year as compared with 1920. The total payments in pensions to employes retired from service since the inception of the Pension Feature October 1st, 1884, aggregate $4,630,316.55.

Of the more than 60,000 employes of the Company, 40,069 are members of the Relief Department.

The number of shareholders in the Company as of December 31st, 1921, was 35,640.

For the purpose of brevity as well as at the suggestion of various shareholders, and with the view to economy, the annual report has been somewhat curtailed by the elimination of certain detailed data and statistical tables. Complete data with respect to the operations of the property are, of course, on file with the Interstate Commerce Commission, and information relating to previous years is available in preceding annual reports.

The reduction in cost of operation and the improved standard of service accomplished during the year covered by this report were both due in large measure to the loyal and efficient efforts of the officers and employes. The board wishes to record its appreciation of their efforts. Their continued helpful co-operation in improving the service and efficiency of the Company is earnestly desired.

By order of the Board.

DANIEL WILLARD, President.

[ADVERTISEMENT]

FOUR HUNDRED AND NINETY-SEVEN freight cars, valued at almost $1,000,000, were exported from the United States in June. Of these 200 went to Argentina and 100 to Chile.

TWO HUNDRED MILLION DOLLARS is the value of merchandise handled by the American Railway Express, in San Francisco, in the course of 12 months, according to the estimate of H. R. Hislop, superintendent, in an article published in a San Francisco business paper. This freight is in four million shipments. In the busy season following the war, the San Francisco office dealt with four train loads of silver each month; 12 cars to a train and 500 bars of silver in a car. Millinery and other dry goods from eastern cities constitute a considerable portion of the regular business. Bread to the amount of 500 cases is shipped daily to surrounding cities and towns; milk brought in averages 30,000 gallons daily and the daily receipts of veals average 500. Motion picture films, handled largely between sundown and midnight, constitute a traffic which requires a special room with a man in attendance every hour of the 24. During the rush hours following the close of evening entertainments, a pick-up service has to be furnished to every exchange in the city and over 200 of these shipments have to be sent out within an hour and a half after they are received. Films have to be receipted for the same as money. Express service is maintained on 70 outward trains and 70 inward each day, requiring the services of 182 messengers. In the city altogether, the company employs 1,000 persons, 100 wagons, 40 gasoline trucks, 5 electric trucks and 14 electric towing tractors.

Railway Financial News

ALABAMA GREAT SOUTHERN.—*Annual Report.*—The annual report issued last week shows the following income account for the year ended December 31, 1921:

	1921	†1920
Operating revenues	$9,542,225	
Operating expenses	8,196,320	
Net revenue from operations	$1,345,905	
Taxes	325,691	
Operating income	1,020,786	$2,177,783
Total non-operating income	427,697	236,193
Gross income	$1,448,483	$2,413,976
Interest on funded debt	475,945	465,239
Total deductions	913,394	754,808
Balance of income over charges	535,090	1,659,168
Dividends on preferred stock*		236,625
Dividends on ordinary stock*		548,100
Additions and betterments charged to income		1,093
Balance carried to profit and loss	$535,090	$873,350

* Dividends of 6½ per cent on preferred and ordinary stock charged to profit and loss.

† Operating revenues and expenses are not comparable, the property having been operated by the U. S. R. A. during January and February, 1920.

BALTIMORE & OHIO.—*Annual Report.*—This company's annual report for 1921 is reviewed in an article on another page of this issue, entitled "Will Baltimore & Ohio Pay a Common Dividend?" See also excerpts from annual report on adjacent pages.

CHICAGO GREAT WESTERN.—*Receivership Rumor Denied.*—President S. M. Felton says: "There is absolutely no truth whatever in the rumors of receivership. We have just got through paying the September 1 interest and no more is due until March 1. We are handling more business than ever before."

CHICAGO, ROCK ISLAND & PACIFIC.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $1,000,000 of first and refunding mortgage gold bonds, to be sold at not less than 83½.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*Dividends Declared.*—This company has declared a dividend of 2 per cent on the common stock, payable November 1 to stock of record September 29. In June, last, a similar dividend was paid, so that the payment of 2 per cent on November 1 will put the stock on a 4 per cent dividend basis for the year.

The company has also declared the regular quarterly dividend of 1¼ per cent on the preferred stock, payable October 20 to stock of record September 29.

DULUTH & NORTHERN MINNESOTA.—*Sold.*—This railroad, extending from Knife River, Minn., to Mile Post, 99.25 miles, has been sold to R. Waldron. On July 15, 1921, the Interstate Commerce Commission authorized the abandonment of the entire railroad. It is planned to use the D. & N. M. as a nucleus for the construction of the Duluth & Ontario, which will extend from Duluth, Minn., to Fort William, Ont. (Canada), a distance of 216 miles. Mr. Waldron will be president of the new company and will be associated with a number of Duluth and Minneapolis men, among them being H. Baxter, of Minneapolis, attorney of the Duluth, Winnipeg & Pacific; M. J. Dooley, of Minneapolis, general manager of the Minneapolis, Northfield & Southern, and R. M. Hunter of Duluth and James S. Sebree of Pierre, S. D.

ILLINOIS CENTRAL.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to issue $6,645,000 of equipment trust certificates to be sold to Kuhn, Loeb & Co. at 95 on a basis to cost 5.32 per cent.

LOUISIANA & NORTH WEST.—*Bond Redemptions.*—Under the provisions of a voluntary sinking fund instituted by the directors, by which 20 per cent of net earnings applicable to dividends is set aside for bond redemptions, the company will receive at its office, 347 Madison avenue, New York, up to noon October 2, written orders for redemption of $12,000 of its first mortgage bonds. A quarterly dividend of 1½ per cent will be paid to stock-

holders of the road on October 1 to holders of record September 15.

MARSHALL, ELYSIAN FIELDS & SOUTHEASTERN.—*Charter Granted.*—A charter has been granted by the State of Texas to this company to operate with a steam locomotive that part of the old Marshall & East Texas, extending between Marshall, Tex., and Elysian Fields, a distance of 17½ miles. The capital stock is $30,000. A request for a charter to operate a motor car was refused. The officers of the road are M. Turney, president, Marshall, Tex.; J. B. Furrh, vice-president, Elysian Fields, Tex., and W. L. Berry, secretary-treasurer. The headquarters of the company will be at Marshall.

MOBILE & OHIO.—*Annual Report.*—The annual report issued last week shows the following income account for the year ended December 31, 1921:

	1921	*1920
Operating revenues	$18,130,180	
Operating expenses	16,124,530	
Net revenues from operations	$2,065,650	
Taxes	737,627	
Operating income	1,174,974	†$730,449
Total non-operating income	786,670	1,414,749
Gross income	$1,961,644	$684,300
Interest on funded debt	1,354,215	1,359,099
Total deductions	1,759,938	1,811,426
Balance carried to profit and loss	$201,705	†$1,127,127

* Operating revenues and expenses are not comparable, the property having been operated by the U. S. R. A. during January and February, 1920.
† Deficit.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to assume liability in connection with an equipment trust agreement which provides for the payment of $497,037 in cash and $1,800 in 15 annual instalments at 4½ per cent. The certificates are proposed to be sold to J. P. Morgan & Co. at 94.89.

NEW ORLEANS & NORTHEASTERN.—*Annual Report.*—The annual report issued last week shows the following income account for the year ended December 31, 1921:

	1921	†1920
Operating revenues	$6,329,586	
Operating expenses	5,854,466	
Net revenues from operations	$475,120	
Taxes	573,862	
Operating income	‡259,591	$624,993
Non-operating income	661,484	702,607
Gross income	$401,893	$1,327,600
Interest on funded debt	392,325	392,325
Total deductions	508,771	496,675
Balance of income	‡$106,878	$830,925
Dividends of 6 per cent on common stock		360,000
Additions and betterments charged to income		821
Balance carried to profit and loss	‡$106,878	$470,104

* Dividends of $360,000 charged to Profit and Loss.
† Operating revenues and expenses are not comparable, the property having been operated by the U. S. R. A. during January and February, 1920.
‡ Deficit.

SOUTHERN RAILWAY.—*Equipment Trusts Offered.*—Hambleton & Co. and E. Lowber Stokes & Co. are offering $2,974,400 Southern Railway Company stamped equipment trust 6 per cent gold notes, maturing $228,800 each January 15, from 1923 to 1935 inclusive, at prices to yield from 4.50 per cent to 5.75 per cent, according to maturities.

ST. LOUIS-SAN FRANCISCO.—*Equipment Trusts Sold.*—A syndicate composed of Speyer & Co., J. & W. Seligman & Co., the Guaranty Trust Company and Lee, Higginson & Co., have sold, subject to the approval of the Interstate Commerce Commission, $6,000,000 of 5 per cent equipment trust certificates maturing in equal annual instalments from September 1, 1923, to September 1, 1937, inclusive, and secured on standard equipment costing about $8,000,000. The bonds were sold at prices to yield from 5 to 5.30 per cent.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—*To Increase Capital.*—The stockholders will vote October 9 on increasing the capital stock from $50,000,000 to $100,000,000, on increasing the bonded indebtedness from $50,000,000 to $100,000,000 and on amendments to the charter or articles of association.

President Henry Miller when asked if the capitalization increase would be the forerunner of a program of expansion and improvement, declared that the reason behind the move was to take care of future financing for provisions necessary to keep pace with growing business. Mr. Miller said that no announcement will be made regarding any future plans until the increase has been authorized.

Treasury Payments to Railroads

Since last announcement, dated August 1, 1922, payments under Sections 204, 209, 210 and 212 of the Transportation Act, 1920, as amended, have been made by the Treasury as follows:

Section 204:	
Chesapeake Western	$11,040
Colorado Springs & Cripple Creek District, Receiver	284,121
Emmitsburg Railroad	2,998
Manchester & Oneida	6,327
Okmulgee Northern	15,684
Owasco River	21,740
Spokane & British Columbia	14,290
Section 209:	
Aransas Harbor Terminal Railway	18,094
Chicago, Peoria & St. Louis, Receivers	78,373
Denison & Pacific Suburban	341
Emmitsburg Railroad	2,498
Galveston Wharf Company	31,743
Liberty-White Railroad Company, Receiver	8,104
Manchester & Oneida	5,487
Montana Western	4,019
Sandy River & Rangeley Lakes	26,534
Sioux City Terminal Railway	21,623
Wabash	618,288
Section 210:	
Cisco & Northeastern	27,862
Section 212:	
Salina Northern, Receiver	8,000
Total	$1,207,366

Total payments to August 31, 1922:

(a) Under Section 204, as amended by Section 212 for reimbursement of deficits during Federal control:		
(1) Final payments, including partial payments previously made	$3,166,676	
(2) Partial payments to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	1,178,102	
Total payments account reimbursement of deficits		$4,344,778
(b) Under Section 209, as amended by Section 212 for guaranty in respect to railway operating income for first six months after Federal Control:		
(1) Final payments, including advances and partial payments previously made	$99,261,777	
(2) Advances to carriers as to which a certificate for final payments has not been received by the Treasury from the Interstate Commerce Commissinn	216,775,672	
(3) Partial payments to carriers as to which a certificate for final payment has not been received, as stated above	130,367,722	
Total payments account of said guaranty		446,405,171
(c) Under Section 210 for loans from the revolving fund of $300,000,000 therein provided		314,721,805
Total		$765,471,754

Repayments of loans have been made to the amount of $81,396,500.

Dividends Declared

Atchison, Topeka & Santa Fe—Common, $1.50, quarterly, payable December 1 to holders of record October 27.

Lackawanna Railroad of New Jersey—1 per cent, quarterly, payable October 1.

Lehigh Valley—Common, 1¾ per cent, quarterly; preferred, 2½ per cent, quarterly; both payable October 3 to holders of record September 16.

New York, Chicago & St. Louis—Common, 1¼ per cent, quarterly, payable September 30 to holders of record September 19; common, 1¼ per cent, quarterly, payable December 30 to holders of record December 19.

Pittsburgh, Bessemer & Lake Erie—Common, 1½ per cent, semi-annually, payable October 1.

St. Louis, Rocky Mountain & Pacific—Common, 1 per cent, quarterly; preferred, 1¼ per cent, quarterly; both payable September 30 to holders of record September 16.

Southern Railway (Mobile & Ohio Certificates)—$2.00, semi-annually, payable October 1 to holders of record September 15.

Western Pacific—Preferred, $1.50, quarterly, payable October 20 to holders of record October 10.

Trend of Railway Stock and Bond Prices

	Sept. 12	Last Week	Last Year
Average price of 20 representative railway stocks	74.16	73.07	58.36
Average price of 20 representative railway bonds	90.37	89.66	76.44

Railway Officers

Executive

C. M. Conway has been elected president and general manager of the newly formed Graysonia, Nashville & Ashdown, (successor to a part of the Memphis, Dallas & Gulf) with headquarters at Texarkana, Ark. The vice-presidents elected are: **Martin Walsh**, vice-president and traffic manager; **Louis Heilbron**, vice-president and land commissioner, and **J. K. Riffel**.

Financial, Legal and Accounting

G. C. Shindel has been appointed paymaster of the Chicago, Burlington & Quincy, with headquarters at Omaha, Neb.

George F. Ancrum has been appointed assistant treasurer of the Grand Trunk with headquarters at Montreal, effective September 1.

H. R. Martin has been appointed general attorney of the Grand Trunk, Western Lines; **Harrison Geer**, consulting attorney; **W. A. Geer**, attorney; and **Leo J. Carrigan**, attorney—all with headquarters at Detroit, Mich.

Henry H. Larimore, assistant general attorney of the Missouri Pacific, with headquarters at St. Louis, Mo., whose promotion to general attorney and interstate commerce counsel was reported in the *Railway Age* of August 26, was born September 14, 1874, at Mexico, Mo. His early education was received at Missouri Military Academy, Mexico, Mo., from which he graduated in 1894. In 1896 he graduated from Washington and Lee University, Lexington, Va., where he studied law. Mr. Larimore entered railway service on February 1, 1909, with the Missouri Pacific in the legal department. On March 1, 1915, he was appointed assistant attorney, with headquarters at St. Louis. On October 1, 1919, he was again promoted to assistant general attorney for Missouri, retaining this position until he was appointed general attorney and interstate commerce counsel on September 1, 1922.

Henry H. Larimore

Operating

N. A. Williams, superintendent of the Wyoming division of the Union Pacific with headquarters at Cheyenne, Wyo., has been appointed general superintendent of the Los Angeles & Salt Lake with headquarters at Los Angeles, Cal. Mr. Williams will be succeeded by **J. E. Mulick**.

W. R. Smith, general superintendent of the Central district of the Great Northern, with headquarters at Great Falls, Mont., has been transferred to the Western district, with headquarters at Spokane, Wash., to succeed **F. S. Elliot** who has been granted a leave of absence. **F. Wear**, division superintendent of the Butte division, with headquarters at Great Falls, Mont., has been promoted to general superintendent of the Central district, with the same headquarters, to succeed Mr. Smith. He will be succeeded by **T. F. Dixon**.

Traffic

W. F. Van Norte has been appointed general agent of the Midland Valley with headquarters at Pawhuska, Okla.

W. A. Wilson, city passenger agent of the Great Northern at Duluth, Minn., has been promoted to district passenger agent, with the same headquarters.

H. R. Todd, general agent of the Colorado & Southern, with headquarters at Birmingham, Ala., has been transferred to Atlanta, Ga., succeeding W. T. Vardaman.

O. B. McClellan has been appointed commercial agent of the Erie, with headquarters at Akron, O., and **W. K. Vandiver** has been appointed commercial agent, with headquarters at Birmingham, Ala., succeeding H. L. Scott. **C. W. Dow** has been appointed commercial agent, with headquarters at Boston, Mass.

Obituary

Robert Quayle, who retired as general superintendent of motive power and machinery of the Chicago & North Western on May 1, 1922, died at his home in Oak Park, Ill., on September 13 at the age of 69.

James Truman Clark, president of the Chicago, St. Paul, Minneapolis & Omaha, with headquarters at St. Paul, Minn., died on September 8, from heart trouble. Mr. Clark is one of the long list of railroad presidents who have risen from the traffic department. From the time that he entered railway service as a messenger boy 52 years ago, Mr. Clark's life is typical of the success that rewards whole-souled devotion to a single end. He was prominent in the St. Paul union depot project and as the representative of the North Western interests in the negotiations preceding the acceptance of the first station site, later rejected by the government, he did much to harmonize the many conflicting interests of the roads involved and to bring about a general agreement for a single plan. Mr. Clark was born on November 20, 1852, at Auburn, N. Y. He entered railway service in 1870 as a messenger boy in the general agent's office of the Illinois Central at St. Louis and up to July, 1873, held various clerical positions. From July, 1873, to April, 1880, he was employed in the general passenger department, general superintendent's office and general manager's office of the Chicago & North Western. From April, 1880, to January 15, 1883, he was general agent at Omaha and Council Bluffs. On the latter date he was appointed assistant traffic manager of the Chicago, St. Paul, Minneapolis & Omaha. He was appointed assistant general freight agent of that road in November of the same year, which position he held until December, 1884. For the next 12 years he held the position of general freight agent, being promoted to general traffic manager on October 1, 1896. On June 5, 1899, he was promoted to vice-president in charge of traffic. On March 9, 1903, his jurisdiction was extended over the operating and construction departments. He was elected president on May 23, 1916, which position he held up to the time of his death.

J. T. Clark

The Union Pacific has announced reductions in transcontinental freight rates on shoes, confectionery, machinery, cereals, dry goods, hardware, fish, cotton, tin, portable houses, shovels, canned goods, stoves, chinaware, plumber's goods and clothing.

EDITORIAL

Railway Age

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Increasing Car Mileage

With the prospect that a car shortage will develop within the next few weeks, the railroads will naturally give special attention to getting the maximum mileage from their freight cars. It is interesting, in this connection, to analyze freight car movement and find where the equipment spends the most time. The operating statistics for the first six months of 1922 show that on the average, each freight car made a round trip in 17 days, exclusive of the time spent on the repair track. During the round trip, the car was in motion about 26 hours under load and about 14 hours empty. The average time for loading and unloading each car was probably very close to the free time allowed—two days in each case. This leaves about 11½ days per trip as the time which the car spent in yards awaiting movement. The railroads must cut down this idle time in yards.

Another Road Adopts Water Treatment

As a general rule, railroads proceed with deliberation in authorizing new projects of one kind or another involving large expenditures; this emphasizes the importance of any project which is once accepted, and makes it of special interest to those roads which perhaps had considered doing the same thing but have desired first to determine the results obtained by others. The recent action of the Chicago, Milwaukee & St. Paul in equipping an entire region of 400 miles of lines with water-treating facilities is therefore noteworthy. As described elsewhere, 14 treating plants in all were installed in the belief that the treatment of water in the locality selected would effect benefits in the way of lessening boiler repairs, reducing fuel bills and improving the transportation service generally that would far overbalance the expenditure for it. That the company was justified in this belief appears already to have been brought out by the results obtained in the short period which has elapsed since the installation of the last treating plant.

Increasing Ton-Miles Per Locomotive

Most of the railroads at present are facing a prospective shortage of motive power. Under this condition, they should naturally do everything possible to get the most ton-miles per month from each locomotive, not only by expediting repairs, but also by careful attention to operating methods. Just how this can be done on each division is a matter for the individual road to work out. In general, better results will be obtained in slow freight service by decreasing the tonnage and increasing train speed. In the first six months of 1922, freight trains made an average of 11.8 miles an hour, which shows the speed of drag freight is still very low. Actual operating results on divisions with fairly heavy grades have shown that when the average speed is 15 miles an hour, the locomotives and the crews can make far more ton-mileage per month than when the trains are loaded to the limit with the speed reduced to about 8 miles an hour. The cost of handling the traffic may be slightly greater at the higher speed, but during the next few months the real problem will be to haul all the traffic that is offered. If the roads can move more freight and increase the gross revenues by running trains faster, the higher transportation cost will be unimportant.

Discarding Written Train Orders

The use of written orders to direct train operation on single or multiple track lines can be largely, if not entirely, eliminated by making slight changes in existing automatic block signal installations or by the installation of a proper signal system where none is now in service. The Erie has demonstrated what can be accomplished in this respect on double track and the same method, with such few changes as are necessary, can be applied as successfully to single-track operation. Such a system does not take the control of the trains out of the hands of the dispatcher, but it eliminates the written order and the inherent defects which go with it. Safety of train operation is increased, as trains are handled by signal indication with all the safeguards which such a method provides. An article elsewhere in this issue on conveying train orders by signal indication is worthy of careful study and consideration.

Who Left the Door Open?

Labor leaders have had a good deal to say during the past year or two about the campaign of Wall Street and business interests generally to destroy the unions and to bring about the "open shop." As a matter of fact many employers have been far less concerned about destroying the unions than they have about keeping the unions from destroying them, and a good part of the "open shop movement" has been nothing more than an effort to cure some of the unions of their habit of bluffing and occasionally calling strikes on the slightest provocation. However, the outcome of the railroad shopmen's strike, which, by reason of individual settlements on the roads that still have room for many of their former employees, is now rapidly becoming a thing of the past, begins to make it appear that Mr. Jewell and some of his associates have become our leading open shop promoters. The shops of most of our leading railroads have become open shops because the union men who wanted to keep them closed have walked out and allowed others to take their places.

Bring Your Specifications Up to Date

The Service Bureau of the American Wood Preservers' Association calls attention to a common fault of engineers in specifying timbers to be given preservative treatment, which is a heritage from the days when timber preservation was unknown. Owing to the fact that the sap wood of most species of timber when used in the natural state is much more susceptible to decay than the heartwood, it has long been the practice to specify that structural timber shall be "all heart," "85 per cent heart," etc. However, in adopting the use of treated timber many engineers still retain the restrictions on the use of sap wood. Owing to the fact that material

which contains considerable sap wood, particularly in the case of Southern pine, can be obtained at less cost than that which is almost entirely of heartwood, the restriction on sap wood in specifications for lumber results in an unnecessary waste of timber and in an increased cost to the user. After a piece of timber has been subjected to preservative treatment, the sap wood is as immune to decay as the heartwood; moreover, investigations by the United States Forest Products Laboratory involving over 300,000 tests show that the sap wood is equally as strong as the heartwood. There is, however, still another reason why the restriction on the amount of sap wood should be removed. The sap wood takes the preservative much more readily than the heartwood and, therefore, a much more thorough treatment is insured in a stick that contains appreciable proportions of the former.

Large Locomotive Purchases

In last weeks issue of the *Railway Age* there were reported orders for 160 locomotives, this being the largest number reported for any one week so far this year with a single exception. That exception was the preceding week in which orders for 226 locomotives were reported. The orders reported in last week's issue included 100 locomotives for the New York Central, 10 for the Western Maryland and 50 for the St. Louis-San Francisco. Since last week's report, orders have been reported for 50 locomotives for the Baltimore & Ohio and 50 for the C. & O., and these will be found in the report for the present week. This, however, does not tell the whole of the story. In last week's issue there were also reported inquiries for a total of over 300 locomotives, orders for a good proportion of which may presumably be expected in the near future. This shows that the railway supply field now has a buying movement for locomotives such as it has not been fortunate enough to have had in a long, long time. The existence at last of some railway net income, the real need for power and the accentuated realization of this need resulting from the shopmen's strike, presumably lead as the reasons for the present heavy purchases. Whatever the reasons, we can at any rate feel optimistic and happy—so long, at least, as the critics hold off from declaring that it would have been better if the orders for locomotives had been placed earlier, before the rush instead of during the rush, and with deliveries before or during the heavy coal movement instead of after it.

A Lost Opportunity

Some lost opportunities may return, but it will probably be a long time before railroads can again purchase machine tools at the low prices prevailing in the early months of this year. Manufacturers were then willing to make price concessions which can by no means be obtained now. Roads purchasing machines in March, therefore, are doubly fortunate because they bought at the bottom of the market and secured machines of great subsequent assistance and value during the strike. Since March there has been a distinct upward trend in machine tools prices due to the increasing cost of raw materials, such as pig iron and brass, coupled with increasing labor costs. At some points it is now difficult to get at any price the skilled labor required in the manufacture of machine tools. To accentuate the rising price tendency, there are clear indications that both the railroads and industrial manufacturers will soon be in the market for machines an adequate number of which are not now available. Stocks of new machines built at the high cost prevailing during the war have been largely liquidated and second-hand machine tools of the better quality have also, to a great extent, been absorbed. In consideration of these facts, it is safe to predict an increase in machine tool prices, especially when the railroads and other industries begin to compete with each other in securing early deliveries. Certain railroads refused to place machine tool orders early in the year because they thought that prices were going still lower, whereas the opposite has been true. The sooner these orders are now placed, the more machines can be purchased with fixed appropriations.

Railroad Power Plant Economies

The average railroad power plant, as a general rule, receives comparatively slight attention from railroad mechanical officers. If it functions to the extent of furnishing the required amount of steam, power, lights, heat, compressed air and water it is liable to be forgotten and is rarely visited. An investigation is made in connection with a new development to determine the power that will be required and consideration is given to the selection of boilers, engines, generators, air compressors and some of the other accessories. The judgment used in the selection will affect both the capital investment and later the operating costs. Other factors, such as the provisions for handling coal and ashes, are not always carefully planned. Even in quite moderate sized plants, an installation of machinery for handling coal and ashes mechanically will usually materially reduce the operating labor costs and such apparatus should always be considered. An initial selection of the equipment and a good layout of the building is not sufficient, however, as conditions and practices which tend to reduce the efficiency of the plant easily creep in and frequently pass unnoticed for a long time. The only way in which results can be checked is by the keeping of suitable power plant records. These records, however, are of but little value unless they are placed in such shape that they can be and then are periodically analyzed. The prevention or reduction of wastes is and always will be a continuous fight.

Keep the Cars Out of Yards

At a time such as this, when the roads have a traffic which is taxing their facilities to the limit and when car shortages and embargoes are appearing, every effort should be made to keep all available cars moving and thereby rendering the maximum service. When confronted with a similar situation in 1920 the roads increased the average movement per car per day from 23.1 miles in 1919 to 28.5 miles in October, 1920. This was equivalent to the addition of three-quarters of a million cars without any capital expenditure and without the added congestion which this large amount of equipment would have created. This increased speed may have been due in some slight measure to the faster movement of trains between terminals, although this is to be doubted. It was due in large part, if not entirely, to the reduction in delays in the terminals. The responsibility may perhaps be largely on shippers for delays in loading and unloading cars, but elsewhere in terminals the delays rest with the roads themselves, for the cars are exclusively under their control. In going through some yards one gains the impression that they are used for the storage rather than the classifying and forwarding of cars. Cases are not infrequent where the replacement of an obsolete, out-grown yard with one of ample proportions and modern design has been followed by a greater detention of cars simply because there was room for them, whereas the very inadequacy of the old facilities required the prompt forwarding of the traffic to get it out of the way of incoming

trains. The terminal is a necessary railway facility, but it should aid in the *movement* of traffic. By making up trains at the original terminal so that it will not be necessary to break them up in intermediate yards, time which would otherwise be required for this additional switching is saved and the movement of the cars is expedited by this amount. No single measure will contribute more to the more rapid movement of cars to destination than their classification for forwarding in trains in a manner which will reduce the amount of switching en route to the minimum. The "main tracker" plan has much to commend it from the standpoint of increasing car movement, particularly at a time such as this, when this objective is so much to be desired.

Improving Train Service Morale

An observer whose business it is to know as much as possible about the produce markets in New York has told us that morale in the train service is low. He makes this deduction from an increase in the number of breakages of eggs in transit which he has noticed lately and which he says always accompanies conditions which would tend to make train and yard men less interested in their work. Whether increased egg breakages can be taken to indicate low morale or not, however, it can readily be admitted that conditions are not so favorable that there is no room for improvement. Furthermore, any improvement which train service men may show in the interest they have in their jobs will have a decidedly favorable effect on the performance of the railroads in handling the heavy traffic of the next few months. It is gratifying, therefore, to notice that certain things are happening which should go far toward offsetting conditions provocative of discontent. One of these is the progress which is being made in the signing of contracts between railroads and the transportation brotherhoods extending present wages and working conditions for another year. The New York Central has gone a step farther and announced its intention to work out a plan under which premiums will be paid to train crews for expediting the movement of their trains. No railroad which is in a position to negotiate a wage contract with its train service employees at this time should delay action any longer than necessary. This, and any other similar step which can be taken now, will work to assist the railroads in handling the heavy traffic of the next few months.

The Engineman of the Lightning Express

Until automatic train control apparatus, now in the minds of everybody as a needed addition to the safety devices in use on our high-speed railroads, can be installed, the duty of maintaining present safeguards continues as pressing as ever. This point, noticed in these columns on September 9, comes again to mind in connection with Chief W. P. Borland's report on the derailment at Winslow Junction, N. J., on July 2, which is noticed in this issue. This report discloses that Engineman Westcott very likely was asleep or dozing; as he omitted two or three whistle signals which customarily would be sounded in the circumstances under which he approached Winslow Junction, and did not apply brakes even when he entered the curve. With such a state of facts, an inquiry is needed as to how this engineman had spent the 13 hours that he was off duty just before starting on this run. The government report gives no light on this point. Without a stronger organization, the Bureau of Safety, very likely is unable to go very thoroughly into such a far-reaching investigation; but the need of it is plain. It will be recalled that this need was brought out on the occasions of the Ivanhoe and South Byron collisions. At Ivanhoe (June, 1918) the engineman, 55 years old, had been without rest for 23 hours. At South Byron (January, 1919) the engineman appears to have been older than 55, and he had been without rest for 18 hours. Wescott, as well as Towerman DeWalt, had a clear record; but clear records do not clear up all doubts. For enginemen of midnight trains running at high speeds, the only satisfactory standard, now as in the past, is that they shall keep their bodies and brains fit, and their habits correct, throughout the 24 hours of every day. And the same is true of the fireman, if we are going to depend on him to corroborate the engineman's reading of signals at the entrance of every block. Instructing, regulating and checking the fireman is a duty often done very poorly, yet he is depended on, ostensibly, for important functions as a lookout man. And the reports of the recent collisions at Leeds, Alsuma and Lester (*Railway Age*, September 9) remind us that the fireman's monitorship is of extreme importance.

Earnings in July

Railroad earnings in July with a net railway operating income of $69,239,000, equal to a return on an annual basis of 4.04 per cent on property investment, fell short by a considerable margin—to be exact, $29,332,800—of the 5¾ per cent return fixed by the Interstate Commerce Commission. Considering, however, the rate reduction effective July 1, the absence of the better part of the coal traffic, and expenses incident to the shopmen's strike, the net for the month is rather better than was to have been expected. Looking ahead a week or two, it is safe to predict that the August earnings will not prove comparatively as favorable as were those for July. The expenses resulting from the strike, combined with the larger mechanical department payrolls due to an increasing proportion of normal shop forces at work, will unquestionably be reflected in the revenues and expenses figures. On the other hand, it will be very much a matter for surprise if the September earnings do not compensate for whatever poor results may be reported in August. The reason is, of course, the coal movement. Many of the coal carrying lines have increased their coal loadings from practically zero for the weeks during coal strike to figures for the weeks since the end of the strike much in excess for those reported for the corresponding weeks of last year. These carriers will show a sudden change in their figure of net income as will also, in only less degree, the carriers which receive coal from them at connections. This makes it extremely worth while to watch the results reported by the coal carriers in particular and it is to be expected that the September earnings reports will be awaited with considerably more interest than has been the case for those of any other month for some period. In view of this situation, on the other hand, the August results—while not being without a large amount of value from other points of view—will nevertheless tell a story that is already out of date a week or more before they begin to be published.

An Advance in the Price of Rails

For over 20 years the marketing of steel rails in the United States has been governed by selling prices that have been established by fiat rather than the untrammeled operation of the law of supply and demand. For this reason, when any change is made in the established base price, such as the $3 advance which goes into effect on October 1, the question arises as to the factors which govern such modifications. For the first eight years after the fixing of $30 as the base price for open-hearth rails, the current

quotations of steel beams and plates averaged about 18 per cent higher than those for rails. During the next seven years, when plates and shapes were on a generally lower level, no adjustment was made in the price of rails, but during the period of fixed prices in 1918, 1919 and 1920, recognition was given to a differential between the prices for rails and those for shapes and plates in establishing prices for the latter that were definitely higher than those for rails. With the depression which followed the boom of 1920, quotations for structural materials fell from approximately $70 a ton to about $30 a ton early in the present year. In the meantime, two cuts in the base price for rails, reduced the latter from $57 to $40. The fact that rails have been quoted at considerably more than the structural material during the last 12 months has been taken as indicating the effect of price stabilization; that $40 represented a base price which would not fluctuate while the quotations on other materials ranged above and below this. It now appears, that this assumption was not correct, for no sooner has the current price of structural material advanced so as to equal that for rails than the price for the latter is also advanced. This increase, however, will be purely nominal as regards those railroads which place orders within the next week for their requirements for the early part of 1923.

Partial Settlement of the Shop Employees' Strike

To those who really know what is the railway situation as affected by the shop employees' strike there can be no doubt regarding the significance of the strike settlement which has been made by the labor leaders and by railways having between one-fourth and one-fifth of the mileage of the country. Whatever they may say, it is a confession by the labor leaders that the strike has been lost by the unions on most of the railways and that in the absence of some kind of settlement it would be lost in time on all the others. It is at the same time an admission by the railways signing the agreement that their situation is such that they can better afford to settle now and take all their striking employees back than refuse to make any settlement and fight the strike out to a finish.

The question of who has lost a strike can always easily be determined when it is ended by the concessions made by the combatants. What have the labor unions conceded in the settlement made in Chicago? First, they have agreed to put the strikers back at work under the very working conditions and wages fixed by the Railroad Labor Board against which they struck. Secondly, they have retreated from their position that they would not make any settlement with any railway or group of railways unless it was made nationally with all the railways. Third, they have given up the position that the strikers must be taken back with their seniority rights unimpaired. The men return to work with their relations to employees who stayed at work and to new employees left to future determination by a commission on which the railways and the labor unions signing the agreement will have equal representation.

The railways signing the agreement do not make a single concession which any individual railway in the country, excepting possibly the Pennsylvania, would not have been willing to have made at any time within several weeks after the strike began. The only concessions they make which any considerable number of railways have been unwilling to make at any time are, first, that they will take all the strikers back and give them the same kind of work at the same places as before the strike, and, secondly, that they will leave the question of seniority to future negotiations instead of explicitly requiring the strikers to return as new employees.

The leaders of the striking labor unions will ask all the other railways individually to sign the same agreement. If some, including a number of the largest systems of the country, consider it fair and expedient to sign it, why should not all? Because owing to differences in local conditions, in the past labor policies of different railway managements and in the way individual railways have been treated by their employees before and since the strike began, the situation on some railways is widely different from what it is on others. Some railways have virtually full forces of competent men and therefore have good reason for not settling with the strikers and no reason for doing so. Other railways which are not in an equally strong position have had chronic trouble in their shops for years because among the employees who struck there were radicals and agitators who took advantage of every opportunity to embroil the men with the managements and to render efficient operation of the shops difficult or impossible. The seniority rules have heretofore prevented these railways from getting rid of these men, but the strike has afforded an opportunity to do so which they do not intend to lose.

We have heard much criticism from business men who stand for the open shop and from some railway officers against the railway executives who negotiated and signed the terms of settlement adopted at Chicago. Such criticism is not inconsistent when made by men who are in favor of the pursuit by employers of an absolute anti-labor union policy. But the railway executives of the country through their various organizations repeatedly have repudiated the charge that they were trying to break up the labor unions and said that all they were opposing were the policies of the unions which tended to foster inefficiency and to interrupt transportation. Those railways which have actually won the strike, and those which are in a fair way to win it and which are confident that they can render the public as good or even better service now and in future by never settling with the strikers as by settling with them, are amply justified in refusing to settle with them. The strikers took their chances on the outcome of the strike and those who have lost by it cannot reasonably blame anybody for it but their leaders and themselves. On the other hand, railways whose situation is such that their managements believe that they can now and in future render the country as good or better service by settling with the strikers as by refusing to do so are amply justified in settling, provided of course, they faithfully live up to all the obligations they owe to men who have stayed at work or have gone to work during the strike. The terms of agreement adopted at Chicago recognize the obligation of the railways fully to protect employees who stayed at work and new employees who have entered the service since the strike began.

There certainly is room for difference of opinion as to which is the more expedient from the railway standpoint of two widely differing labor policies which always have had advocates among railway officers and which have been advocated with unprecedented energy since the shop employees' strike began. On the railways, as elsewhere, men who deal with labor may be roughly divided into two classes—those who are naturally antagonistic to labor unions and everything they stand for, who would prefer to have nothing to do with them and are willing to fight out every difference with them to a finish, and those on the other hand, who naturally favor labor organizations, who are always willing to negotiate with them and who would rather effect fairly satisfactorily settlements with them at any stage of a controversy than engage in finish fights with them. Practically all the railway executives who have made the recent settlement belong to the latter class. Among the railway executives who have refused to participate in the recent settlement are not only those who are naturally hostile to labor organizations and their methods, but also many who on principle are friendly to the labor organizations but who for reasons

growing out of the strike do not feel they can afford to deal any longer with the shop crafts unions.

It will be well worth while to study the comparative results obtained on the railways which settle and on those that refuse to settle. Certainly past experience is that railways which have fought great strikes to a finish won them and refused to make any settlements, have subsequently got better results from the work of their employees and been more favorably treated by them than railways which have shown a tendency to try to placate the labor unions. The railways which have most completely won the shopmen's strike are almost all of them railways such as the Pennsylvania, Illinois Central, Burlington, Union Pacific and Southern Pacific, which at one time or another have fought truculent labor unions to a finish and completely whipped them.

The principal argument that the railways have made in favor of negotiations and settlements of labor controversies between individual railways and their own men rather than on a national scale is that this would make it possible to adopt different policies and by carrying them out determine which were best for all concerned. That some railways have signed the Chicago agreement and that many will not sign it will have the beneficial effect of making it possible for different railways and their employees to adopt different methods of co-operating with each other and to test what methods actually secure the best results.

"Our Road"

A RAILWAY EXECUTIVE has made this request: "You have had considerable to say in your editorial comments* recently about the necessity for improving the relations between the employees and the managements of the railways. You have referred to the so-called personnel work in other industries. Won't you be a bit more specific and tell us definitely just what you think the railways should do to eliminate internal friction and misunderstandings and bring about as nearly as possible ideal conditions?"

The answer is not an easy one! Nor is it as simple as some would have us believe. In the first place, not one, but a great many things, must be done to bring about the desired result. These, however, will be useless if they are not done in the right spirit and actuated by the best motives. One reason why labor is so suspicious of capital and management is that some managements in the past, either through ignorance or design, have taken advantage of the employees under the guise of welfare work. Then, too, the term "welfare work" has become objectionable to employees and progressive managements alike because of the stigma attached to it in its earlier stages, due to the paternalistic spirit in which it was too frequently promoted. This was, and is, particularly objectionable to American workingmen.

Possibly it will be easier to get the proper perspective if we attempt to visualize the objective of welfare or personnel work in a concrete way—"improving the relations with the employees" is a rather general and hazy statement. Is not the goal for which we should strive, the cultivation of such a spirit of respect and cordiality on the part of the employees that they will speak of the railroad as "our road"? What would not the accomplishment of this ideal mean to the peace of mind and development of the individual employees? What would it not mean in a greater interest in their work, in greater efficiency and production, in giving better and more efficient service to the public, in making a larger contribution to the prosperity of the communities served, and in stabilizing the prosperity of the nation as a whole?

We have seen recently, on a large scale, one effect of the lack of this spirit. Can such conditions be allowed to continue? How far railway employees, in many cases, are from this ideal may be learned from listening to them talk matters over among themselves, or by studying the expressions of their brotherhood or union leaders, or through reading their union magazines.

One reason for the great gulf between employers and employees in these days is the tremendous size to which many companies have grown. It is not difficult for the small employer to keep close to his men and to arrive at satisfactory terms with them as to wages and working conditions. The larger a concern grows, however, the more difficult it is to preserve a sufficiently close contact to avoid serious misunderstandings. The tendency in the railroad field since the beginning of the period of federal control has been to intensify this difficulty by taking matters relating to wages and working rules out of the hands of the individual roads and putting them on a national basis. Obviously, and particularly when we take into consideration the widely varying conditions throughout the country, it is important that the individual roads should deal direct with their employees in all matters of this sort, if the right sort of contacts are to be made and preserved. How have other large industries handled this and other questions relating to the personnel? Possibly the railroad officer's question may be best answered by referring to what some of these industries have done.

So far as wages, hours of work and working conditions are concerned, some of the larger industries have placed the responsibility for this entire matter in the hands of a special officer or department reporting direct to the chief executive and having the full support of that executive and the board of directors. Such departments have been variously named, but fundamentally their duty is to study conditions and develop a constructive policy looking to the payment to the men of the best wages reasonably possible. The aim is to establish a length of working day which will not be detrimental to the health of the worker, and will give him a reasonable amount of leisure and yet maintain a low cost of production. Such a department, to function properly, must develop means whereby misunderstandings or grievances on the part of the employees will be brought to the attention of those in authority without delay and will be handled quickly. In many cases the best way of heading off the development of misunderstandings and grievances has been found to be through devising ways and means of keeping the employees informed as to problems confronting the industry and by removing "the mystery" from the business and taking the workers into confidence as to the actual facts. It is difficult enough to accomplish these things in a single plant. The problem of doing it on the railroads, with many departments and with the employees scattered over a vast territory, is far more difficult, but it is not impossible of accomplishment, and, as we have indicated in previous editorial comments, *it must be done*.

Closely allied with this problem of relieving friction by arranging for a channel whereby the management may keep intimately in touch with the needs and feelings of the workmen and promptly adjust difficulties, is the necessity for giving greater attention to the selection and training of men for supervisory positions. It has been found that many of the real grievances, and the most unnecessary ones, were caused by foremen or subordinate officers who were selected because of their skill as workmen, rather than for their ability to understand and control men. Almost invariably, therefore, after inaugurating a department such as suggested above, it has been found necessary to give the foremen special coaching or training in the art of handling men. In not a few instances some of the foremen have had to be replaced because of their inability to fit themselves for this larger task. Provision for promptly locating and following up the grievances, automatically discovers the men who are weak in this respect. The cause, rather than the effect,

* See "The Next Step," August 19, p. 319; "Looking Ahead," August 26, p. 363; "One Way to Raise Wages," September 2, p. 407; "What Causes Inefficiency on the Railroads," September 9, p. 455; "Developing Machinery and Neglecting Men," September 16, p. 495.

should be treated, however, by taking immediate steps to provide special instructions and training for all of the foremen.

The problem of stability of employment has been tackled in a number of different ways by different industries. Much has been accomplished by careful study and planning of the work and the transfer of forces from one department to another as the demands fluctuate, due to seasonal or other causes. Special funds have been created in some cases to be used as unemployment insurance. Closely allied to the fear of losing his job, is the workman's fear of disability and helplessness in old age. This is being met by providing pension funds, relief funds and sick benefits. It is interesting to note that in many cases the men contribute a certain percentage to the pension fund, and if they leave the service are entitled to a cash consideration equaling the amount of money they have paid in. Group insurance is now being installed in many industries and on several railroads.

Special efforts have been made in some industries looking toward health conservation. The loss through inefficiency, due to poor health, which can be corrected in most cases, is very considerable in some industries and this has resulted in the development of medical and dental departments which have been a great boon to the employees, and have paid for themselves in the increased efficiency of the employees, and in the reduction of absences from work, which interfere seriously with the work schedules and hamper production. Industries which have conducted safety first campaigns as actively as have some of the railroads, have also given an equal amount of attention to this matter of health conservation, with splendid results.

The question of working conditions has been overlooked to a large extent on the railroads and in many industries. Poor light and ventilation and unsatisfactory environment put the brakes on efficiency. The question of properly equipped lavatories and locker rooms and other conveniences which make for efficiency is also important.

Some companies have assisted the employees by encouraging them to save and by advising them in making sound investments. In not a few instances employees have been encouraged to buy the stock or bonds of the companies by which they are employed. The employees have in many cases greatly appreciated company aid in financing the purchase of property and the building of homes. Some industries have been most helpful to their employees in promoting certain kinds of co-operative buying.

The mechanical departments of American railroads have given more or less attention to the education of shop apprentices. Unfortunately, however, only a few of the roads have adopted the best practices and the most modern methods. The whole question of providing adequate training for those entering other classes of work in all departments and of training the men for promotion has been largely neglected. Other industries have done much more in this respect, even to the extent of arranging for the education and training of men already employed and who may even have been rated as skilled workers. Certain conditions which may have been inherited from federal control and which need not be reviewed here, make it imperative that the railroads should give this whole question of education and training of employees more intelligent attention.

The promotion of schemes for recreation has met with a good reaction in many places. This includes athletic programs, social clubs, reading and literary clubs, etc.

Most industries have given far more attention to the employment problem than have the railroads, which are among the largest employers. Properly organized employment departments not only examine the men carefully as to their experience and skill, but have them passed upon by the medical department. If accepted, special pains are taken to see that they are introduced to their new work in such a way as to make a good impression at the very start. Their work is carefully followed up, in many instances to such an extent as to insure that men who are unfitted for the class of service to which they have been assigned may be transferred until they find their proper place in the organization.

No reference has been made to profit sharing plans because these are largely in an experimental stage and there is also a question as to whether they are applicable to a public utility. There are, however, better ways of paying men in proportion to their skill and output than are now used by the railroads. Seniority, of course, makes it more difficult to recognize individual initiative. Piecework, banished from the railroads for a while, when properly installed and maintained, has many advantages for both the men and the managements on some classes of work. It will be interesting to follow the result of the graduated wage scales now being introduced in the mechanical department by some roads. Bonuses for practical ideas and suggestions have been found to be productive of good results in many industries.

The above touch in a rough way upon some of the noteworthy things that have been done by the industries to improve the relations with the employees. The inference is not that the railroads have not done any of these things or that some of them may not have done many of them. It is a fact, nevertheless, that the railroads have not been nearly as active in these respects as they should have been.

One thing is vital in solving the human relations problem in a big way, and that is, that a policy must be adopted which is not subject to the whims or peculiarities of any one individual officer and that the employees understand this. A permanent policy must be adopted and supported by the board of directors. And why not? Is there any greater problem confronting American railroads today?

The Shopmen's Strike— A Series of Blunders

EXPERIENCE IS the best teacher. Some people welcome its lessons when it shows they have been right but reject its lessons when it shows they have been wrong. Progress is due to those who are willing to learn from experience, as well as other teachers, even when the teachers show they have been wrong.

The shopmen's strike, which has now been settled on some railways, has afforded an experience which should teach some most important and valuable lessons to railway managers, railway labor leaders and railway employees. The future experience of the railways which have settled and are taking the strikers back and those which have not settled will afford some additional lessons.

The strike has been terribly costly to the railways, the strikers and the public. The issuance of the original order for it and its continuance so long have been due to a series of big blunders. But all the blunders have not been committed by the labor leaders and the members of the unions. Every party concerned has blundered. Some things which when done seemed obviously wise and beneficial to those who did them now appear in an entirely different light.

One of the worst blunders of the series that has caused and protracted the strike was that made by the railways which adopted the policy of contracting out work which it had been customary to do themselves. They saved money by it for a time, and it seemed to their managers wise and proper. It was done by only a small part of the railways but it has had important consequences for all of them. It exasperated and alarmed labor leaders and employees to an extent that few people realized until recently. The labor leaders and the employees feared that the system of contracting would be extended to all the railways of the country,

with the result of breaking down all the working conditions and wages favorable to labor that had been approved by the Labor Board. There is no doubt now that the policy of contracting out work contributed largely toward causing the strike. In addition it gave the labor leaders a pretext for charging that the railways had violated, or at least evaded, the law and the decisions of the board on a wholesale scale, and for using this charge in defense of the employees' action in striking against the decisions of the Labor Board. It is wholly inconsistent for spokesmen of the railways to denounce employees for striking against decisions of the Labor Board when railways themselves are doing virtually the same thing.

The next blunder was committed by the labor leaders when they issued the strike order. They knew they could get rehearings by the Labor Board in the wage cases at any time. They should have known that public sentiment and the sentiment of many members of their own organizations would be against a strike which was in defiance of decisions of the Labor Board that had been reached after full hearing of all the matters in controversy.

The next blunder was made by the Labor Board in immediately issuing statements that the strikers had sacrificed their seniority rights, and by many railways in issuing notices that unless the strikers returned to work within a very few days their seniority rights would be forfeited. These announcements and ultimatums immediately became a bar to an early settlement of the strike. It was unreasonable to expect that men who had struck would return to work within a few days. Some roads which gave the strikers two weeks, or even more, within which to return to work got back many of their men before the time limit expired. If the seniority issue had not arisen as a result of so many railways prematurely depriving the strikers of opportunity to return to work with their rights unimpaired the strike would have been ended within three weeks.

The next blunder was made by President Harding when, after the strike had been going on for some time, he proposed that it should be terminated by the railways taking the strikers back with their seniority rights unimpaired. This encouraged the strikers to stay out in the hope that a settlement finally would be made which would restore their seniority rights after the railways had committed themselves so far to the men at work that they could not honorably or with any regard for future consequences take the strikers back with their seniority rights.

The result of these and other blunders has been a strike which lasted ten weeks on the railways which have settled, which is still continuing on most of the railways, which has cost employees, railways and the public hundreds of millions of dollars and the effects of which will cost hundreds of millions in future. It has had and will have some good effects. It has broken down the plan of national negotiations and settlements by which the labor unions had imposed uniform working conditions and wages on all the railways, and by which they were determined to maintain them. It has disillusioned many thousands of railway employees who had been led to believe that the railways could not or would not long resist a nation wide strike and that they had more to gain by striking than by accepting the decisions of the Railroad Labor Board. But the net result is to demonstrate what every sane man should have conceded before it occurred—namely, that the railways and their employees have more to gain by dealing with each other fairly and reasonably and by accepting and carrying out decisions of the Railroad Labor Board regarding controversies that they cannot settle themselves than they have to gain by fighting their differences out in strikes.

A strike, like a war, is a game in which usually everybody concerned loses. What the shop employees and the public have lost is fairly obvious. Even railways which have won the strike have suffered losses which they will feel for years. The strike should cause the leaders in the railway field, in the labor field and in public life to join in good faith in an effort to devise and carry out measures which will prevent similar struggles in future. This is what would be done if the wishes and counsel of the moderate men of all interests should prevail. Unfortunately the extremists connected with the various interests are as influential as the moderate men, and labor leaders whose real goal is the destruction of private ownership, railway leaders whose real desire is the destruction of labor unions and politicians whose sole object is the promotion of their own selfish ambitions will exert as much influence on the final outcome as the moderate men.

Would the Public Pay the Bill?

In recent public discussions of the coal mining industry the over-development of bituminous mine capacity has frequently been referred to as one of the most difficult conditions with which the industry is confronted, both as it affects labor conditions within the industry and its relations with the public. It has an equally important bearing on the development of railroad capacity. This is brought out clearly in an article on another page, describing the effect of the coal strike on the coal movement from the eastern Kentucky fields over the Louisville and Nashville. In enlarging its capacity to serve these fields this railroad has spent within the last 20 years an amount equal to approximately 15 per cent of its total investment in physical property. Almost one-quarter of this amount has been spent since the termination of Federal control and it has all been applied to a part of the system aggregating not more than 18 per cent of the total system mileage. But notwithstanding this intensive development the mines served by the railroad in this territory, working full time, can probably produce more than twice as much coal as the railroads can move away from the mines. This situation may be considered fairly typical of the relation between railroad and mine capacity throughout the bituminous coal fields.

The fact that the country's fuel supply has always been moved, indicates that the capacity of the railroads cannot be very far behind the actual requirements of the market. But, with the coal-mining industry organized on a basis of low average production with high peak loads, caused by disturbances such as the recent coal strike, the capacity of the railroads becomes the limiting factor and the roads are subjected to much loose criticism for their inability to supply cars up to the full loading capacity of the mines. The apparent car shortage, however, is not primarily a lack of sufficient cars. It is a lack of main tracks, of passing tracks, of block signals, of yards and of engine terminal facilities, without which additional cars and motive power are useless.

From 25 to 30 per cent of the tonnage moved on the railroads of the United States is bituminous coal and if the railroads are to meet the peak load demands caused by the unstable and erratic operating conditions within the bituminous mining industry, they must provide facilities great enough to move the nation's annual coal supply in a few months of the year. But to provide facilities on such a scale would involve a tremendous investment which would be fully utilized for short periods only. It is obvious that under a policy of public regulation which limits the return on investment in railway property to the lowest point short of confiscation no such increase of railway facilities is possible. But even if it were possible, would the public be willing to pay the price of such a tremendous increase of railroad facilities in the form of increased rates? Unless this question can be answered in the affirmative, adverse criticism of the railroads because of car shortages when the surplus mine capacity of the country is suddenly brought into production is not only unjust, but futile.

Letters to the Editor

[The Railway Age welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

A Well Deserved Tribute

New York.

To the Editor:

The railroad shopmen's national strike of July 1, 1922, will go down in history as unique in three particular respects, i.e., first, the large percentage of shopmen who left their work; second, the relatively small interference caused thereby in the movement of the railroad traffic of the country during the ensuing two months; and third, the loyal support and co-operation of the supervising officers and employees who performed the work of the strikers in order to provide the public, including the strikers, with food, milk, fuel and other necessities.

The railroad mechanical department heads and supervising forces deserve particular commendation and recognition. No jobs have been too difficult or arduous for them to undertake and perform in order to keep locomotives and cars moving. The sterling and seasoned qualities of these men, and the maintenance in safe operating condition of the motive power and equipment under their care, have been put to a most severe test and they have made good. Too much consideration cannot now be given, by the railroad executives, to those of these officers who are deserving of increased remuneration, authority and advancement, for the purpose of retaining in the railroad service true and tried men who otherwise will continue, as during the past ten years, to enter industrial and commercial fields where opportunities for promotion and increased earning capacity have been much more attractive.

John E. Muhlfeld.

Instructing and Pleasing the Public

Cleveland, Ohio.

To the Editor:

People do not realize the bigness of a railroad. It is important to explain the magnitude of our railroad system frequently and in varied ways, so that the facts will penetrate the resisting mind. For example, the New York Central's advertisement telling how it has the power to move a long freight train around the world in one day—who had ever thought of that? A person who goes to Europe on the *Mauretania* gets some idea of what the steamship company has to do to give him such gorgeous comfort and marvelous speed; but the traveler on the New York Central has only a dim idea of how many cars—how many tons of steel—have to be hauled over the road to give him the regularity of facilities and the comfort which are furnished to him so cheaply.

I have just read the Illinois Central's manifesto, in the St. Louis Globe Democrat. The president of that road says: "We are constantly seeking to promote good-will among our patrons. We are attempting to render a dependable, efficient transportation service, by having officers and employees who are at all times courteous and obliging. It is our hope that the Illinois Central System will always stand in the front rank of the railroads of this country in having the good-will of its patrons."

How many readers of that statement can begin to understand the task thus implied? The average reader, if he should hear that President Markham received 50 letters in one day complaining of incivility on the part of station agents, clerks, conductors, brakemen and others would declare the advertisement a fraud—a lie. And yet that number, 50, probably would not equal one in 500 or one in 1,000 of cases wherein an employee *might* forget his manners. The Illinois Central, according to the Official Guide, has about 1,000 stations where passengers can ask foolish questions every day, and many times a day.

Another thing that passengers at ticket offices and patrons of freight stations should remember is that a railroad must seek efficiency first. A store clerk is uniformly polite—"courtesy first"—but he frequently gives you poor service. The railroad man must do his work safely and honestly, even if he should occasionally lose his temper.

President Markham invites constructive criticism. I venture to suggest (assuming that his road is not far above the average of the big roads) that he invite his trainmen and the agents and clerks at the smaller stations to constructively criticise themselves by constructing a few sentences (in good English) every day. One of the most common faults of these people is silence. If a question is the least bit difficult, they evade the issue; they remain dumb. I do not mean vital questions; they will tell you enough so you won't get left, and they don't mean to let you run in front of a moving locomotive; but there are many other things on which such servants of the public ought to do a little thinking now and then. For example, I rode, the other day, in a very old coach; and in a semi-jocular manner I asked the young and rather green conductor where he found that car. Apparently no such irregular question ever confronted him before; and instead of grasping the opportunity to explain the company's expenditures and efforts to provide steel cars, and how a rush had compelled the use of the ancient buggy on this occasion, he only grinned. He was an intelligent fellow, however, and probably within a half hour recovered sufficiently to see that he ought to have said something. Another conductor comes to my mind; one not old nor specially smart looking, who patiently took three minutes to explain to a passenger, as clearly as President Harding could have done it, some of the whys and wherefores of government regulation of railroads. That conductor reads something besides the sporting pages and the local news. And he did not explain every unpleasant feature of the service as being required by "the orders of the Interstate Commerce Commission."

Having "knocked" the store clerks, I want to give them a good word. I advise all railroad men to watch them closely. The competent retail salesman, at the end of his first year, can give the average railroad man a hundred points on pleasing the public, which the said railroad man seems to try in every way to avoid.

No superintendent, I suppose, will send groups of his men to the department stores to take the courses of instruction which I am here suggesting, and so I will propose an easier measure: require every passenger brakeman to write down, and report, each week, what questions are asked of him by passengers. Do not require him to report what answers he has made. This will afford a chance to compare brakemen in a new way. After the first week, the most frequent questions, those which can be answered easily, can be omitted.

Anything to get trainmen to think! Do we stop to reflect how much idle time the brakeman has every day? Idleness tends to promote sloth; yet we call upon these men to be mentally alert.

Oberlin.

Train Orders by Signal Indications

Trains on Single or Double Track Can Be Operated by Signals Without the Use of Written Orders

By A. R. Fugina
Signal Engineer, Louisville & Nashville, Louisville, Ky.

Erie Train Order Signals

Is it possible and profitable to operate trains by signal indications instead of by written orders? It undoubtedly is. Then why are the railroads so slow to adopt this more efficient method of operation? Wm. Nichols said in his treatise on train operation which was published in 1916, that "with a proper block signal system, the signals to govern train movements into and out of sidings, trains may be moved safely on single track without train orders and with but few train rules." It is our purpose in this paper to show that it is feasible and advisable to operate trains in this manner.

The problem is relatively simple for double track movements and many railroads are now operating such divisions more or less completely under signal indications. The best example of this method of operation is that in use between Port Jervis, N. Y., and Chicago on the Erie, a distance of approximately 900 miles. The system has been employed on this road for many years and has been found to be a great improvement over the old method of using written train orders to convey information. Several years ago the writer and one of our division superintendents made a careful investigation of the operation on the Susquehanna division of the Erie, spending a number of days on it interviewing local officers, visiting dispatchers' offices and riding various classes of freight and passenger trains. The operation was found to be smooth and every one concerned was favorable to it with the possible exception of the train dispatchers who did not like to assume the additional responsibility of directing all of the train movements in spite of the fact that their work was made more easy.

To make effective the Erie method of train operation by signal indication the line of road is equipped with one-arm automatic signals of the three-position upper quadrant type. Where train order signals are required, they are placed on the automatic signal mast below the automatic signal. The train order signals are one-arm, three-position electric signals. They are located at passing sidings or crossovers and are controlled from the nearest day and night train order office. The dispatcher directs their operation by telephone instructions to the office controlling them. One operator usually controls the train order signals at the point where he is located, as well as at either one or both adjacent sidings, this being possible because they are electrically controlled.

Train Order Signal Indications

The upper arm of the signal is the automatic signal and it controls the movement through the block in the usual way. The lower arm or train order signal indicates as follows:

Horizontal (red light)

Stop on main track and consult dispatcher on telephone.

Diagonal (yellow light)

Take siding and consult dispatcher on telephone when clear of main track.

Passenger trains will report before pulling into siding.

Vertical (green light)

(1) Proceed regardless of following preferred trains until otherwise directed by dispatcher.

(2) Trains are forbidden to accept this indication if there is any known cause that will prevent their making their usual running time. In such event they will consult immediately with dispatcher by telephone. When a train accepts the "proceed" indication and for any cause is unable to make its usual running time, it must protect itself against the following preferred train according to Rule 99, operating department.

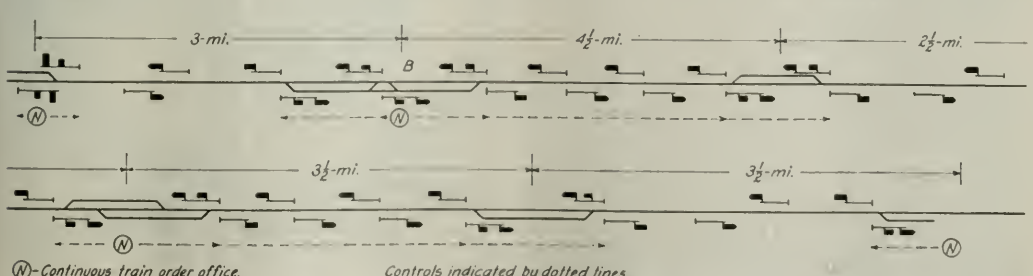
When the train order signal displays "stop" or "take siding" the automatic signal displays "stop."

Under this system a freight train, whether local or through, holds the main track on the time of any passenger train until directed by the dispatcher to take siding through means of the train order signal.

Single Track Operation

Our thorough investigation of the Erie system convinced us of the desirability of this method of operation for double track movements and also that a similar scheme can be developed for use on single track. We submit the following method for operating on single track.

The diagram represents a typical single track railroad equipped with automatic signals of the absolute permissive type and electric train order signals arranged to be controlled

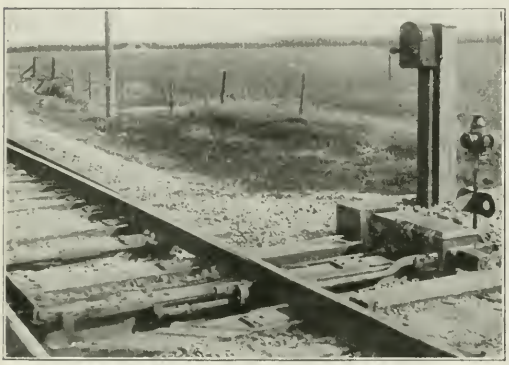


How Trains May be Operated on Single Track Without Written Orders

by the operator to convey orders to trains at the direction of dispatcher.

All entering signals at passing tracks are to be equipped with a second arm, this arm to be a three-position electrically-controlled train order signal. The train order signals and the leaving automatic signals will be under the control of the operator. The leaving signal is a positive signal and by placing it under the control of the operator a train may be stopped by it if desired. The indications of the train order signals will be the same as used by the Erie as previously explained. Thus the operator is enabled to inform the train to proceed, take siding; stop at the entrance of the siding and get into telephone communication with the dispatcher, or to proceed on the main track to the clearance point at the leaving end of the siding.

When there is a double siding such as at B, in the sketch,



Outlying Switch Operated by Low-Voltage Machine

additional train order signals may be located between the switches of the sidings. The addition of these signals will enable the operator to instruct the train to enter either of the two sidings. A similar arrangement may be used at lap sidings if thought desirable. However, this should not generally be necessary if each siding is used only by trains in a certain defined direction.

The proposed plan of operation includes a train-announcing scheme which may consist of a separate small light, similar to lights used on telephone exchange boards, to represent a direction of traffic for each positive block, the light to indicate when the block is occupied. For example, on a northbound movement, the northbound light would indicate as soon as a train passed the leaving signal at the next station to the south, and the southbound light for this block would indicate from the time that the southbound train left the leaving end of the siding until it had cleared at the next station. The lights would continue to indicate until the train cleared the block.

The Use of Electric Switch Machines

Train operation may be further expedited by equipping siding switches with electrically-operated switch mechanisms and placing their control in the hands of the operator. This will enable the operator to move a train into or out of a siding without stopping it or requiring the train crew to throw the switch. The low-voltage electric switch movement enables switches to be so equipped at reasonable cost and switches may be fitted up at certain locations or over the entire territory as may be felt desirable. Some roads are making large savings by the installation of these machines to enable the operator to handle bad pull-in or pull-out switches for trains, and yet the roads generally have been very slow in adopting this time and money-saving device, the efficiency of which has been proved many times.

Each train should be provided with a portable telephone train set in order to enable it to get into communication with the dispatcher if it should be unduly delayed between stations or at other points not near a telephone location.

Operation under this system will, of course, call for quite a departure from the Standard Code operating rules, making a revision or separate set of operating rules or instructions necessary.

The cost of providing the additional facilities necessary for train operation by signal indication where automatic signals are already installed, is not very great and the operating advantages that will be obtained will far outweigh the cost of installation as the economies made in operation would pay for the expenditures within a very short time. I am satisfied that when systems of this kind are installed they will prove as safe, economical and desirable as automatic signal systems.

Railroads have been slow to avail themselves of the full benefits offered by signal systems. As an example, the "19" order for restricting the rights of trains represents one of the greatest advantages of an automatic signal system, and yet it required years of missionary work to induce any road to adopt this economical method of operation, and many roads still refuse to do so.

Since the railroads are so slow in availing themselves of the use of the "19" order for restricting rights of trains in automatic signal territory, or in using electrically-operated passing siding switches, it is not strange that they are failing to eliminate written train orders and substitute therefor the signal indication method of conveying orders. And yet this will be brought about sooner or later.

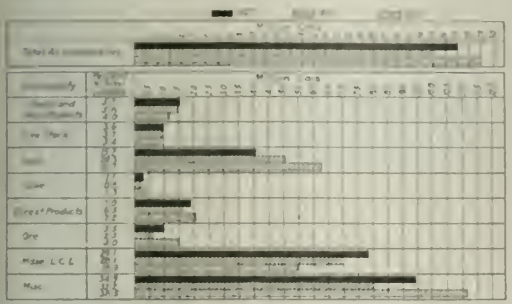
From the St. Louis Globe-Democrat

Wouldn't This Be a Good Time to Try and Invent a Different Kind of Clock?

Freight Car Loading

WASHINGTON, D. C.

THE NUMBER of cars loaded with revenue freight during the week ending September 9 was 882,744, an increase of 85,192 as compared with the corresponding week of 1921, but a decrease of 50,071 as compared with the corresponding week of the record year 1920. The decrease of nearly 100,000 as compared with the preceding week is



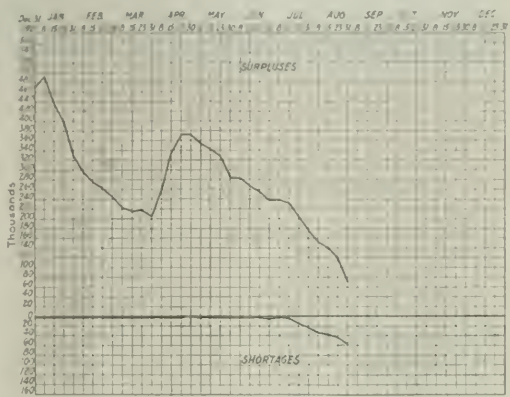
Cars of Revenue Freight Loaded—Cumulative January 1 to August 26

attributable to the Labor Day holiday. Increases as compared with the corresponding week of last year were shown in all districts except the Pocahontas and in all classes of commodities except grain and grain products and coal. Revenue coal loaded amounted to 139,570 cars, a decrease of 2,578 as compared with the year before and a decrease of approximately 10,000 as compared with the previous week, which contained no holiday. The summary as compiled by the Car Service Division of the A. R. A. is given in the table at the bottom of the page.

A total of 195,142 cars were loaded with coal during the week which ended on September 16, according to reports received from the railroads by the Association of Railway Executives. Of this total, 175,326 cars were loaded with bituminous coal, an increase of 17,316 cars over the week before, when, however, there was a falling off in coal loadings due to the observance of Labor Day. The remaining 19,816 cars were loaded with anthracite coal during the past week, which was the first week of production since the recent agreement was reached.

On the basis of these loadings, coal production last week approximated 10,033,000 tons, of which 9,050,000 tons consisted of bituminous coal and 983,000 tons were anthracite coal. A total of 5,088 cars were loaded with anthracite coal on Saturday, September 16, the largest number for any one day since operations were resumed in the anthracite fields, and 384 cars in excess of the preceding day. This was within 363 cars of the average daily loading in September last year.

Loadings of bituminous coal on Saturday amounted to 25,073 cars, 2,798 cars below the preceding day. Coal loadings in the bituminous fields, however, always show a decrease on Saturday compared with other days in the week. These figures include both revenue and non-revenue loading.



Car Surpluses and Shortages Up to August 31, 1922

An accompanying chart presents an analysis of revenue freight loaded for the period January 1 to August 26 inclusive for the past three years. It will be noted that the total of all commodities shows about two million cars less loaded to date this year than in 1920 and about the same number of cars increase over 1921; furthermore, that the loss in loading this year compared with 1920 is due entirely to

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS. COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, SEPTEMBER 9, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Misc. L. C. L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	7,107	2,532	29,960	1,321	5,469	6,095	56,244	86,115	194,843	.....	.....
	1921	7,597	2,361	37,641	1,277	3,914	2,291	53,443	70,323	.....	178,847	203,248
Allegheny	1922	3,024	2,814	44,505	4,493	2,921	8,698	44,566	73,165	184,186	.....	.....
	1921	3,108	2,465	39,195	2,102	2,217	5,178	41,563	50,504	.....	146,332	185,812
Pocahontas	1922	175	330	16,904	139	1,003	29	4,181	2,361	25,122	.....	.....
	1921	247	296	16,669	103	975	78	4,946	3,914	.....	27,228	35,968
Southern	1922	3,667	2,600	19,606	872	16,469	867	32,455	33,482	110,018	.....	.....
	1921	3,537	1,758	19,984	328	13,613	243	34,932	31,881	.....	106,276	124,378
Northwestern	1922	17,016	7,517	6,762	1,003	13,264	35,654	24,656	31,636	137,028	.....	.....
	1921	18,226	6,488	8,381	497	9,987	18,298	24,661	30,830	.....	117,368	154,138
Central Western	1922	12,718	10,987	15,448	440	6,931	2,109	27,985	47,492	124,110	.....	.....
	1921	17,253	8,572	16,273	150	5,367	667	27,539	40,462	.....	116,233	117,398
Southwestern	1922	4,025	2,740	6,885	150	5,829	391	13,579	23,856	57,437	.....	.....
	1921	4,996	2,760	4,055	175	5,723	864	14,063	24,632	.....	57,268	62,373
Total Western Districts	1922	33,759	21,336	28,595	1,593	26,044	38,144	66,220	102,984	318,575	.....	.....
	1921	40,475	17,820	28,659	822	21,077	19,829	66,263	95,924	.....	290,869	334,009
Total, all roads	1922	47,732	29,513	139,570	8,418	51,906	53,833	203,666	298,107	832,744	.....	.....
	1921	54,964	24,706	142,148	4,652	41,796	27,619	201,147	252,546	.....	749,552	.....
	1920	38,997	27,285	179,746	16,327	58,148	75,444	186,488	300,980	.....	.....	883,415
Increase compared	1921	.....	4,811	.....	3,786	10,110	26,214	2,519	45,561	83,192	.....	.....
Decrease compared	1921	7,232	.....	2,578	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1920	8,735	2,227	.....	.....	.....	.....	17,178	.....	.....	.....	.....
Decrease compared	1920	.....	.....	49,176	7,909	6,242	21,511	.....	2,973	50,671	.....	.....
September 2	1922	47,732	29,513	139,570	8,418	51,906	53,833	203,666	298,107	832,744	749,552	883,415
September 2	1921	54,019	31,847	149,487	8,389	58,706	62,354	233,550	333,246	931,598	833,288	961,633
August 26	1922	51,562	32,046	111,030	8,390	60,466	65,041	230,000	329,303	890,838	828,883	1,001,308
August 19	1922	55,893	29,756	81,959	8,201	57,934	67,201	229,935	325,350	856,219	815,147	968,103
August 12	1922	57,567	28,370	84,559	8,420	56,163	68,197	230,632	317,65	852,580	808,269	971,269

the decrease in total coal loading, so that as an aggregate all other commodities show an increase over both 1920 and 1921.

It is particularly interesting to note that in spite of the fact that the year 1921 as a whole witnessed the heaviest grain and grain products loading on record, the current year to date shows slightly greater total loading of this commodity. Live stock, coke and forest products show an increase over last year to date and correspond favorably with 1920. Coal naturally shows a considerable decrease compared with the two previous years, and ore shows a decrease over 1920 but an increase over 1921. Merchandise (LCL) shows a marked increase over both of the two previous years; miscellaneous freight shows an increase over 1921 and a decrease in the aggregate compared with 1920. The total of these two items, however, would show an aggregate increase over both of the two previous years.

Except for two days in last March and one other day in 1921, more cars were loaded with bituminous coal on Monday, September 18, than on any day during the past 2½ years. The total was 37,330 cars.

Coal Priority Bill Passed

WASHINGTON, D. C.

THE CONFERENCE report on the Cummins-Winslow bills to restrain profiteering in coal by authorizing the Interstate Commerce Commission to order priority in favor of coal sold at a fair price or embargoes against coal for which an unreasonable price has been charged or paid at the mines, was adopted by the House on September 15 by a vote of 228 to 70 and by the Senate on September 16 by a vote of 37 to 12. The report represents a combination of the principles and phraseology of the two bills, the principal change being the adoption of the Senate provision making it apply solely to interstate commerce, and a change in the period to one year. The main provisions of the bill as rewritten by the conferees are as follows:

"That by reason of the prolonged interruption in the operation of a substantial part of the coal-mining industry in the United States and of the impairment in the service of certain carriers engaged in commerce between the States and by reason of the disturbance in economic and industrial conditions caused by the World War a national emergency exists which endangers the public health and general welfare of the people of the United States, injures industry and business generally throughout the United States, furnishes an opportunity for the disposition of coal and other fuel at unreasonably high prices, limits the supply of heat, light, and power, threatens to obstruct and hamper the operation of the Government of the United States and of its several departments, the transportation of the mails, the operation and efficiency of the Army and the Navy, and the operation of carriers engaged in commerce among the several States and with foreign countries.

"SEC. 2. That the powers of the Interstate Commerce Commission * * * are during the aforesaid emergency, enlarged to include the authority to issue in transportation of coal or other fuel orders for priorities in car service, embargoes, and other suitable measures in favor of or against any carrier, including vessels suitable for transportation of coal on the inland waters of the United States which for such purpose shall be subject to the interstate commerce act, or region, municipality, community, person, copartnership, or corporation, and to take any other necessary and appropriate steps for the priority in transportation and for the equitable distribution of coal or other fuel so as best to meet the emergency and to promote the general welfare, and to prevent upon the part of any person, partnership, association, or corporation the purchase or sale of coal or other fuel at prices unjustly or unreasonably high. This act shall not be construed as repealing any of the powers heretofore granted by law to the Interstate Commerce Commission, but shall be construed as conferring supplementary and additional powers to said commission and as an amendment to section 1 of the interstate commerce act, and subject to the limitations and definitions of commerce controlled by said act, and all powers given said Interstate Commerce Commission shall be applicable in the execution of this act.

"SEC. 3. Because of such emergency and to assure an adequate supply and an equitable distribution of coal and other fuel, and to facilitate the movement thereof between the several States and with foreign countries, to supply the Army and Navy, the Government of the United States and its several departments, and carriers engaged in interstate commerce with the same during such emergency, and for other purposes, and for the further purpose of assisting in carrying into effect the orders of the Interstate Commerce Commission made under existing law or under section 2 hereof there is hereby created and established an agency of the United States to be known as Federal fuel distributor, whose appointment shall be made and compensation fixed by the President of the United States. Said distributor shall perform his duties under the direction of the President.

"SEC. 4. It shall be the duty of the Federal fuel distributor to ascertain:

"(a) Whether there exists within the United States or any part thereof a shortage of coal or other fuel and the extent of such shortage;

"(b) The fields of production of coal and other fuel and the principal markets to which such production is or may be transported and distributed and the means and methods of distribution;

"(c) The prices normally and usually charged for such coal and other fuel and whether current prices considering the costs of production and distribution, are just and reasonable; and

"(d) The nature and location of the consumers, and what persons, copartnerships, corporations, regions, municipalities, or communities should under the acts to regulate commerce administered by the Interstate Commerce Commission, including the transportation act, 1920, in time of shortage of coal and other fuel, or the transportation thereof, receive priority in transportation and distribution, and the degree thereof, and any other facts relating to the production, transportation, and distribution of coal and other fuel; and when so ascertained the Federal fuel distributor shall make appropriate recommendations pertaining thereto to the Interstate Commerce Commission from time to time, either on his own motion or upon request of the commission, to the end that an equitable distribution of coal and other fuel may be secured, so as best to meet the emergency and promote the general welfare. All facts and data within the possession of the Federal fuel distributor shall be at all times accessible and furnished to the Interstate Commerce Commission upon its request. The Interstate Commerce Commission is hereby authorized and directed to receive and consider the recommendation of the Federal fuel distributor, based upon his reports upon the foregoing subjects, and any other information which it may secure in any manner authorized by law.

"SEC. 5. The Federal fuel distributor may make such rules, regulations, and orders as he may deem necessary to carry out the duties imposed upon him by this act, and may co-operate with any department or agency of the Government, any State, Territory, district, or possession, or department, agency, or political subdivision thereof, or any person or persons, and may avail himself of the advice and assistance of any department, commission, or board of the Government, and may appoint or create any agent or agency to facilitate the power and authority herein conferred upon him; and he shall have the power to appoint, remove, and fix the compensation of such assistants and employees, not in conflict with existing laws, and make such expenditures for rent, printing, telegrams, telephones, furniture, stationery, office equipment, travel, and other operating expenses as shall be necessary for the due and effective administration of this act. All facts, data, and records relating to the production, supply, distribution, and transportation of coal and other fuel in the possession of any commission, board, agency, or department of the Government shall at all times be available to the Federal fuel distributor and the Interstate Commerce Commission, and the person having custody of such facts, data, and records shall furnish the same promptly to the Federal fuel distributor or his duly authorized agent or to the commission on request therefor.

"SEC. 6. That whenever the President shall be of the opinion that the national emergency hereby declared has passed he shall by proclamation declare the same, and thereupon, except as to prosecutions for offenses, this act shall no longer be in force or effect, and in no event shall it continue in force and effect for longer than 12 months from the passage thereof.

"SEC. 7. Every person or corporation who shall knowingly make any false representation to the Interstate Commerce Commission or the Federal Fuel Distributor or to any person acting in their behalf or the behalf of either of them respecting the price at which coal or other fuel has been, is being, or is to be, sold or bought, the inquiry being made for the purposes of this act, or whoever having obtained coal or other fuel through a priority order or direction shall dispose of the same for purposes other than those for which said priority order or direction was issued without the consent of the Interstate Commerce Commission, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than $1,000 nor more than $20,000: *Provided*, That any person or any officer or director of any corporation subject to the provisions of this act, or the interstate commerce act and the acts amendatory thereof, or any receiver, trustee, lessee, agent, or person acting for or employed by any such corporation, who shall be convicted as aforesaid, shall, in addition to the fine herein provided for, be liable to imprisonment in the penitentiary for a term not exceeding two years, in the discretion of the court. Every violation of this section may be prosecuted in any court of the United States having jurisdiction of crimes within the district in which such violation is committed, or through which the transportation is conducted, or in which the car service is performed, or in which such concession or discrimination is granted or given or solicited or accepted or received; and whenever the offense is begun in one jurisdiction and completed in another it may be dealt with, inquired of, tried, determined, and punished in either jurisdiction in the same manner as if the offense had been actually and wholly committed therein.

"SEC. 8. There is hereby authorized to be appropriated the sum of $250,000, available until expended, for the purposes of this act, including payment of personal services in the District of Columbia and elsewhere, and all expenses incident to organizing the work of the President's fuel distribution committee, and not exceeding $50,000 thereof shall be available for reimbursement and payment upon specific approval of the President of expenses incurred since May 15, 1922, in connection with the work of the President's fuel distribution committee organized for the purpose of helping to meet the emergency existing in the matter of fuel."

The title has been amended to conform to the text as agreed upon in conference, as follows:

"To declare a national emergency to exist in the production, transportation, and distribution of coal and other fuel, granting additional powers to the Interstate Commerce Commission, providing for the appointment of a Federal Fuel Distributor, providing for the declaration of car-service priorities during the present emergency, and to prevent the sale of fuel at unjust and unreasonably high prices."

One of the Three Tent Villages for Employees at the Corbin, Ky., Shops of the L. & N.

L. & N. Moves Coal in Spite of Obstacles

Heavy Traffic Increase Caused by Coal Strike Subjected to Intensive Sabotage Since July 1

THE COAL STRIKE which began April 1 effected a tremendous increase in coal traffic on the railroads serving the great non-union producing territories of West Virginia and Kentucky. With the advent of the shopmen's strike extraordinary efforts were put forth to hinder or block the movement of coal from these territories; other traffic has been left to move practically unhindered by the intensive sabotage to which coal traffic has been subjected.

The Louisville & Nashville, serving the Eastern Kentucky fields, is one of the three roads which have been most directly affected by this situation and because of its strategic, and vulnerable, position in the Cumberland field, has perhaps been subjected to greater pressure than any of the others. But notwithstanding the shopmen's strike and the intensive efforts to cripple the service on its largest coal producing division, the railroad moved practically as great a volume of coal from the coal fields actually in production, during July, 1922, as was moved during the same month of the previous year.

The Louisville & Nashville serves coal fields on four widely separated parts of the system. Normally, 63 to 68 per cent of its total coal traffic comes from the Eastern Kentucky and Cumberland fields; 15 to 20 per cent from Western Kentucky, and 11 to 14 per cent from the Alabama field. These are all non-union fields. About four per cent of the road's normal coal traffic comes from union mines in Illinois.

Although conditions created by the shopmen's strike have somewhat disturbed the movement from the Western Kentucky, as well as from the Eastern Kentucky and Cumberland fields, the greatest difficulties have been encountered in the Cumberland fields and the present article will be confined to a description of the conditions in that territory, particularly as they affected the Cumberland Valley division, which serves the Cumberland field.

Eastern Kentucky Fields Rapidly Developing

The Louisville & Nashville serves two coal fields both of which are largely in the eastern part of Kentucky. The more southerly of the two, known as the Cumberland field, lies in Tennessee, Kentucky and Virginia. It extends from southwest to northeast for a distance of about 90 miles, parallel with the Kentucky-Virginia state line, and is approximately 25 miles wide. The principal developments in this field lie along the Cumberland river valley in Southeastern Kentucky and are served by the Harlan branch of the Cumberland Valley division. Including the main line, which also produces some coal, both in Kentucky and Virginia, this division has a track capacity for handling about 800 carloads of coal a day. This field is a comparatively old development, but during the past 22 years the railroad has spent over $9,000,000 in new mine branches, grade revisions, double track and increased yard facilities to enlarge the coal handling capacity of these lines.

The northerly, or Eastern Kentucky field proper, covers an area of 12,000 sq. mi. and is comparatively undeveloped. This field is served on the east by the Chesapeake & Ohio and the Baltimore & Ohio along the Big Sandy river and its tributaries. The Eastern Kentucky division of the L. & N., extending in a southeasterly direction from the main line of the Kentucky division at Winchester, Ky., enters this field along the North Fork of the Kentucky river which it follows to its extreme head-waters, a distance of about 185 miles. In the past 12 years the L. & N. has spent about $17,000,000 in adding to the line and enlarging yard and track facilities on the Eastern Kentucky division. This division now has a daily capacity of about 650 carloads of coal.

A large percentage of the coal produced in the territories served by both the Cumberland Valley and the Eastern Kentucky divisions is moved from Corbin, Ky., and Ravenna, Ky., respectively, over the lines of the Kentucky division which extends north from Corbin, Ky., to Cincinnati, Ohio. During the past 12 years approximately $13,000,000 has been spent in enlarging track facilities on this division, including extensive double tracking and a hump yard at De Coursey, Ky., for classifying Cincinnati bridge deliveries. This constitutes a total of over $39,000,000 which has been spent on the fixed plant, largely to meet the requirements of coal traffic from the two Eastern Kentucky fields, most of which has been spent since 1910. Adding to this total $7,000,000 worth of equipment which may properly be apportioned to the coal traffic in this territory, a total of over $46,000,000 has been spent on road equipment to meet the

requirements of this territory, approximately $11,000,000 of which has been authorized and spent since the termination of Federal control on March 1, 1920.

Notwithstanding the magnitude of these increases in railroad facilities there has been a constant development of mine capacity in excess of the normal requirements of the market so that, working full time, the mines in the Eastern Kentucky fields have a maximum loading capacity greater than the track capacity of the railroad. Although, under average conditions the mines on the Cumberland Valley division, working three or four days a week, load some 3,000 cars which the railroad moves at the rate of about 500 loads a day, these mines have a maximum loading capacity of 1,700 cars a day.

Typical of the tendency toward over development of mine capacity is the fact that, under the present favorable market conditions, this road is being subjected to more or less pressure to provide branches aggregating about 117 miles in the Eastern Kentucky fields, which would open up 195,000 acres of new coal land and add approximately 20,000,000 to 30,000,000 tons annually to the capacity of the mines on this part of the system.

Big Increase in Traffic Caused by Coal Strike

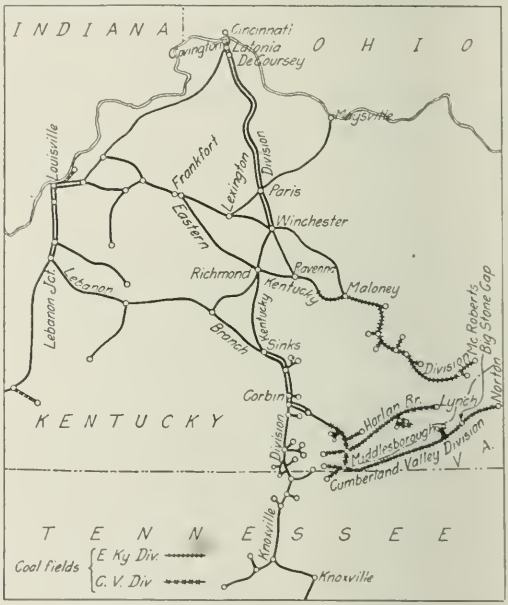
The record carload coal traffic on the Louisville & Nashville was handled in 1920, aggregating from all fields approximately 512,500 carloads. The largest single month's business during that year was handled in December and totaled 51,175 carloads. The volume of coal traffic in 1921 was slightly greater than that during the preceding year although the number of cars handled was less. A new record was established in October, 1921, however, when a total of 52,717 loads were moved, at the rate of 2,081 cars per working day.

At no time since April 1, until the coal strike was finally settled, was any coal loaded in the Illinois field. From the other fields, however, the L. & N. handled an aggregate business of 66,415 cars in May and 64,558 cars in June, at the rate of 2,460 loads per working day in May and 2,483 loads per working day in June, rates exceeding that of the largest previous record by 18 and 19 per cent, respectively. On several days during these two months the Cumberland Valley division loaded over 1,000 cars of coal; a record was established on June 12, when 1,241 cars were loaded. In May the average loading per working day on this division was 818 cars and in June, 814 cars, marking the full utilization of available track capacity, while on the Eastern Kentucky division, with a record of 900 cars as the largest day's business, the loading averaged 669 cars a day in both May and June. Furthermore, a number of mines on the east end of the Cumberland Valley division between Big Stone Gap and Norton, Va., from which business normally moves over other lines, threw a heavy movement westward over the Cumberland Valley division. During March the movement from this territory had averaged about four loads a day. By April 15 it had increased to 250 loads a day. This business had to be moved over 75 miles of line the character of which requires the use of light power, with grades which limit the rating to less than 800 tons per train.

Normally about 40 per cent of the coal produced on the Cumberland Valley division moves north over the Kentucky division, 40 per cent moves west from Sinks, Ky., over the Lebanon branch to Louisville, Ky., and 20 per cent moves south over the Knoxville division. During the coal strike, however, about 75 per cent of the Cumberland Valley coal has been moving north over the Kentucky division, adding materially to the volume of traffic movement over the 58-mile single track line from Sinks to Winchester, Ky., a line with 1.2 per cent ruling grades, requiring helper service throughout the entire distance. With the increase in loading on the Cumberland Valley and the Eastern Kentucky divisions and the changes in the routing caused by the coal strike the Kentucky division handled a total of from 1,000 to 1,600 cars a day into the De Coursey yards at the north end of the division, averaging during the months of April, May and June 46 per cent more traffic than was handled during the same months in 1921, which, because of a rapidly growing traffic, had not themselves been exceeded by the same months of any previous year.

Corbin the Key to the Cumberland Field

Corbin, Ky., is one of the most important freight terminals on the L. & N. It forms the terminal of the Kentucky division on the north, the Knoxville division on the south and the Cumberland Valley division on the east. Traffic between Louisville, Ky., via the Lebanon branch and points south and east of Corbin also passes through the Corbin yards. During the month of May, 25,799 loads from the



Lines of the Louisville & Nashville Serving the Eastern Kentucky and Cumberland Coal Fields

Cumberland Valley divisions, 3,084 loads from the south over the Knoxville division, and 3,463 loads from the north over the Kentucky division and the Lebanon branch, were handled through the Corbin yards, a total of over 32,000 carloads. In addition to the loads, over 20,000 empty coal cars were moved into Corbin from the north for distribution to the mines on the Cumberland Valley division, making a total of more than 50,000 cars which were handled through this terminal during the month.

Mechanical facilities at this point consist of a 25-stall roundhouse with a small machine shop to take care of running repairs and a limited amount of light classified repairs, and a wood mill for finishing car repair materials. The terminal normally despatches from 50 to 60 locomotives a day and at the time of the strike employed 686 men in the roundhouse and on the car repair tracks. On the morning of July 1 the master mechanic and three foremen constituted the entire force at this point and all that could be accomplished was the movement of passenger trains until a new

force could be built up. This alone repaired the despatching of 11 engines in 24 hours.

Corbin is exclusively a railroad town and local sympathy was lined up solidly behind the striking shopmen. Therefore, before a new force could be built up it was necessary to establish a self-contained camp at the terminal with a complete commissary organization. Beginning July 7, a camp of 150 sleeping tents, floored and electric lighted, was established in three villages with seven complete kitchen and dining tent units. Everything possible, under the circumstances, has been done to make agreeable the life of employees compelled to live in complete isolation from direct contact with the outside world. The camp includes shower baths, an emergency hospital, a moving picture show and a radio outfit. Open entertainments for the benefit of the employees are provided by the two latter facilities every evening. A check car has also been provided, where personal effects may be stored in safety.

Since the establishment of this camp, notwithstanding a lack of trained sub-foremen, the force has been gradually built up and developed into a working organization the effectiveness of which is constantly increasing. At the end of August it consisted of approximately 650 mechanics and helpers and about 150 laborers, in addition to about 200 guards required properly to patrol the railroad property throughout the 24 hours.

Two Thousand Cars Maliciously Damaged

But delays incident to the building up of a new organization in the Corbin terminal were by no means the only obstacles placed in the way of the movement of traffic. At the beginning of the strike there were about 3,500 loads on hand on the Cumberland Valley division outside of Corbin and 1,200 loads in the yards at Corbin. At the outset all of this equipment was unguarded and when power began to be available whole strings of these loads at the tipples or on sidings were found with the air hose cut and with coupler

Typical Examples of Cut Air Hose Removed from Cars at Corbin, Ky.

knuckles, brake shoes and brake shoe keys removed. On one string of 39 cars, 76 hose were found to have been maliciously destroyed. As many as 30 and 40 cars have been rendered unserviceable in a single night in the yard at Corbin.

Up to August 28 there were clear records of 1,122 cars in Corbin and on the lines adjacent to Corbin on which the air hose was cut, 75 cars on which the passage through the hose was stopped and 150 on which the journals, couplers and brake shoes had been tampered with. Including cars subjected to similar sabotage on other parts of the system, there is a clear record of approximately 2,000 cars known to have been damaged by deliberate intent. That sand and other destructive materials have also been applied to the journals of many other cars which were not discovered in the yards, is evident from the many complaints from train service employees. In one train more than 14 cars had to be brassed and relubricated within a distance of 20 miles.

To keep traffic moving since the strike it has, therefore, been necessary to do an unusual amount of car repair work at outlying points on the Cumberland Valley division. But it was impossible to send men out to do the work without armed guards for their protection. Accordingly, a traveling repair force of 18 men with the necessary armed guards was organized and provided with five cars, including commissary, materials, tools and supplies. Under this method of handling the work the division had been practically cleared of shop cars by the end of August.

Under these conditions the dropping off of coal movement from the Cumberland Valley division in July is not surprising. On several days during the first ten days of the month the loading was less than 10 cars a day. By the end of the month, however, it had increased to over 400 a day and had averaged 259 cars a day for the month. Taking the system as a whole, and excluding from the comparison the St. Louis division in Southern Illinois, on which coal was loaded only during the first three months of this year, the total loadings in July amounted to 37,235 cars, or nearly 96 per cent of the loading in July, 1921.

A Five-Day Brotherhood Strike

During the first two weeks in August the daily loadings on the Cumberland Valley division were gradually increasing, for the first five days averaging 390 cars a day and for the next week 489 cars a day. Then, on the morning of August 14, a strike of train service employees, confined to the Cumberland Valley division, tied up the division and the Corbin yard, which is operated by the Cumberland Valley division employees. The grievances out of which this strike grew involved the alleged unsafe condition of motive power and cars and the employment of armed guards. It was settled, however, without adding any serious handicaps to operation and the men returned to work on the afternoon of August 18. With operations on the other two divisions running into Corbin continuing during the five days of the strike on the Cumberland Valley division, several days elapsed before the accumulation of loads in the yard and on the line of the division itself could be cleared, and the first empties were not placed at the mines until August 24.

Operations Improving

By the end of August bad-order cars were practically cleared up on this division, the terminal at Corbin was despatching from 40 to 44 engines a day,—all of which were leaving the terminal in condition to meet the most exacting demands of the train service employees,—and operations are rapidly returning to normal.

With the general resumption of coal production in the union bituminous mines throughout the country, however, and the entire industry ready to load to full mine capacity, the limiting factor in the production in the Eastern Kentucky coal fields in the future is much less likely to be track or motive power capacity than the ability to secure an adequate supply of empty coal cars.

THREE EMPLOYEES and two passengers killed is the reported result of a collision on the Northern Pacific on Thursday evening, September 7, at Parkwater, Wash., four miles east of Spokane. Westbound passenger train No. 41 ran into a four-car train of shopmen occupying the main track and headed west. Reports indicate that both of the passengers killed would be classed as employees. It is said that the shop train entered the main track after reading a switch indicator which indicated that no train was approaching. The automatic block signal which should have stopped Train 41 is 6,000 feet in the rear.

Hearing on Daugherty Injunction Completed

After four days of incessant allegation of violence and lawlessness, the United States rested its case against the Railway Employees Department of the American Federation of Labor for conspiracy to disrupt interstate commerce and in support of a plea for the now famous "Daugherty injunction." The opening phases of this legal battle were described in the *Railway Age* of September 16, page 507. As indicated at that time, the government continued throughout the week to read thousands of affidavits from witnesses of acts of violence and instances where strikers have taken the law into their own hands in the name of unionism, and, by every known artifice of intimidation and actual crime, sought to terrorize men into allegiance to the strikers' cause.

The affidavits showed that the strikers dynamited and burnt; they fired shots through workmen's homes and through camp cars in which workers were interned on railroad property; they blew up water tanks and put railroad buildings to the torch; they stuffed sand, gravel and emery in the journals of locomotives and cars; they pulled bolts and nuts from rolling stock and withdrew spikes from rails; they painted signs of "scab" on workmen's homes and on the sidewalks in front of them; they coerced mayors and police authorities into looking the other way when violence was committed against loyal workers; they kidnaped workmen and threatened to make way with their families; they frightened storekeepers into refusing to sell to "scabs" and boarding houses from giving them food or lodging. Hundreds of men had sworn to cases of brutal assault in the main streets of towns and cities.

With the presentation of this evidence, the government has rested its case. On September 18 the defendants retaliated with a scathing denunciation of the government's evidence as "an avalanche of hearsay, mixed with perjury." Donald R. Richberg, chief of counsel for the striking shopmen, asked that Attorney-General Daugherty's petition for permanency of the injunction now temporarily in effect be dismissed. He questioned the government's right to seek such an injunction, doubted the jurisdiction of the court and insisted that the attorney-general and his staff have failed to make out a case.

The 25,000 affidavits filed by the government "do not charge the defendants named in the case with any crime," he said. "They recite acts of violence, but not one of them directly connects the defendants with the crimes charged."

The first ruling by Judge J. H. Wilkerson construed as favoring the shop crafts in the injunction proceedings, came on September 19 when he ordered the first class of affidavits submitted to the government, 283 in number, thrown out on the petition of Attorney Richberg. It was charged the makers of the affidavits were unaware that they were to be used in court, and that they were therefore not liable for perjury. Judge Wilkerson had previously ruled against throwing out the remaining classes of affidavits.

Attorney-General Daugherty Defends His Injunction Activities

Attorney-General Daugherty defended his course in the injunction proceedings and incidentally paid his respects to Samuel Gompers, president of the American Federation of Labor, in a statement reading in part as follows:

"I would say that, if this case is fortunate in its preparation and presentation and decision, I would guess there is nobody now living old enough to take observation of these proceedings who would ever see another strike involving the transportation facilities of interstate commerce.

"It has been a long time since the decision in the Debs case. That was the outstanding case that involved these questions and aside from the changes and extensions that naturally come in the law and the construction of the law in the development of the times, there is very little new in this case.

"Anything that would have been held, or can be held, to be a violation of the law construed in connection with the restraining order in the Debs case, these same facts being shown, would be construed to be a violation of the order in this case, and there is nothing in this case that would be held a violation of the restraining order that would not likewise be held to be a violation of the restraining order in the Debs case. Our order is a little more elaborate and accommodatingly exquisite.

"Mr. Gompers has criticized the government. You see, some people call him Uncle Sam, but he is not the Uncle Sam we are taking our orders from. There is another Uncle Sam here. And he talks about 'our constitution.' That is the one that he and some of his friends made. We are talking about the constitution that the American people made, and it is big enough and broad enough and fair enough to cover everything. This late demand and complaint on the part of the so-called minority for trampling upon their rights is all unjustified, but sometimes I feel like asking the question whether the majority have any rights at all. Whether the majority is expected to obey the will of the minority.

"I have nothing hard to say about labor—nothing hard to say about unions. If I were a workman in a factory I would belong to a union, but I would not belong to any union that had any rule of action or conduct which set aside the laws of the government. If I were running a shop or a factory, I would run an open shop—that means a man who works if he wants to work without being compelled to present a certified paper that he belongs to any organization. That is what a free country means. And as the days go by it will be found that this proceeding will be beneficial to legitimate unions, and they will commend it as things settle down."

It is probable that by the time this issue of the *Railway Age* is off the press, Judge Wilkerson will have rendered his decision in the case.

The shop-worn allegations of "interlocking directorates" and an iniquitous control of the railroad industry by the "inner banking circle centering around the House of Morgan" were again resurrected by legal representatives of Mr. Jewell and his associates in an advertised counter attack before Judge Wilkerson on September 19. Eight men representing the "railroad committees of the New York bank combine" considered to bring about the rail shop crafts' strike and have opposed peace in that strike in order to forward their "deliberate anti-labor union policy," according to an affidavit filed by Mr. Jewell and backed up by a fat exhibit giving figures, names and charts of interlocking railroad directorates which, it is alleged by the defense attorneys, are illegal. Mr. Jewell made a sweeping denial of all the government's charges of a conspiracy and counter charged that the Association of Railway Executives deliberately precipitated the strike as a part of a plot to crush the railway unions. The strike, Mr. Jewell asserted, was caused primarily by the refusal of the railroads to cease "farming out" repair work as ordered by the Labor Board. All this, it was pointed out by government attorneys, has little to do with the immediate issue at stake. It was suggested that the defense was filibustering since there has been no argument for modification of the terms of the Daugherty order.

The Jewell defense, however, does admit that the strike once lawfully called had the purpose of obstructing interstate commerce. The court wanted to know if it was permissible for either side in an industrial controversy to stop a service which was absolutely indispensable to the carrying on of commerce. Mr. Richberg replied that the rights of the human beings involved were more important to preserve than the "sacred rights of interstate commerce"; that constitutional rights must be preserved, commerce or no commerce. The precedent to be set in this case, it appears, is whether the government entering a controversy of this character on behalf of the whole people can set aside the rights and the freedom permitted in other industrial disputes. Judge Wilkerson has indicated several times that the Clayton Act provisions which the defense relies upon do not hold in a case of this character where the dominant purpose was to obstruct interstate commerce. Strike bulletins presented by the defense show that this was the purpose and that instructions were issued by the defendant officials.

The Ljungstrom Turbine-Driven Locomotive

Remarkable Efficiency Shown in Swedish State Railway Tests by Locomotive with Many Striking Features

WHEN IT IS RECALLED that the superheated steam locomotive converts only about six to eight per cent of the heat value of the coal consumed into useful work, whereas from 15 per cent to 19 per cent is converted in modern power plants, it is apparent that there is room for large improvements in locomotive efficiency. The importance of the matter stands out prominently at the present time on account of the world-wide increasing cost of fuel. While this increase has not been as pronounced in this country as in Europe, fuel is still one of the largest items of railroad operating expenses.

At the present time the steam turbine is the most generally used prime mover in important stationary plants and is being extensively applied in the marine field, despite the efficiency of the compound or triple expansion engines formerly used. In any consideration of radical changes in locomotive design, one thus naturally turns to the steam turbine. As an evidence of this trend of design, three turbine-driven locomotives are now in operation in Europe. These include a 10-wheel locomotive with a geared Zoelly turbine built by Escher, Wyss & Co. of Zurich, Switzerland; the Ramsay turbo-electric locomotive of the 2-6-6-2 type and 22,000 lb. tractive force on the London & North Western, England, built by Armstrong, Whitworth & Co.; and the Ljungstrom geared-turbine locomotive of 30,000 lb. tractive force on the Swedish State Railways. A very complete description of the Swedish design has been given in recent issues of Engineering (London) to which the *Railway Age* is indebted for most of the information and illustrations used for this article.

Object and General Description of Design

The design is largely the work of Fredrik Ljungstrom, assisted by his older brother, Birger Ljungstrom, general manager of Aktiebolaget Ljungstroms Angturbin, at whose factory near Stockholm the work of construction was carried out. In regard to running gear, boiler design, locomotive practice and requirements, the engineers of the Swedish State Railways collaborated with the builders. By combining the knowledge of an old established manufacturer of turbines and power plant equipment with that of practical railroad engineers, an epoch marking locomotive has been brought out after a vast amount of investigation and preliminary experimental work. In working out the details the object aimed at was to adapt the most advanced power station practices to the space and weight limitations of an ordinary locomotive and still retain the relatively high efficiency, reliability and possibility of long continued operation without inspection or withdrawal from service for repairs to boiler or machinery. Bearings and running parts have been enclosed as far as possible. The feed water is used over and over, thus reducing the amount of scale and necessary boiler work to a minimum. Tests in regular service have shown a fuel consumption of less than half that of standard type locomotives of a similar capacity when hauling the same trains. The small size of the boiler and the little coal required are striking proofs of increased efficiency.

It will be noted from the drawings that the locomotive consists of two parts, a boiler unit and a condenser unit. The forward half, containing the boiler and coal bunker, weighs 138,800 lb. and is carried on a four-wheel leading truck and three pairs of wheels with boxes and pedestals of ordinary European design. All ten wheels are of 38¼ in. diameter and are used simply for carrying the weight. The rear unit, in addition to the condenser, carries the turbine, reduction gear and part of the auxiliary machinery. It weighs 143,360 lb. and is carried on three pairs of coupled driving wheels, 56¼ in. diameter, and a two-wheel trailing truck with 43¼ in. wheels. The weight on the driving wheels is 107,520 lb. and on the trailing truck, 35,840 lb.

Boiler and Air Heater

The boiler carries 285 lb. steam pressure and is of the straight top type, 66 in. outside diameter, with a firebox 63 in. long by 63 in. wide which gives a grate area of 28 sq. ft. There are 160 tubes, 3 in. outside diameter and 9 ft. 10⅛ in. long between the tube sheets. The evaporative heating surface includes 108 sq. ft. in the firebox and 1,130 sq. ft. in the tubes.

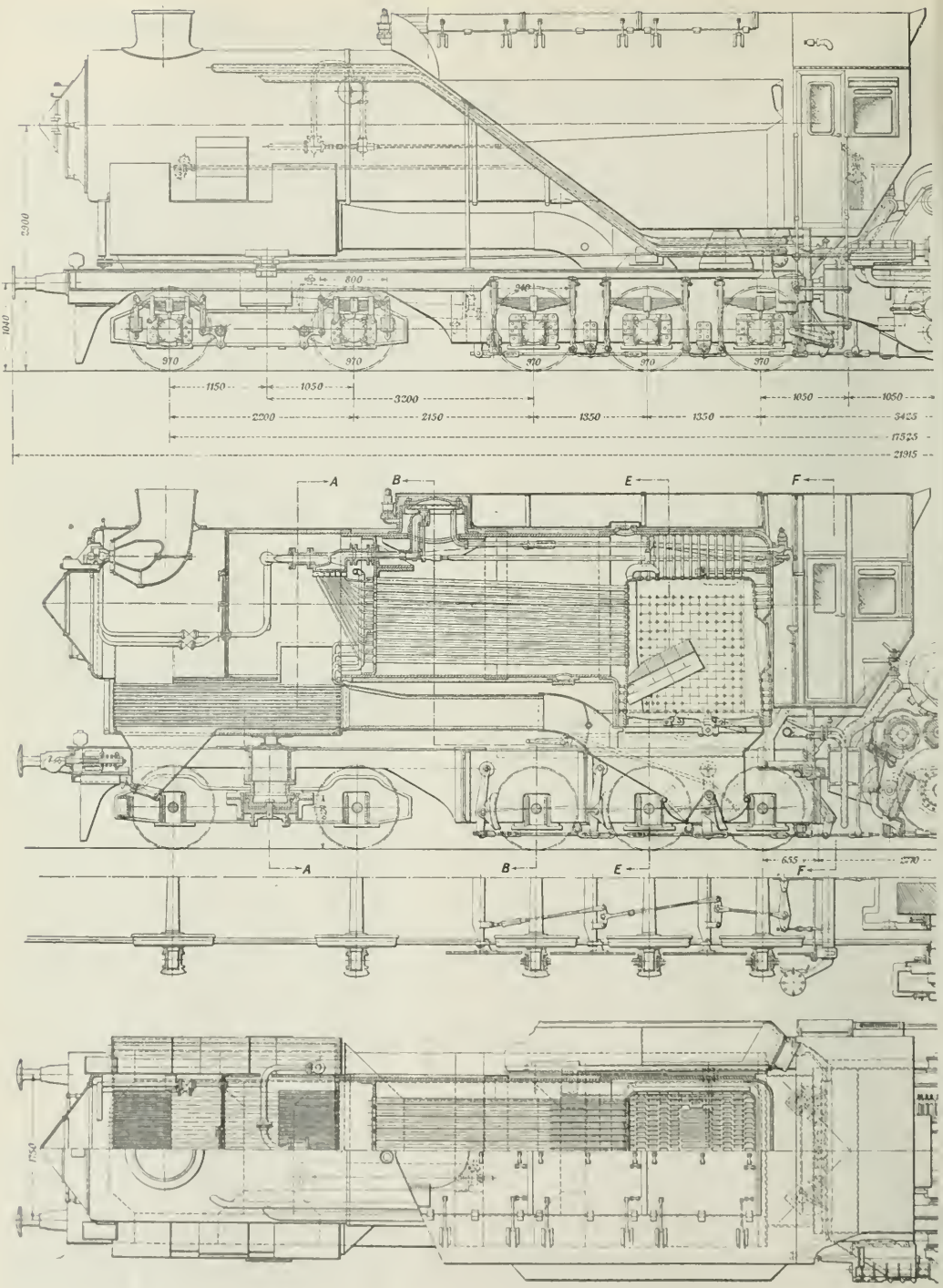
The length of the tubes is only about two-thirds that of ordinary locomotive boilers. This was decided upon because it was thought that greater economy could be secured by utilizing the surplus heat contained in the gases for preheating the air required for combustion. This is believed to be the first instance in which an air preheater has been used on a locomotive.

The smokebox is divided into two portions by a transverse diaphragm which causes the gases to pass down and through the air heater before going to the stack. This heater which is located beneath the smokebox contains 650 longitudinal brass tubes, 1.3 in. outside diameter, 8 ft. 11¼ in. long and with a heating surface of 1,787 sq. ft. The gases leave the boiler tubes at about 610 deg. F. and are cooled to about 300 deg. F. in passing through the air heater while the air for combustion is raised to about 300 deg. F.

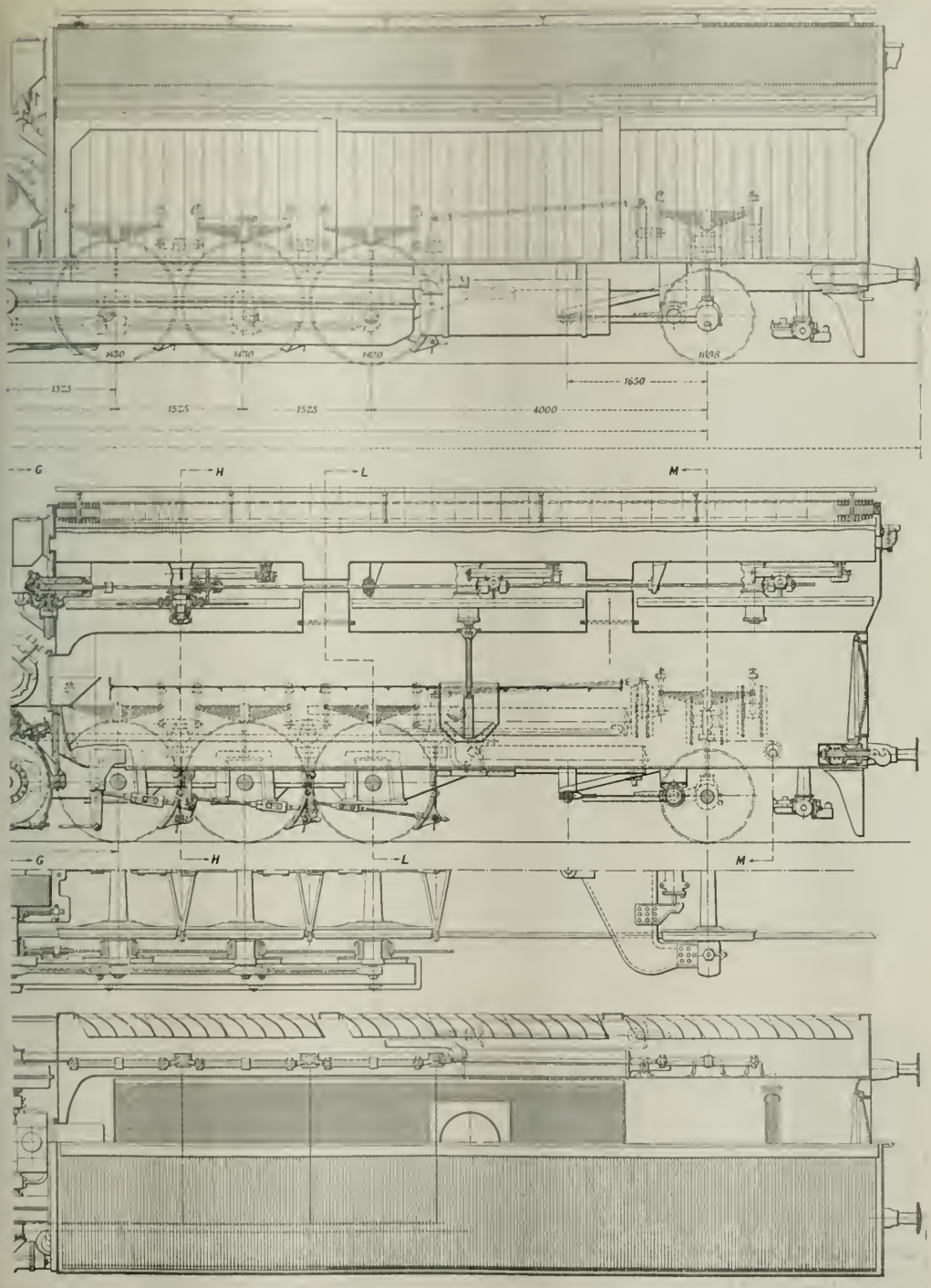
The front portion of the air heater casing is extended downward to form a hopper in which soot and dust can collect and from which they can be discharged at will. A large duct connects the rear end of the air heater to the closed ash pan. The supply of air to the ash pan is controlled by a series of vertical shutters or dampers which cover the front end of the heater and can be opened and closed from the cab. The handle by which they are operated is interlocked with the firedoor in such a way that they are closed automatically when the firedoor is opened, thus avoiding the danger of flame or gases being blown back into the cab when the door is opened, while the locomotive is running. There is also an additional damper in the duct to the ash pan for further regulation. The coal is carried in a saddle bunker of seven tons capacity, mounted on top of the boiler and extending from the front of the dome to the cab. Its tapered form serves to bring the coal to doors opening to the foot plate on each side of the firebox where it is most convenient for the fireman.

Induced Draft Fan

As the exhaust steam is all condensed, it becomes necessary to use a fan to create the required draft. As will be noted from the drawings, the stack has an extension reaching down into the front compartment of the smokebox, and carried forward where it terminates in an annular opening with a horizontal axis. A turbine-driven fan is mounted on the front of the locomotive with the fan blades close to the annular opening to the stack and serves to draw the gases from the smokebox and force them through the stack. The cooling of the gases to 300 deg. F. while passing through



Elevation, Sections and Plan of



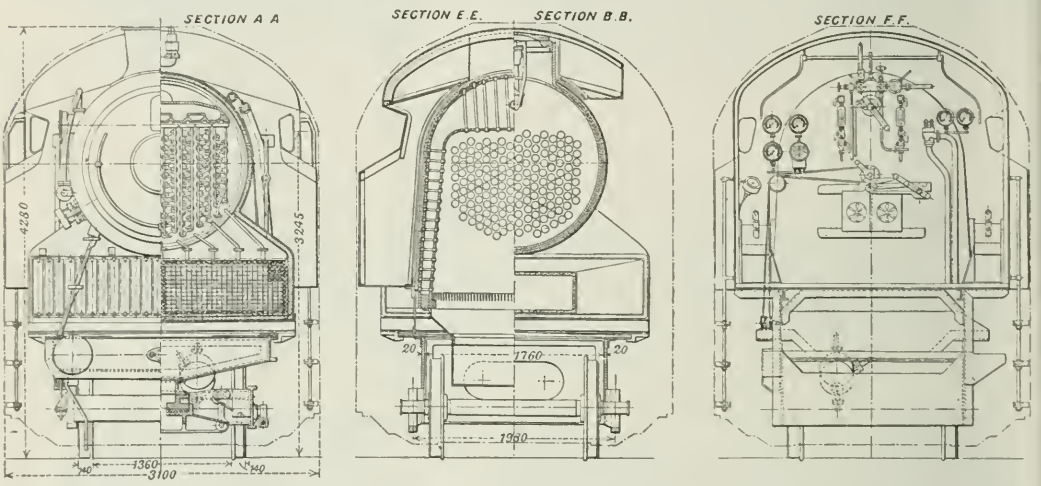
Ljungstrom Turbine-Driven Locomotive

the air heater also reduces their volume, both of which simplify the fan problem. The maximum speed of the fan is 10,000 r.p.m., at which speed the turbine develops 40 hp.

Superheater and Tube Blower

All tubes contain superheater elements. Each element is heated by the gases passing through two tubes, the superheater pipes making four passes through the first tube and then four through the second tube before returning to the header. The length of each pass is shorter as the steam becomes superheated. The total superheating surface is 861 sq. ft.

Provision has been made for blowing the soot out of the tubes, the mechanism being operated from the cab. A horizontal steam pipe extends across the front tube sheet above the top row of tubes, and to this pipe is connected a series of smaller vertical pipes between each alternate row of tubes. These small pipes have drilled holes opposite each tube opening. When the engineman desires to remove the soot from the tubes he can admit steam to each one of the vertical pipes in succession. As extensions of the pipes pass down into the air heater, boiler tubes, superheater elements and air heater tubes are all cleaned at the same time. The tubes being blown in small sections, there is no appreciable interference with the draft, such as would result if all tubes were blown at the same time.



End Views and Sections of Boiler Unit

The Main Turbine

The main turbine is of the impulse-reaction type with axial steam flow and develops 1,800 b.h.p. at the maximum speed of 9,200 r.p.m., which corresponds to a locomotive running speed of 68.3 m.p.h. Superheated steam is carried from the boiler unit to the turbine by a steel pipe with a U-shaped bend to obtain the required flexibility between the two units of the locomotive. The cast-steel steam chest contains five nozzles, each of which is independently controlled by a valve operated by oil pressure through a rotary control valve conveniently located in the cab. The steam as it leaves the nozzles acts on a velocity compounded impulse wheel with two rows of rotary blades with one row of stationary blades between. After leaving the impulse blading the steam passes through 15 rows of reaction blades mounted on a built-up conically shaped rotor. A novel and ingenious method has been adopted to shorten the length of the turbine and bring the large exhaust opening in line with the center of the turbine. The last row of reaction blades carries another row of blades mounted on their tips. The steam after leaving the last inner row of blades goes through a reversing passage in the turbine casing and then backward axially through the outer row of blades to the exhaust passage which surrounds the turbine cylinder.

As a safeguard, the turbine is fitted with an overspeed governor which acts to shut off the steam should the speed exceed a certain predetermined amount above the normal maximum.

The Main Reduction Gear

A double reduction gear with a ratio of approximately 22 to 1 is used to bring down the rotative speed from 9,200 r.p.m. of the turbine to 420 r.p.m. of the low speed gear. On either end beyond the turbine spindle and in line therewith, is a double helical high speed pinion in rigid bearings. Flexibility is obtained by mounting flexible couplings on the ends of the turbine spindle and on the outer ends of the pinions, each pair of couplings being connected by a shaft which passes through the hollow shaft of the pinion.

The high speed pinions mesh with the teeth of two gears mounted on a shaft, the center portion of which is the low speed pinion. A spring connection is interposed between the rims of the high speed gears and the shaft which forms the low speed pinion to cushion such shocks as may arise between the driving wheels and the turbine. The low speed pinion normally meshes with the low speed gears mounted on the jack shaft, at the ends of which are cranks at 90 deg. angles. Connecting rods couple the crank pins to the three pairs of driving wheels. As an illustration of the precautions taken in designing this locomotive to exclude dust and dirt from all bearings, the cranks and connecting rods to the driving wheels are entirely enclosed. The lower part of the cover can be removed with little effort when inspection is necessary and in addition, small covers are provided for the inspection of the crank pins.

As the turbine is non-reversing, it is necessary to provide means in the gearing for the reversing of the locomotive. The arrangement used is a novel and bold one, but apparently effective and reliable. When the engine is to be run in a backward direction, the crank shaft is first dropped

slightly so that the low speed gear is thrown out of mesh with the pinion which drives it. After the gears have come to rest, an idler gear is brought into mesh with both the low speed gear on the crank shaft and the low speed pinion. As this idler gear has to connect with both the gear and the pinion in the train and as all gearing is of the double helical type, it has to be cut with helical teeth running in one direction and then recut with teeth running in the opposite direction. This doubling of the spirals reduces the tooth bearing to one-half of that used for driving in the forward motion, but as the idler pinion is only in use when the locomotive is backing, the strength is ample. The process of disengaging the pinion and bringing the idler into mesh is done automatically by oil pressure controlled by a simple movement of the handle of a control valve. The means employed for locking the gear in the two positions and for securing meshing without injury to the gears are interesting but not necessary to describe in detail. It is sufficient to state that the whole process of reversal is as quickly and as easily accomplished as with an ordinary locomotive equipped with a power reverse gear.

The Condenser

The efficiency of a steam turbine depends upon the employment of a condenser which will ensure the maintenance of a high vacuum. The ordinary type of condenser used in stationary and marine installations with a large number of water tubes was considered to be impractical on account of the size, weight and large quantities of cooling water that would be required. An air-cooled condenser was consequently decided upon as the most suitable for locomotive use. In the condenser as in other parts, the design adopted shows good engineering, ingenuity and a willingness to depart from the conventional provided there is a clear advantage to be gained by so doing.

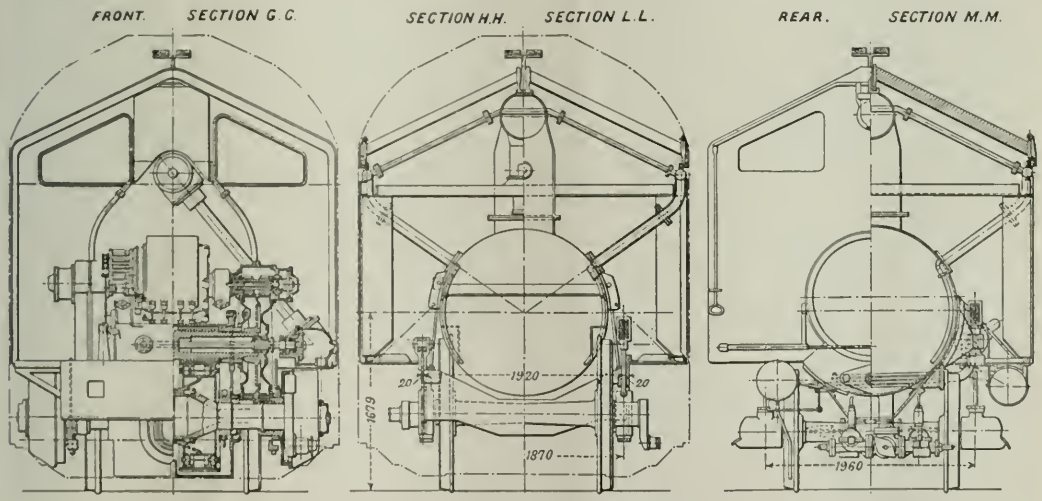
As has been stated, the condenser occupies most of the space of the second unit of the locomotive, the actual room occupied by the turbine and reduction gear being small. Running the full length of the unit and at the bottom is a cylindrical vessel about 66 in. in diameter which is normally half full of water of condensation. The turbine is bolted direct to a flange on the front of this vessel without interposed piping or expansion joints. The exhaust steam passes in on top of the water and then rises through two short connecting pipes to another cylindrical vessel about 22 in. in diameter which is located near the top of the unit.

Between the two drums are three fans which are driven from the main turbine by an inclined shaft and bevel gears. The fans themselves are driven by friction wheels which can be shifted to give the desired speed. Each fan has a capacity of 141 cu. ft. of air per second. The object of the fans is to induce a strong current of air over the cylindrical drums and past the copper tubes referred to later. The sides of the vehicle consist of vertical sheet steel guide plates which facilitate the entrance of air while the locomotive is running. The shape was determined by results obtained from experiments with a specially constructed wind tunnel.

The roof of the vehicle consists of a large number of specially formed flattened copper tubes in which most of the condensation takes place. These tubes are closely packed together and contain about 3,530 sq. ft. of cooling surface over which the air from the fans passes.

Feedwater Heater

After the steam has been condensed, it is fed back to the boiler and on the way passes through three feedwater heaters arranged in series. Each heater is supplied with exhaust steam at a different temperature so that the feed water is heated progressively from about 120 deg. F. to 300 deg. F. The heaters are circular and contain a series of brass tubes, surrounded by exhaust steam. The first heater is supplied with steam at approximately atmospheric pressure and 195 deg. F. from the condensate pump turbine, the air ejector for the condenser, the vacuum brake ejector, leakage from the dummy piston of the main turbine and steam from the other heaters. The intermediate heater is supplied with steam at approximately 9 lb. pressure and 230 deg. F. from the turbine boiler feed pump. The high pressure heater is supplied with steam at approximately 60 lb. pressure and 295 deg. F., being the exhaust from the induced draft fan turbine.



End Views and Sections of Condenser Unit

Pumps and Air Ejector

The condensed water is taken by a condensate pump and delivered to a boiler feed pump which forces it through the feedwater heaters into the boiler. The condensate pump

which operates under a low head is of the single-impeller rotary type and driven by a small turbine, the speed being brought down by a single helical reduction gear. Saturated steam is used for this turbine although in practically all other places superheated steam is employed.

The boiler feed pump also is of the rotary type. It has three impellers in series and is driven by a direct-connected turbine. The boiler feed pump is mounted on a cast-iron oil reservoir. In this reservoir there is a rotary lubricating oil pump with a vertical spindle which is driven by a worm mounted on an extension of the boiler feed pump shaft. This pump supplies oil to the main turbine, the reduction gear, the various auxiliaries and also the important bearings on the locomotive. The use of force-feed lubrication in conjunction with the enclosure of running parts is expected to greatly increase the durability and make it possible to run the locomotive for long periods without requiring any attention.

An air ejector is used to free the condenser of air. This has two steam jets which work in series and is much simpler than an air pump. The discharge from the ejector is piped to the low-pressure feedwater heater so that there is little loss of heat.

Tests and Performance

Fuel economy is one of the strong claims for the Ljungstrom locomotive although low maintenance costs, large starting torque and evenness of turning effort also are advanced. The ordinary Swedish locomotive with about 145 lb. boiler pressure, steam superheated to 650 deg. F. and expanded down to an exhaust pressure of six pounds above atmosphere, will convert about 200 B.t.u. into useful work for every pound of steam used. The Ljungstrom locomotive with its higher pressure and steam expanded down to 2.1 lb. absolute converts about 400 B.t.u. into useful work. The fuel consumption is thus only 50 per cent as much as with an ordinary locomotive. In addition there are further economies resulting from preheating the air for combustion and from feedwater heating.

Before the locomotive was placed in service it was submitted to tests on a specially constructed dynamometer, which tests extended over several months and were carried on under the supervision of engineers from the Swedish State Railways.

Following these successful tests, it was turned over to the railroad and has since been used on numerous runs, hauling heavy trains and conforming to the operating conditions of other locomotives, the firing and running being performed by ordinary railway employees. In repeated instances a dynamometer car has been attached to the train and full records of performance thus obtained. The drawbar pull repeatedly has reached 30,000 lb. and the work performed has been in excess of 1,500 hp. These test records bear out the claims for fuel economy. For example, on one of the runs between Stockholm and Upsala the train consisted of 11 coaches and a dynamometer and weighed 596 short tons including the locomotive. The maximum speed was 51 m.p.h. and there were only a few stops. The coal consumption for the run averaged 37.4 lb. per 1,000 ton-miles. Under other conditions and where the stops have been frequent, the coal rate has been as high as 67 lb. A vacuum of 26 in. to 27 in. was easily maintained with an air temperature near the freezing point.

In operation, the locomotive has shown a better starting torque and quicker acceleration than standard locomotives. It is easily controlled and runs with unusual smoothness at all speeds. Coal consumption has been reduced 50 per cent and as there is very little loss of water, the supply lasts for a considerable time before replenishing is necessary. The continued performance of this remarkable locomotive will be watched with the greatest interest.

Appropriation for Additional Service and Safety Inspection

Washington, D. C.

A DEFICIENCY appropriation of $100,000 for the Interstate Commerce Commission for the employment of additional service agents and other personnel to carry out the car service work of the commission, and another appropriation of $66,150 for 15 additional safety appliance inspectors was recommended in a report of the committee on appropriations and was passed by the House on September 19. The commission had also asked for an additional appropriation of $201,917 for locomotive inspection to provide for 35 additional inspectors, but the committee took the position that this appropriation could not be made because the number of inspectors is provided in the permanent law.

J. C. Roth, director of service, who with other representatives of the commission testified in support of the appropriations before the sub-committee on September 14, said that the deterioriated condition of railroad equipment has resulted in accumulations of loaded freight cars upward of 100,000 cars. He said that the slowing down in transportation has dislocated the car supply to such an extent that it will take months to clear up the congestion and to repair the bad-order cars and locomotives. He expressed the opinion that not less than 25 per cent of the cars were in bad-order as compared with 15 per cent when the shopmen's strike began. In order to meet the emergency and to assist in the movement of freight, he said the commission had increased its force of service inspectors in the field from 4 to 20 by drawing them from various other bureaus of the commission and it has also been necessary to increase the clerical force because of the vast flood of correspondence coming from shippers in all sections of the country. Secretary McGinty said that since the first emergency service order was issued in July the commission has assigned to the service bureau 39 employees at an expense of $76,020 and that thus far most of them have been drawn from other work in the commission, whose places it is necessary to fill, as the President has said that the regular work of the safety and locomotive inspection bureaus must go on. He said the force would be reduced as quickly as possible when the emergency is over. When members of the committee made the point that the number of locomotive inspectors was governed by law, he said that the President and the director of the budget bureau thought that this objection could be overcome in an emergency.

Mr. Roth said that the commission is pressing down upon the carriers through the men in the field, through personal conferences and correspondence to get the cars to the places where they are needed and that it is helping both the carriers and the shippers in various ways. A. G. Pack, chief inspector of locomotives, expressed the opinion that even with the settlement of the strike it will take several weeks to deal with the situation and improve conditions and it will take at least a year for the railroads to gain what they have lost in condition of motive power and equipment. Secretary McGinty said that the commission is receiving not "only thousands, but hundreds of thousands of complaints from all over the country."

W. J. Patterson, assistant chief inspector of safety, explaining the need of additional safety inspectors, said that in addition to the cars reported as in bad-order by the railroads themselves, the percentage of cars found by the commission's inspectors to be defective has increased from 3.41 per cent of the number inspected in January to 11.32 per cent in August. During the month of June 15 cases of violations of the safety appliance law were transmitted to the United States attorneys for prosecution, involving 39 counts. During July no cases were transmitted, but during

August 24 cases were transmitted, resulting in courts. He said the inspectors inspect approximately [illegible] cars a month.

Mr Pack said that during the past [illegible] year the locomotive inspection bureau has been seriously hampered in the performance of its duties by the lack of funds and that the number of inspectors was not increased when the law was extended to cover all parts of the locomotive. He said that the presence of the commission's men even on a division has a most beneficial effect on the improvement of motive power. In June of this year, he said, 45 per cent of the locomotives inspected by the commission were found to be defective; during July 60 per cent, and during August 71 per cent. Legislative representatives of the train service brotherhoods also testified before the sub-committee regarding the necessity for additional inspectors.

The appropriations committee also proposed an appropriation of $150,000 to carry out the provisions of the new coal priority act passed by the Senate and the House last week. While the act authorized an appropriation of $250,000, Secretary Hoover testified before the committee that the amount required would depend upon the length of time federal supervision was to continue and that a smaller sum than that authorized would suffice if transportation conditions become normal at an early date. Secretary Hoover said that if a hopeful view of the situation is taken, the necessity for having a federal fuel distributor will be over by the first of January, "but if, on the other hand, it develops that transportation is more deeply injured than now expected, that is, if the strike continues and we go on with degenerating motive power, we will be in the throes of coal famine all winter long."

Strike Settled by Negotiation and Defeat

Some Roads Take Back Strikers Under Willard-Jewel Plan—Wage Contracts for Train Service

THE ATTEMPT to place in effect the so called "Willard-Jewell peace plan," fully described in the *Railway Age* of September 16, page 503, has resulted in some misunderstanding between representatives of the shop employees and those roads which signified their willingness to cooperate in ending the shopmen's strike under the terms of this agreement. At one point the result was further rioting. Later reports indicate, however, that these misunderstandings are gradually being ironed out and that, insofar as those roads that have agreed to the plan are concerned, the shopmen's strike will soon be definitely ended. On many other roads which were not parties to this agreement it is likewise claimed that the shopmen's strike is ended but in an entirely different way. Practically all of these roads are claiming normal forces and normal production in their shops, and, while their officers state that they will take back any of the strikers who have not been guilty of violence and who are willing to come back minus their seniority rights but with their pension and other similar rights and privileges intact, they consistently maintain that they are not negotiating with Mr. Jewell's organization.

When representatives of the employees and of the roads came together to complete the terms under which the shopmen were to return to work under the "Willard-Jewell" plan, there immediately arose misunderstandings as to the intent of certain terms of this plan, particularly the status of the men now at work in the shops. On the Chicago & North Western for instance, the shopmen's committee demanded that all of the men who remained on the job when the strike was called or who were subsequently hired to take the place of strikers, be discharged. Officers of the road in turn pointed out the terms of the "Willard-Jewell" plan and eventually the difficulty was straightened out. The men were returning to work all along this line according to the latest reports.

A similar misunderstanding on the Chicago, Milwaukee & St. Paul led to minor disorders at the Galewood, Grand Avenue and Bensonville shops but this trouble was quickly ended with the arrival of police. Later announcements by officers of this road indicated that the men were returning to work as fast as arrangements could be completed for them.

From other points where representatives of the railroads and employees were negotiating under the new peace plan came reports of similar misunderstandings, but present indications are that the shopmen on the roads which have agreed to this plan will be on the job again during the present or the coming week.

As yet there has been no definite announcement of the roads which are included in the list agreeing with Mr. Jewell on the solution of the strike problem, a fact which has led to a great deal of speculation as to the inclusion of certain carriers in this plan. Within several days after the announcement of the new plan officers of the following carriers definitely announced that their properties were not included in the negotiations with Mr. Jewell or would not agree to the peace plan:

The Atchison, Topeka & Santa Fe; the Atlantic Coast Line; the Boston & Albany; the Central of Georgia; the Central Railroad of New Jersey; the Chicago & Alton; the Chicago, Burlington & Quincy; the Chicago Great Western; the Delaware & Hudson; the Delaware, Lackawanna & Western; the Elgin, Joliet & Eastern; the Erie; the Fort Worth & Denver City; the Gulf Coast Lines; the Illinois Central; the Louisville & Nashville; the Lehigh Valley; the Minneapolis & St. Louis; the Missouri, Kansas & Texas; the Missouri Pacific; the New York, New Haven & Hartford; the Norfolk & Western; the Northern Pacific; the Pennsylvania; the St. Louis-San Francisco; the St. Louis Southwestern; the San Antonio & Aransas Pass; the Southern Pacific; the Texas Pacific; the Virginian; the Wabash; the Western of Alabama; the Nashville, Chattanooga & St. Louis; the Tennessee Central; the Chicago, Rock Island & Pacific and the Union Pacific.

Labor Board Chairman Comments on Peace Plan

The strike having been partly settled through direct negotiation between the railroads and the employees concerned, Chairman B. W. Hooper of the Railroad Labor Board was asked for a comment on the new peace plan. The following was the result:

"As a positive disbeliever in the moral right and practical efficacy of railway strikes, I am glad to know the strike has ended on a part of the roads. It is to be hoped that some plan of settlement can be agreed upon for all the others.

"No extended comment either in a postprandial or postmortem vein, is necessary.

"The settlement sustains the Transportation Act and the theory of orderly procedure for the adjustment of labor troubles in the railway industry. The decisions of the Labor Board stand un-

modified by the appeal to economic and physical force. All the questions upon which the strike was predicated will come back to the Board, if the parties desire to bring them there. If they should be, at any time, re-opened, the Board will accord them the fullest and fairest consideration, without any spirit of vindictiveness or reprisal.

"The question of seniority that arose out of the strike, is not disposed of by the settlement, as neither party yielded its position, but the matter is referred to a commission, composed of representatives of both sides. This is nothing more or less than an adjustment board, with jurisdiction limited to questions arising out of the strike, and is in strict conformity with the Transportation Act.

"It may also be noted that this settlement is in substance and effect, identical with the last recommendation made by President Harding."

Washington Regards Strike as Virtually Over

Official Washington appears to have treated the partial settlement of the shop strike as indicating virtually the end of the strike and representatives of the administration expressed varying degrees of optimism as to the effect of the strikes and their termination upon prospects for an era of great business expansion.

"While the losses to the country due to the two great strikes are considerable, they are easily over-estimated," said Secretary Hoover in a statement to the press. "The estimate of current coal miners' wages lost in the five months is not a correct basis of estimation of the loss because over a period of 18 months we will probably consume approximately the same amount of coal. In other words, the miners will work more days in the week and produce more coal in the next six or eight months than they would have produced if there had been no strike, and thus the wage roll of the next six or eight months will be larger and will in a considerable degree compensate the loss during this suspension.

"The real loss would lie more in the loss of productivity in industries that have, or might have, to close down as a result of the coal strike. If all of our industries can be kept in motion the loss will be much less from the coal strike than is currently estimated.

"The greatest loss today is the one being met by the farmer as a result of the railway strike. The export of farm produce has been seriously interfered with by inability of the railways to transport produce. Prices are, therefore, unduly depressed in the agricultural regions and the farmer is suffering grievously.

"The inability to transport manufactured products will create some degree of loss, but not so serious as that to agriculture.

"There are other losses that must be counted into the national balance sheet, such as the damage to the railways, the extra charges which they have been put to, the cost of keeping the mines open and maintaining them during the period of suspension, and a hundred other items that are of importance.

"In the broad view, however, if we can get back to business, if we can secure a resumption of transportation and rapid distribution of coal and agricultural produce, we will not have received such an economic wound as cannot be very quickly recovered from. We will probably not be on such a high plane of business prosperity during the next six months as we would have been had the strikes not taken place, but we will undoubtedly be on a much higher and much more comfortable plane than that of last year."

Davis and Mellon Optimistic

Secretary Davis of the Department of Labor had issued a statement saying the settlement of the strikes had removed the last obstacle to "unprecedented" prosperity, while Secretary Mellon of the Treasury Department, although considering the business outlook "very good" recognized limitations imposed on the productive capacity of the country by the fact that the railroads have not been expanding their facilities in recent years as well as by the present condition of equipment. Mr. Mellon was represented as seeing no difficulty ahead of the carriers in supplying the requirements of the country over the winter, but reports to the Treasury Department indicate that some commercial projects have been deferred until next year as a result of the uncertain conditions created by the coal and railroad strikes.

Hearings on motion of the United States attorney and United States marshal for the District of Columbia to dismiss the injunction proceedings brought by the National Brotherhood of Electrical Workers were postponed by Justice Stafford of the Supreme Court of the District of Columbia from September 15 to September 25. The temporary injunction restraining interference with meetings of the railroad strikers will remain in force until that hearing.

Harrison Wants More Boiler Inspectors

Senator Harrison of Mississippi, who has a habit of interrupting the consideration of bills in the Senate by making partisan political speeches, interjected a discussion of the railroad situation into the debate on the resolution for a government loan to Liberia by offering an amendment to appropriate $100,000 to enable the Interstate Commerce Commission to appoint such additional number of inspectors of locomotive boilers as may be necessary to meet the present emergency at salaries of $1,800 a year. The adoption of such a plan might tend to find jobs for a number of men who have lost their seniority rights during the strike. Senator Harrison supported this proposed amendment by citing figures showing an increase in the number of bad order cars and locomotives in such a way as to give the impression that all the bad order equipment was in service and therefore unsafe for use. Senator Cummins said he intended to vote for the amendment, although he would prefer to have it constituted a permanent addition to the interstate commerce law. He said he had been attempting for a year and a half to have the number of inspectors increased from 50 to 100 and to increase their compensation. He said the commission's appropriation for this purpose has been formerly $300,000 a year, but that the Budget Bureau had reduced it to $290,000.

Two Bills to Abolish Labor Board

Two bills to abolish the Railroad Labor Board were introduced in the House on September 14 in addition to one previously introduced by Representative Hoch. The bill introduced by Representative Cooper of Ohio would repeal the section of the Transportation Act under which the board was created and would turn the files of the board over to the United States Board of Mediation and Conciliation, which has not yet been legally abolished, but which has gone out of existence because no appropriation was made for it. Mr. Cooper said he sought to reestablish the plan of mediation, conciliation and arbitration provided for by the Newlands act. The other bill, to abolish the board, was introduced by Representative Goodykoontz of West Virginia.

There were 8,890 less cars requiring heavy repairs on September 1 last than there were at the beginning of the shopmen's strike on July 1, according to reports filed with the Car Service Division of the American Railway Association.

There were, however, 5,981 more cars requiring light and minor repairs on September 1 than at the beginning of the strike. This made a net decrease of 2,909 cars in the number requiring both light and heavy repairs since July 1.

The total number in need of repairs on September 1 was

321,674 cars, or 14.1 per cent of the cars on line. On July 1 there were 324,583 cars, or 14.3 per cent.

There were also 52,413 less cars requiring both heavy and light repairs on September 1 last than on the same date one year ago. Of cars requiring heavy repairs, there was on September 1 last a decrease of 33,237 cars below the total on that date last year, while there was a decrease, compared with one year ago of 19,176 in the number requiring light repairs. One year ago, 16.2 per cent of the cars on line needed repairs.

Reports also showed a decrease of 23,339 in the number of cars needing repair on September 1, compared with August 1 last, with 15,292 less cars requiring heavy repairs, and 8,047 less cars requiring light repairs. On September 1 there were 345,013 cars in need of repair, or 15.3 per cent of the cars on line.

Strike Situation Rapidly Clears in Chicago and Western Territory

Conditions in the shops of carriers in western territory are rapidly approaching normal with the consummation of the so-called "Willard-Jewell peace plan" on several of the roads and the continued recruiting of new forces on others. As it has become more and more apparent that the shopmen's strike has collapsed completely, a fact indicated by the success of the carriers in recruiting new forces and by the attitude and action of Mr. Jewell in finally agreeing to a separate peace with each carrier, the reports of violence, bombing and similar activities on the part of strikers or their sympathizers have become fewer and of only minor importance.

As indicative of the general conditions prevailing on western lines, the Western Presidents' Committee of the Association of Railway Executives issued a statement on September 19 outlining the situation on the previous day. This statement said:

"Reports for September 18, show that 122,415 men are now employed in the shop and repair forces of the western roads. This was 77.5 per cent of the force employed on June 30, the day before the strike began. Excepting the three western roads which have joined in the 'Willard-Jewell' peace movement, namely the Chicago, Milwaukee & St. Paul, the Monon and the Chicago & North Western, the shop forces of the remaining western carriers were 76 per cent of normal yesterday."

Reports made to the Western Presidents' Committee on September 20 indicated that 83 per cent of the normal shop forces of the western roads were at work on that day. It was also reported that the western lines were handling an exceptionally heavy traffic.

The use of dynamite and bombs continued to a small extent during the last week, reports being made of the bombing of homes of three Louisville & Nashville employees at Birmingham, Ala., and a Wabash employee at St. Louis and the bombing of a Chicago & Alton tank car at Bloomington, Ill., and a Louisville & Nashville freight car at Albany, Ala. Riots, slugging and similar outbreaks were comparatively few, the press reporting trouble of this character at Chicago and Burlington, Ia., where the homes of loyal employees were attacked. Local police officers at Needles, Cal., where there has been more or less disorder since the strike began, requested the proclamation of martial law and the sending of troops to that point as the result of the sheriff's statement that he could not supply sufficient men to give protection to railroad employees who are now working.

There have been numerous instances during the past week where strikers or their sympathizers have been fined and sentenced to prison terms on the charge of violating injunctions issued to the carriers prohibiting interference with railroad operation. At Peoria, for instance, fines totalling $3,700 and various prison sentences were given to strikers who were convicted of violating injunctions issued to the railroads and similarly three former Chicago & Alton employees at Slater, Mo., were convicted on similar charges.

Strike Settled on Four Roads in East and South

The strike of the shopmen has been settled on the Seaboard Air Line, the Baltimore & Ohio, the Southern and the New York Central under the terms of the "Willard-Jewell" agreement. Settlement on the New York Central did not come until Tuesday, after preliminary negotiations had failed and until B. M. Jewell had been called from Chicago to reopen negotiations. Earlier conferences failed to reach an agreement, it was said, because of the attempted interjection by the unions' representatives of terms not outlined in the announced plan of settlement.

Settlement on the Southern

A conference between Vice-President Miller of the Southern Railway and the general chairmen of the six striking shop crafts held on September 16 adjourned without reaching an agreement for immediate termination of the strike but at another meeting on Monday agreements were signed both for the Southern and the Mobile & Ohio, on the basis of the Chicago agreement. The Southern was willing to settle on the basis of the Chicago agreement and presented this to the shop craft chairmen for their signature, but they at first declined to sign and were insisting on the dismissal of the new men employed during the strike.

Lehigh Valley Will Not Meet Representatives of Strikers

The Lehigh Valley has announced that it will not enter into negotiations with representatives of strikers and that present employees are now forming an association with which the company will co-operate in every way. The statement of President E. E. Loomis follows in part:

"Lehigh Valley is not a party to any agreement which may have been made in Chicago. The pledges we have made to our employees who continued working after the strike was called, as well as to the new men who have entered our service since that time, to say nothing of our policies to our supervisory offices, make it out of the question for us to accept any such plan as is proposed.

"The Lehigh Valley employees are now forming an association of their own, started of their own initiative, and we have promised to co-operate with them in every way. I do not see how a railroad can be expected to retain or build up a loyal organization on any other basis."

According to Mr. Loomis, the new organization will be known as the Association of Maintenance of Equipment Employees of the Lehigh Valley Railroad.

L. F. Loree, president of the Delaware & Hudson, reiterated on Wednesday his previously announced intention to refuse to confer with Mr. Jewell or his associates.

Violence in East and South

Dynamite outrages figured in the news dispatches during the past week from Albany, Ga., Jacksonville, Fla., and Cumberland, Md. At Cumberland, the Welton Tunnel bridge of the Western Maryland, over the Potomac river, was damaged about $500 at 4 o'clock in the morning of September 16. At Jacksonville on the 17th, a man was arrested charged with having attempted to destroy a trestle of

the Atlantic Coast Line at Baldwin, Fla. On the same day another man was arrested for having aided in the escape of men who had been engaged in another bridge outrage. In this connection, eight men are now in custody at Jacksonville. At Albany a car in a freight train was blown up at 10 o'clock in the evening of September 13. Frank Parkhouse, a police officer of the Delaware, Lackawanna & Western, died at Elmira, N. Y., on September 15 from pistol wounds; and a colored man, James Whitfield, a machinist, employed by the road, is held on a charge of murder. The report says that Whitfield stole whisky from a car.

Roads Sign Wage Contracts With Train and Engine Employees

Contracts covering wages and working conditions of train and engine service employees have been entered into by a number of Eastern roads. These contracts, in general, extend present wages and working conditions until September, 1923. Among the roads which have entered into these agreements with all or some of the classes mentioned above are the New York Central, the Pennsylvania and the Lehigh Valley. Conferences with representatives of the transportation brotherhoods and managements of a number of other roads are expected shortly. Settlements and negotiations looking toward settlements have been reported also from the West and South.

New York Central Contemplates Premiums for Freight Train Employees

In addition to entering into a wage contract with its trainmen and conductors, the New York Central has announced that it is studying a plan whereby premiums will be paid to these employees in freight service for prompt movement of freight trains. The statement given out by the company follows:

A. H. Smith, president of the New York Central Lines, in direct conference with representatives of conductors and trainmen of the entire system, has concluded an amicable agreement whereby all matters of controversy now pending before the United States Railroad Labor Board will be immediately withdrawn. The settlement arrived at will remain in effect until Sept. 30, 1923.

Under the terms of the agreement a joint committee representing the employees and the management will be appointed to consider the question of compensating employees in the freight train service on a basis of paying premiums for prompt movement over the roads, as against slow movement, which results in the imposition of costs in the form of penalty overtime.

This proposal is an innovation in railroad operation and it looks toward economy and increased efficiency in freight movement from which notably good results are expected mutually for the managements and employees.

This direct settlement between the New York Central management and the employees marks the return to the former successful practice of adjusting difference in personal negotiations across the conference table.

It is anticipated that further direct negotiations will result in a similar agreement with the engineers, firemen and switchmen.

It has been in a spirit of keen realization of the existing extraordinary conditions in this country that the New York Central Lines management has directed its efforts in this settlement and is now approaching also a settlement of the shopmen's controversy. The country is entering a period of business revival and the stoppage of coal mining for five months requires that this vast tonnage be moved in an unprecedented short time. The farmer has large crops to sell and it is of prime importance that they be prompt in reaching the markets.

W. G. Lee, president of the Brotherhood of Railroad Trainmen, in commenting upon the wage agreement with the New York Central, said:

In July, 1920, a wage increase was granted the conductors, engineers, firemen and trainmen of $1.04 a day. On July 1, 1921, the Railroad Labor Board reduced this increase 80 cents. At that time the carriers applied to the board for a further reduction, which would take away from the men the remaining 24 cents. This matter has never been heard by the board.

The action taken by the New York Central and the Pennsylvania today under the terms of the agreement means that they will at once withdraw this application from consideration by the Labor Board. As we are about to conclude similar agreements with all the roads of the country, the matter of a further wage cut will be entirely removed from action by this board. On the other hand we had a number of applications and requests before the board relative to working conditions and rules that were counter proposals to the wage cut request. These will be withdrawn. The letter withdrawing them is being written now.

Mr. Lee made another statement also to the effect that the railroads and unions were going back to the method of settling their differences by direct negotiation, rather than by interference from outside agencies. This statement was widely interpreted to signify that by direct negotiations for wage contracts the employees and the railroads were "ignoring" the Labor Board. The fact is that the Transportation Act provides for appeal to the Labor Board only when disagreements arise which cannot be settled by the parties thereto. The successful outcome of the negotiations between the train service unions and the railroads is in entire accord with the letter and obvious intent of the Transportation Act.

Photos Kadel and Herbert

Interior Views of a French Railway Instruction Car, With Models Which Can Be Raised to Increase Seating Capacity

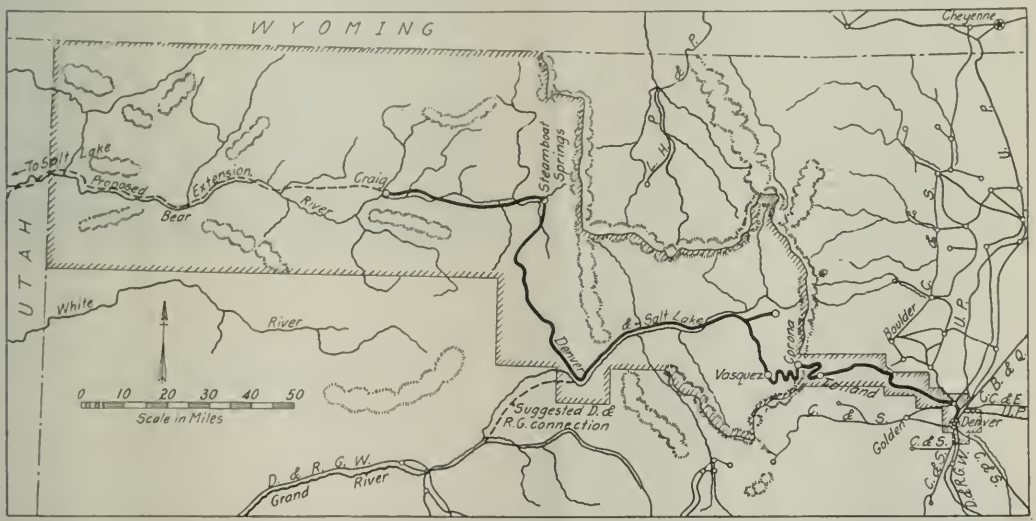
Colorado Prepares New Plans for Moffat Tunnel

Creation of an "Improvement District" to Underwrite Bond Issue Now Being Tested in Courts

ANOTHER CHAPTER is now being written in the story of the long projected Moffat tunnel in Colorado, this time through the novel procedure of enacting legislation for the creation of an "Improvement District" embracing that part of the state assumed to be benefited by the improved means of communication to be afforded by the construction of this tunnel. A commission has been appointed, as provided in the statute, and a test case is now being carried through the Colorado courts for the purpose of determining the constitutionality of the law as a preliminary to the marketing of bonds.

The project to build this tunnel had its inception in the construction of the Denver, Northwestern & Pacific under the leadership of D. G. Moffat with a view to affording rail transportation to the northwestern portion of Colorado and the eventual extension of the line to Salt Lake City. The line was chartered in 1902 and completed as far as Craig, Colo., in 1909. The chief obstacle in the construction of this line and what subsequently militated against its successful operation is the crossing of the continental divide about 65 miles west of Denver. A study of the physical conditions at the time of original location pointed to the need of a long tunnel at an elevation of about 9,100 ft. above sea level, but lack of funds led to the postponement of this feature of the project and the substitution of what was then considered a temporary line across the divide, having the summit at Corona at an elevation of about 11,500 ft., a length 23 miles greater than that of the tunnel line, four per cent grades and extremely heavy curvature. The physical characteristics of this summit location, coupled with adverse weather conditions, characterized by heavy snow storms at almost any season of the year, have made the operation of the line extremely difficult and as a consequence the property has never enjoyed earnings that enabled it to command sufficient credit for the construction of the tunnel. Moreover, it has been conceded that without an improvement of the line which can only be made in this way, its extension to Salt Lake City is commercially impractical.

Extensive surveys have been made from time to time to determine the best location for the tunnel to relieve the adverse operating conditions of the railroad via the temporary line over the Corona summit, and have resulted in the location of a bore 6.4 miles long, with its eastern portal on the South Boulder watershed near Newcomb, Colo., and with its west portal on the Fraser river watershed two miles from the station of Vasquez, Colo. These surveys have determined the selected tunnel site to be the only one that exists at as low an elevation as 9,100 ft. directly west of Denver and for many miles north or south of the Moffat road.



Outline of the Colorado "Improvement District" in Relation to the Location of the Denver & Salt Lake and Its Proposed Extension

The construction of this tunnel would eliminate all of the four per cent grades and the 16 deg. curves. It would save 2,500 ft. of rise and fall, some 8,000 deg. of curvature, and no portion of the road would be subject to the severe snow conditions.

Because the completion of an effective rail connection between Denver and Salt Lake City would place Denver on a direct transcontinental route and also afford convenient access to a large undeveloped portion of the state of Colorado, the people of the Colorado capital have long taken a special interest in the tunnel project. As a result of this, in 1913 the city voted to issue $3,000,000 in bonds to pay two-thirds of the cost of the tunnel to be constructed by the railroad which had been reorganized at that time as the Denver & Salt Lake. However, the following year this bond issue was declared unconstitutional, making it necessary to search for other means of financing this project. In 1920

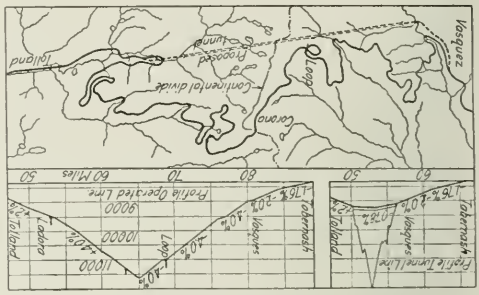
another plan was undertaken whereby the state as a whole was to underwrite the construction of this tunnel; to make the plan attractive to the people of other parts of the state, it included projects for the construction of two other tunnels through the continental divide, but this scheme also proved abortive.

The present plan, which was the result of a law passed in May, 1922, provides for an improvement district modeled after the common form of taxing bodies organized for public improvements, such as irrigation, drainage, sanitation, etc. The justification in this case is stated in Section I of the statute as follows:

"It is hereby declared that to provide for an avenue of communication by means of a transportation tunnel through the continental divide at or near James Peak will reduce the barrier which now separates the western portions of this state from commercial intercourse with the eastern portion thereof, will facilitate communication all seasons of the year, will promote the health, comfort, safety, convenience and welfare of the people of the state of Colorado, and will be of especial benefit to the property within the boundaries of the improvement district hereinafter created."

The boundaries of the district are indicated on the map and include a large portion of the northwestern part of the state, tapering down into a narrow zone on either side of the Denver & Salt Lake, but including all of the city of Denver. Under the law, this district is to be managed by a board of five members to be elected at intervals of two years by "all persons holding real estate within the district who are citizens of the state of Colorado."

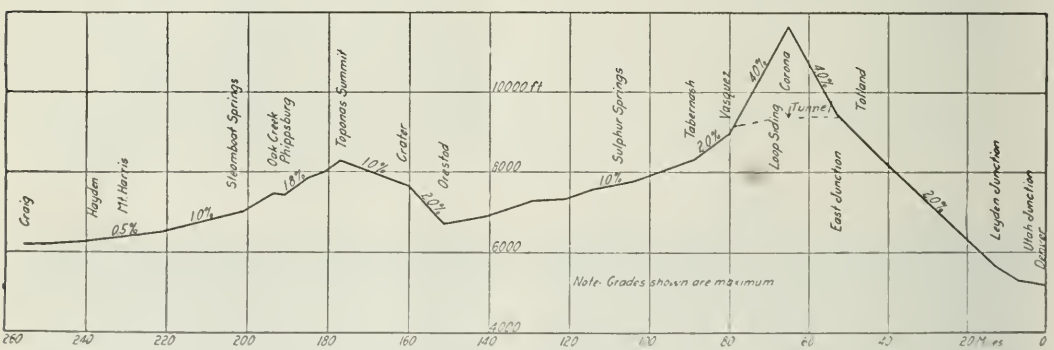
The law also provides specifically that the object of this organization is for the construction of a tunnel substantially in the location determined upon for the Moffat tunnel, but provides for no legal relationship to the Denver & Salt Lake other than to state that the approaches of the tunnel shall for levying assessments against the property in the Improvement District for any deficiencies in the funds available from the tunnel revenues. According to Section 19, the "tunnel, its approaches, equipment and appurtenances shall be owned perpetually by the Moffat Tunnel Improvement District, and shall remain forever a public improvement for public transportation and communication, and after the



Map and Profiles of the Present and Proposed Routes at the Location of the Proposed Tunnel

bonds which may be issued under the provisions of this act are fully paid, it shall then be maintained and operated as provided by law.

The board is also given the necessary power to provide for the employment of engineers, attorneys and other employees required in connection with the construction and operation of the tunnel, including the adoption of electric power, the construction of power plants, etc. W. G. Robinson is president of the Moffat Tunnel Commission and L. D. Blauvelt, former chief engineer of the Denver & Salt Lake, is chief engineer of the commission. Construction plans now under consideration imply no change in the location, grades or alinement of the tunnel from those determined upon when plans were prepared in 1914. It is expected that questions as to the constitutionality of the law will be definitely settled through a Colorado Supreme Court decision some time this fall and that with a favorable conclusion it will be possible to start active construction work in the early part of next spring.



Profile of the Operated Line

be constructed so that they may be used by standard-gage railroads. It also provides for the use of the tunnel for telephone and telegraph lines, for the transmission of water and the transportation of automobiles and other vehicles. The board is authorized to make leases or contracts with persons or corporations desiring to use the tunnel for periods not to exceed 99 years, with the specific proviso that no monopoly for the use of the tunnel or its approaches shall be granted to any one in connection with the granting of any such leases.

The estimated cost of the tunnel is indicated by the fact that the board is authorized to issue bonds to the limit of $6,720,000, bearing interest at the rate of six per cent. Revenues from the use of the tunnel are to be applied against the interest and amortization of the bonds with provision

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THE ERIE has cancelled its contract with the Hornell Machinery Company which has been operating its shops at Hornell, N. Y., and at one or two other terminals.

St. Paul Adopts Water Treatment on Large Scale

An Installation of Fourteen Plants Results in an Economical Solution of Serious Operating Problem

By C. Herschel Koyl
Engineer Water Service, Chicago, Milwaukee & St. Paul

IN THE COUNTRY between Lake Michigan and the Rocky mountains, the Chicago, Milwaukee & St. Paul has more than 8,000 miles of steam-operated mileage; and because most of this is a country of less than average rainfall, with few streams and fewer lakes, the railroad is confronted with many water problems. The most difficult of these are east of the Missouri river in South Dakota, where the few streams run slowly through lands so rich in the soluble salts of

The Installation at Lennox, S. D., Typical of the Branch Line Plants

calcium and magnesium that the river waters are always hard, and the more the rainfall on adjoining lands and the higher the rivers, the harder the water.

Quality of Water Bad

In that part of the country, because of the scarcity of water at or near the surface, most railroad supplies are derived from drilled wells, which vary in depth from 50 ft. to 1,500 ft. and in which the character of the water varies as widely. In the ground are two layers of sandstone whose horizontal cracks furnish the supply, the water from the lower sandstone being very hard (80 to 90 grains per gallon) and carrying also 20 to 60 grains of sodium sulphate or chloride, while the water from the upper sandstone so closely resembles the lower water after softening that it is presumed to be the same water softened in the ground, that is, by zeolitic action. At distances from 100 to 200 miles east of the Missouri river, the soft water rises to ground level and is used by the railroad, but near the river the water must be pumped from a depth of 300 ft. Since this soft water is both scarce and difficult to pump, we drill to the lower sandstone and get hard water which usually rises to ground level.

The problem confronting the road in this locality was one of getting more of this water (as bad as it is) and of accomplishing something in the way of improving it. To enlarge the supply, sand-proof wells were drilled at Sanborn, Iowa, and at Lennox, Plankinton, Yankton, Scotland, Tyndall and Platte in South Dakota. These wells range from 50 ft. to 900 ft. in depth and were completed last year.

Our experience with these waters for locomotive boilers having been very expensive, in spite of all the boiler compound that could be used, this program of getting more water was supplemented by the establishing of water treating facilities at various points. Fourteen treating plants were installed in all, one each (on the main lines) at Sanborn and Rock Valley, Iowa, and at Canton, Lennox, Marion Junction, Bridgewater, Vermilion, Yankton, Scotland and Ethan, S. D.; and (on branch lines) at Tyndall, Avon and Platte, S. D. Treating plants having been installed previously at Sioux City, Iowa, and at Mitchell and Elk Point, S. D., this gave a total of 17 treating plants on the district, with a plant at every water station on the treated water district including about 400 miles of lines.

The Plants Are of Two Kinds

The new plants are continuous in operation and are of two types of construction. All of the main line plants with the exception of those at Lennox and Bridgewater are designed to treat 15,000 gal. of water per hour continuously and consist each of a hard water pump; a 40-minute reaction tank within which the mixture of hard water and the necessary chemicals (all fed in continuous streams) is slowly

An Exterior View of the Plant at Scotland, S. D.

stirred by mechanical means; a three-hour settling tank; a treated water pump which delivers to the track tank; and a chemical storage room; all strongly housed and heated.

The plant at Scotland, S. D., illustrated in the drawings, is typical of the main line plants. Everything is of wood except the machinery and pipe. The drilled well, 12-in. by 168-ft., under the pump room furnishes water to a double-stroke deep-well pump which delivers it through a six-inch pipe to the water wheel which does the stirring. The water, after passing the wheel, flows to the bottom of the mixing tank where, as it rises, it meets in succession the continuous streams of milk-of-lime, sodium carbonate and ferrous sulphate solutions.

Hydrated lime is used in water treating to extract the carbonic acid, which brings about the precipitation of the scale-making limestone carbonates down to three grains per gallon or less. Sodium carbonate (soda ash) is used to re-

place completely the scale-making limestone sulphates by non-scaling sodium sulphate. Ferrous sulphate (green sulphate of iron) is used for the treatment of the last three grains of calcium carbonate so that it will not clog the injector or branch-pipe; this, by converting half of the calcium carbonate into calcium sulphate.

In these plants, these reagents are all fed by regulated streams of water from the pipe which supplies the water wheel. The milk-of-lime box, holding 480 gal. of water, carries in suspension in each case enough hydrated lime for a five-hour's supply (at Scotland 400 lb.) and this is fed continuously by a small stream of water entering at the bottom of the lime box and overflowing near the top through a two-inch pipe to near the bottom of the mixing tank. The drawing shows a lime pump at the top of the lime box, but it is there only for emergencies.

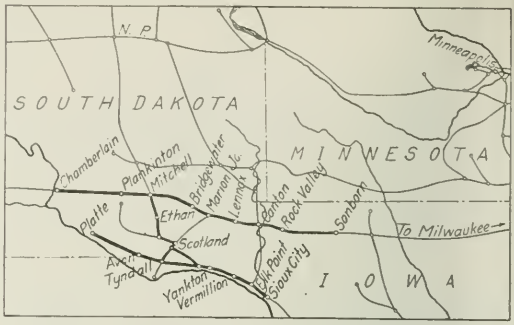
Once every hour, an hour's supply of dry hydrated lime is added to the supply in the box. This method produces an hourly variation in the rate of lime feeding, but the stirring in the mixing tank is so thorough and so prolonged (45 min.) that only a slight variation is found in the water as it overflows from the top of the mixing tank to the bottom of the settling tank.

The dry soda ash rests on a shelf in the soda box and is fed to the mixing tank by a spray. The supply on the shelf is replenished hourly. The sulphate of iron is fed in solution from its box by a small stream which enters at the bottom and overflows near the top.

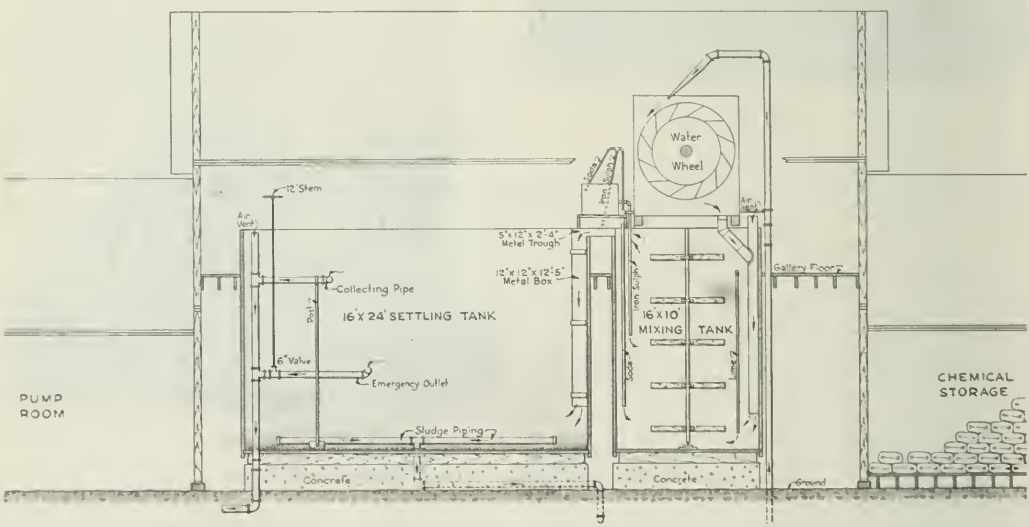
The best method of feeding any reagent to a treating plant is determined principally by its solubility in water and in all cases the thinner the solution or mixture the better. The arrangement of feeding devices described above is not theoretically perfect, but has been adopted as the result of experience in handling railroad plants which are frequently miles from a repair shop and are seldom operated by skilled mechanics. The uniformity of results is the best proof of the wisdom of the design and method.

The water, with its chemical reactions practically complete and its precipitate ready to settle, arrives at the bottom of the settling tank and there commences to leave its precipitate as the water slowly rises to overflow through the perforated collecting pipe to the treated water pump in the pump room, whence it is sent to the track tank. The two pumps in the pump room are operated by a 10-hp. oil engine, each pump having a clutch on the engine shaft.

The settling tank is freed of its accumulated sludge once daily by opening for 30 seconds the valves controlling the system of perforated sludge pipes lying in the bottom of the settling tank. The perforations are in the bottom of the sludge pipes, and the branch pipes are connected to the main pipes by street-ells so that they are close to the floor. The pump room and working rooms are heated by hot water pipes along the walls. The chemical storage room is of $2^1/_2$ cars capacity.



Where the Water Treating Plants Were Installed



A Sectional View of the Plant at Scotland, S. D., Showing Arrangement of Piping and Tanks

Roadside Tanks Converted into Treating Plants

The plants at Lennox, Bridgewater, Avon, Tyndall, and Platte differ from the other plants in that, being smaller stations, the existing roadside tanks are utilized as settling tanks as well as storage spaces for water to be drawn off by locomotives. One of the illustrations gives an exterior view of one of these plants. In the plant the mixing tank is built inside the roadside tank and a small engine is installed below the tank to furnish the power to operate three small

pumps which discharge the chemicals each from a separate vat, into the untreated water. This engine also furnishes power to drive the agitator in the mixing tank. Under this arrangement the untreated water enters at the bottom of the mixing tank where it receives the chemicals and is stirred continuously as it rises to the top, flowing thence through an over-flow pipe to the bottom of the settling compartment. Water for filling locomotive tanks is then obtained from the top of the settling space by a pipe, the receiving end of which is buoyed up by a float. The housing around the base of the tank is equipped with a stove for heating purposes and is made large enough to store the requisite supply of chemicals.

Plants Do Effective Work

At Scotland the well water has the general character of all the waters derived from that layer of hard-water sandstone (the upper layer of soft-water sandstone having run out a few miles away). Our laboratory analysis shows its dissolved mineral content as follows:

Calcium Sulphate	64.9	grains	per gallon
Magnesium Carbonate	10.0	"	" "
Magnesium Sulphate	11.8	"	" "
INCRUSTING SOLIDS	95.7	"	" "
Alkali Sulphate	9.7	"	" "
Alkali Chloride	2.6	"	" "
NON-INCRUSTING SOLIDS	12.3	"	" "
TOTAL, DISSOLVED SOLIDS	108.0	"	" "

The treated water analysis follows, it being understood that there are daily variations up to one grain per gallon due to lack of uniformity in the rate of pumping water or feeding chemicals:

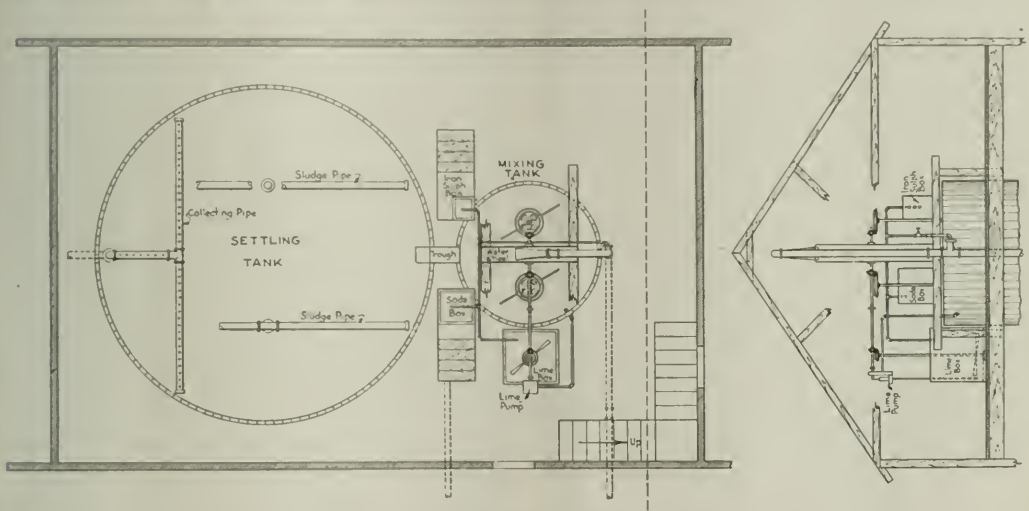
Calcium Carbonate	3.3	grains	per gallon
Sodium Hydroxide	0.8	"	" "
Alkali Sulphate	92.0	"	" "
Alkali Chloride	2.6	"	" "

Mechanical Mixing and Up-Flow Important Features

The chemistry of water softening is simple in both theory and practice when working on a small scale and with a filter, but when working on a large scale, where the resulting water must be settled instead of filtered, certain precautions are necessary. Experience shows that slow and continuous mixing of the hard water with the chemicals for a period varying from 25 min. to 50 min., according to the temperature and cleanness of the water, is necessary to complete chemical action; and experience shows also that unless the softening plant is to be encumbered with filters (a very serious drawback to a railroad plant) other special precautions must be taken to insure the perfection of settling.

In the plants built last year on the Chicago, Milwaukee & St. Paul, the advantage of the 40-min. mixing tank with its continuous but slow stirring is that the precipitate is all formed and ready to settle when the water enters the settling tank, and there is none left to form just below the top of the settling tank when it is too late to settle. Another feature of construction insures a character of precipitate which settles easily. When the chemicals first meet the water the rapidity of chemical action is so great that the particles of precipitate formed are very large and tend to settle quickly; but when the chemical work is nearly done and the few remaining molecules of carbon dioxide meet the few remaining molecules of calcium oxide, the particles of precipitate formed are so small that millions of them make only a bluish cloud which will float for hours and is the bane of water intended for boilers, because precipitate suspended in the water of the boiler is the cause of the foaming attributed to many treated waters.

These small particles, at the moment of coming out of solution (commonly called the nascent state), have great adhesive power and will attach themselves to any solid matter within adhesion distance. In the old way of feeding with a reaction tank at the top so that the flow was downward, the heavy precipitate had gone ahead and there was nothing for these last and very small particles to attach themselves to; but in the plants referred to, the hard water and the chemicals are introduced at the bottom of the reaction tank and flow upward, so that (since the precipitate lags behind the water) the reaction tank soon becomes and remains charged with a mass of precipitate to the full sustaining power of the upward flowing current, and these infinitesimal particles attach themselves to the older and larger particles as fast as they are born. The result is that the water flowing from the top of the reaction tank to the bottom



Plan Drawing of the Treating Facilities and Sectional View of Mixing Floor

of the settling tank carries only comparatively few and large particles which settle rapidly and leave the water free from haze.

The Plants Have Already Paid for Themselves

The treating plants were built by company forces at an expenditure of approximately $18,000 for each of the larger plants and $7,000 for the smaller ones. Since their installation (the last plant built being the one at Scotland, S. D., which was set in operation on January, 1922), our boilers have been free from scale and from leaking, and almost free from foaming. I know that there has been some foaming because sometimes one of those little rivers will change the character of its water 10 grains per gallon over night (from a rainstorm perhaps a hundred miles away, perhaps a week before) and sometimes something may go wrong in the plant and the water be under-treated, but when the treatment is correct there is little foaming.

Of course, we save in boiler repairs and coal, and we have a much superior service. As mentioned, the last plant has been in operation less than a year and the accounts are not yet made up, but the plants have paid for themselves (and will do so every year) in items of saving that can easily be calculated in dollars. Boiler repairs on the district are now almost nothing and during the entire strike period no boiler troubles attributable to water were reported on this district. Of interest in this connection, also, the statement was made at a recent meeting of master mechanics on the road that while previous to the installation of these plants, the boilers were always leaking, cases of buckled side sheets were frequent and three or four boiler failures occurred on the district every week, no leaking has been reported since the installation of the plants, no cases of buckled side sheets have arisen nor any boiler failures, and during the winter season not one engine was sent into the shop for heavy repairs, although it had been a customary practice before to send all power into the shop for this purpose annually.

We have much bad water on other divisions where traffic is more dense than on these, and it is true that the damage to a railroad from a bad water increases with the number of locomotives which use it, but the waters about Mitchell were so very bad and the difficulty of railroading so great that it was decided to utilize our 1920 money in that district.

I. C. C. Issues New Service Orders

WASHINGTON, D. C.

THE Interstate Commerce Commission on September 19 issued its Service Order No. 25, applicable eastward from the west bank of the Mississippi river, which cancels and supersedes Service Order No. 23, effective at midnight September 20, 1922.

By reason of certain embargoes issued by carriers, the commission says, complaints have been made that various commodities, which in the public interest should be handled currently and promptly, have not been so handled. In addition to the commodities specified under Service Order No. 23, this order adds mine supplies, medicines, fertilizers, seeds, news print paper and petroleum and its products in tank cars to the list of commodities to be given preference and priority in movement, when carriers are currently unable promptly to transport all freight traffic offered to them for movement. The words "fuel oil" as used in Service Order No. 23 are changed to read "other fuels."

Service Order No. 23 directed all carriers to discontinue the use of open-top cars suitable for the transportation of coal for the transportation of commodities other than coal, so long as any coal mine remained to be served with such cars. There are extensive road-building projects with uncompleted gaps, which, in the public interest, should be completed before cold weather sets in, and for which appropriations have been made by the States and by the Federal Government. There are large building programs under way which must be completed without undue delay to avoid serious loss. Service Order No. 25, therefore, permits the use of open-top cars suitable for the loading and transportation of coal, after the discharge of the coal lading, for the transportation of road and building construction materials, ore, mine supplies for current operation and fluxing stone for furnaces, when the destination of such commodities is in direction of, but not beyond the mine or mines to which such open-top cars are destined for coal-loading, and when such use will not materially delay or minimize the production and transportation of coal. Carriers are directed to place an embargo against the further placement of open-top cars for loading with such commodities for any shipper who shall fail or refuse to load the open-top cars within 24 hours after placement for such loading and are directed to place an embargo against any consignee who shall fail or refuse to unload such cars within 24 hours after placement.

The order further cancels the priority afforded consumers which was embraced in Class 2 in Paragraph 7 of Service Order No. 23. "The production of bituminous coal has increased to approximately nine and one-half million tons per week, and should," the commission's notice to the public says, "with reasonable use, take care of current needs, if panic, undue storage and waste of fuel and equipment are carefully avoided. The commission, therefore, feels that it can now relax its previous order by omitting general priorities by classes of consumers, reserving, however, the right in special cases of great emergency to direct carriers to furnish any coal mine with such open-top cars as may, in the public interest from time to time, be designated by it or its agent therefor. By virtue of the general priority which is given both to movement and use of open-top cars for coal, the effect of the change now made is to advance all coal into the priority class, instead of only those classes of consumers formerly embraced in the priority designations. While it was necessary during the period of extremely limited production to give priority in use to certain highly essential classes, this necessarily involved deferring others. Under existing circumstances, it is believed that the course now taken will tend to a considerable improvement in the production of coal by facilitating its movement and general distribution. It will be necessary, however, to avoid a return to priority classifications, for continued efforts looking to the avoidance of overstocking, of delay to equipment, and to the curtailment of demand to meet bare daily necessities until the reserve of coal in circulation can once more be built up."

This cancellation of the classified list of preferred consumers was recommended at the conference of railroad and business men called by Secretary Hoover and the Chamber of Commerce of the United States last week.

Service Order No. 24, which required carriers west of the Mississippi river to afford priority in movement to certain commodities, and for the return movement of empty cars for such loading, has also been amended to correspond with Service Order No. 25, applicable in Eastern United States. Service Order No. 22, as to routing of freight to avoid congestion, remains in effect.

Service Order No. 25 reads as follows:

It appearing. In the opinion of the commission, that an emergency which requires immediate action exists upon the lines of each and all the common carriers by railroad subject to the Interstate Commerce Act, east of the Mississippi river, including the west bank crossings thereof, and because of the inability of said common carriers properly and completely to serve the public in the transportation of essential commodities. *It is ordered and directed,* that effective September 21, 1922, and until the further order of the commission:

1. That each such common carrier by railroad, to the extent that it is currently unable promptly to transport all freight traffic offered to it for movement, or to be moved over its line or lines of railway shall give preference and priority to the movement of each of the following commodities: Food for human consumption, feed for live stock, live stock, perishable products, mine supplies, medicines, fertilizers, seeds, news print paper,

coal, coke and other fuel, and petroleum and its products in tank cars.

2. That to the extent any such common carrier by railroad is unable under the existing interchange and car service rules, to return cars to its connections promptly, it shall give preference and priority in the movement, exchange, interchange and return of empty cars intended to be used for the transportation of the commodities specially designed in paragraph numbered 1 hereof.

3. That any and all such common carriers by railroad which serve coal mines whether located upon the line or lines of any such railroad or customarily dependent upon it for car supply, herein termed coal-loading carriers, be, and they are hereby, authorized and directed whenever unable to supply all uses in full, to furnish such coal mines with open-top cars suitable for the loading and transportation of coal, in preference to any other use, supply, or distribution of such cars; provided, that the phrase "open-top cars suitable for the loading and transportation of coal" as used in this order shall not include or embrace flat (fixed) bottom gondola cars with sides 42 inches or less in height, inside measurement, or cars equipped with racks, or cars which, on July 1, 1923, had been definitely retired from service for the transportation of coal and stenciled or tagged for other service.

4. That all such common carriers by railroad other than coal-loading carriers, herein termed non-coal-loading carriers, be, and they are hereby, authorized and directed to deliver daily to a connecting coal-loading carrier or carriers, or to an intermediate non-coal-loading carrier for delivery through the usual channels to a coal-loading carrier, or carriers, empty coal cars up to the maximum ability of each such non-coal-loading carrier to make such deliveries and of each such connecting coal-loading carrier to receive and use the coal cars so delivered for the preferential purposes herein set forth.

5. That all such common carriers by railroad be, and they are hereby, authorized and directed to discontinue the use of open-top cars suitable for the loading and transportation of coal, for the transportation of commodities other than coal, so long as any coal mine remains to be served by it with such cars; and as to each non-coal-loading carrier, so long as deliveries of any such cars to connecting carriers may be due or remain to be performed under the terms of this order; provided, that such open-top cars suitable for the loading and transportation of coal, after the discharge of the coal lading thereof, may be used for the transportation of road and building construction materials, ore, mine supplies for current operation and fluxing stone for furnaces when the destination of such materials is in the direction of the mine or mines to which such open-top cars are destined for coal loading, and when such use will not materially delay or minimize the production and transportation of coal; provided, further that an embargo be placed against the further placement of open-top cars for loading with such commodities for any shipper who shall fail or refuse to load the open-top cars within 24 hours after placement for such loading thereof.

6. That all such common carriers by railroad be, and they are hereby, authorized and directed, to place an embargo against the receipt of coal or other freight transported in open-top cars suitable for coal loading, by any consignee, and against the placement of such open-top cars for consignment to any consignee, who shall fail or refuse to unload such coal or other freight so transported in coal cars and placed for unloading, within 24 hours after such placement, until all coal or other freight so transported in coal cars and so placed has been unloaded by such consignee and shall notify the commission of such action. This authorization and direction as to embargoes shall not interfere with the movement of coal to tidewater or the Great Lakes for transshipment by water, nor shall it apply where the failure of the consignee to unload is due directly to errors or disabilities of the railroad in delivering cars.

7. That in the supply of cars to mines upon the lines of any coal-loading carrier, such carrier is hereby authorized and directed, to place, furnish, and assign such coal mines with open-top cars suitable for the loading and transportation of coal for such special purposes as may from time to time be specially designated by the commission or its agent therefor by special priority direction in writing, in preference and priority to any other use; provided, that the open-top cars so placed, furnished, and assigned, shall after loading be transported for the special purposes designated, and shall not be subject to reconsignment or diversion except by and with the approval of the commission.

For the more prompt and effectual administration during the present emergency of the authorizations, directions and requirements of this paragraph No. 7, the following persons are designated and appointed as agents of the commission, with authority to give directions as to car service and to the matters referred to in paragraphs (15 and 16) of section 1 of the Interstate Commerce Act, and referred to in paragraph No. 7, viz: John C. Roth, director, E. H. DeGroot, Jr., assistant director, Frank C. Smith, chief inspector, and B. S. Robertson, service agent, of the Bureau of Service of the commission, and the directions so given by them shall be regarded as directions of the commission.

8. That all rules, regulations and practices of said common carriers by railroad with respect to car service as that term is defined in said act are hereby suspended so far as they conflict with the direction hereby made.

9. That Service Order No. 23, as amended, be, and the same is hereby, suspended and superseded, effective at midnight September 20, 1922.

10. That copies of this order be served upon the carriers hereinbefore described, and that notice of this order be given to the general public by depositing a copy hereof in the office of the secretary of the commission at Washington, D. C.

By the commission, division 5.

Inquiry Into Erie's Embargo of California Perishables

An inquiry into the embargoes issued last week by the Erie and other anthracite-carrying railroads against the receipt from their connections of certain classes of perishable freight in order that they might give preference to anthracite coal, although food stuffs are also given priority in the Interstate Commerce Commission's service orders, was instituted by Division 5 of the commission at a conference in Washington on September 14. The representatives of the railroads were asked to give an explanation for their action in issuing the embargoes and what the commissioners apparently considered a substitution of the judgment of the railroad for its judgment as expressed in the service orders.

H. A. Taylor, general solicitor, and A. E. Ruffer, transportation manager, of the Erie, explained that the condition of their motive power was such that the Erie was moving only about 75 per cent of a normal traffic and that a large part of the freight shipments which had been embargoed consisted of wine grapes from California which had been shipped in such a condition as to indicate that they were intended to be crushed into grape juice and serve as a substitute for the product of California which formerly was transported in tank cars. Mr. Taylor said that the shipments of grapes have greatly increased and constitute 42 per cent of the fruit and vegetable traffic handled by the Erie. He brought out these facts to show that the embargo was not intended to hold back essential food products, to which the priority order was presumably intended to appiy, and in reply to a question as to what changes the railroad would recommend in the commission's service order, Mr. Taylor suggested that this class of grapes be excluded from the list of perishable freight.

W. E. Jenney, vice-president and general counsel of the Delaware, Lackawanna & Western, said that that road had issued its embargoes to prevent the diversion of fruits, vegetables and live stock to its rails for delivery at New York, because it had no facilities for handling those classes of traffic. Reference was also made to a conference between representatives of the Erie and the Pennsylvania, which was expected to result in the Pennsylvania taking some of the fruit traffic the Erie could not handle. Representatives of the fruit and vegetable shippers who attended the conference were vigorous in their protests against the embargoes. C. M. Shaeffer, chief of transportation of the Pennsylvania, expressed the personal view that to rescind the commission's Service Order No. 23 would do much toward helping the railroads handle their traffic as the observance of priority regulations tends to cause delay.

Erie Removes Embargo

Following the inquiry, the Erie removed its embargo against shipments from California. It retains, however, its embargo against diversions of traffic from other lines—which embargo is similar to that of a number of Eastern roads.

Anthracite Production Increases

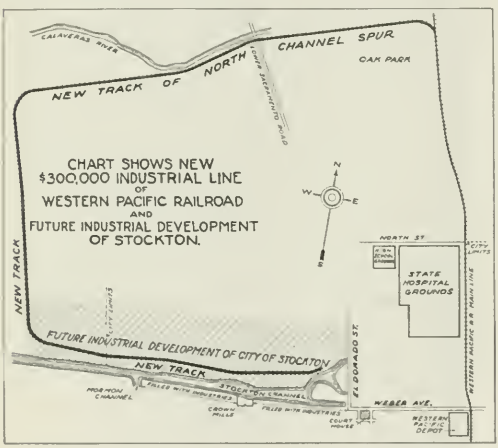
Although more than a week has elapsed since the resumption of anthracite mining, production has not gained full headway as yet. The Lackawanna loaded 713 cars on September 19, but it is hoped that this figure can in a short time be brought up to 1,000 cars a day. On the same day the Lehigh Valley handled 41,248 tons—a total which exceeded that of last year, but the road hopes to increase this loading materially. Loadings of other anthracite carriers show considerable increases during the week, but on none of them has production apparently reached its maximum. The attainment of maximum production in the anthracite fields is watched with interest, because probably not until it is achieved will the traffic on Eastern roads reach its peak.

CATTLE SHIPMENTS from Alberta to the United States are reported as unusually heavy because of the desire to avoid paying the prospective high duties of the United States tariff. During August nearly 10,000 head were shipped from Calgary alone, whereas during July, August and September of last year only 1,136 head were shipped.

Western Pacific Plans New Industrial Section

ACTIVE CONSTRUCTION operations have been begun by the Western Pacific in the development of what is expected to become the leading industrial section of Stockton, Cal. The company has secured all necessary rights and franchises and has complied with all legal requirements for the construction of over six miles of industrial trackage in and adjoining that city. Contracts have been let to the Utah Construction Company, nearly all of the right of way has been bought, and before the seasonal rains of the winter months have set in, the company hopes to have the initial trackage of about six miles, laid and ready for ballasting.

The Western Pacific, in starting this improvement, secures access to the north side of Stockton channel with its navigable water, for a distance of about 10,000 ft. It also gains access to several square miles of level land admirably located for industries. With one operation the Western Pacific is placed in a position to create a great manufactur-



ing district and a freight terminal adequate for a city several times the present size of Stockton.

The heart of the retail section of Stockton is embraced in the district shown on the accompanying chart between the Western Pacific station and the Court House. Stockton is famous on the Pacific Coast for its manufacturing industries. Three large tractor manufacturing companies are located there. It also has a well developed flour milling business, many clay working concerns, glass and paper industries, and others of varying nature. It is served by the Western Pacific, the Southern Pacific and the Santa Fe and by three interurban electric lines.

Its water front activities, at present, are along the south side of Stockton channel, and to a less extent along Mormon channel, the point of intersection of which with Stockton channel is shown on the map. All three of the steam lines have access to the south side of the channel to a greater or less degree. The north side of the channel, to which the Western Pacific gains access, is to all intents and purposes not now in use.

The Western Pacific calls this new project the North channel spur. As planned by Col. J. W. Williams, chief engineer, and Thomas L. Phillips, construction engineer, the new track leaves the main line over two miles north of the present passenger station. The track goes westerly for more than two miles, then turns almost due south for something less than two miles, and then turns almost directly east for, as stated, about 10,000 feet. On this final portion of the spur, the tracks will be laid from 100 to 200 feet from the water line, enabling connection to be made with water facilities wherever desired.

In planning this spur, or industrial track, the Western Pacific followed in principle the theory which was adopted when the road built its belt line around the city of San Jose, Cal. The San Jose belt line comes into that city along its eastern side, then turns around the southern side, and then turns along the western side of the city, the total length being nearly six miles. The North channel spur does not enclose Stockton on three sides, but it does enclose or reach several square miles of virgin territory, and gives the Western Pacific access to a valuable piece of undeveloped water front property.

Coal Production

WASHINGTON, D. C.

THE TOTAL production of all coal, anthracite and bituminous, in the week ended September 16 was estimated by the Geological Survey on Saturday at 10,200,000 to 10,500,000 tons.

Final returns on soft coal production in the week ended September 9 show 8,756,000 tons which, although less in the aggregate than for the week before, was at a higher daily rate, the holiday (Labor Day) considered. For the week of September 11-16 the output of bituminous coal is not expected to exceed 9,500,000 tons. Over the three weeks' period following general resumption of mining under the Cleveland agreement production has been at a rate less than 9,500,000 tons a week.

Mining of anthracite under the Philadelphia agreement began on Monday, September 11, and gained headway rapidly during the week. Production was between 900,000 and 950,000 net tons.

The following statement of cars of bituminous coal loaded shows the trend of output, day by day. Loadings on Monday, September 11, were 35,808 cars, a larger number than reported for any day since March, and gave promise of large production during the week, but the decline which has usually developed during the week was more marked than in preceding weeks. On Tuesday, loadings dropped to 30,786 cars and on Thursday were down to 26,923 cars. These figures indicate a total output for the week of between 9,300,000 and 9,700,000 tons.

	1st week	19th week	20th week	21st week	22nd week	23rd week	24th week
Monday	11,445	16,229	15,703	18,601	30,662	9,753	35,808
Tuesday	11,019	13,729	13,032	17,801	28,197	33,645	30,786
Wednesday	11,437	13,368	12,531	18,524	28,641	31,044	28,565
Thursday	11,090	13,277	13,521	19,388	28,687	28,274	26,923
Friday	11,296	13,539	13,718	22,882	27,040	28,477	.....
Saturday	8,888	11,009	13,524	23,070	25,517	27,476	.....

"Transportation is the dominant and limiting factor in soft coal supply," says the Geological Survey bulletin. "Restricted by transportation difficulties the rate of soft coal production is seemingly fixed temporarily at 1,600,000 tons a day, or 9,600,000 tons a week—this in spite of a strong market and prices sustained at high levels not only by demand for current consumption but also by the need for rebuilding ordinary reserves and by extraordinary call for household sizes."

Total production of bituminous coal for the calendar year to September 9 was 241,676,000 tons, as compared with 269,836,000 last year.

Loadings of anthracite on Monday, September 11, were 928 cars; on Tuesday they were 1,783 cars; on Wednesday, 3,258 cars, and on Thursday, 4,024 cars. When the mines are in full production loadings average about 6,000 cars

a day. In the last week of the anthracite strike only 1,018 cars were loaded, practically all of which was steam sizes dredged from the rivers. The total output was 55,000 tons, against 1,483,000 in the corresponding week a year ago.

At the close of the 23-week strike the cumulative output since the beginning of the calendar year was 22,255,000 tons, against 64,285,000 tons in 1921. The present year is therefore 42,030,000 tons behind last year.

Stocks of anthracite are very low. The reserve on the Lake Superior docks on September 1 was only 23,833 tons against 120,384 tons on the same date of 1921. Stocks of retail coal merchants in Massachusetts on August 15 were the lowest on record in the last three years and equivalent to but three per cent of the year's requirements.

Soft coal shipments from the mines to Lake Erie ports, under stimulus of priority orders increased 55 per cent during the week ended September 10 over the preceding week. The Ore and Coal Exchange reports a total of 717,226 tons dumped as against 463,242 the week before. Of the total 682,724 tons were cargo coal and 34,502 tons were vessel fuel. The rate of dumpings was 58 per cent greater than that in the corresponding week a year ago, but 21 per cent behind the rate in the corresponding week of 1920. The total quantity of cargo coal forwarded during the present lake season now stands at 6,019,999 tons, but of this 908,251 tons have gone to destinations not ordinarily taking lake coal. The quantity sent to regular lake markets was only 5,111,748 tons as against 10,650,153 tons in 1921 and 12,201,266 tons in 1920.

In the following table coal shipments on September 11, 12 and 13 are compared with the average daily shipments for the weeks ended August 26, September 2, and Sept. 9. The total shipments on Monday, September 11, were the largest recorded for any day since March. General increase was shown for all of the coal-producing districts as compared with shipments during the preceding week. On Tuesday and Wednesday, however, shipments from a majority of the districts declined to levels below those of corresponding days during the preceding week.

In Pennsylvania, shipments have decreased slightly and on Wednesday were at the rate of about 400,000 tons daily. In northern West Virginia, output has decreased notably, principally on account of transportation difficulties. The same condition was shown by Wednesday's shipments in Ohio, Indiana and Illinois.

In the non-union fields of the middle and southern Appalachian regions the coal output continues to be greatly reduced by railroad disabilities. This is strikingly shown by the great drop in mid-week shipments as compared with shipments on Monday which were comparatively large because the Sunday holiday enables the roads to make temporary recovery. In the region immediately west of the Mississippi river there was a small increase in shipments.

In Colorado, shipments last week were larger than during preceding weeks but the large gain on Monday was not maintained on Tuesday and Wednesday. Other western states show similar changes.

Coal Prices and Distribution

Belief that the natural processes of increased supply, provided distribution is facilitated, will bring down the price of bituminous coal, and assure complete supplies to the householders and industry, a definite pledge on the part of commercial interests to aid expediting those natural processes, and determination on the part of the government that advantage shall not be taken of the recent strike in an effort to exact high coal prices from the public were evidenced at the conference on the bituminous coal situation on September 15 at the Department of Commerce. Officials of the United States Chamber of Commerce, the American Railway Association, the National Association of Manufacturers, the National Association of Purchasing Agents, and the public utilities associations met with the Secretary of Commerce, H. Foster Bain of the Department of the Interior, and C. B. Aitchison, of the Interstate Commerce Commission.

It was agreed that the mines had ample capacity, even to the point of surplus, to meet the situation, that the problem was wholly one of transportation, and that the price would ameliorate if transportation could be increased and if consumers would purchase only for their immediate needs.

The conferences voted to organize voluntary campaigns for three major purposes:

1. To induce manufacturers, utility corporations, and buyers generally not to purchase coal beyond their day-to-day needs until the flow of coal becomes more normal.

2. To persuade holders of coal contracts not to call for delivery on those contracts past their day-to-day needs. It was considered that about one-half of the coal in the country is under contract at normal prices and that a relaxation in the demand for this coal to the minimum daily requirements would allow an increase in supply to the general public.

3. To expedite the movement of coal in every way.

The co-operation of the responsible coal operators in these matters will be sought.

The question of priorities in coal movement was discussed at great length, it being the consensus of opinion of the meeting that more mobility would be given to movement with less opportunity for speculation if the priorities to special uses, which have been necessary prior to the reopening of the union mines, should be relaxed and priority parallel with agricultural produce should be given to the movement of all coal without discrimination as to consignees. It was also pretty generally the opinion of the meeting that all reconsignment rights upon coal should be abolished in order to prevent speculation in coal.

DAILY SHIPMENTS OF SOFT COAL FROM PRODUCING DISTRICTS

Net tons, assuming 50 tons to the car, based upon records of cars loaded, as reported by the railroads to the American Railway Association

District	Average wk. ended Aug. 26	Average wk. ended Sept. 2	Average wk. ended Sept. 9	Monday Sept. 11	Tuesday Sept. 12	Wed'sday Sept. 13
Central Pennsyl..	75,958	141,225	129,250	157,400	156,150	153,000
W. Pa., incl. Prce.	39,355	61,292	90,000	115,900	117,900	118,000
Clbrg-Westmore..	39,425	44,225	46,192	55,150	50,150	45,500
Connels. & Somerset-Meyersdale..	58,742	59,750	60,800	67,200	63,030	68,750
S. Fork & Wmd.	8,042	14,842	14,633	18,700	19,250	16,750
Total Pennsyl..	221,492	321,334	340,875	414,350	406,500	402,000
Georges Cr., Up. Poto. & Cumb-Pied.	14,883	15,017	10,700	14,000	10,650	13,000
Fmont & W. Va. Panhandle ...	87,191	100,383	98,034	139,000	125,400	120,650
Coal and Coke...	8,858	6,217	7,092	4,350	5,400	6,650
Kan. & Coal Riv.	18,092	20,750	13,975	31,400	16,350	20,000
Logan	27,225	26,708	27,100	28,600	32,100	24,000
New River (C. & O.N. R. Div.)	19,367	18,642	17,558	21,050	16,800	14,000
Wmd. Gulf (Vir.)	17,383	18,825	14,683	32,150	15,000	14,500
Poca. & Tug Riv.	71,067	67,583	49,408	61,350	59,750	45,100
Kenova-Thacker..	27,400	26,308	22,675	37,950	19,800	7,650
TotalWVa.& Md.	291,466	300,433	261,225	369,850	301,250	265,550
Eastern Kentucky	51,733	51,467	50,875	78,900	37,300	58,000
Western Kentucky	59,258	42,975	32,825	43,900	31,350	28,700
Tennessee	16,800	14,492	13,567	21,600	14,900	8,550
Cinch Val. & S. W. Virginia....	22,475	21,433	21,792	32,800	25,500	18,700
Alabama & Georgia.	50,842	44,166	44,833	62,000	59,050	56,000
Ohio	94,408	115,508	109,350	144,950	124,850	110,000
Indiana-Illinois ..	79,308	330,008	275,208	411,350	337,400	310,000
Michigan	1,475	3,892	3,592	4,800	4,050	5,100
Ia.,Mo.,Kan.,Okla., Ark., & Texas..	19,675	51,508	60,850	81,700	78,700	86,000
Colorado	34,525	29,167	24,375	33,850	30,650	30,000
New Mexico.....	6,034	7,225	9,683	10,950	9,700	9,500
Utah	16,783	16,458	16,150	24,000	17,850	16,400
Mont., Wyo. & N. Dak.	10,584	40,151	39,792	53,700	49,600	43,900
Washington	3,708	3,983	4,200	8,000	7,900	5,400
Total, E. of Miss. River	889,257	1,245,708	1,154,142	1,584,500	1,342,150	1,262,600
Total, W. of Miss. River	91,309	148,492	155,050	212,200	194,400	191,200
Grand total bit. shipped	980,566	1,394,200	1,309,192	1,796,700	1,536,550	1,453,800

General News Department

The Railway Fire Protection Association will hold its annual meeting at Willard Hotel, Washington, D. C., on October 17, 18 and 19.

The Senate on September 19 agreed to strike out of the rivers and harbors appropriation bill provisions for the purchase of the Cape Cod and Dismal Swamp canals.

Persons Going Up in aeroplanes, from New York City, mostly or wholly for amusement or recreation, are said to have numbered, in the week ending on September 16, no less than 574. It is said that a group of 15 persons may now take a flight over the city, lasting 15 minues, for $3.50 each.

The Michigan Central reports that its automobile loadings from Detroit plants this year have far exceeded all past records, a total of 55,045 carloads in the first eight months this year, as against 25,724 in the same period of 1921, an increase of 114 per cent. August, 1922, was the banner month of history, with loadings of 8,557 carloads.

A Fire at New Orleans, La., on September 16, destroyed extensive wharves and warehouses belonging to the Federal Government and used, under lease, by the Louisiana State Dock Board. The fire is said to have started in a carload of bagging, and 40 loaded freight cars were included in the property destroyed. The total loss was estimated at $5,000,000.

The Railroads of Georgia, by a law recently passed in that State, are allowed to issue annual passes to sheriffs and deputy sheriffs, one of each in each county. According to a statement made by a member of the Public Service Commission, it appears that this law is designed to accommodate the sheriffs when they are engaged in transporting criminals.

Pensions Paid by the New York Central to superannuated employees during the current year will amount to $1,083,000 which is nearly double the total amount thus paid in 1916. This total includes the payments of the constituent companies, and the total prior to 1922 amounted to $7,018,486. The number of pensioners on the roll at the beginning of 1921 was 2,771, a number which is about two per cent of the total forces employed.

A Delegation of Canadian railway officers conferred on September 20 with the Interstate Commerce Commission and officials of the Car Service Division of the American Railway Association in an effort to obtain the return of a large number of Canadian box cars now on American lines to the Canadian roads in order to relieve a severe car shortage in Eastern Canada. It was estimated that approximately 30,000 Canadian cars are held on American roads.

In the Federal Court at Memphis, Tenn., on September 18, Jacob Cohen, editor of the Labor Review, was sentenced to six months' imprisonment and to pay a fine of $1,000 for violation of the injunction against interfering with railroad operation or abusing railroad employees. Cohen had published an article referring to men employed in places of strikers as "loathsome and scurrilous scabs." Another Memphis editor has been arrested on a similar charge.

The Shopmen of the Central of Georgia have organized two unions, one the Central of Georgia carmen's organization and the other the Central of Georgia metal trades' organization. C. O. Voss, of Savannah, is chairman of the carmen and W. J. Bice, also of Savannah, a boilermaker, is chairman of the metal trades. It is said that the new unions have already made contracts with the railroad company, which conform to the rulings of the United States Labor Board.

Radiophones, for transmitting news and other matter to passengers, are to be introduced on one of the fast trains of the Louisville & Nashville running between Cincinnati and New Orleans, successful experiments having been made with apparatus on a train which was run out of Louisville on September 13. The apparatus worked all right while the train was in the tunnel beneath Muldraughs Hill, 300 ft. below the surface of the earth. This hill is said to contain a large percentage of iron.

Hearings before the House judiciary committee on impeachment charges instituted by Representative Keller against Attorney General Daugherty partly on account of his action in obtaining the injunction against the railroad shop unions, were postponed by the committee on Monday until the next session of Congress in December. Chairman Volstead said that this was because Mr. Keller had refused to produce or submit other than general evidence and that time should be allowed for the attorney general to appear in his own behalf.

The Alaska Railroad, since July 1, has been running a through passenger train twice a week between Seward and Nenana, 412 miles, making the trip in less than 24 hours, with a regular connection from Nenana to Fairbanks; but, according to news despatches, the result in tourist travel has been disappointing. General tourist travel to other sections of Alaska has been good throughout the season but it is claimed that the older routes have been very active in their solicitation of business and it appears that they have had much success in retaining their traffic. The new train has sleeping and dining accommodations.

Steel Car Design and Construction

John A. Pilcher, mechanical engineer of the Norfolk & Western, will present a paper entitled, "The Design and Building of Steel Freight Car Equipment" at the meeting of the Railway Club of Pittsburgh, in the English Room of the Fort Pitt Hotel, Pittsburgh, on Thursday, September 28, 1922, at eight o'clock.

Chicago Has Tag Day for Shop Strikers

After two weeks of strenuous effort, which included the calling of a special meeting of the city council, S. W. Govier of the Chicago Board of Aldermen succeeded in having a permit issued for a city-wide tag day on September 20, to benefit the striking railroad shopmen, their wives and children. "I know the city has an ordinance providing for only three tag days a year, but we have given generously for the aid of stricken people in foreign lands, and we can stand one more tag day to take care of our fellow citizens here at home," Mr. Govier declared.

Newspaper Investigates Shipping Conditions

The Chicago Tribune last week conducted a business survey throughout the central western states to determine how the railroads were serving the shippers. In a full page advertisement under the caption: "Here is What Shippers Say About the Railroads" parts of 53 letters were reprinted of which 37 stated the service to be very good and 12 fair, while only four considered the efforts of the carriers a complete failure. The Tribune believes that the business conditions in the central west are generally good and that the railroads are furnishing adequate and satisfactory service.

D. & R. G. W. to Spend Over $23,000,000

A rehabilitation program involving the expenditure of $23,792,511 for improving the Denver & Rio Grande Western was requested of C. E. Herrington, special master recently appointed by the United States District Court at Denver. The attorney for the railroad, who presented the above plan to the Federal Court,

stated that the expenditure is necessary to make up deferred maintenance costs and to bring the road up to the advancing requirements of a rapidly developing territory. The budget includes as its largest item $15,314,376 for additions to the fixed property. This item includes $6,132,000 for new rails and $2,736,900 for new shops. Other main divisions of the budget are $6,226,283 for new rolling stock and $2,251,859 for improvements to existing equipment.

Coroner's Jury Reports on P. R. R. Car Shop Fire

The fire at Pittsburgh, Pa., on September 3, in which seven employees of the Pennsylvania Railroad were burned to death in their lodging room, has been investigated by a coroner's jury and a verdict was rendered on September 13 to the effect that the origin of the fire could not be discovered. The verdict censures the officers and employees of the railroad company for housing 25 men in a building containing a large quantity of inflammable material, including oil-soaked waste and petrolite; for making changes to convert this shop or storehouse into lodgings without securing a permit from the city, and for maintaining an exit stairway too narrow. The verdict also said that the railroad company had fire-fighting equipment in and near the building but had no efficient organization for handling the apparatus.

Great Western Installs Motor Car Service

A two-unit motor train, consisting of a passenger motor car and a trailer, was placed in service on September 18 by the Chicago Great Western on its line between Des Moines, Ia., and Marshalltown. Interest was attached to the inauguration of this

Photo by International

Ready for the Initial Trip

service for the reason that this type of equipment was an innovation in Iowa railroading. A number of Great Western officers and others made the initial trip, leaving Des Moines on Monday morning and reaching Marshalltown by noon that same day.

Adding Insult to Injury

According to the Macon (Ga.) Telegraph more than $600 and some watches and jewelry were stolen from the occupants of the Savannah sleeping car of the Central of Georgia, in Macon, as the car lay on a side track at the Terminal station, on the morning of September 15, the car having arrived about 3:30 a. m., and the passengers being asleep. A screen window at one end of the car had been cut out where the thief had made his entry and another at the other end where he made his escape.

C. H. Findley, chief claim agent of the railroad, a passenger on the car, was relieved of a gold watch and some documents; and the hammock in which his clothing was lying was removed from the berth.

The porter, who claimed to have been awake all the time, was in one end of the car shining shoes and did not hear any noise. When one of the passengers called the porter to locate his trousers a number of pairs of trousers were found crumpled in a heap on the floor of the women's dressing room with the pockets rifled.

A. R. E. A. Building Specifications Ready

The Committee on Buildings of the American Railway Engineering Association has been working for two years on specifications for buildings for railway purposes which specifications have now been completed and have been issued by the association in Bulletin No. 247, a publication of 100 pages. These specifications have been published at this time in order that an opportunity may be afforded for criticism prior to their presentation before the association at its annual meeting next March. It is the intention of the committee that these specifications shall be prepared in loose leaf form with the idea that specifications for any particular building may be built up by combining the necessary sheets into one specification. The committee solicits suggestions and comments and requests that they be sent to J. W. Orrock, principal assistant engineer, Canadian Pacific, Montreal, Que., who is chairman of the sub-committee in charge of their preparation.

Railway Revenues and Expenses

The Interstate Commerce Commission's monthly summary of revenues and expenses for 198 Class I roads for July and for seven months is as follows:

	July		Seven Months	
Item	1922	1921	1922	1921
Av. miles operated..	235,220,77	234,723.96	235,250.44	234,775.67
Revenues:				
Freight	$299,168,876	$314,821,079	$2,164,725,019	$2,185,406,581
Passenger	[1]100,668,083	[2]108,885,612	[3]603,567,620	[4]683,889,236
Mail	7,179,155	7,312,170	51,873,142	56,434,779
Express	10,367,269	8,144,021	68,842,474	49,809,643
All other transp.	15,031,819	13,601,492	98,695,015	91,146,467
Incidental	10,130,570	9,753,768	62,141,945	69,384,590
Joint facility—Cr.	808,058	610,821	5,897,668	4,513,345
Joint facility—Dr.	170,840	189,270	1,211,847	1,226,069
Railway op. revs.	443,182,990	462,939,693	3,054,531,036	3,139,358,572
Expenses:				
Maintenance of way..	65,462,571	65,177,102	411,600,380	435,649,291
Maint. of equipment.	78,715,628	95,277,725	669,681,672	737,148,017
Traffic	7,597,239	6,896,362	50,469,424	49,955,317
Transportation	172,553,833	178,239,301	1,172,481,450	1,376,637,660
Misc. operations	4,180,234	4,279,556	26,971,716	29,389,778
General	12,861,191	13,311,456	91,825,525	100,963,220
Trans. for inv.—Cr.	644,887	425,228	3,427,781	3,407,231
Railway op. exp.	340,725,809	362,756,274	2,419,602,386	2,726,336,052
Net. rev. from ry. op.	102,457,181	100,183,419	634,928,650	413,022,520
Railway tax accruals.	26,089,187	23,706,289	173,438,621	157,185,934
Uncollectible	114,565	112,490	775,267	682,140
Ry. op. income.	76,253,429	76,364,640	460,714,762	255,174,446
Equip. rents—Dr. bal.	5,187,763	5,244,742	32,074,464	29,317,256
Joint facility rent—				
Dr. balance	1,826,629	1,795,702	10,369,204	11,143,112
Net Ry. op. inc.	69,239,037	69,324,196	418,271,094	214,714,078
Per cent of expenses.	76.88	78.36	79.21	86.84

[1]Includes $2,932,311, sleeping and parlor car surcharge.
[2]Includes $2,823,339, sleeping and parlor car surcharge.
[3]Includes $17,879,407, sleeping and parlor car surcharge.
[4]Includes $18,846,480, sleeping and parlor car surcharge.

Former C. & E. I. Coal Road Sold

Purchase has been concluded of that portion of the former Brazil branch of the Chicago & Eastern Illinois between West Melcher, Ind., La Crosse and Goodland, and the Illinois-Indiana state line. This road, which was known, until the first part of this year, as the Brazil branch and the Indiana Coal division of the C. & E. I., will hereafter be known as the Chicago, Attica & Southern. Much of the stock in the new company has been sold to farmers, mine owners and grain elevator operators who are located along the line. These people have exerted every effort to prevent the junking of this road which proved so unprofitable to the C. & E. I., this company averaging a loss of about $500,000 or more annually.

The purchase price was said to be $250,000. Among those interested in the purchase of the road are J. S. Nave of Attica, Ind.; C. W. Zeigler, Attica, chairman of the Indiana highway commission; F. Lyons of Brook, Ind.; L. Shipman of Fowler, and E. S. Booe of Kingman, Ind. That part of the coal division between West Welcher and Brazil was recently saved from abandonment when the Cincinnati, Indianapolis & Western purchased it. This is considered the most profitable section of the branch line.

Operating Statistics of Large Steam Roads — Selected Items for the Month of July, 1922,

Region, road and year		Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross. Excluding locomotive and tender	Ton-miles (thousands): Net. Revenue and non-revenue	Average number of locomotives on line daily: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:													
Boston & Albany	1922	394	232,100	244,969	23,415	4,423	69.3	209,668	74,005	112	31	21.5	...
	1921	394	238,548	257,204	28,825	4,268	63.4	227,907	88,303	120	29	19.2	...
Boston & Maine	1922	2,455	484,969	543,775	42,671	11,245	75.3	517,762	205,627	318	125	28.3	39
	1921	2,469	501,041	554,038	47,562	10,413	67.7	543,685	221,613	343	115	25.1	63
N. Y., N. H. & H.	1922	1,959	431,276	470,649	25,939	11,454	73.4	530,317	210,789	266	79	22.9	22
	1921	1,959	455,987	495,440	32,299	10,340	65.3	545,425	225,718	301	80	21.0	38
Great Lakes Region:													
Delaware & Hudson	1922	887	227,653	305,365	30,192	6,394	73.3	340,886	156,871	307	8	2.6	197
	1921	880	338,651	441,012	31,292	8,198	60.9	546,714	267,406	269	44	14.0	114
Del., Lacka. & Western	1922	994	433,070	516,024	102,500	13,933	73.3	678,399	284,549	302	63	17.2	39
	1921	995	485,022	587,595	110,734	14,683	67.5	822,777	383,357	307	53	14.7	47
Erie (inc. Chic. & Erie)	1922	2,309	762,044	826,198	65,316	26,246	69.4	1,410,470	594,201	509	251	33.0	78
	1921	2,259	873,116	981,640	46,710	28,202	66.0	1,687,295	771,155	522	177	25.3	96
Lehigh Valley	1922	1,316	458,879	508,933	71,774	13,233	71.9	707,946	321,178	443	114	20.5	164
	1921	1,316	527,360	583,615	58,303	14,918	62.3	916,825	421,736	416	127	23.4	131
Michigan Central	1922	1,827	472,084	488,279	23,274	16,848	68.8	841,441	318,343	311	91	22.5	88
	1921	1,829	424,997	435,511	16,762	12,713	62.4	702,150	263,680	315	91	22.5	82
New York Central	1922	5,675	1,494,716	1,656,384	122,625	56,892	70.8	2,928,017	1,214,787	943	628	40.0	288
	1921	5,655	1,542,562	1,706,487	118,905	52,688	62.5	3,061,207	1,290,314	1,001	641	39.0	279
N. Y., Chicago & St. L.	1922	1,225	455,952	463,544	1,316	14,014	71.5	691,147	278,239	163	59	26.4	35
	1921	1,225	397,911	399,451	1,359	11,064	64.8	582,108	225,529	182	80	30.6	64
Pere Marquette	1922	2,182	290,199	294,754	5,105	7,117	72.3	362,532	162,618	162	49	23.2	17
	1921	2,196	308,281	315,658	6,615	7,297	65.6	413,440	180,964	171	38	18.1	20
Pitts. & Lake Erie	1922	228	90,987	95,849	713	2,927	68.8	191,525	110,091	65	20	23.8	15
	1921	225	63,824	73,384	601	2,105	62.6	150,967	83,215	61	24	28.7	21
Wabash	1922	2,418	434,732	516,192	5,088	15,265	77.3	733,353	314,893	282	54	16.0	32
	1921	2,418	534,146	560,938	6,954	15,153	70.0	802,090	343,814	270	78	22.4	49
Ohio-Indiana-Allegheny Region:													
Baltimore & Ohio	1922	5,235	1,181,969	1,344,521	87,285	32,041	73.8	1,738,520	858,448	671	686	50.6	54
	1921	5,185	1,636,926	1,881,304	138,232	39,357	60.7	2,572,741	1,267,476	991	411	29.3	154
Central R. R. of N. J.	1922	689	227,461	243,597	24,762	4,956	70.1	246,809	108,288	266	33	12.7	57
	1921	679	258,539	286,873	36,510	5,604	60.1	382,069	174,647	203	59	22.4	9
Chicago & Eastern Ill.	1922	945	201,498	204,434	3,486	4,886	71.1	252,546	118,596	115	62	34.8	29
	1921	1,131	229,412	230,394	3,664	5,100	58.5	317,682	145,858	130	49	27.2	55
C., C., C. & St. L.	1922	2,383	578,038	604,578	10,240	17,764	65.9	1,010,760	462,099	250	199	44.4	13
	1921	2,382	570,313	593,615	2,884	15,322	59.8	939,316	400,001	289	148	33.8	28
Elgin, Joliet & Eastern	1922	459	90,527	97,434	4,244	2,866	71.2	195,263	107,985	86	21	19.8	21
	1921	456	77,587	83,817	3,900	2,318	67.0	167,340	89,639	97	11	9.9	41
Long Island	1922	394	42,268	44,040	8,214	461	61.0	25,612	9,187	36	8	17.8	1
	1921	395	41,338	46,194	7,501	486	56.4	26,710	10,075	34	8	19.6	2
Pennsylvania System	1922	10,903	4,138,189	4,417,758	293,461	115,140	69.2	6,830,747	3,275,724	2,589	783	23.2	599
	1921	10,877	3,945,857	4,260,058	309,256	100,934	62.3	6,861,872	3,389,384	2,656	836	23.9	868
Phila. & Reading	1922	1,119	432,878	466,829	46,012	10,404	70.0	600,729	298,737	389	73	15.8	227
	1921	1,119	489,507	540,438	65,992	11,469	61.3	783,701	405,987	367	84	18.7	169
Pocahontas Region:													
Chesapeake & Ohio	1922	2,548	590,151	654,263	15,674	17,048	60.3	1,300,857	701,899	357	193	35.1	35
	1921	2,548	733,183	791,576	22,964	21,003	55.3	1,696,036	917,372	431	129	23.0	57
Norfolk & Western	1922	2,228	787,301	977,073	30,522	21,159	59.4	1,612,112	872,036	617	99	13.8	117
	1921	2,221	688,146	819,340	33,548	18,469	57.3	1,452,452	790,132	606	89	12.8	207
Southern Region:													
Atlantic Coast Line	1922	4,922	536,756	540,202	9,473	12,106	70.2	596,704	245,859	322	87	21.3	19
	1921	4,877	518,249	519,392	7,342	11,163	63.3	580,102	220,973	294	113	27.8	54
Central of Georgia	1922	1,907	267,346	273,880	4,540	5,595	75.5	272,950	119,036	119	8	6.0	...
	1921	1,899	267,556	273,381	3,410	5,343	66.2	289,506	120,822	112	23	17.0	...
I. C. (inc. Y. & M. V.)	1922	6,137	1,801,871	1,840,274	48,819	48,012	63.9	2,946,368	1,312,072	738	91	11.0	11
	1921	6,151	1,482,989	1,489,040	33,517	38,321	62.9	2,427,182	1,078,466	703	98	12.2	19
Louisville & Nashville	1922	5,021	1,362,840	1,406,627	47,338	24,370	66.8	1,426,449	675,223	618	74	10.6	1
	1921	5,026	1,495,866	1,604,636	58,585	26,514	61.4	1,667,336	776,532	551	102	15.6	24
Seaboard Air Line	1922	3,537	394,245	400,189	10,431	8,567	72.1	426,470	175,652	159	117	42.4	...
	1921	3,537	392,819	398,574	6,648	8,084	66.8	415,454	165,263	166	92	35.6	...
Southern Ry.	1922	6,942	1,229,021	1,257,320	39,880	27,123	75.4	1,308,649	563,848	840	207	19.8	17
	1921	6,942	1,248,422	1,274,243	27,214	26,352	64.6	1,395,942	554,415	898	221	19.7	52
Northwestern Region:													
C. & N. W.	1922	8,419	1,253,211	1,298,987	26,157	29,303	70.4	1,508,570	609,232	782	259	24.9	74
	1921	8,334	1,409,544	1,455,190	18,178	27,994	59.2	1,674,822	627,808	838	245	22.6	106
C. M. & St. P.	1922	11,027	1,497,565	1,539,897	66,884	38,720	68.2	2,050,219	904,925	814	245	23.2	114
	1921	10,992	1,370,466	1,403,957	61,197	33,087	65.8	1,802,674	798,912	876	213	19.6	160
C., St. P., M. & O.	1922	1,726	350,452	385,214	19,089	6,406	68.8	378,460	159,020	156	56	26.3	28
	1921	1,726	284,665	301,346	11,330	5,292	69.8	277,285	120,122	156	57	26.7	52
Great Northern	1922	8,263	749,175	760,943	29,315	20,987	65.2	1,255,500	627,627	572	147	20.4	91
	1921	8,159	675,191	692,217	23,438	17,747	64.6	1,041,651	483,345	604	175	22.4	268
M., St. P. & S. Ste. M.	1922	4,355	508,741	513,773	9,588	11,662	72.8	581,756	268,282	351	53	13.0	12
	1921	4,225	414,724	444,343	5,641	8,572	66.9	430,928	181,936	344	56	13.9	41
Northern Pacific	1922	6,389	840,498	873,022	38,368	22,577	76.4	1,181,845	552,955	573	127	18.2	85
	1921	6,408	650,735	681,792	43,847	18,733	68.8	1,023,521	462,866	526	150	22.2	116
Ore. Wash. R. R. & Nav.	1922	2,143	206,552	226,092	31,747	4,973	72.6	274,975	130,082	133	29	17.8	1
	1921	2,198	164,190	178,681	21,417	3,952	74.2	214,633	102,177	115	39	25.3	8
Central Western Region:													
Atch., Top. & Santa Fe	1922	9,798	1,594,010	1,676,876	78,860	44,547	69.4	2,434,903	960,121	777	157	16.8	149
	1921	9,771	1,473,477	[illegible]	70,602	39,005	63.8	2,213,962	846,339	785	181	18.7	158
Chicago & Alton	1922	1,010	191,170	193,656	4,584	4,433	72.7	234,110	[illegible]	77	65	45.7	16
	1921	1,010	[illegible]	314,418	4,584	7,116	61.0	447,480	178,049	127	46	26.8	16
Chic., Burl. & Quincy	1922	9,326	[illegible]	1,434,411	68,546	36,226	68.9	1,969,313	[illegible]	762	214	21.9	106
	1921	9,326	1,404,258	1,466,710	69,382	36,526	64.6	2,207,330	1,061,983	687	264	27.8	110
Chic., Rock Isl. & Pacific	1922	7,662	[illegible]	1,406,651	18,583	32,087	72.3	1,640,442	690,435	581	182	23.8	44
	1921	7,661	1,512,753	1,537,187	16,097	31,608	65.7	1,801,650	778,733	586	158	21.3	31
Denv. & Rio Grande West'n.	1922	2,593	[illegible]	[illegible]	59,283	4,971	67.8	[illegible]	149,436	234	84	26.4	29
	1921	2,593	192,432	237,788	46,882	4,230	[illegible]	247,330	119,750	223	79	26.1	50
Oregon Short Line	1922	2,360	308,550	324,710	26,697	6,922	70.4	389,736	179,661	181	49	21.2	51
	1921	2,359	261,436	267,409	15,303	5,827	64.3	319,021	156,525	179	44	19.8	59
Southern Pacific	1922	6,983	[illegible]	1,316,178	238,595	33,456	67.2	[illegible]	[illegible]	595	173	[illegible]	16
	1921	6,975	[illegible]	1,370,609	[illegible]	31,825	61.7	[illegible]	[illegible]	564	190	25.3	13
Union Pacific	1922	3,707	[illegible]	801,227	38,705	25,613	69.8	1,359,975	524,978	416	106	20.3	167
	1921	3,615	[illegible]	839,584	32,362	25,161	63.2	1,466,093	[illegible]	383	149	28.0	104
Southwestern Region:													
Gulf, Colo. & Santa Fe	1922	1,895	[illegible]	210,233	5,950	5,425	71.3	293,160	[illegible]	131	[illegible]	11.0	31
	1921	1,895	[illegible]	334,737	7,499	7,723	63.5	471,084	[illegible]	121	35	22.5	14
Missouri, Kans. & Tex.	1922	1,658	[illegible]	221,120	9,193	6,304	66.1	337,956	130,277	121	63	34.4	56
	1921	1,709	[illegible]	269,467	8,554	6,838	59.8	397,090	158,070	149	32	17.7	56
Mo. Kans. & Tex. of Tex.	1922	1,738	156,676	160,987	4,956	3,059	69.6	163,284	68,811	67	79	54.0	11
	1921	1,740	[illegible]	281,467	2,712	5,277	58.9	[illegible]	140,561	107	40	27.4	20
Missouri Pacific	1922	7,305	[illegible]	925,672	33,543	23,538	75.5	[illegible]	572,121	414	166	28.6	3
	1921	[illegible]	[illegible]	1,111,816	30,714	[illegible]	68.4	1,461,215	665,580	402	176	30.4	15
St. Louis San Francisco	1922	4,683	795,443	801,031	13,480	14,268	69.0	794,668	356,722	337	105	23.8	3
	1921	4,683	800,838	812,832	10,887	13,742	63.6	806,007	354,247	336	143	29.9	41
Southern Pacific Lines (in Texas and Louisiana)[1]	1922	3,710	550,375	557,826	5,687	11,341	66.5	652,448	288,079	198	95	32.4	19
	1921	3,647	[illegible]	534,943	4,147	10,374	64.7	610,573	274,014	176	124	41.4	4
Texas Pacific	1922	1,953	199,215	199,215	2,289	5,028	70.4	259,987	105,244	112	85	43.1	27
	1921	1,953	256,070	256,070	1,573	5,709	65.7	316,284	126,048	120	69	36.5	24

[1] No passenger train service.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Compared with July, 1921, for Roads with Annual Operating Revenues above $25,000,000.

Region, road and year		Average number of freight cars on line daily: Home	Foreign	Total	Per cent unserviceable	Stored	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton miles per car-day	Car miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotive and tender	Passenger Service: Train miles	Passenger train car miles
New England Region:															
Boston & Albany	1922	3,19[illegible]	4,94[illegible]	8,13[illegible]	7.6		[illegible]3	[illegible]19	16.7	293	[illegible]5.3	6,0[illegible]	[illegible]	315,568	2,045,[illegible]56
	1921	3,[illegible]66	[illegible]	7,[illegible]	7.3	1,131	9[illegible]5	370	20.7	365	[illegible]7.8	7,231	1[illegible]7	313,597	2,063,683
Boston & Maine	1922	16,125	[illegible],647	[illegible],77[illegible]	17.3	1,081	1,0[illegible]	424	18.3	223	16.2	2,701	16[illegible]	9[illegible],644	5,190,788
	1921	1[illegible],494	[illegible]	[illegible],121	[illegible]1.3	2,921	1,065	442	21.3	234	16.3	2,896	146	945,638	5,319,161
N. Y., N. H. & H.	1922	[illegible]3,517	16,94[illegible]	40,4[illegible]9	24.4	155	1,[illegible]0	489	18.4	168	12.4	3,471	162	1,090,111	7,006,312
	1921	[illegible]7,037	14,0[illegible]7	41,[illegible]	21.9	833	1,198	495	21.8	177	1[illegible].4	3,716	155	1,117,459	7,353,973
Great Lakes Region:															
Delaware & Hudson	1922	12,529	4,[illegible]0	17,519	7.5	6,107	1,497	689	24.5	289	16.1	5,705	1[illegible]2	[illegible]22,347	1,288,684
	1921	11,1[illegible]4	5,[illegible]36	16,[illegible]30	13.6	1,33[illegible]	1,614	790	32.6	531	26.8	9,798	176	2[illegible]5,541	1,287,739
Delaware, Lacka. & West.	1922	17,08[illegible]	7,6[illegible]1	[illegible]4,734	13.3	379	1,566	657	20.4	371	24.8	9,234	164	509,318	3,809,328
	1921	17,8[illegible]	[illegible],[illegible]74	[illegible]4,[illegible]7[illegible]	13.7	4[illegible]5	1,696	790	26.1	495	28.1	12,433	162	511,678	3,871,434
Erie (inc. Chi. & Erie)	1922	35,6[illegible]7	19,[illegible]66	54,9[illegible]3	19.1	3,921	1,851	78[illegible]	22.6	349	22.2	8,300	136	691,879	5,195,316
	1921	40,9[illegible]2	14,868	55,790	21.7	11,028	1,932	883	27.3	446	24.7	11,013	1[illegible]9	684,884	5,361,532
Lehigh Valley	1922	31,457	9,[illegible]4	4[illegible],0[illegible]1	12.6	6,[illegible]95	1,543	700	24.3	252	14.4	7,871	171	355,319	2,867,678
	1921	3[illegible],578	[illegible]81	41,159	15.1	3,[illegible]86	1,739	809	28.3	331	18.8	10,335	154	370,802	2,956,049
Michigan Central	1922	15,[illegible]88	13,4[illegible]5	28,[illegible]3	16.6	.....	1,782	674	18.9	356	27.3	5,622	109	603,046	5,185,851
	1921	19,964	1[illegible],[illegible]14	31,97[illegible]	19.7	1,197	1,652	6[illegible]0	20.7	266	20.6	4,650	111	624,246	5,480,919
New York Central	1922	75,574	4[illegible],[illegible]16	124,490	17.4	1[illegible],354	1,759	813	21.4	315	20.8	6,905	118	2,502,472	20,719,559
	1921	91,726	43,619	135,345	15.6	27,255	1,985	837	24.5	308	20.1	7,361	111	2,490,233	20,663,826
N. Y., Chi. & St. L.	1922	4,966	8,85[illegible]	13,818	15.0	369	1,516	610	19.9	650	45.7	7,324	122	156,15[illegible]	920,036
	1921	8,384	7,[illegible]2[illegible]	15,611	20.9	1,271	1,463	567	20.4	466	35.3	5,937	105	15[illegible],844	796,834
Pere Marquette	1922	10,112	10,4[illegible]6	20,5[illegible]8	12.9	200	1,249	560	22.8	255	15.4	2,404	135	273,283	1,580,482
	1921	11,5[illegible]7	8,745	2[illegible],27[illegible]	17.9	1,000	1,341	587	24.8	288	17.7	2,658	121	336,485	1,828,840
Pitts. & Lake Erie	1922	18,585	10,278	28,863	32.3	4,913	2,105	1,210	37.6	123	4.8	15,581	93	119,635	660,177
	1921	19,080	7,039	26,119	34.9	2,145	2,[illegible]65	1,304	39.5	103	4.2	11,950	88	111,914	623,110
Wabash	1922	11,723	11,314	23,037	11.3	554	1,482	636	20.6	441	27.6	4,201	132	459,669	2,738,862
	1921	13,295	10,124	23,419	10.6	1,055	1,502	644	22.7	474	29.8	4,587	141	5[illegible]9,312	2,946,668
Ohio-Indiana-Allegheny Region:															
Baltimore & Ohio	1922	67,341	37,381	104,722	14.7	5,317	1,471	726	26.8	264	13.4	5,290	196	1,396,119	8,716,297
	1921	72,904	27,674	100,578	10.0	6,030	1,572	774	32.2	407	20.8	7,886	174	1,398,686	9,035,055
Central R. R. of N. J.	1922	20,268	8,311	[illegible]8,579	6.0	11,245	1,085	476	21.8	122	8.0	5,071	216	414,173	2,109,320
	1921	20,739	7,504	28,243	23.2	4,560	1,478	676	31.2	199	10.7	8,303	168	391,142	1,975,085
Chicago & Eastern Ill.	1922	15,793	5,042	20,835	18.9	6,584	1,253	589	24.3	184	10.6	4,048	148	206,865	1,351,673
	1921	16,535	3,896	20,431	10.8	4,100	1,367	636	28.6	230	13.8	4,160	152	222,173	1,478,981
C., C., C. & St. L.	1922	17,563	20,172	37,735	15.4	7,165	1,749	799	26.0	395	23.1	6,256	121	707,901	4,277,590
	1921	19,322	14,826	34,148	12.8	2,642	1,647	701	26.1	378	24.2	5,416	131	708,250	4,428,814
Elgin, Joliet & Eastern	1922	9,157	5,915	15,072	13.7	.....	2,157	1,193	37.6	231	8.6	7,587	108	(1)	(1)
	1921	9,735	3,539	13,274	9.9	2,363	2,157	1,155	38.7	218	8.4	6,337	115	(1)	(1)
Long Island	1922	2,146	2,799	4,945	5.2	68	606	217	19.9	60	4.9	752	364	225,663	1,427,787
	1921	2,450	3,268	5,718	2.6	1,120	646	244	22.6	57	4.5	824	346	229,546	1,402,524
Pennsylvania System	1922	191,825	85,847	277,672	14.1	22,308	1,651	792	28.4	381	19.3	9,692	137	5,257,619	34,940,235
	1921	221,026	63,610	284,636	13.4	58,482	1,739	859	33.6	384	18.4	10,052	128	5,386,945	36,265,386
Phila. & Reading	1922	23,985	11,053	35,038	4.8	8,864	1,388	690	28.7	275	13.7	8,610	194	511,817	2,360,082
	1921	28,817	9,269	38,086	8.6	7,309	1,631	845	35.4	344	15.8	11,705	173	536,967	2,456,785
Pocahontas Region:															
Chesapeake & Ohio	1922	35,512	15,769	51,281	16.0	739	2,204	1,189	41.2	442	17.8	8,886	131	449,181	2,528,102
	1921	41,885	10,850	52,735	9.2	4,298	2,313	1,251	43.7	561	23.2	11,613	117	447,842	2,571,572
Norfolk & Western	1922	28,087	12,421	40,508	5.3	.....	2,048	1,108	41.2	694	28.4	12,627	178	397,703	2,461,987
	1921	37,444	5,414	42,858	9.0	4,152	2,111	1,148	42.8	595	24.2	11,476	155	516,265	2,715,463
Southern Region:															
Atlantic Coast Line	1922	15,776	8,554	24,330	17.7	.....	1,112	458	20.3	326	22.9	1,611	121	701,732	4,181,273
	1921	20,840	6,153	26,993	22.9	.....	1,119	426	19.8	264	21.1	1,459	132	719,321	4,278,560
Central of Georgia	1922	3,275	5,208	8,483	13.9	.....	1,021	445	21.3	453	28.2	2,014	165	335,567	1,700,167
	1921	4,861	3,787	8,648	15.4	.....	1,082	452	22.6	451	30.1	2,052	155	322,135	1,593,931
I. C. (inc. Y. & M. V.)	1922	37,112	27,527	64,639	11.3	3,943	1,635	728	27.3	655	37.5	6,897	129	1,450,975	8,261,121
	1921	48,512	16,648	65,160	12.6	6,946	1,637	727	28.1	534	30.2	5,655	127	1,425,986	8,195,244
Louisville & Nashville	1922	31,162	21,471	52,633	12.3	71	1,047	495	27.1	414	22.4	4,338	182	1,017,778	5,889,950
	1921	40,229	15,435	55,664	26.1	94	1,115	519	29.3	450	25.0	4,984	160	961,307	5,636,106
Seaboard Air Line	1922	12,141	10,464	2[illegible],605	34.1	.....	1,082	446	20.5	251	17.0	1,602	167	481,587	2,711,855
	1921	11,525	6,739	18,264	29.5	.....	1,058	421	20.4	292	21.4	1,507	174	561,757	3,193,925
Southern Ry.	1922	33,186	28,141	61,327	13.3	.....	1,065	459	20.8	297	18.9	2,620	197	1,319,584	7,626,898
	1921	39,379	15,485	54,861	19.9	1,957	1,118	444	21.0	326	24.0	2,576	191	1,326,402	7,855,123
Northwest Region:															
C. & N. W.	1922	43,734	26,268	70,002	9.3	2,100	1,204	486	20.8	281	19.2	2,334	147	1,546,210	10,201,241
	1921	51,174	22,692	73,866	10.1	8,900	1,188	445	22.4	274	20.6	2,430	163	1,697,026	11,020,761
C. M. & St. P.	1922	50,249	23,816	74,065	17.6	.....	1,369	604	23.4	394	24.7	2,647	129	1,481,482	9,400,444
	1921	48,516	20,597	69,113	19.8	1,845	1,315	583	24.1	373	23.5	2,344	148	1,533,010	9,834,996
C., St. P., M. & O.	1922	3,565	9,503	13,068	14.5	135	1,080	454	24.8	393	23.0	2,972	137	303,919	1,849,105
	1921	4,451	10,334	14,785	17.8	2,628	974	422	22.7	262	16.5	2,245	148	322,117	1,912,111
Great Northern	1922	45,274	9,499	54,773	12.9	.....	1,696	848	29.9	370	19.0	2,450	122	969,800	6,841,078
	1921	47,228	5,376	52,604	20.0	.....	1,543	716	27.2	296	16.9	1,911	145	1,002,138	6,676,060
M., St. P. & Ste. M.	1922	18,619	6,723	25,342	7.9	3,715	1,144	527	23.0	341	20.4	1,987	112	446,949	2,773,723
	1921	19,045	7,149	26,194	14.5	4,974	1,039	439	21.2	224	15.8	1,389	128	442,020	2,728,939
Northern Pacific	1922	33,581	9,665	43,246	13.8	428	1,406	658	24.5	412	22.0	2,792	115	854,603	6,903,874
	1921	39,148	6,532	45,680	14.6	7,056	1,573	711	24.7	327	19.2	2,330	122	878,259	6,670,281
Ore. Wash. R. R. & Nav.	1922	6,586	2,303	8,889	2.6	1,219	1,331	630	26.2	472	24.9	1,958	187	262,825	1,860,735
	1921	6,192	2,313	8,505	3.5	2,508	1,307	622	25.9	388	20.2	1,500	209	261,013	1,884,460
Central Western Region:															
Atch., Top. & Santa Fe	1922	48,501	14,635	63,136	8.6	7,555	1,528	602	21.6	491	32.8	3,161	131	1,672,955	13,285,553
	1921	46,686	14,227	60,913	12.3	5,124	1,497	572	21.7	448	31.4	2,794	140	1,644,914	12,552,567
Chicago & Alton	1922	(2)	(2)	(2)	(2)	1,200	1,225	484	20.9	(2)	(2)	2,952	181	282,115	1,639,929
	1921	10,148	4,569	14,717	4.4	248	1,321	525	25.0	390	25.6	5,685	165	295,543	1,712,249
Chic., Burl. & Quincy	1922	46,887	21,948	68,835	11.9	7,960	1,432	647	24.6	417	24.7	3,079	140	1,549,258	10,957,783
	1921	50,664	19,435	70,099	13.8	398	1,572	756	29.1	489	26.0	3,673	144	1,542,012	10,786,860
Chic., Rock Isl. & Pacific	1922	31,759	14,355	46,114	14.2	3,867	1,177	495	21.5	483	31.0	2,907	145	1,310,281	7,833,462
	1921	31,079	18,192	49,271	13.7	4,191	1,191	515	24.6	510	31.5	3,279	153	1,374,351	8,214,812
Denver & Rio Grande Western	1922	12,453	3,521	15,794	11.1	2,826	1,328	657	30.1	302	14.8	1,859	183	280,783	2,090,015
	1921	13,226	3,022	16,248	10.5	2,086	1,285	622	28.3	238	12.5	1,490	192	253,492	1,919,990
Oregon Short Line	1922	6,589	2,647	9,236	5.3	414	1,263	582	26.0	627	34.3	2,456	130	319,744	2,460,514
	1921	7,189	2,544	9,733	5.8	2,025	1,335	599	26.0	519	30.1	2,140	143	324,808	2,432,918
Southern Pacific	1922	23,420	20,787	44,207	7.2	990	1,635	637	22.0	537	36.3	3,400	143	1,392,875	11,940,304
	1921	24,179	17,429	41,608	8.9	1,917	1,610	615	23.2	573	39.9	3,416	143	1,448,617	11,788,673
Union Pacific	1922	17,083	7,519	24,602	12.9	3,706	1,721	661	20.5	688	48.1	4,568	125	914,923	7,934,912
	1921	19,490	7,589	27,079	19.0	4,378	1,770	679	22.4	670	47.4	5,019	138	924,001	7,931,555
Southwestern Region:															
Gulf, Colo. & Santa Fe	1922	6,607	3,602	10,209	5.4	481	1,458	673	24.9	427	24.0	2,303	131	197,898	1,152,357
	1921	8,578	3,533	12,111	5.2	316	1,461	695	29.0	597	32.4	3,815	128	194,951	1,145,665
Missouri, Kans. & Tex.	1922	8,745	6,453	15,198	7.5	3,500	1,536	633	22.1	296	20.2	2,709	130	238,288	1,782,484
	1921	7,972	5,297	13,269	7.5	2,243	1,475	587	23.1	384	27.8	2,983	129	272,230	1,976,085
Mo., Kans. & Tex. of Tex.	1922	261	10,285	10,546	7.2	1,730	1,042	439	22.5	210	13.4	1,277	154	212,821	1,362,624
	1921	266	13,357	13,623	4.6	430	1,185	508	26.6	333	21.2	2,606	141	274,621	1,714,524
Missouri Pacific	1922	28,413	21,111	49,524	10.9	3,167	1,342	626	24.3	373	20.3	2,526	145	929,255	5,418,954
	1921	32,124	19,065	51,189	9.4	4,265	1,322	602	26.3	419	23.3	2,956	142	954,153	5,561,227
St. Louis San Francisco	1922	20,759	16,321	37,080	9.7	.....	999	448	25.0	310	18.0	2,457	184	741,653	4,135,151
	1921	21,161	11,[illegible]22	32,383	6.7	.....	1,006	442	25.8	352	21.5	2,440	175	782,011	4,471,593
Southern Pacific Lines (In Texas and La.)[1]	1922	6,938	11,862	18,800	7.9	876	1,185	523	25.4	494	29.3	2,504	126	547,457	3,504,503
	1921	8,951	13,145	22,096	20.7	1,539	1,186	524	26.1	400	23.4	2,423	127	537,988	3,513,402
Texas Pacific	1922	5,496	5,527	11,023	19.4	.....	1,305	528	20.9	308	20.9	1,739	142	295,517	1,822,291
	1921	6,397	4,748	11,145	23.6	.....	1,235	492	22.1	365	25.1	2,082	136	301,232	1,974,565

[1]Includes Galveston, Harrisburg & San Antonio, Houston & Shreveport, Houston & Texas Central, Houston East & West Texas, Iberia & Vermillion, Lakes Charles & Northern, Louisiana Western, Morgan's La. & Tex. R. R. & S. S. Co., and Texas & New Orleans.

[2]No data available.

Fire Risk in Northern Minnesota Forests

The railroads in Northern Minnesota, having suffered serious losses in damages paid on account of forest fires, particularly in 1918, have been taking special precautions to guard against the recurrence of these disasters. William Byrne, supervisor of the railway fire patrol, under the State forestry service, says that during the recent drought, the railroads have given a good account of themselves. He cites, particularly, the Duluth, Missabe & Northern, operating many trains daily through a section of woods which by the protracted drought, has become a mass of tinder. This road uses a small fleet of speeders, and one follows every train. Every fire caused by sparks is quickly reported and where necessary a special fire train is dispatched to extinguish it. Scores of small fires have thus been kept within the right-of-way. This fire train consists of a locomotive and four tank cars with a high-pressure steam pump on the locomotive.

Railway Books Selected by Executives

The Hotel McAlpin, New York, asked a number of railway executives to recommend books on transportation subjects for the hotel's business library. A number of executives gave their selections and the hotel has made public the titles chosen by Messrs. Kruttschnitt, Holden, Willard, Gorman and Parmelee. These lists varied from eleven to seventeen books each and the titles chosen by three or more of the five whose selections have been made public are:

Principles of Railroad Transportation, by E. R. Johnson and T. W. Van Metre,
The American Transportation Question, by Samuel O. Dunn,
Railroads: Rates and Regulation, by W. Z. Ripley.
Railroad Traffic and Rates, by E. R. Johnson and G. C. Huebner.
Regulation of Railways, by Samuel O. Dunn,
Railroads and Government, by F. H. Dixon,
Waterways versus Railways, by H. G. Moulton,
Where and Why Public Ownership Has Failed, by Yves Guyot,
Government Ownership of Railways, by Samuel O. Dunn,
Railroad Administration, by Ray Morris.

Titles mentioned on two of the five lists which were submitted are:

The Railways and the Traders, by Sir W. M. Acworth,
Railroads: Finance and Organization, by W. Z. Ripley,
Elements of Railway Economics, by Sir W. M. Acworth,
The Rise of Rail Power in War and Conquest, by E. A. Pratt,
Economic Theory of the Location of Railways, by A. M. Wellington.

Report on Winslow Junction Derailment

The Interstate Commerce Commission has issued a report, dated July 26, and signed by W. P. Borland, Chief of the Bureau of Safety, on the cause of the derailment at Winslow Junction, N. J., on the Atlantic City Railroad, July 2, when three passengers and four trainmen were killed and 84 passengers and five employees were injured. This derailment was reported in the *Railway Age* of July 8, page 77 (with editorial comment in the issues of July 8 and July 15). The present report gives few additional details. It contains excellent photographic engravings showing the line of the road and the signals. The summary at the end of the report says that the evidence is conclusive that the route was lined for the branch at least five minutes prior to the approach of train No. 33 The approach locking would not have prevented the signalman from changing the route after the train had passed the distant signal, but there is no evidence that this was done and the inspector accepted the signalman's statement that he had not moved any of the levers after setting up this route. Engineman Wescott was employed as a fireman in 1906 and was promoted to engineman in 1909; and his record was clear. He had been on duty about one hour and 40 minutes, and before that was off duty 13 hours or more. The report says, further: "The investigation disclosed that Engineman Wescott apparently failed to shut off steam, did not acknowledge proceed signals given by brakemen at the rear end and head end of freight train No. 491 (standing on the side track), did not whistle for the crossing near the distant signal, and did not sound one long blast on the whistle required to be sounded when approaching junctions, and customarily sounded at this particular point to call for the high-speed route to Atlantic City." The report contains the usual recommendation for the introduction of automatic train control apparatus.

Commission and Court News

State Commissions

Final Effort to Prevent Junking Part of M. D. & G.

Roused in final effort to prevent junking of that portion of the Memphis, Dallas & Gulf between Hot Springs, Ark., and Glenwood, and seeking immediate restoration of freight and passenger service as vital to the interests of over 1,500 square miles tributary to the line, more than a dozen petitions were presented to the Arkansas Railroad Commission on September 18. The petitions, many of which were in bulk form, containing the names of many farmers, mill operators, fruit and truck organizations, laborers, schoolteachers and other producers and shippers, set forth that following the annulment of service on the railroad: "Mills have shut down, immigration and land settlement has stopped, bank deposits have shrunk, trade has dwindled, lands have depreciated in value, many businesses have gone into bankruptcy and permanent junking of the said railroad or longer annulment of service means financial ruin to hundreds of farmers and scores of business enterprises. . . ." The petitions represented a territory from Hot Springs west to New Hope, about 70 miles.

United States Supreme Court

Court Will Construe Tariffs, Regardless of I. C. C.

In an action by an elevator company against the Great Northern and the Director General to recover $80 alleged to have been exacted in violation of the carrier's tariff, as a reconsignment charge for corn shipped from points in Iowa and Nebraska to Willmar, Minnesota, and after inspection rebilled to Anoka, it appeared that the tariff rate from points of origin to both places was the same. Willmar is the place where grain by this route is inspected and graded under the state and federal laws. The shipper claimed that the case was within the exception, Paragraph A, to Rule 10 of the tariff. Whether the charge was payable depended solely upon a question of construction; that is, whether the body of the rule or the exception to it applied. On this question there was room for reasonable difference of opinion. The railroad, relying particularly upon Texas & Pacific vs. American Tie & Lumber Co., 234 U. S. 138, and Loomis vs. L. V. 240 U. S. 43, claimed seasonably that until the true construction of the tariff had been determined by the Interstate Commerce Commission the trial court was without jurisdiction. The court overruled this objection, construed the exception, and entered judgment for the shipper, which was affirmed by the Minnesota Supreme Court. The case was brought to the United States Supreme Court on writ of certiorari, 255 U. S. 567.

The railroad contended that, to insure uniformity, the true construction must, in case of dispute, be determined by the Commission. The Supreme Court says, in part: "This argument is unsound. It is true that uniformity is the paramount purpose of the commerce act. But it is not true that uniformity in construction of a tariff can be attained only through a preliminary resort to the Commission to settle the construction in dispute. Every question of the construction of a tariff is deemed a question of law; and where the question concerns an interstate tariff it is one of federal law. If the parties properly preserve their rights, a construction given by any court, whether it be federal or state, may ultimately be reviewed by this court either on writ of error or on writ of certiorari; and thereby uniformity in construction may be secured. What construction shall be given to a tariff presents ordinarily a question of law which does not differ in character from those presented when the construction of any other document is in dispute. . . . In this case no fact, evidential or ultimate, is in controversy; and there is no occasion for the exercise of administrative discretion.

Judgment of the State Supreme Court was affirmed. Great Northern vs. Merchants' Elevator Co. Opinion by Mr. Justice Brandeis. Decided May 29, 1922.

Foreign Railway News

A Swiss to Direct Electrification in Japan

Press dispatches from Geneva are authority for the statement that a Swiss engineer named Durler has been appointed director of works for the electrification undertakings planned by the Japanese State Railways.

120 Miles of Color-Light Signals for New Zealand Railways

The New Zealand Government Railways are to instal automatic block signals on 120 miles of line, single track, color-light signals to be used, and the electric apparatus to be alternating current. The material has been ordered from the Westinghouse Brake & Saxby Signal Company, London.

Technical Details of Portuguese Railway Equipment

Consul General Hollis at Lisbon has prepared a report called "Equipment on Portuguese Railways" which can be obtained by any interested manufacturer by applying to the Bureau of Foreign & Domestic Commerce, Washington, D. C., and asking for exhibit No. 64991. This report shows the various standard types of locomotives and freight and passenger cars in use on Portuguese railways, giving complete technical details.

Wages in Ireland to Stay Up Temporarily

LONDON

A year ago, on the termination of government control, the Irish railway companies proposed to reduce their employes' wages, but this proposal was resisted and eventually an agreement was arrived at, which was later extended and was finally to expire on August 15, 1922, the anniversary of decontrol. The railway companies have now intimated to the provisional government that in view of the present disturbed state of the country, and in the national interest they will carry on to the best of their ability until the end of the year under the present conditions, it being understood that the government will see that the interests of the shareholders are not prejudiced.

Automatic Train Control Tests in Ireland

LONDON.

On September 4 tests were conducted of an automatic train control and fog signaling apparatus invented by Andrew Kerr, of Belfast. A 4-4-0 locomotive belonging to the Northern Counties section of the Midland Railway had been fitted with Mr. Kerr's apparatus, which is designed to give an audible warning and partial brake application at distant signals, to bring a train compulsorily to a stop at home signals and to give also a definite clear indication when passing a signal which is "off." The apparatus is entirely mechanical. The tests were carried out under the direction of Bowman Malcolm, chief engineer; F. G. Hopkirk, assistant engineer, and F. Cochrane, general foreman of the locomotive works.

Hungary Builds Locomotives With Water Tube Fireboxes

LONDON.

The Hungarian State Railways with a view to testing the relative merits of the 4-6-0 type of passenger engine arranged for simple and compound operation, in both cases with superheated steam, have built one of each type at the shops at Budapest, and some extensive tests have been made. These tests favored the single-expansion type of locomotive and large orders for this class of locomotive are now in course of execution. The engines are fitted with water tube fireboxes, feed water heaters with purifiers and other special features. For freight traffic locomotives of the 2-8-2 and Mallet types have been introduced and both these are similarly equipped with water tube fireboxes and the other devices mentioned. The locomotives are of large proportions and designed for the highest tractive effort that circumstances permit. The difficulty in Hungary is that maximum axle loads of 14 tons cannot be exceeded in the Eastern zone and 16 tons per axle in most of the other districts. These moderate loadings have naturally had their effect upon locomotive design, the weight having to be distributed over a greater number of wheels than would otherwise have been necessary.

Color Light Signals on the Great Western

LONDON

At Paddington station, London, of the Great Western Railway, color light signals have been installed, suspended from the passenger footbridge across the station, in place of mechanically operated repeating signals and some of the backing signals. These color light signals have orange and green indications and can be seen in both directions. They are designed so that a failure of the operating current will cause the orange light to be given in all cases.

London & North Western Ticket Limits

The London & North Western announces in New York that passenger tickets for journeys in Great Britain, bought in America, are now valid for 40 days from date of issue; and the return halves of round trip tickets are good for 3 months. The requirement for further stamping or dating at stations in Great Britain is discontinued. The free allowance for baggage, subject to a few exceptions, is, in Scotland, on one first-class ticket, 120 lb., and on one third-class ticket, 60 lb. Between all stations in England and Wales and to or from Scotland, on one first-class ticket, 150 lb.; on one third-class ticket, 100 lb.

The Riga Railway Conference

At the railway conference held in Riga during the last two weeks of June, three agreements were adopted regarding direct traffic between the Baltic states (including Finland) and Germany and Russia, according to Commerce Reports.

The first agreement concerned traffic between Russia and the Baltic states (Latvia, Esthonia, Lithuania) and Finland, and represented the so-called Baltic states and Russian Direct Traffic Union. According to this convention, the states in question retain freedom of action in stipulating the rates for direct communication until the drafting of mutual tariff scales. A mutual settlement of accounts is to be offered on the fifteenth of each month.

The second agreement concerned direct traffic between Germany and Soviet Russia, by way of Latvia, Lithuania, and Esthonia. According to this agreement, Russia will exact payment in Russian currency for the conveyance of passengers, goods, and luggage between the Russian border and the Russian interior; Germany receives that part of the remuneration which covers the conveyance of such traffic between Germany and the Russian borders via Latvia and Lithuania. Both Latvia and Lithuania settle their accounts with Germany, each in its respective currency.

The third agreement relates to direct traffic between Germany and the States of Latvia, Lithuania, and Esthonia. These several agreements are subject to confirmation by the respective governments, whereupon they come into force.

Electrification of the South Eastern & Chatham Railway, England

Plans and negotiations are being made for the purpose of obtaining a supply of electric power for the electrification of the South Eastern & Chatham. The railroad company has applied to the Electricity Commissioners for consent to the establishment of a 60,000-k.w. generating plant at Angerstein's Wharf, Charlton. The West Kent Electric Company Limited also applied for consent to build a 150,000-k.w. generating station at Belvedere in the urban district of Erith. During the course of the inquiry, offers to supply the railroad company were made by the West Kent Company and by the County of London Electric Supply Company.

An important factor in this case is the forthcoming grouping into one railway system of the London & South Western, the London, Brighton & South Coast and the South Eastern & Chatham Railways. The London & South Western Railway Company is supplied with electric power from its 25 cycle generating station at Wimbledon. The London, Brighton & South Coast purchases

energy from the London Electric Supply Corporation. The further electrification of that railway's suburban lines will entail a supply which will be many times in excess of that now furnished by the London Electric Supply Corporation and this additional supply must be supplied at a frequency of 25 cycles, for the reason that the equipment of the company's rolling stock is designed for that frequency. The South Eastern & Chatham Railway Company also desire a supply at 25 cycles, but as their system of electrification will be direct current, a supply at a frequency of 50 cycles is also practicable.

It is expected that the first stages of the electrification of the South Eastern & Chatham will be completed by June 30, 1925, and arrangements have been made with the Treasury for a guaranteed loan of £6,500,000, five millions of which are to be expended on the electrification of the lines. This financial assistance is dependent upon making arrangements for an adequate power supply. If the railway company purchases its power supply from an outside source, it will be relieved from a capital outlay of something more than £1,000,000.

What Great Britain's Railways Have Accomplished Since Returned to Private Control

London, Eng.

It is now practically one year since the railways of Great Britain were handed over by the British government to their owners. The coal strike and trade depression at that period had caused a serious diminution in railway revenues and it was well known that the railways were working at a loss. With the return to private ownership the railway companies were confronted with the necessity of making expenditures and revenue balance. They had at the same time to meet the persistent demands of the British public for a reduction in rates and fares, the public absolutely ignoring the financial embarrassment of the railways. It was under such conditions that the companies were faced with the necessity of restoring their financial equilibrium. The problem of giving improved facilities to those which had been possible during the period of government control was rendered more difficult by the fact that the chief item of railway expenditure, namely wages, was outside the control of the companies, being regulated by a sliding scale based on the cost of living, and that no direct action could be taken to reduce the cost of fuel and other materials required by the railways. There was also the fear that in the then depressed condition of trade the attempt to provide better facilities for passenger and merchandise traffic at lower rates would easily result in actual loss. It is, however, to the credit of the British railways that no sooner were they placed on their own resources than they instituted quite an elaborate program of holiday excursions. These concessions included day and half-day excursions at a single fare for the double journey, period excursions at a fare and a third for the double journey, guaranteed day and period excursions by special trains, daily tickets for local journeys to and from holiday resorts under certain circumstances at a single fare for the double journey, cheap fares to passengers attending local events, such as flower shows, agricultural shows, and so forth, from stations within a radius of 60 miles, week end tickets and commercial travellers tickets at a fare and a third for the double journey, tourist and pleasure party, walking tour, shopping and other cheap tickets. These facilities, however, lack the generosity of those prevailing before the war. It is also interesting to note that as passenger fares are still 75 per cent above prewar level, cheap tickets are also 75 per cent above those prevailing in 1913.

With reference to freight traffic, the 100 per cent increase brought into operation on September 1, 1920, has been reduced to 75 per cent, while the flat rate increases have been lowered by one-half.

Much progress has also been made in the speeding up of passenger services and the provision of through travelling facilities and the restoration of old and the introduction of new cross-country trains. This last feature has been made possible owing to the union of interests arising out of the railway grouping scheme. With regard to the speeding up of freight traffic the revival of express services for perishable freight and the improved timing of many long-distance services following the exclusion of vacuum brake fitted cars from the car pooling scheme, is of interest. Runs of trips of 500 to 600 miles are now made by freight trains in 48 hours.

Equipment and Supplies

Locomotives

The Lehigh Valley is inquiring for 25 Mikado type locomotives.

The Maine Central is inquiring for twelve 4-6-0 type locomotives.

The Seaboard Air Line contemplates buying 15 Pacific type locomotives.

The Great Northern contemplates purchasing a number of locomotives.

The Atlantic Coast Line has ordered 25 Pacific type locomotives from the Baldwin Locomotive Works.

The Chicago, Rock Island & Pacific is inquiring for 30 Mikado type and 10 Mountain type locomotives.

The Erie will have repairs made to about 100 locomotives at the shops of the Crucible Steel Company, Harrison, N. J.

The Nashville, Chattanooga & St. Louis has ordered 7 Mikado type locomotives from the Baldwin Locomotive Works.

The Baltimore & Ohio has placed an additional order for 50 Mikado type locomotives with the Baldwin Locomotive Works.

The Northern Pacific is expected to issue inquiries within the next few weeks for from 50 to 80 miscellaneous type locomotives.

The Delaware, Lackawanna & Western has ordered 15 Mikado type locomotives from the American Locomotive Company. These locomotives will have 28 by 32 in. cylinders and a total weight in working order of 355,000 lb.

The Chesapeake & Ohio, reported in the *Railway Age* of September 16 as negotiating for the purchase of 50 Mallet type locomotives, has ordered this equipment from the American Locomotive Company to be built at its Schenectady, N. Y., works.

The New York Central's order for 100 locomotives reported in the *Railway Age* of September 16 has been changed to 90 locomotives—50 Pacific type and 40 Mikado type. The Pacific locomotives will have 23½ x 26 in. cylinders and a total weight in working order of 288,000 lb., and the Mikado locomotives will have 28 x 30 in. cylinders and a total weight in working order of 340,000 lb.

The Texas & Pacific, reported in the *Railway Age* of September 16 as inquiring for 8 Pacific type and 8 switching locomotives, has ordered this equipment from the American Locomotive Company. The Pacific type will have 26 by 28 in. cylinders and a total weight in working order of 281,000 lb. The six-wheel switching locomotives will have 21 by 28 in. cylinders and a total weight in working order of 164,000 lb.

The Norfolk & Western, reported in the *Railway Age* of September 16 as inquiring for from 20 to 40 Mallet type locomotives and 12 Mountain type locomotives, has ordered 30 Mallet type locomotives from the American Locomotive Company and 12 Mountain type locomotives from the Baldwin Locomotive Works. The Mallet type will have 25 and 39 by 32 in. cylinders and a total weight in working order of 531,000 lb.

Freight Cars

The Grand Trunk is inquiring for 250 refrigerator cars.

The Atchison, Topeka & Santa Fe is inquiring for 50 caboose cars.

The Fruit Growers Express is inquiring for 1,000 steel underframes.

THE ELGIN, JOLIET & EASTERN [illegible] having repairs made to 200 side dump cars.

THE NEW YORK, CHICAGO & ST. LOUIS is inquiring for 200 steel center constructions for freight cars.

THE CHICAGO & ALTON is asking for prices on repairs to 300 gondola cars. This company however, may repair its own cars.

THE WESTERN PACIFIC reported in the *Railway Age* of September 16 as inquiring for 100 gondola cars is inquiring for 100 automobile cars instead

THE ROXANNA PETROLEUM COMPANY, St. Louis, Mo., has ordered 50 insulated tank cars of 8,000 gal. capacity from the Standard Tank Car Company.

THE CHAMBLIN REFINING COMPANY, Enid, Okla., has ordered 500 tank cars of 8,000 gal. capacity with 40-ton trucks, from the Pennsylvania Tank Car Company.

THE WABASH, reported in the *Railway Age* of September 16 as inquiring for repairs to 500 box cars, 300 stock cars and 250 automobile cars, has decided to do its own repair work

THE CHICAGO, ROCK ISLAND & PACIFIC will soon issue inquiries for 500 box cars, 500 coal cars, 500 automobile cars, 250 flat cars, 250 ballast cars, 250 refrigerator cars, and 250 stock cars

THE BALTIMORE & OHIO, reported in the *Railway Age* of September 2 as inquiring for 1,000 steel hopper cars of 55 tons' capacity, has ordered this equipment from the American Car & Foundry Company.

THE CINCINNATI, INDIANAPOLIS & WESTERN was erroneously reported in the *Railway Age* of September 16 as having placed an order with the Pullman Company for 300 gondola cars. No contract for this equipment has been closed to date.

THE PITTSBURGH, SHAWMUT & NORTHERN, reported in the *Railway Age* of September 16 as inquiring for 200 stock cars of 30 tons' capacity and 50 box cars of 40 tons' capacity, is also inquiring for 200 stock cars of 40 tons' capacity, 50 box cars of 50 tons' capacity and from 150 to 200 stock car bodies.

THE INDIAN STATE RAILWAYS are inquiring through the car builders for a total of about 3,100 cars to include 1,875 covered goods wagons, 500 open goods wagons, 100 bogie wagons, 35 bogie rail and timber, all of broad gage, 585 four-wheel covered goods wagons and 25 bogie rail and timber of meter gage.

ST. LOUIS-SAN FRANCISCO, reported in the *Railway Age* of September 9 as inquiring for 1,500 steel frame, double hopper cars of 55 tons' capacity, 1,500 single sheathed box cars of 40 tons' capacity and 300 stock cars of 40 tons' capacity, has ordered 1,000 hopper cars from the Chickasaw Ship Building Company and 500 hopper cars from the Pullman Company; the 1,200 box cars from the American Car & Foundry Company and 300 stock cars from the Mount Vernon Car Manufacturing Company.

Passenger Cars

THE CHICAGO, ROCK ISLAND & PACIFIC will soon issue inquiries for 50 all-steel suburban passenger cars.

THE CHICAGO & EASTERN ILLINOIS, reported in the *Railway Age* of September 9 as inquiring for 17 steel baggage cars, 70 ft. long, has ordered this equipment from the Pullman Company.

Iron and Steel

THE ST. LOUIS-SAN FRANCISCO is inquiring for 600 tons of structural steel.

THE MISSOURI PACIFIC has ordered 275 tons of structural steel from the American Bridge Company

THE LONG ISLAND will receive bids until 10 a. m. September 30 for 8,000 gross tons of open-hearth steel rail.

THE UNION PACIFIC has placed an order with the American Bridge Company for 2,735 tons of structural steel.

THE MISSOURI PACIFIC has asked prices on its 1923 requirements for steel rails, the tonnage not being specified.

THE CHICAGO & EASTERN ILLINOIS is expected to place contract with the Illinois Steel Company for 5,000 tons of new rail.

THE CHICAGO, BURLINGTON & QUINCY has placed an order with the American Bridge Company for 1,056 tons of structural steel for miscellaneous bridge work.

A MAJORITY OF THE WESTERN RAILROADS are negotiating direct with the steel companies for new rail to place contracts before the price increase becomes effective

THE PENNSYLVANIA RAILROAD has ordered from the Phoenix Bridge Company 1,000 tons of bridge steel for five bridges to be built over street crossings at Elizabeth, N. J

THE NEW YORK CENTRAL will receive bids until 12 o'clock noon September 25, for the requirements of the New York Central and subsidiary lines of not to exceed 200,000 tons of open-hearth steel rail, ranging from 120 lb. to 80 lb. sections with the necessary angle bars for delivery not later than July 1, 1923

Track Specialties

THE WABASH is inquiring for 370 kegs of track bolts.

THE MOBILE & OHIO is inquiring for 900 kegs of track spikes.

THE ST. LOUIS SOUTHWESTERN is inquiring for 500 kegs of track bolts and 300 kegs of track spikes.

Machinery and Tools

THE CENTRAL OF GEORGIA is inquiring for 15 miscellaneous type machines.

THE CHICAGO & NORTH WESTERN has ordered a coal handling gantry crane with a 1½ yd. bucket from the Milwaukee Electric Crane & Manufacturing Company. The crane will be leased to the Armour Grain Company for use at its grain elevator in South Chicago.

THE MISSOURI, KANSAS & TEXAS is inquiring for 37 miscellaneous type lathes, six planers, six radial drills, six crank shapers, five milling machines, three grinders and two boring mills, besides shears, bulldozers, boxlathes, bolt cutters, pipe threaders and other miscellaneous equipment. The machines are to be motor driven with push button control.

Miscellaneous

THE BROWN HOISTING MACHINERY COMPANY, Cleveland, Ohio, is inquiring for 107 trucks.

THE NEW YORK CENTRAL LINES WEST will receive bids until October 2 for its requirements until January 1, 1923, for fuel oil, gasoline, kerosene, lubricating oil, grease and tallow candles.

THE GOVERNMENT OF THE NETHERLANDS, Colonial Branch, New York, is asking for bids on 2,000 axles and 400 wheels for service on passenger and freight cars of the State Railways in the Dutch East Indies.

THE GOVERNMENT OF THE NETHERLANDS, Colonial Branch, New York City, has bought from the American Copper Products Company, New York, 900,000 lb. of copper cable for a 70,000-volt transmission line to be erected in Java in connection with the electrification of the Java State Railways. An order has also been given for high tension insulators of the link type Hewlitt insulator to R. Thomas & Son, East Liverpool, Iowa.

Signaling

THE GOVERNMENT OF JAPAN, through the Takata Exporting Company has ordered from the General Railway Signal Company 200 Model 2 A semaphore signals and 70 light signals. The order includes all auxiliary equipment such as relays, transformers, etc., required for installation. Seventy color light signals are to be shipped to Kobe and 200 upper left-hand quadrants to Yokohama. This order follows one placed last year for 370 automatic signals

Supply Trade News

H. C. Thomas, general superintendent of the **United Alloy Steel Corporation**, Canton, Ohio, has been promoted to assistant general manager.

The **Chicago Flexible Shaft Company**, Chicago, Ill., has opened a new district sales office at 305 Merchants Bank building, Indianapolis, Ind., in charge of **F. W. Odemar**.

The merger of the **Bethlehem Steel Corporation** and the **Lackawanna Steel Company** was ratified at recent meetings of the stockholders of these companies. Announcement of this merger was made in the *Railway Age* of May 20, page 1196.

C. T. Pratt, treasurer of the **Brown Hoisting Machinery Company**, Cleveland, Ohio, has resigned and **A. C. Brown**, president of that company, has assumed the additional duties of treasurer. **J. F. Pierce** has resigned as auditor and director of the same company. This latter vacancy probably will not be filled for the present.

The **Walworth Realty Company**, a subsidiary of the **Walworth Manufacturing Company**, Boston, Mass., manufacturers of pipe fittings, piping tools, etc., has awarded to **Dwight P. Robinson & Co., Inc.**, New York, a contract for the design and construction of a warehouse, pipe shop and garage to be located at Jackson avenue, Long Island City, N. Y.

H. C. Mull, in charge of railway sales for both the Reliance Manufacturing Company, Chicago, and the Warren Tool & Forge Company, Warren, Ohio, with headquarters at Chicago, has resigned from the former and will hereafter represent only the latter, with headquarters at Warren, Ohio.

Russell, Holbrook & Henderson, 30 Church street, New York, has been appointed sales representatives for the territory in and near New York City of the **Oilgear Company**, Milwaukee, Wis. The **Cadillac Machinery Company**, Detroit, Mich., will handle Oilgear products in the state of Michigan and the **R. E. Ellis Engineering Company**, 621 Washington boulevard, Chicago, will represent the Oilgear Company in Chicago and the surrounding territory.

John S. Ruble, who recently resigned as vice-president of the Austin Company, has been elected vice-president in charge of all construction of the **H. K. Ferguson Company**, engineers and builders, Cleveland, Ohio. Mr. Ruble was graduated in mechanical engineering from Pennsylvania State College in 1901. He was then engaged for four years in dock, ore storage and unloading equipment design and construction with Hoover & Mason, contracting engineers. He subsequently served for eight years as an engineer with the U. S. Steel Corporation at various places, then as construction engineer for the Tennessee Coal, Iron & Railroad Company, at Birmingham, Ala.

The stockholders of the **New York Air Brake Company**, New York City, at a recent meeting voted to amend the certificate of incorporation so as to provide that the authorized and outstanding 100,000 shares of common capital stock of the par value of $100 each be changed into 200,000 shares of common stock without par value, so that each stockholder in the company will hold two shares of common stock without par value for every share of capital stock of par value of $100 heretofore held. The certificate of incorporation was further amended so as to create an issue of class A stock of an authorized number of shares of 100,000 and the board of directors unanimously resolved that this class A stock be offered to the stockholders of record September 28, 1922 pro rata for subscription at $50 per share.

Obituary

J. M. Potter, president of the Northwestern Malleable Iron Company, Milwaukee, Wis., died on September 6, at the age of 64 years. Mr. Potter had been connected with the above company for 22 years.

Frederick W. Cooke, formerly general manager of the Cooke Locomotive Works whose death on August 30 at his summer home at Quogue, Long Island, was noted in the *Railway Age* of September 9, was born on July 10, 1860, at Paterson, N. J., and graduated from Stevens Institute in 1882. He served as vice-president and general manager of the Cooke Works from 1883 until the plant was sold in 1901 to the American Locomotive Company and then was general manager until his resignation in 1912. The Cooke Works originated as the Charles Danforth Company, manufacturer of cotton machinery at Paterson, N. J. In 1852 John Cooke became associated with these interests and a new company was organized in July of that year under the name of Danforth, Cooke & Company, Paterson, N. J., to build machinery and locomotives; and it continued under this name until 1865 when the name was changed to the Danforth Locomotive & Machine Company, of which John Cooke was the head and active manager of the locomotive branch. The business soon outgrew the machine interest and the latter was given up entirely some years later. John Cooke died in February, 1882, and was succeeded by his brother, James Cooke, formerly superintendent. The latter died on August 2, 1883, shortly after which date the stock control passed into the hands of the Cookes and the corporate name was changed to the Cooke Locomotive & Machine Company with John S. Cooke, president, and Frederick W. Cooke, vice-president and general manager. The business increased and work was started in 1888 on new works on the present site. In 1901 the works were sold to the American Locomotive Company and became the Cooke Works of that company. Mr. Cooke continued as general manager until his retirement in 1912. During the late war Frederick W. Cooke took an active part in the raising of funds for the various war reliefs.

Frederick W. Cooke

Trade Publications

BEARING METALS.—The A. W. Cadman Manufacturing Company, Pittsburgh, Pa., has recently issued engineering bulletins M-1 and M-2. The first bulletin deals with the properties of bearing metals, especially those alloys known as Cadman metals. The second contains miscellaneous technical information pertaining to bearings and bearing metals, discussing such questions as the theory of bearing metals, friction in bearings and permissible bearing pressures.

THE PENNSYLVANIA proposes during the next nine weeks to put forth a "giant effort" to do more than its share in moving bituminous coal from mines to Cleveland, Ashtabula, and Erie, for the upper lake territory. The Northwest has been taking an average of 22,000,000 tons of lake cargo bituminous coal annually. The season for the lake boats ends about November 15. The Northwest is estimated to be short more than 10,000,000 tons in lake coal. It is calculated that the total lake cargo coal that the railroads can move to lake ports will run about 1,000,000 tons a week. This amount is not yet in sight for a weekly haul. The Pennsylvania has ordinarily hauled 21 per cent of this freight. The Bedford yard, 12 miles out of Cleveland, used exclusively for bituminous coal and ore trains, has been reopened. The Pennsylvania has coal-loading machines at Cleveland (3), at Ashtabula (2) and at Erie (2), seven in all. The record for speed at the Cleveland docks is 40 cars in an hour. Under an arrangement just put into effect bituminous coal reaching lake ports will be pooled, assuring faster boat loadings and saving in time probably 20 per cent.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—The Interstate Commerce Commission has issued a certificate authorizing the construction of two branch lines in Osage County, Okla., one beginning at a point 17 miles north of Burbank and extending in a northeasterly direction through De Noya, 6.24 miles, and the second beginning at De Noya Junction on the above branch and extending in an easterly direction 2.97 miles. Construction of the two lines was begun on February 4, 1922, but at the time it was intended to operate them as spur tracks.

ATCHISON, TOPEKA & SANTA FE.—This company has awarded a contract for a machine shop at Waynoka, Okla., to E. Ware, El Paso, Tex., and a contract for sash work to the Truscon Steel Company, Detroit, Mich.

CHICAGO & WESTERN INDIANA.—This road is working on plans for a new passenger terminal on its present location at Chicago for use by the roads using the present terminal with facilities sufficient to accommodate also the roads using the LaSalle and Grand Central stations.

CHICAGO, BURLINGTON & QUINCY.—This company will close bids on September 25 for the construction of a passenger station 24 ft. by 100 ft. at Clarence, Mo., and will close bids on September 29 for a 50-ton coaling station at Clarinda, Iowa.

CHICAGO UNION STATION.—This company will receive bids for the widening of Canal street, Chicago, from Harrison street 225 feet north.

FLORIDA EAST COAST.—This company has applied to the Interstate Commerce Commission for a certificate authorizing an extension from Okeechobee to Miami, Fla., 125 miles. The line is to develop the Everglades south and east of Lake Okeechobee and open a territory practically devoid of any means of transportation. The extension would also afford a separate through line inland from Miami to Smyrna, 240 miles, which would serve as a second main line.

ILLINOIS CENTRAL.—This company will construct additional storage tracks at Manchester, Iowa, and passing tracks at Gilman, Ill., Weedman and Guthrie, and at one other place.

ILLINOIS CENTRAL.—This company will improve its water facilities at Peosta, Ia., at a cost of $15,000; at Kinmundy, Ill., $20,000; at Pana, $9,000; at Ramsey, $21,000; at Memphis, Tenn., $27,000, and at Champaign, Ill., $18,000. This company will also improve its coal handling facilities at McComb, Miss., at a cost of $69,000, and its air testing facilities at Dubuque, Ia., at a cost of $10,000. Passing tracks will be constructed at Dowell, Ill., at a cost of $20,000; Lenzberg, $11,000, and Marion, $13,000. This company will also extend its passing and yard tracks at Marissa, Ill., at a cost of $76,000, and passing and storage tracks will be constructed at Cambria, Ill., at a cost of $25,000.

MISSOURI PACIFIC.—This company is receiving bids for the construction of a car repair shop 120 ft. by 510 ft. at Kansas City, Mo.

OREGON, CALIFORNIA & EASTERN.—This company, which operates a railroad between Klamath Falls, Ore., and Hildebrand, a distance of 24 miles, will within the next few months, extend its line from the latter point northward to Squaw Flat, a distance of eight miles, while during the first part of 1923 it is proposed to extend the line six miles further to Sprague river. This same company is also doing some work on what is known as the Bonanza branch, a line extending eastward from Dairy to Bonanza, a distance of seven miles. Part of the grading has been finished and a small amount of track laid and it is expected to complete this line early in 1923. The construction of another branch line known as the Swan Valley branch has also been undertaken. This will extend from a point 15 miles northeast of Klamath Falls into the Swan Valley region. Two miles of this branch is already completed and it is intended to extend it several miles further. The O. C. & E. Company contemplates eventually extending northward to Bend, Ore., where it will connect with the Oregon-Washington Railroad & Navigation Company and the Oregon Trunk Line. The Klamath Falls-Bend line will be 175 miles in length. From a point 20 miles south of Bend a branch of the O. C. & E. will extend eastward to Crane, a terminus of a branch line of the Union Pacific. The line from Silver Lake to Lakeview, a distance of 80 miles, will connect at the latter point with the Nevada-California-Oregon, while at Klamath Falls a direct connection is made with the Southern Pacific. All the surveys for this system, which in total, will comprise 423 miles of line, have been completed and a large part of the right-of-way obtained. The cost of the entire project will be $10,000,000, much of which has been raised locally. In anticipation of this construction, numerous lumbering, irrigation and other enterprises have been inaugurated, some of them 75 miles ahead of the track.

LAKE SUPERIOR & ISHPEMING.—This company will construct a steel repair shop, 69 ft. by 301 ft., a paint and coach shop, 48 ft. by 100 ft., and a woodmill, 47 ft. by 100 ft., at Marquette, Mich., the total cost of which is estimated at $250,000.

SOUTHERN PACIFIC.—This company will construct a new five span steel girder bridge approximately 929 ft. long across the Rio Grande river at Eagle Pass, to cost about $225,000. The bridge will be owned jointly by the Mexican National and the Southern Pacific.

UNION PACIFIC.—This company is receiving bids for the extension and repairing of its passenger station at Kearney, Neb.

UNION PACIFIC.—This company, in conjunction with the city of Denver, Colo., has awarded contracts for the Broadway viaduct of steel truss and girder spans having a total length, including embankment and reinforced concrete approaches of 2,257 ft. To C. S. Lambie & Company, Denver, was awarded the contract for the concrete substructure of the viaduct proper and to D. Munro, of Kansas City, Kan., for the reinforced concrete work in the approaches. The steel superstructure will be furnished by the American Bridge Company and erected by the Kansas City Bridge Company. This company has also awarded a contract for an addition to its passenger station at Cheyenne, Wyo., to H. W. Baum Company, Salt Lake City, Utah.

THE ST. LOUIS-SAN FRANCISCO moved 730 cars of peaches from southeast Missouri and northeast Arkansas orchards during the season which recently closed. Of the total, 476 cars were from the Fort Smith district; 222 cars from the Koshkonong, and Brandsville districts; 24 from the Springfield district, and eight from Oklahoma. This is considered one of the best seasons experienced by the growers of southeast Missouri.

LABOR UNION DISCIPLINE.—Too little public attention has been paid to certain acts of discipline worthy of praise for organized labor. There was lately published a list of a dozen trainmen who were punished by their union for the abandonment of passenger trains in Arizona and California. All of them lost their union cards, although a majority of them were union officials. This action does credit alike to the character and the intelligence of the train-service brotherhoods. It is in line with their previous refusal to break their service contracts for the purpose of striking in sympathy with the shopmen, and with the threat to revoke the charter of the unions whose strike contributed to the receivership of the Chicago & Alton Railroad. The train-service brotherhoods are entitled to recognition of the fact that their conduct in these cases supports their character as a superior sort of union. The brotherhoods abide both by their own laws and by the laws of the country, and within the past few days their highest officials have rebuked members who have rashly broken contracts of employment for the purpose of striking in a manner "unlawful," according to brotherhood rules. These facts gain significance in contrast with the course of the unions affiliated with the American Federation of Labor. The difference in the conduct of the two sorts of unions shows why the train services have resisted all overtures from the Federation to join forces, and gives value to the independent action of the train services. The mechanics employed by the railways are in industrial competition with workers in private employ. Either can exchange their duties at will, and their pay should be approximately equal, all conditions considered. The train-service brotherhoods are real railway workers, and the country is fortunate that they are so conservative in their policies.—*New York Times.*

Railway Financial News

BANGOR & AROOSTOOK.—*Preferred Stock Offered.*—An issue of $3,480,000 7 per cent cumulative preferred stock offered by Brown Brothers & Co. and Hayden, Stone & Co., at 95 and accrued dividend, to yield 7.36 per cent, has been over-subscribed.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—*Equipment Trust Authorized.*—This company has been authorized by the Interstate Commerce Commission to assume obligation and liability in respect of $725,000 of equipment trust certificates.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*Stock Exchange Offer Extended.*—See New York Central.

DELAWARE, LACKAWANNA & WESTERN.—*Annual Report.*—The annual report issued this week shows the following income account for the year ended December 31, 1921, compared with the combined corporate and federal account for the previous year:

	1921	1920
Total revenues	$85,977,815	$83,340,062
Total expenses	67,872,058	73,898,430
Net revenue from operation	18,105,757	9,441,632
Tax accruals	5,312,066	4,539,785
Operating income	12,781,395	4,899,037
Add additional income	13,478,144	19,382,212
Gross income	26,259,539	24,281,249
Deductions from income	7,101,136	9,622,805
Net income for year	19,158,403	*14,658,444
Less dividends declared	13,510,576	8,444,110
Balance, surplus	5,647,827	6,214,334

*To afford, as far as possible, a correct basis for comparison, the operating results of the U. S. R. A. for the months of January and February, 1920, together with overlapping items relating thereto, are included with the operating results of the company for the ten months of 1920, resulting in an increase in this item of $983,334.81 over the actual net income of the company, as shown on page 6 of the annual report for the year 1920.

DENVER & RIO GRANDE WESTERN.—*Expenditures for Improvements.*—A correspondent at Denver, Colo., states that the receiver of this road is asking permission to spend $23,000,000 for improvements during the next three years.

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC.—*Annual Report.*—The annual report issued this week shows the following income account for the year ended December 31, 1921:

	1921	*1920
Operating revenues	$17,170,446	
Operating expenses	14,789,237	
Net revenue from operations	2,381,209	
Taxes	643,547	
Operating income	1,942,444	$4,026,759
Total non-operating income	276,869	134,359
Gross income	2,219,314	4,161,117
Rent for leased roads	1,324,205	1,218,954
Interest on equipment obligations	153,645	175,040
Total deductions	1,515,778	1,432,482
Total available income	703,535	2,728,635
Dividends of 5 per cent on preferred stock	122,670	122,670
Dividends of 12 per cent in 1921 and 13 per cent in 1920 on common stock	358,800	388,700
Additions and betterments charged to income		950,000
Balance carried to profit and loss	222,065	1,267,265

*Operating revenues and expenses are not comparable, the property having been operated by the U. S. R. A. during January and February, 1920.

CHICAGO, ROCK ISLAND & PACIFIC.—*Bonds Sold.*—Speyer & Co. and Harris, Forbes & Co. subject to the approval of the Interstate Commerce Commission, have sold an issue of $5,000,000 first and refunding mortgage 4 per cent gold bonds, due April 1, 1934.

GEORGIA SOUTHERN & FLORIDA.—*Annual Report.*—The income account for the year ended December 31, 1921, follows:

	1921	*1920
Operating revenues	$4,586,770	
Operating expenses	4,669,211	
Net revenue from operations	†82,141	
Taxes	206,313	
Operating income	†552,561	†$277,852
Total non-operating income	393,002	216,912
Gross income	†159,559	†60,940
Interest on funded debt	280,000	280,000
Total deductions from gross income	716,343	309,785
Deficit charged to profit and loss	†425,784	†370,725

*Operating revenues and expenses are not comparable, the property having been operated by the U. S. R. A. during January and February, 1920. †Deficit.

ILLINOIS CENTRAL.—*Asks Authority for a New Line.*—This company, the Chicago, St. Louis & New Orleans and the Kentucky Midland have filed a joint application with the Interstate Commerce Commission for orders authorizing the purchase of the Kentucky Midland by the Chicago, St. Louis & New Orleans for $255,000 and for the construction of a new line connecting with it and to be operated in connection with it by the Illinois Central under lease. The line of the Kentucky Midland extends from Central City to a point near Earles, Ky., 11 miles, and it is proposed to build an extension from Earles to a point 5 miles north of Dawson Springs, Ky.

Equipment Trust Notes.—Kuhn, Loeb & Co. have placed privately an issue of $6,645,000 Illinois Central 1-15-year 4½ per cent equipment trust notes, at price to yield about 4.95 per cent. These are the first equipment trust notes issued since the war to bear 4½ per cent interest.

LACKAWANNA OF NEW JERSEY.—*Stock Offered.*—Joseph Walker & Sons, of New York, are offering $200,000 4 per cent capital stock of this company at a price to yield nearly 5 per cent. The total authorized capital stock amounts to $11,000,000, of which $10,750,000 is outstanding. The road is leased in perpetuity to the Delaware, Lackawanna & Western at a rental of 4 per cent per annum on capital stock.

NEW YORK, CHICAGO & ST. LOUIS.—*Equipment Trusts Sold.*—The Guaranty Company of New York, the Union Trust Company and Hayden, Miller & Co. of Cleveland, have sold at 100 and accrued dividend, $3,150,000 equipment trust 5 per cent certificates. They are dated September 1, 1922, and mature $225,000 each September 1, 1924 to 1937, inclusive.

NEW YORK CENTRAL.—*Exchange Offer Extended.*—The offer made to Cleveland, Cincinnati, Chicago & St. Louis stockholders to exchange New York Central stock for Big Four preferred and common on the basis of par for par for the preferred and 80 shares of New York Central for 100 shares of Big Four common has been extended until November 1. This extension offer was on condition, however, that holders surrendering Big Four common for exchange after September 28 should pay $1 for each share of common stock thus exchanged in order to equalize the position of the common stockholders exchanging before and after that date.

NORTHERN PACIFIC.—*Dividend Declared.*—The directors have declared the regular quarterly dividend of $1.25 a share, payable November 1 to holders of record October 2. This is the same dividend as was declared last March when the rate was reduced from $1.75 to $1.25 a share quarterly.

READING COMPANY.—*Listing.*—The New York Stock Exchange has authorized the listing of certificates of deposit of J. P. Morgan & Co. and Drexel & Co. for the general mortgage 4 per cent gold bonds, due 1997, of the Reading Company, and the Philadelphia & Reading Coal & Iron Company.

SEABOARD AIR LINE.—*Equipment Trusts Offered.*—Ladenburg, Thalman & Co., Redmond & Co., Kissel, Kinnicutt & Co., and Freeman & Co. are offering a new issue of $2,560,000 5½ per cent equipment trust certificates, series U due semi-annually from 1923 to 1932 inclusive, at prices to yield from 5 to 5.75 per cent, according to maturity. The certificates are to be issued in part payment for standard equipment.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—*Authentication of Bonds Authorized.*—The Interstate Commerce Commission has authorized this company to procure authentication and delivery of $2,499,000 of general mortgage 4 per cent gold bonds to be held in the treasury.

Dividends Declared

Cleveland, Cincinnati, Chicago & St. Louis.—Common, 2 per cent, payable November 1 to holders of record September 29; preferred, 1¼ per cent, payable October 20 to holders of record September 29.

Kansas City Southern.—Preferred, 1 per cent, quarterly, payable October 16 to holders of record September 30.

Minneapolis, St. Paul & Sault Ste. Marie (Leased Lines).—$2.00, semi-annually, payable October 1 to holders of record September 20.

New York Central.—1¼ per cent, quarterly, payable November 1 to holders of record September 29.

Trend of Railway Stock and Bond Prices

	Sept. 19	Last Week	Last Year
Average price of 20 representative railway stocks	73.45	74.16	56.24
Average price of 20 representative railway bonds	80.80	90.37	76.47

Railway Officers

Executive

W. H. Finley, president of the Chicago & North Western with headquarters at Chicago, has been elected also president of the Chicago, St. Paul, Minneapolis & Omaha.

J. M. Schweizer has been appointed assistant to the vice-president of the Cuba Railroad with headquarters at Camaguey, Cuba, succeeding H. W. Lillengren, resigned.

J. Fred Townsend, of Pittsburgh, has been elected vice-president of the Lake Terminal Railroad, the McKeesport Connecting Railroad and the Benwood & Wheeling Connecting Railway.

A. B. Atwater, assistant to the president of the Grand Trunk, lines west of the Detroit and St. Clair rivers, with headquarters at Detroit, Mich., has retired from active service. Mr. Atwater was born in November, 1845, at Sheffield, O. He entered railway service in 1864, as a telegraph operator of the Cleveland & Erie. From October, 1865, to June, 1885, he was consecutively: in engineering service on the Jamestown division of the Cleveland & Erie; resident engineer on construction of the Canadian Southern; assistant engineer of the Port Dover & Lake Huron; general superintendent of the Georgian Bay & Lake Huron division of the Grand Trunk and chief engineer of the Chicago & Grand Trunk. In June, 1885, he was promoted to superintendent of the Grand Trunk lines west of the Detroit river, which position he held until July 12, 1898, when he became assistant general superintendent of the Michigan Central. He held this position until July, 1902, when he was made assistant to the president of the Grand Trunk, lines west of the Detroit and St. Clair rivers, the position he was holding at his retirement.

Financial, Legal and Accounting

H. A. Toland has been appointed auditor of the Union Pacific at Omaha, Neb., succeeding H. J. Stirling.

E. L. Parker has been appointed auditor of freight accounts of the Seaboard Air Line succeeding B. B. McCaa, deceased.

J. R. Turney, assistant general solicitor of the St. Louis Southwestern, with headquarters at St. Louis, Mo., has been appointed acting general solicitor, with the same headquarters, succeeding D. Upthegrove, deceased.

C. H. Bender, assistant treasurer and paymaster of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Minneapolis, Minn., has been promoted to treasurer, with the same headquarters, and **W. R. Harley,** assistant secretary, with headquarters at Minneapolis, Minn., has been promoted to secretary, with the same headquarters. **J. E. Olson** has been appointed assistant treasurer and assistant secretary, with headquarters at Minneapolis, Minn.

Operating

T. F. Conklin has been appointed general trainmaster of the Michigan Central, with headquarters at Detroit, Mich.

P. L. Randall, assistant to the superintendent of car service of the Pullman Company, has been appointed acting superintendent of car service succeeding D. J. Hinchey, resigned.

J. P. Johnson, assistant superintendent of the Canadian National, with headquarters at Prince Albert, Sask., has been promoted to superintendent of the Prince Albert division, with the same headquarters.

F. C. Fox, general manager of the Atchison, Topeka & Santa Fe, Eastern Lines, with headquarters at Topeka, Kan., who has been on a six months' leave of absence, resumes his duties October 1, succeeding **W. K. Etter,** acting general manager who resumes his duties as assistant to the vice-president at Chicago, succeeding **G. W. Lupton,** who resumes his duties as superintendent of terminals at San Francisco, Cal.

C. H. Gaffeney, whose appointment as superintendent of telegraph of the Central of New Jersey, with headquarters at Jersey City, was announced in the *Railway Age* of September 2, page 450, was born on July 27, 1867, at Lawrenceville, Mercer county, N. J. He was educated in the public schools at Lawrenceville and studied also with the International Correspondence School, Scranton, Pa., and Cooper Institute, New York City and was graduated from the Trenton (N. J.) Normal School. Mr. Gaffeney entered railway service in 1883 with the Pennsylvania as a telegraph operator and served with that company in various capacities, including that of train dispatcher. After leaving that company, he entered the service of John Hoey, president of the Adams Express Company, as private telegraph operator. After Mr. Hoey's death, he worked in various clerical capacities with this company and thereafter entered the employ of the National Service Docks Railway as assistant dispatcher and operator, which position he resigned in 1900 to become chief clerk to the supervisor of signals of the Central of New Jersey. Two years later he was appointed chief clerk to the superintendent of telegraph and remained continuously in that position until the time of his recent promotion.

C. H. Gaffeney

Traffic

G. W. Neudling has been appointed general agent of the Kansas, Oklahoma & Gulf, with headquarters at St. Louis, Mo.

F. G. Brown has been appointed commercial freight agent of the Western Maryland, with headquarters at Kansas City, Mo.

D. R. Peck has been appointed district freight agent of the New Orleans Great Northern, with headquarters at Chicago, Ill.

L. S. Wickes has been appointed assistant general freight agent of the Oklahoma Southwestern, with headquarters at Oklahoma City, Okla.

F. D. Wilson, traveling freight and passenger agent of the Union Pacific, with headquarters at Reno, Nev., has been appointed general agent, with the same headquarters.

H. W. Brodie, general passenger agent of the Canadian Pacific with headquarters at Vancouver, has been appointed assistant passenger traffic manager with headquarters at Montreal. **W. H. Snell,** general passenger agent at Montreal, succeeds Mr. Brodie at Vancouver. **George A. Walton,** general passenger agent at Winnipeg, has been transferred in a similar capacity to Montreal. **R. C. McNellie,** assistant passenger agent at Winnipeg, has been promoted to general passenger agent with the same headquarters. **N. R. DesBrisay,** district passenger agent with headquarters at St. John, N. B., has been appointed assistant general passenger agent with headquarters at Winnipeg. **G. P. Burpee,** general agent at Cleveland, Ohio, has been appointed district passenger agent at St. John, N. B. **Walter Maughan,** assistant general passenger agent with headquarters at Montreal, has been appointed assistant to the general passenger traffic manager

with the same headquarters. **W. B. Howard**, district passenger agent at Toronto, has been appointed assistant general passenger agent with headquarters at Montreal. **W. Fulton**, assistant district passenger agent at Toronto, has been promoted to district passenger agent. **W. Horder**, chief clerk in the general passenger department at Montreal, has been promoted to assistant district passenger agent at Toronto.

Louis R. Jones, whose appointment as assistant general freight agent of the Philadelphia & Reading was announced in the *Railway Age* of September 9, page 491, was born on February 22, 1882, at Haddonfield, N. J., and attended public school in that city from 1888 to 1901. On July 29, 1901, he entered the service of the Philadelphia & Reading as a clerk in the comptroller's office, Reading Terminal, Philadelphia. In connection with this position he also served in the offices of the auditor of freight traffic, auditor of traffic receipts and auditor of disbursements. On May 1, 1907, he was transferred to the freight traffic department as tariff and rate clerk, holding that position until February 28, 1920. He was then promoted to chief clerk of the freight traffic department, which position he held until the time of his recent promotion.

Mechanical

J. J. Hanlin has been appointed assistant superintendent of motive power of the Seaboard Air Line, with headquarters at Portsmouth, Va., effective September 19.

Robert Collett has been appointed superintendent of fuel and locomotive performance of the New York Central with headquarters at New York, effective September 1.

B. F. Bardo has been appointed superintendent of electric transmission on the New Haven in charge of operation and maintenance of the wire plant between New York and Cedar Hill with headquarters at Cos Cob, Conn., reporting to H. A. Shepard, general superintendent of electric transmission and communication. Mr. Bardo was born in Wilkes Barre, Pa., December 16, 1889. He was educated in the Morris High School, New York City, and Cornell University, being graduated from the latter institution with a degree of mechanical engineer in 1913. After graduation he served for a little more than a year in the testing department of the General Electric Company at Schenectady, N. Y., and at Pittsfield, Mass. In August, 1914, he entered the services of the New York, New Haven & Hartford in the office of the superintendent of power. In October, 1915, Mr. Bardo was appointed inspector of power plants and in November, 1917, was promoted to engineer of power plants, serving in that capacity until his present appointment.

B. F. Bardo

Engineering, Maintenance of Way and Signaling

S. J. Stinson, signal maintainer of the Canadian National, with headquarters at Saskatoon, Sask., has been appointed acting signal supervisor of the Saskatchewan district, with the same headquarters, succeeding R. G. Gardiner, transferred.

T. L. Doyle, assistant division engineer of the Mackinaw division of the Pennsylvania, with headquarters at Grand Rapids, Mich., has been promoted to assistant to the chief engineer of the Pennsylvania-Detroit Railroad, with headquarters at Detroit, Mich. **R. Stephens**, an assistant in the engineering department of the Mackinaw division, with headquarters at Grand Rapids, Mich., has been appointed acting assistant division engineer of that division, with the same headquarters, succeeding Mr. Doyle.

Obituary

C. A. Benscoter, assistant general passenger agent of the Southern with headquarters at Knoxville, Tenn., died September 19.

J. R. Dickinson, assistant general solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, Ill., died in that city on September 17, after an extended illness.

W. H. Richardson, general passenger agent of the Chicago & Eastern Illinois, with headquarters at Chicago, whose death on September 4 was reported in the *Railway Age* of September 9 was born on January 25, 1862, at Bloomington, Illinois. He entered railway service in 1880 as a stenographer to the division superintendent of the Chicago & North Western at Baraboo, Wisconsin. In 1882, he left this company to enter the employment of the Chicago & Eastern Illinois as a stenographer. Six years later he was promoted to rate clerk and remained in this capacity until 1895, when he was promoted to chief clerk in the passenger traffic department. In 1900 he was promoted to general passenger agent which position he held at the time of his death.

W. H. Richardson

Charles M. Carter, assistant treasurer of the Chicago, Burlington & Quincy, with headquarters at St. Joseph, Mo., died on September 1. Mr. Carter was born on September 22, 1852, at Cambridge, Mass. He entered railway service on August 1, 1876, as a clerk in the assistant treasurer's office of the Burlington & Missouri River, at Omaha, Neb. From March 1, 1877, to August 1, 1880, he was assistant treasurer of the Chicago, Clinton, Dubuque & Minnesota at Dubuque, Ia. From August 1, 1880, to January 1, 1885, he was assistant treasurer and auditor of the Kansas City, St. Joseph & Council Bluffs at St. Joseph, Mo., and on August 1, 1884, he was also acting auditor of the Hannibal & St. Joseph. He was appointed assistant auditor of these roads on January 1, 1885, which position he held until May 1, 1885, when he was promoted to auditor. He was also auditor of the St. Louis, Keokuk & Northwestern and the Chicago, Burlington & Kansas City from July 1, 1891, to February 1, 1903. He was appointed assistant treasurer of the Chicago, Burlington & Quincy, lines east of the Missouri river on February 1, 1903, his jurisdiction later being extended over the system, which position he held to the time of his death.

Chas. M. Carter

EDITORIAL

Railway Age

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As an average for every 100 cars that are moving, loaded or empty, there are 119 being loaded, 119 being unloaded, 164 on repair tracks, and 680 standing in yards. The last figure deserves the careful attention of railway operating officers. Millions will be spent to get cars in condition during the next few months, but if the time in yards could be reduced one-fourth, it would be equivalent to putting all the bad-order cars back in service. Is there any reason why the average time cars spend in yards on each trip cannot be reduced from 11 days to 8 days?

An Opportunity for Saving Cars

Telegraph and telephone facilities have not kept pace with increases in track capacity and improvements in motive power on not a few railroads. Too often train delays due to lack of wires or modern telephone equipment are considered inevitable. As an illustration, on one important small road which is considered to be in good financial condition, as evidenced by extensive improvements in track and power, the communication system is inadequate. The superintendent of telegraph of this road has long desired to discard considerable of the old equipment, install a new telephone system and make many improvements in the telegraph but he has instructions to spend no money as long as the business can possibly be handled without extensive improvements or replacements. As a result of this policy this road will suffer serious delays from its obsolete communication system during the heavy business now coming. The regrettable feature is that the road may struggle through the traffic congestion blind to the small defect that is causing trouble. With the existing pole lines, new instruments, combined circuits, or new wires can be installed in a short period and at a small cost compared with the benefits. Considering this condition it might be well for other roads to check up the capacity of their communication facilities while there is yet time to correct conditions.

Antique Communication Facilities

The railroads have for some time been supplementing the activities of their own repair shops by sending to the car and locomotive builders large numbers of cars and locomotives for repair. The shopmen's strike has proved sufficiently serious to increase the volume of this outside repair work by the regular equipment builders. In addition it has also brought out a new development in the form of contracts for repair work which have been given by various railroads to concerns not previously experienced in car or locomotive repair work. Car repairs by concerns familiar with similar activity do not seem to present a difficult problem outside of that of so organizing the work as to keep down costs. Locomotive repairs, however, represent a problem not quite so simple of solution. The companies which are taking on this work are familiar in only a general way with locomotive repairs and it is naturally to be supposed that they may lack various kinds of equipment. They are presumably, on the other hand, being asked to repair only the smaller locomotives and it is very likely that in each of the shops which has taken a contract there is a fair proportion of the forces familiar with railway work. One industrial plant offered a locomotive repair contract found that it had 80 former railroad employees, including an ex-master mechanic. If these companies show that they can come through with results, however, the new development will be one of great importance. It will help those railways taking advantage of it out of a rather difficult situation and not the least element in its importance is that it means that a large number of concerns will have been enlisted in helping the railways fight the railway shopmen's strike. Apparently about as far as one can go at this time, however, is to say that the new development will be watched with interest.

Equipment Repair Work

It is characteristic of native merchants in the Far East always to set the first price of an article high above the anticipated selling price. Tourists and traders are compelled, therefore, either to haggle with the natives and drive hard bargains, or else pay more than goods are worth. In cases where both buyer and seller understand that the first price is unduly high, this haggling represents a needless waste of time and energy, the final selling price being beaten down to what will give the seller a reasonable profit and what he could just as well have stated in the first place. Continual efforts of a buyer to obtain unjust price concessions are equally ineffective, as this characteristic becomes known and first quotations are made correspondingly high. Haggling over material prices has little place in modern business and it is to be regretted that certain railroads follow this method in purchasing supplies and equipment, of which machine tools may be taken as an example. Of two powerful roads in the same general territory, one requests bids and absolutely holds the machine tool manufacturers to whatever prices are first quoted. The other road requests bids, plays the manufacturers against each other and exerts undue pressure to obtain price reductions. Knowing this fact from past experience, the manufacturers in self-defense quote a higher price to the second road than that at which they expect to sell and realize a reasonable profit. The repetition of bids and negotiations for price reduction represents a total loss of time and energy which fails in its purpose of getting the machinery for the second road at a reduced price.

Haggling Over Material Prices Does Not Pay

The article by A. S. Baldwin, which appeared in the *Railway Age* of September 2, affords an object lesson in the scientific study that should be given to the design of a large passenger station by those responsible for the development of plans for such projects. The intensive thought given this subject has resulted in the formulation of certain fundamental principles which, if we are to judge from the arrangement of some of the older stations, were not brought to light in the

Design of Large Passenger Stations

development of the earlier designs. One fundamental principle that now seems axiomatic is that the route of the passengers through the station must be so obvious and direct that an individual of average intelligence should have no occasion to ask directions from the time that he enters the street door until he shows his ticket to the attendant at the track gate. All the facilities which must serve him should come to his attention through visual indication in his movement from the street to the train or in reverse order. This condition is best fulfilled if the train gates can be placed on the same level as all the other station facilities, a requirement that is not always easily met. For this reason the plan of the headhouse for the new Chicago Union station, which is described on another page of this issue, will be found of interest to students of station design, where the requirement has been fulfilled in spite of adverse street levels. The ultimate solution is exceedingly favorable, since it has been found possible to place even the tracks on the same level with the rest of the station.

Make Hay While the Sun Shines

The shop strike cost the railroads a lot of money. This will be reflected in the monthly balance sheets by increases in operating expenses. Although the shop forces have now been restored almost to normal on most roads, through the agency of settlements or the perfection of new organizations, the strike will continue to exert an influence on operating expenses because of the large forces which must be employed to restore cars and locomotives to a normal condition of maintenance. This state of affairs will have an unfortunate influence on the operating ratio unless the expenses are curtailed in some other way and, as is usually the case under such circumstances, the maintenance of way department becomes the victim. This tendency is now being reflected on more than one road in the form of instructions to reduce the track forces and carry over bridge and building repair work. In the face of a capacity traffic that bids fair to continue well into the winter months and with the memory of the "holiday" seasons of 1917 and 1918 still well impressed on the minds of all railway officers, curtailment of maintenance of way at this time does not bear the stamp of good judgment. A stretch of soft track may tie up traffic just as effectively as a car with defective brake rigging, while the repair of a snow fence in a cut, some new switch ties on a ladder track or a better frost box on a water tank may exert as much influence on the car mileage as new flues in a locomotive boiler. This is no time to talk of retrenchment which affects operating facilities.

False Economy

A western railway has been considering the elimination of a limiting grade on one of its heavy traffic lines for more than fifteen years. Survey after survey has been made without locating an entirely satisfactory line. Finally, after many of the officers had given up the search and the project had been dormant for three or four years, one of the engineers, who was not willing to admit that no satisfactory line existed, secured authority to undertake a new study, as a result of which he found an entirely new line which was such a marked improvement over any other line that had been located in first cost and in operating characteristics that its construction has been authorized. This illustrates the economy of liberality in engineering investigations. In general, the railways make more detailed investigations of proposed improvements than other industries, but there are numerous instances where roads have spent unnecessarily large sums for work the cost of which a more detailed investigation would have reduced materially. The proportion which the cost of engineering investigation and design bears to the total expenditure is so small and the possibilities for economies in construction and in operation are so large that the fullest opportunity should be given to the engineering department to make adequate investigations before undertaking work of any magnitude. In fact, it would be economy for the management to insist that such investigations be made before approving plans and authorizing work and the efficiency of an engineering department should be determined by the character of its construction rather than by the size of its payroll.

Increase the Car Loading

It is trite to say that the number of cars required to move a given volume of traffic varies inversely with the amount loaded in each car. It is equally evident that a car shortage can be relieved or averted as directly by increasing the average load per car as by adding to the number of cars. The roads have ordered a large amount of new equipment in recent months, some of which is now being delivered. This new equipment will not, however, be sufficient to enable the roads to cope successfully with the traffic now confronting them and they must of necessity resort to the heavier loading of cars if a serious shortage is to be avoided. The loading of cars is controlled by the shipper, subject only to certain minimum restrictions, but the roads can do much to increase the loading by enlisting the co-operation of their patrons, as was evidenced during the fall of 1920 when the average car load rose to 31.2 tons in December, as compared with 27.7 tons in the same month of the previous year. This improvement effected an increase in the carrying capacity of the railroads equivalent to the addition of more than a quarter of a million cars, with no added investment and with an increase in operating expenses far less than that in revenues. The roads are now facing a serious shortage of cars, particularly those designed for the transportation of coal, grain and fruit. It is therefore important that the measures which were instrumental in bringing about the increase in loading in 1920 be again restored. Much can be done in this direction through campaigns directed and co-ordinated by system officers. The real work, however, devolves upon the local traffic and operating men who come in contact with the patrons and who can appeal to them for their support in using the equipment which is available in a way which will enable it to serve the largest possible number of shippers. These local officers can do no more effective work for their roads under the present conditions than by bringing the necessity for car conservation to the attention of their patrons and showing them how they can co-operate.

Finding and Using the Best Shop Methods

A railroad system with considerable mileage is obliged to operate engine terminals and repair shops for maintaining locomotives and cars at widely separated points. Under such circumstances there is a strong tendency for each shop, large or small, to be conducted as an independent unit. Master mechanics and foremen are so busy with routine work and matters that must receive prompt attention that they often have far too little time even to sit down and think out plans for improved methods of doing work in their own shops, to say nothing of familiarizing themselves with the methods used at other shops. On how many systems are the foremen familiar with the practices followed at other points on the same road which are only a few hundred miles

apart? At practically every shop there are foremen who, being not only good mechanics but possessed of considerable ingenuity, have devised excellent methods and devices for doing certain jobs. These may be simpler and more economical than the usual methods followed at other points, but the railroad does not obtain the full benefit of the improvement as long as it is used at one point only. Much benefit could be obtained by the inauguration of a well-planned and systematic arrangement for foremen periodically visiting other shops, supplemented by an occasional meeting of all foremen holding similar positions on the system. Another method which also has been productive of considerable good and is followed frequently by many industrial concerns operating a number of plants at different points, is to employ some one, frequently in the capacity of a general superintendent, whose duty it is to divide his time between the various plants, investigating the methods followed, harmonizing practices and advising changes in layout and equipment to reduce operating costs and increase output. Such a person, freed from the details of routine administration, has an opportunity to familiarize himself with machine tools and ways of doing work which is not possible to a man directly responsible for shop operation.

The Transportation Situation—Cause and Effect

THE FARMERS, business men and other people of the United States who have been responsible for the policy of government regulation and government operation of railroads which has prevailed during the last fifteen years are now beginning to have an experience which should be as instructive to them as it is to be feared it will be expensive. The railways in the week ended September 16, the last date for which we have the figures, moved 945,919 carloads of freight. The largest business ever handled by them in their history was in 1920. The number of carloads of freight moved in the week mentioned was only 3½ per cent less than in the corresponding week of 1920, and only 6 per cent less than the largest number of carloads ever moved in any week in history.

In spite of the remarkable transportation results being obtained under adverse conditions, the railroads for the week ended September 8 reported for the first time since 1920 a net shortage of cars. The orders for cars in some parts of the country which could not be filled exceeded by 15,000 the surplus cars in other parts of the country for which there were no orders. The net shortage was small. But on April 8, 1921, the railways had a car surplus of 507,427 cars, and even six months ago there was a car surplus of 260,000 cars.

It has taken only this short time for the increase in business activity to wipe out the large car surplus. The so-called "car shortage" is a symptom, not a disease itself. The disease is inadequacy of railway facilities of all kinds, and we have not yet felt its worst effects.

Business activity and production are increasing throughout the country. Every class of producers and shippers is clamoring for more transportation. Although the amount of coal transported has increased over 125 per cent since the coal strike was settled, the United States Geological Survey in its report for the week ended September 16 says: "Transportation is the dominant and limiting factor in soft coal supply."

One of the associations of manufacturers of lumber in a circular letter calls attention to the fact that the production of lumber has for some time been exceeding the amount that could be shipped, and that finally lack of transportation is forcing a curtailment of production. The National Association of Sand and Gravel Producers has been before the Interstate Commerce Commission to secure modification of its priority orders in favor of coal because these priority orders are seriously interfering with road building and other construction work. There are wide-spread complaints in the west because the railroads cannot move the grain as fast as the farmers desire to ship it. Governor Kendall of Iowa issued a statement on September 1 in which he said: "The car shortage in the state is a serious embarrassment to all industry and enterprise and it is one most difficult to remedy." He stated that the elevators are overflowing everywhere, and heavy losses will be sustained unless provision can be made for the immediate marketing of the grain. He advocates a transportation priority order in favor of cereals for two weeks. This condition exists in spite of the fact that thus far in 1922 the railways have moved more grain than ever before. The number of cars of grain moved this year to September 9 was 1,636,230. The previous high record was that of 1921, when up to the same date shipments of grain had been 1,571,538 cars.

Governor Kendall said the prolonged strike left the railways without adequate equipment. The situation would be somewhat better if the railways did not have an abnormal amount of equipment in bad order. But the shop employees' strike is by no means the principal cause of the present transportation situation. The principal cause of the present situation is that the general development of the railroads has very greatly declined within recent years while all the other industries of the country have continued to expand at a normal or more than normal rate. Consider the significance of the following figures some of which already have been published in these columns: The number of locomotives in service increased 17,725 in the seven years ending with 1907, only 10,579 in the next seven years, and only 1,912 in the seven years ending with 1921. The number of freight cars in service increased 626,000 in the seven years ending with 1907, only 349,000 in the seven years ending with 1914, and only 41,000 in the seven years ending with 1921. The increase in the number of locomotives for the seven years ending with 1907 was more than *nine times* as great as in the last seven years, and the increase in the number of freight cars was over *fifteen times* as great. If these reductions of the increase in the number of cars and locomotives had been the only reduction in railway development, the situation would not be so bad. But there has been a corresponding reduction of the increase in all railway facilities.

When the restrictive policy of government regulation began to be applied about 15 years ago those who opposed it predicted that this very reduction of railway expansion would be the result. They said the policy of reducing and limiting the net returns the railways could earn would drive new capital away from them, and that, of course, without sufficient new capital railroad expansion would decline. The advocates of the policy which has been followed ridiculed these predictions. The predictions have come true, and the nation is now entering on a new period of business revival with a transportation system utterly inadequate to the demands which will be made upon it if the demands increase as much in proportion as they have in every past period of business revival.

What is to be done, if anything, to remedy this situation? The natural way to stop an effect is to remove its cause. Since restrictive regulation has arrested the development of the railroads, it would seem that the logical thing to do would be to make regulation less restrictive. The net return earned by the railroads on their valuation in July, the first month after the recent reductions of wages and rates went into effect, was only four per cent. Business is increasing and the net return earned will increase if the railways are fairly regulated. If they earn an adequate net return they

will raise the needed new capital and provide the needed facilities.

In a large part of the country, however, there is being carried on a powerful agitation for legislation which would repeal all the constructive provisions of the Transportation Act and make the government's policy of regulation worse than it was before government control was adopted. In Governor Kendall's own state of Iowa the republicans have nominated for United States Senator a man who is making his campaign largely upon the ground that the valuation of the railways made by the Interstate Commerce Commission is from five to seven billion dollars too large and should be correspondingly reduced. In Wisconsin the republicans have renominated by a large majority Senator LaFollette, who has for years been the most persistent advocate of the very policy of regulation which is chiefly responsible for the fact that at the present time the farmers of Wisconsin, Iowa and other western states cannot get enough transportation to move their crops to market.

In other words, many of the farmers of those states are complaining bitterly of the losses they are suffering and the greater losses they fear because they cannot get enough transportation, and at the same time are supporting for election to Congress and to the Senate men who advocate policies which would cause railroad development to be even less in the next seven years than it has been in the last seven years.

The present transportation situation and the still worse situation which seems to be coming are due to policies the adoption of which has been caused by the very people who are now complaining most about the lack of transportation. The railways are doing, and will do their best to move all the traffic with the facilities available because, other things being equal, the more traffic they handle the more money they make. It is evident, however, that no matter how well they do, the country is going to suffer severely from lack of transportation. Perhaps the experience will teach the public that it has much to lose and nothing to gain by supporting a policy of regulation, the direct and necessary effect of which is to render the railways unable to handle the country's commerce.

What Will Be Done With the Victory?

THE RESULT of the shop employees' strike has been a victory for the railways. In strikes, as in wars, it is often easier to win a victory than to use it wisely. Germany won a great victory in the Franco-Prussian war but did not use it wisely. Fifty years later Germany is much worse off than she probably would be if she had not triumphed so completely.

The outcome of the shop employees' strike is that on a large majority of railways the shop crafts' unions affiliated with the American Federation of Labor no longer exist. For some years the worst labor conditions on the railroads have prevailed in their shops. The rules and working conditions which the labor unions got adopted partly before and partly during government control had become an almost insuperable obstacle to efficiency and economy. The shop employees as a class had become, under bad leadership, the most radical and insubordinate class of employees. It seemed impossible to remedy this condition as long as the shop employees all belonged to national unions which successfully insisted upon only national negotiations of differences with the railway managements and upon nationally uniform wages and working conditions.

The result of the strike is to enable all the railways which have not settled with the unions to deal separately with their own men. This means with representatives of their own men, since in no other practical way can large numbers of men deal with employers regarding matters of importance. The shop crafts' unions are quite certain to try to extend their organizations over these railways again. The managements will naturally try to prevent this. The most effective means of preventing it will be for the managements to convince the employees that it is contrary to their own interest to allow themselves to be drawn back into these unions. In order to do this it will be necessary for the managements, in concert with representatives of the employees, to establish means of co-operation between them which will work to the benefit of the employees as well as the railroads. The railways will naturally try to establish working conditions which will promote efficiency and economy of operation—which, in other words, will increase the output obtained per man and per machine. If, however, they are to attain this result without alienating their employees and causing the growth among them of a sentiment in favor of a renewed affiliation with the shop crafts' unions, it will be necessary, first, to bring about the establishment of relations which will give the employees a real opportunity to present their views and wishes to the management and participate in determining the conditions under which they shall work, and which, secondly, will convince the employees that they have more to gain by dealing directly with the management of their own railway than by dealing with it through the national unions.

The means adopted to bring about co-operation between the managements and the men and to secure increased efficiency will naturally differ on different railroads. It is to be hoped that many new means will be tried—local adjustment boards, shop committees, piece-work, and so on. If many new and varying methods are tried opportunity will be afforded to compare the results obtained for both the railways and the men. The outcome on most roads should be that controversies which may arise will be settled without going to the Labor Board, that the more hard-working and efficient men will be enabled to earn higher wages than the minimums fixed by the Labor Board, and that the railways at the same time will be enabled to get a given amount of work done at a lower total cost than they would have been able to if the strike had not occurred.

As paradoxical as the statement may sound, the outcome of the strike has also opened some new opportunities to the shop crafts' unions. They are still in existence as before on the railways which have made settlements with the strikers. The greatest fault of the shop crafts' unions, like so many other unions, has been that in efforts to further what they have regarded as the interest of their members they have pursued policies which directly militated against efficiency. They have proceeded on the false economic theory that there is only a limited amount of work to be done and that the more they restrict the amount done by each man the more they will increase the number of men that can and will be employed. The leaders of these unions can persist in following the old policies if they choose to. On the other hand, if they choose to, they can adopt a new policy of encouraging their members to do the most and best work they are capable of and to co-operate with the managements of the railways in increasing the efficiency and economy of operation.

The conditions will be such that, it would seem, the leaders of the unions would find it expedient to do this. With the shop crafts' unions representing the employees on some railways and not representing them on others, there will be opportunity to compare the results obtained for both the men and the railways where the unions are recognized and dealt with and where they are not recognized or dealt with. Persistence by the labor leaders in the policies for which they have stood in the past is almost certain to make the conclusions drawn from these comparisons unfavorable to labor unionism and its methods.

The outcome of the strike should have good effects on both the managements of the railways and the labor unions. It should stimulate the managements of the railways which have refused to settle with the unions to use every reasonable means to so promote the welfare of their employees as to make them satisfied and loyal to the companies. It should at the same time stimulate the shop crafts' unions to so deal with the railways which have made settlements with them as to convince their managements and the public that these railways did not make a mistake in so doing instead of fighting the strike to a finish. The strike has cost a great deal and the employees, the railways and the public will not cease to feel its effects for a long time to come. But if it results in causing both the railways and the labor unions to follow more enlightened policies in future it will be worth far more than it has or will cost.

Does It Pay?

WHAT IS THE VALUE of a well-balanced athletic program for employees on a railroad system? Can it be measured in terms of increased output or in other practical ways? These questions are suggested by the fact that at a time when various railway associations and railway clubs are cancelling and discontinuing meetings because of unrest and the congestion of traffic, the Pennsylvania Railroad has gone forward with its athletic or recreation program, which culminated in the great system field meet at Altoona last Saturday. Not only did this mean relieving many workers over the system to take part in the events—including the shutting down for the day of the great Altoona shops—but many special trains were required to carry the employees to Altoona from all parts of the system.

The crowd—possibly 35,000 were in the grandstands on Saturday afternoon—included the workers and their families, from the president and some of the directors down to office girls and boys, apprentices and laborers; and they were apparently welded together in a complete and happy unit. Nowhere was this better evidenced than in the way in which President Rea, backed up by many of his official family, left the grandstand for the field and personally gave out the medals and trophies to the fortunate contestants in the many events.

What did the day not mean also to thousands of workers all over the system who were not fortunate enough to be able to go to Altoona for the day, but who followed the reports which were wired direct from the top of one of the grandstands? Two minutes after one of the young ladies had won a close race the telegraph operator called to her from the top of the stand, "Betty, they already know all about it in Philadelphia and are proud of you." This, of course, is an extreme case, but surely the enthusiasm and comradeship of the day must mean something in the development of a better family spirit throughout the great system, as well as in increased loyalty.

After all, the great field meet, with its hundreds of contestants and thousands of spectators, was a small thing compared with the other thousands of employees and more tens of thousands spectators who took part in the preliminary training and events all over the system during the preceding months. This, measured in terms of improved health alone, means much to the railroad aside from other aspects. Intangible, you say. Possibly so. But it will be interesting to watch the Pennsylvania in the coming weeks and months and see if it is reflected in better performance under the trying conditions which lie before it. Obviously, an athletic program in itself may not mean much in inspiring loyalty and co-operation. To be really fruitful for good, it will ordinarily be linked up with other things that were mentioned in the editorial entitled "Our Road" in the *Railway Age* of last week; in the last analysis it will depend for its effect, good or bad, directly upon the spirit back of the whole thing and by which it is dominated.

Speeding Up Train Movement

THE SUGGESTION has been made that in some cases freight train performance might be improved by decreasing the tonnage and thus increasing the speed. But this method could not be adopted with good results in most cases. For one thing, it would add to the number of locomotives turned at roundhouses and would not be practicable where the locomotive terminals are congested. Another method of increasing the ton-miles per locomotive would be to increase the speed without decreasing the tonnage. There are probably many cases where this could be done. Operating officers usually consider that the speed is fixed by the tonnage, but this is true only if the locomotive is worked at a definite rate.

The power that is developed depends on the amount of coal supplied to the fire. A higher rate of firing means more power and, therefore, higher speed. The maximum rate for hand firing is about 7,500 lb. per hour. Few firemen can equal this, but it would not be unreasonable to expect them to fire 5,000 lb. an hour while running. The actual rate will often be found as low as 3,000 lb. One of the principal reasons why some crews do not get over the road is because they do not develop the proper amount of power from the locomotive. Road foremen of engines by checking the rate of firing should be able to speed up the movement of trains appreciably. A method that is still more effective is to provide some additional incentive for increasing speed, either by giving the slow-freight crews an opportunity to exceed the basic 12½ miles an hour, or by establishing turn-around service. It is hard to give road crews continual supervision to keep them up to a high standard if the only object is to improve the company's operating performance, but the engineer and fireman can be depended upon to work hard to get over the road if it is to their personal advantage to do so. Still another method of increasing ton-miles per locomotive is that of maintaining the speed while increasing the tonnage per train. This also imposes heavier work on the locomotive, and makes necessary better firing. The importance of maintaining or even increasing speeds is greater now than it was a few years ago because of the necessity of paying train crews punitive overtime after eight hours. From the standpoint of locomotive efficiency the main object to be attained is an increase of ton-miles per locomotive hour, or per train hour, which is almost the same thing, and usually the way in which this has been attained has been by increasing the train load even when this had the effect of reducing the average speed.

For example, on one of the best operated railways in the entire country the average speed of the freight trains declined from 12.05 miles an hour in April to 10.7 miles in August. Because of the large increase in the average train load, however, the average ton-miles per train hour—practically the same thing as per locomotive hour—increased from 7,967 to 8,651. The result was that this railway was able to handle in August the largest freight business in its history—undoubtedly a larger business than it could have handled at higher train speeds—with maximum economy. Determination of the speeds and loads with which freight trains can be operated with the greatest efficiency and economy depends on local conditions, and therefore these conditions must always be given the most careful consideration if the best results are to be attained.

Letters to the Editor

Labor's Opportunity

El Paso, Texas

To the Editor:

The idea outlined herein has been evolved as the result of disputed points between the railroad employer and employee since the writer can remember, and he is now 54 years of age. It has been strengthened by the fact that a local brick manufacturing plant, of most modern construction and equipment, was built, put in operation, and is operated by a labor organization.

Contention has always existed: First, by the employee that wages are kept down to a point out of proportion to railroad earnings. Second, that abnormal earnings thus made possible for the operating companys are accumulated to the enrichment of large stockholders and the over-payment of executives. Third, that repairs contracted for outside of the carriers' own shops represent waste of money for the main purpose of discrediting organized labor.

The employer claims that the wage scales demanded, compared with freight tariffs, permit of inadequate earnings to create legitimate and fair interest on investment, and sufficient surplus with which to care for repairs, operating expenses, maintenance of way, overhead, etc. (That this claim is valid, of record, and accounted for by various corps of most skilled men, selected by the government for their fitness, means nothing to those who contradict these facts).

Why would it not be possible to select some road which has been a profitable property, but is now in the hands of a receiver, or a previously profitable road about to be sold for indebtedness, and with our government as referee, permit allied trades unions to take such property over for operation.

Some of our best and most profitable roads have gotten into financial difficulties at times, and men like Mr. Loree have been given the hard task of rehabilitating them and putting them on their feet again.

Such a plan would open to the unions an investment for their treasury funds and men like Samuel Gompers, who have accumulated some means, should jump at the opportunity to invest some of their money in such property, where it would be safeguarded by the individuals for whom they have fought and whom they have championed. There would also be the great value of such a departure as an object lesson, highly valuable to the contestants as well as to our government.

Some capable, worthy man, identified with labor, having executive ability, but whose light has been hidden under a bushel, would be given the opportunity to accept the service for which several railroad executives receive $100,000 and $150,000 per year, at a salary of $10,000 to $15,000. In addition to this, the road under this new plan of management could immediately, with special governmental permission, reduce the freight tariffs, raise the wage scale, and put all work of repairs through their own shops, to the end that the public would at once begin to profit in saving of freight charges. All tonnage possible in tributary territory would be routed over the lines of this road; the increased revenue would go to the unions, and no element would have any reason to be dissatisfied, for the public, the patrons, would not begrudge the investors and operators the increased earnings when receiving better service at lower cost.

All new ideas are scouted as radical when the departure suggested is at such variance with custom, and yet were it possible to carry this roughly outlined plan into operation, the result it would accomplish within twelve months would be definite and mean that which has not been attained in many years of heated argument, dispute, and struggle at cross purposes.

E. E. Morrow.

Need for Courts of Last Resort

Boston.

To the Editor:

In one of your recent interesting editorials on improving the personnel of the railroad service, you mention, as an essential in promoting friendly co-operation, the settlement of disagreements by having them taken before one or more referees. (Page 319, August 19.) Disputes arise in all important human affairs and provision for settling them is of the first importance; yet we go on neglecting the duty. President F. D. Underwood, of the Erie, in an interview, has proposed local arbitration of disagreements between employer and employee; which means that our present ponderous machinery for settling grievances is very inadequate. This everybody knows. It is a kind of machinery which is likely at any time (if you try to accomplish useful results with it), to come to a full stop from its own internal friction.

Failure to recognize this need of a final arbiter *who can act promptly* is the cause of half our troubles. We recognize this need in various vital matters every day, and yet in other vital matters we are oblivious to it. The Supreme Court of the United States has been called the sheet anchor of our liberties. It is more than that; its influence steadies our feet every day. Yet, what is it but a board of arbitrators? Nine men whose word we agree to heed and obey, whether they be right or whether they be wrong. All of our recent labor and wages troubles have been due to the lack of this spirit; lack of a man or men whom we can agree to obey. All efforts should be directed to finding some way to select and appoint suitable arbitrators. The futility of trying to compose our differences in any other way is illustrated by the action of the baseball men in appointing Judge Landis to boss them. The motion picture people have done the same thing, employing Mr. Hays; and a similar course is proposed in the theatrical business.

Note my italics. In the complicated affairs of the modern industrial world, there can be no satisfactory progress unless we can get rid of tedious delays. The legal profession does many things for us; but, on the other hand, too many of our lawyers make their living by manufacturing delays—or calling them down from the heavens. It is the lawyers who have taught us how to accomplish all sorts of ends, good and bad, by delay, delay and more delay. Most grievance committees spend a good deal of their time in making sure that their business shall not go on too rapidly.

There are two halves to the arbitrator problem. It is hard enough to find a man who can comprehend our controversies and who will have the courage to decide them with absolute freedom from fear or favor; but the second half is harder yet; to get ourselves into the state of mind—and heart—where we are willing to accept the arbitrators' decisions when they are rendered. (It is yet to be demonstrated whether or not this exalted mental and ethical state has been reached and can be maintained by the baseball and movie people.) The first qualification of an arbitrator is impartiality; this is more important than education or than knowledge of the railroad field; but the latter can be acquired; an impartial mind cannot. Equally important with impartiality is the arbitrator's reputation for impartiality. This quality is valueless unless people recognize it. Mr. Underwood's idea is a good one; but we need a lot of committees, right away, to hunt for the individuals whom we can trust to tell us what to do, or what to submit to, when, left to ourselves, we should sulk, or strike or fight. Every large road needs a score of men.

E. Moseman.

Work Under Way on Union Station Headhouse

Architects Solve Difficult Problem in Combining Office Building with Terminal Structure

While work is in progress on the excavation and basement of the great headhouse and five of the new station tracks already in use, the completion of the new union station at Chicago is now definitely in sight. Progress on the plans for the headhouse also has now reached the point that permits of a more tangible conception of the principal features of this important terminal than has been possible heretofore.

The general character of this station is now a matter of rather common knowledge among railway men; it will comprise a double stub terminal with two grids of station tracks extending to the north and south respectively from a train concourse lying between the Chicago river and Canal street, with the headhouse occupying an entire block west of that street. The station tracks and the main floor of the station are depressed below the streets, permitting the latter to pass over the tracks and over the connection between the headhouse and the train concourse.

The original plan for the headhouse contemplated a structure of monumental type housing only the main waiting room and the auxiliary station facilities, and foundations were designed and constructed on the basis of the loads imposed by such a structure with an allowable foundation bearing of 6.5 tons per square foot, transmitted to concrete caissons carried to hardpan about 60 ft. below city datum (lake level). The subsequent decision to provide a structure to serve the dual purpose of a station headhouse and a high office building necessarily imposing loads much greater than those originally contemplated, introduced a serious foundation problem and naturally raised a question as to the application of greater loads to the caissons already in place. As a means of affording a possible answer to this, two test caissons were sunk on adjacent ground and subjected to test loads, as a result of which authority was granted by the city building department for an increase in the allowable bearing pressure to 10 tons per square foot subject to certain restrictions.

Further complications attending the decision to construct the office building type of headhouse arose from the fact that a redesign of the building superstructure resulted in some marked changes in the location of building columns, so that the existing caissons would not in all cases fit the new column locations, and although the use of reinforced concrete distributing girders made it possible to utilize nearly all of the caissons already in place, the general result of the change in plans has been a considerable increase in the number of caissons. This additional foundation work is now well under way.

General Plan Not Changed

The earlier plan for the headhouse provided for a great waiting room in the center of the block, and by designing the office building as a hollow square with a central court the principal feature of this plan has been retained without involving the support of any column loads over the 100-ft. span of the waiting room ceiling. This not only insures adequate skylighting of this waiting room, but also permits of an application of the originally contemplated architectural treatment, that of the Roman baths.

The base of the building will occupy practically the entire block bounded by Canal, Jackson, Clinton and Adams streets, and will have a length of 372 ft. north and south by 319 ft. 10 in. east and west. However, the mass of the building above the base, that is, the outline of the office building portion, is to be set back 50 ft. 4 in. on the Canal street side, 59 ft. on the Clinton street face and similar amounts on Jackson boulevard and Adams street, giving the effect of a terraced base, extending practically to the fourth floor level. On Canal street, this is to be treated as a portico comprising a colonnade of Roman Doric columns, 39 ft. high, and will serve to emphasize the two main entrances to the station. A similar treatment is to be used on Clinton street except that the building wall will be flush with the backs of the columns. On the Jackson boulevard and Adams street sides, the base projections of the building will be occupied by two cab and baggage driveways entering at the two west corners of the building with ramps descending toward the east, the outside walls being pierced by large openings for the sake of ventilation and lighting. Architectural emphasis will be given to the two entrances to the driveways by ornamental pavilions at the two corners of the building, and for the sake of symmetry, similar construction will prevail at the two east corners.

The underlying thought in developing the design of the station was to evolve a plan of the utmost simplicity in which all facilities of direct service to the passenger in arriving or departing on trains are assembled on a single level. Special pains were taken to insure that the routing of the passengers through the station would not only be obvious but would also afford direct access to the various facilities with practically no opportunity for confusion on the part of even the most inexperienced traveler. It is the opinion of the officers of the station company that the plan is unique among stations placed either above or below the street level and that the efforts and expense incurred in developing the plan will be entirely warranted by the operating results to be obtained.

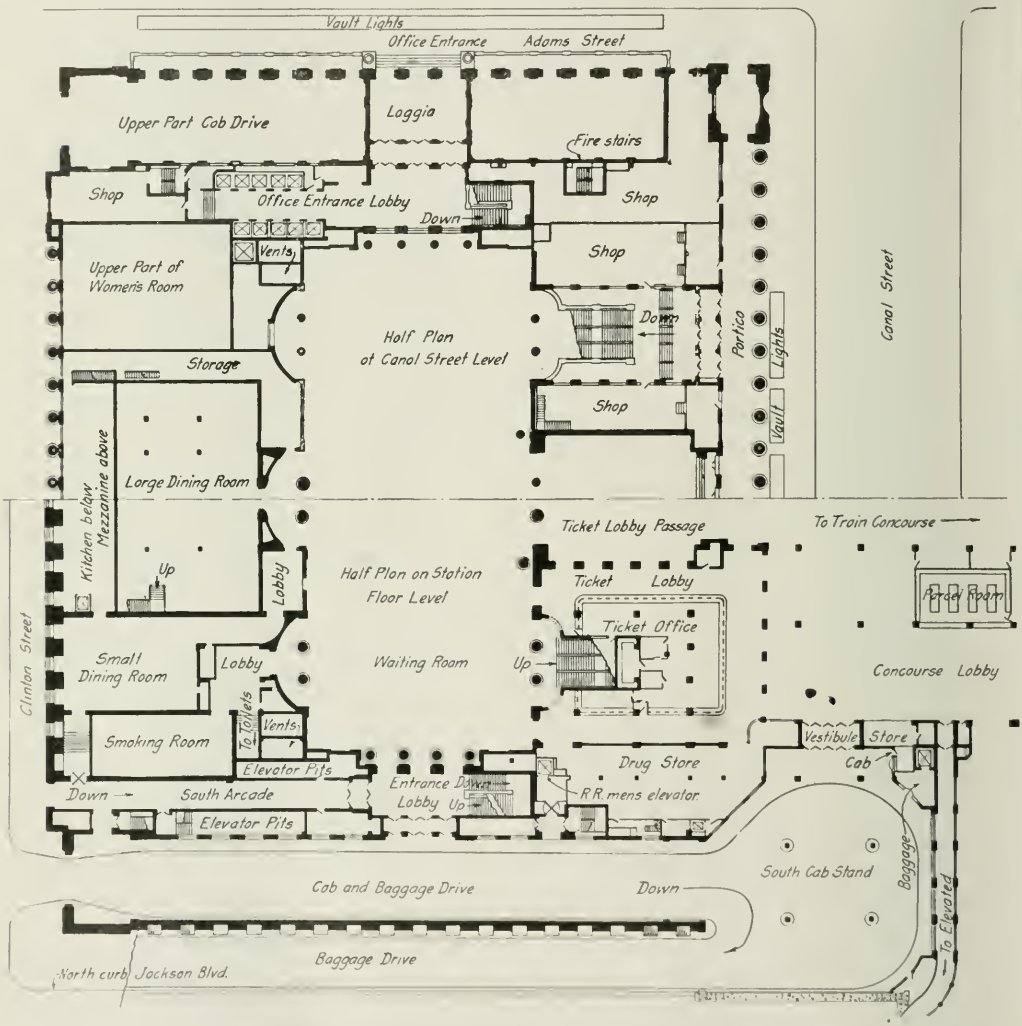
An understanding of the station arrangement implies a thorough conception of the arrangement of the street grades. To provide adequately for a separation of the track grades from those of the streets, it was necessary to raise Canal street to elevation + 26, which is approximately the same elevation as the bridges over the tracks and the river, whereas the elevation of Clinton street, which is on a level with the other streets to the west of the station is + 15, necessitating descending grades from Canal street to Clinton street on the two streets flanking the headhouse on the north and south. Therefore, by placing the level of the main waiting room floor at + 10, it was readily possible to provide a concourse leading to the east under Canal street, while the fact that Clinton street is 11 ft. lower than Canal street was also of advantage in providing ramps for the descending driveways entering from the two Clinton street corners.

The main waiting room will be an enormous hall, 100 ft. wide by 217 ft. long and having a ceiling 114 ft. from the floor. The interior treatment will consist primarily of paneled walls, with recesses marking large openings at each end and at three equally spaced intervals on each side, these openings being emphasized by marble columns surmounted by a classic entablature that extends around the room at a height of 47 ft. above the floor. Above this level will be a clerestory covered by a flat barrel vault ceiling, the walls being pierced by windows at each end and at three places on each side. Although this room will have no outside walls, these openings will be afforded natural light because the walls of this clerestory are to clear the interior walls of the office building by a distance of 16 ft. The ceiling of the waiting room will consist entirely of skylights with

the exception of one tier of coffers around the sides and ends.

The main entrance to this waiting room from the street will comprise duplicate entrance lobbies 40 ft. wide by 85 ft. long, fronting on Canal street 70 ft. 10 in. to either side of the east and west axis of the building. These lobbies will enclose stairways leading down to the waiting room level, but will function also as arcades giving access to shops bordering on either side. In addition, a large part of the trian arcades 11 ft. 10 in. wide by 134 ft. long communicating with Clinton street.

The passengers entering the waiting room will find the space to the west of it devoted to restaurants and separate accommodations for men and women, one each of the three large doorways mentioned above marking entrance to each of these three facilities. The south doorway will communicate with the smoking room and with a stairway leading to



Composite Plan of the Headhouse on the Station Floor and Canal Street Levels

Canal street front of the building not occupied by the entrance lobbies will be devoted to shops.

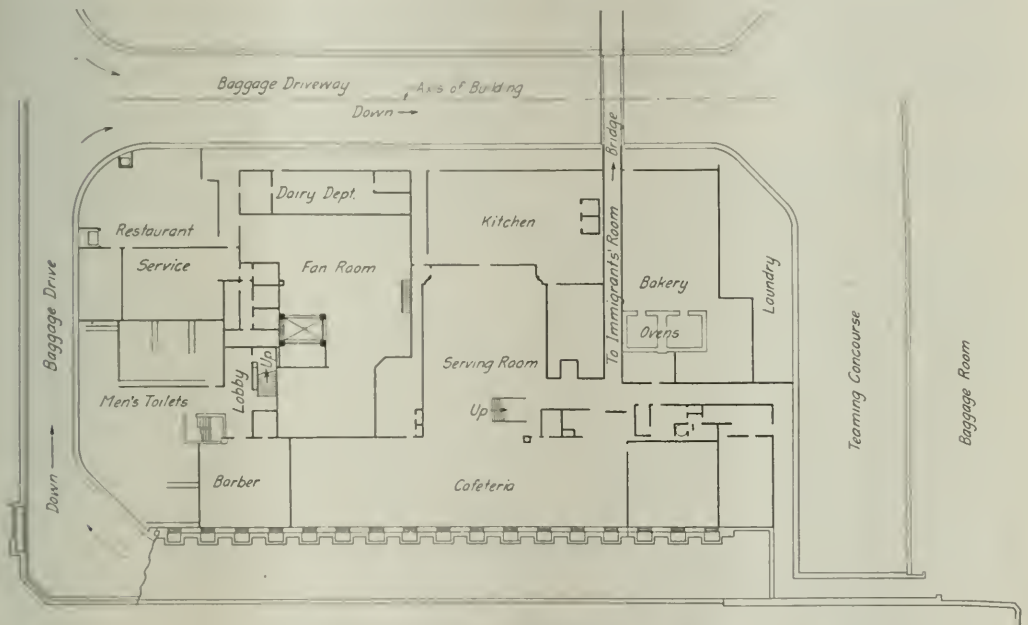
There will be two other entrances into the waiting room, namely, at the north and south ends where three doors will lead to entrance lobbies 18 ft. by 43 ft., communicating directly with the cab and baggage driveways and will serve as the cab entrances to the waiting room. To the west of these entrance lobbies a connection will be had with pedes- a toilet room in the basement. The central doorway will lead to a large restaurant and, by means of a lobby and corridor, to a smaller restaurant affording greater seclusion from the activities of the station. The north doorway in the west wall will lead to the women's waiting room and by a stairway to a toilet room in the basement.

The main restaurant will be a room 48 ft. by 110 ft. with a ceiling 40 ft. above the floor. It will have a walnut

wainscot 12 ft. high above which the walls will be treated with paneled caenstone. The ceiling will have an over-all pattern of coffer treatment in color. The smaller dining room, 40 ft. by 60 ft. with a 30 ft. ceiling, will have somewhat similar architectural treatment.

On the main axis of the building in the east wall between the two main stairways will be a large doorway leading to the ticket concourse from which direct access is had further east to the concourse lobby under Canal street, and beyond that to the train concourse. However, this central passageway will be supplemented by smaller doors on each side of the two stairways so that, with the exception of the space occupied by these stairways, one will be able to pass from the waiting room into the concourse space to the east at almost any point in the entire length of the east wall. In other words, there will be an open passageway from the waiting room in the general direction of the train concourse, having a total width of 192 ft. Immediately under the south stairway an enclosed grill or cage 64 ft. by 49 ft. will be provided for a ticket office, affording service windows on all four sides. Under the north stairway a similar enclosure will be provided for the baggage service with an elevator, chute and stairway communicating with the baggage room on the floor below.

Direct entrance to the concourse lobby will also be afforded by vestibules to the north and south connecting with the two cab stands under the two Canal street corners of the building at the lower end of the driveways descending from Clinton street. In addition to suitable landing platforms, adjacent space will be devoted to a taxicab office, baggage service counter for checking hand baggage, and a toilet room for cab men.



Plan of the South Half of the Basement

Separate Entrances for the Office Building

Since the headhouse will encompass an office building of large size it is essential to provide adequate entrances to the office building in such locations and under such an arrangement as to isolate them from the station facilities. Accordingly, entrances have been provided in the center of the Jackson boulevard and the Adams street sides of the building at a considerable distance from any of the entrances to the station proper. By provision for a flight of six steps from the sidewalk level access will be had to a loggia with a floor at an elevation +23.5, or sufficiently above the level of the inclined driveway from Clinton street so that this loggia may bridge across the driveway with a sufficient clearance for the vehicle traffic. This loggia leads to an entrance lobby abutting on the end of the waiting room, but at an elevation 13 ft. 9 in. above the station floor level so that it gives the general effect of a balcony overlooking the waiting room. To the west of this loggia is a corridor leading to two banks of five elevators each. These elevators will not run below the office entrance level so that they cannot be used for direct communication between the offices and the station. This arrangement was deemed necessary to separate the offices from the station, but for the benefit of office employees who have occasion to go into the station a stairway has been provided to the south of the office building lobby which leads to the station floor level in the entrance lobby at the end of the waiting room. As a further facility for railway officers or for trainmen reporting to division offices on the upper floors a special elevator connection to the upper floors will be provided with entrance on the station level, opening out onto the cab drive from which it is but a short walk to the concourse. Further means of communicating between the office floors and the ground level will be afforded by four stair wells enclosed in fire walls in the four corners of the building.

Baggage Room in the Basement

The driveways leading from Clinton street to the cab stands are also used for access to the baggage room in the basement. From the cab stands a continuation of the ramp is to be carried westward outside of the first run of the drive

to the corner of Clinton street, thence to the middle of the block on Clinton street and thence eastwardly on the center line of the building to a teaming concourse under Canal street. This concourse will be 47 ft. wide and will have tailboard space for a length of 382 ft. along its east side beyond which all of the space under the train concourse is to be occupied by the baggage room. The remaining portion of the basement, that is, the part directly below the headhouse will be devoted to a variety of purposes. One interesting innovation is provision for a large cafeteria near the south wall of the building, with communication from the main waiting room by means of a stairway leading down from the south vestibule, which will have a table room 38 ft. by 144 ft. to be supplemented by a service room 50 ft. by 55 ft. and a kitchen 40 ft. by 76 ft. In the north half of the building a room 54 ft. by 90 ft. will be assigned to immigrants and connected by a corridor to a stairway that gives direct access to the train concourse. Other portions of the basement are to be used for the main toilet rooms, storage space for the concessions, employees' rooms, etc.

The design and construction of the union station is under the direction of J. D'Esposito, chief engineer, Chicago Union Station Company. Graham, Anderson, Probst & White of Chicago are the architects.

Long Island to Improve and Extend Electric Service

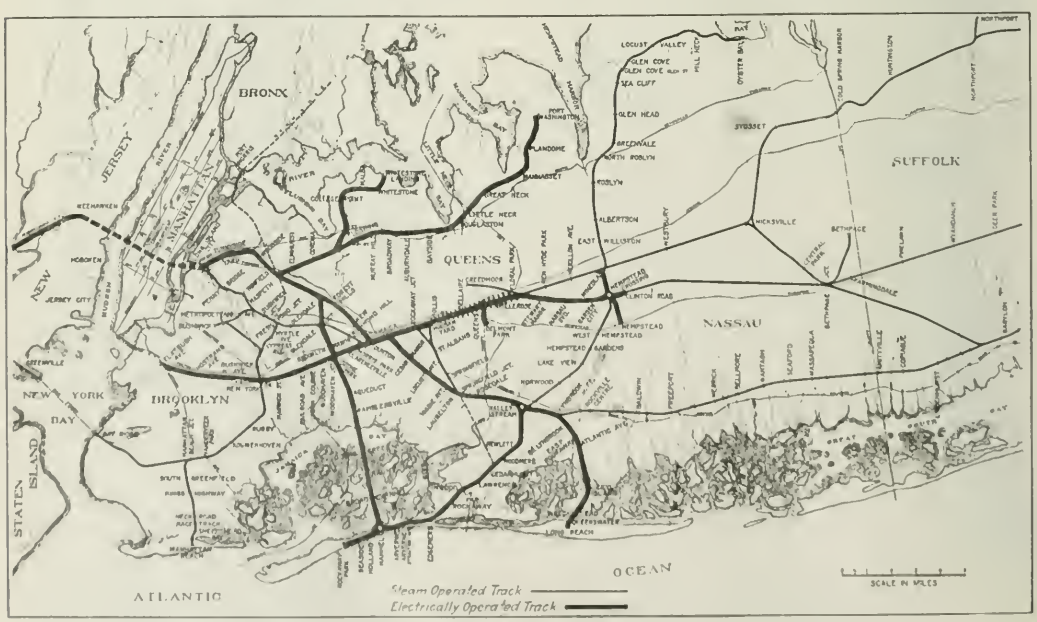
To care for present requirements and to prepare for the carrying out of a plan for improving and extending the electric service on the Long Island, a 25,000-kilowatt generator is now being installed in the Long Island City power plant and additional feeders are being run in conduit along the right of way to Forest Hills.

This fall the company will begin the extension of the elevated structure through Hollis, eastward through Queens to the Nassau County boundary line, a distance of about two miles. This section will be elevated and four-tracked at the same time and the four-track section will be continued to Floral Park, two miles farther east. It is estimated that the work will require about a year and a half for completion at a cost of approximately $2,000,000. Building of many new homes in Hollis, Queens, Bellrose and Floral Park has caused a large increase in traffic with resultant congestion. The new four-track elevated structure will make it possible for express trains to pass locals between Hollis and Queens and thus speed up operation over the entire line.

Tentative plans for future building include extending the electrification of the Montauk division from Lynbrook to Babylon, a distance of 19 miles, the entire Oyster Bay branch and the Wading river branch to Northport. It is also planned to connect the old unused Central Railroad line with the main line to divert express service from the entire Montauk division east of Babylon through Hicksville and Mineola to Jamaica.

The Long Island is properly a standard railroad and it is the contention of its president, Ralph Peters, that New York City should not depend on the Long Island to furnish rapid transit, as this transportation line is needed to serve all other parts of Long Island for passenger and freight transportation. In explaining the situation President Peters said: "I have tried to impress upon the transit commissioners of this city that they ought to build a four-track rapid transit line from Jamaica over the Queens Boulevard route to Long Island City, thence under the river and across the city to 10th Ave., intersecting all the north and south lines on Manhattan Island and giving the Borough of Queens real rapid transit."

According to a report presented to the Italian parliament, the Italian railways at present possess 6,436 steam and electric locomotives and they have under construction 475 steam and 82 electric locomotives. Grants have been made for the construction of 120 locomotives and another 75 will shortly be ordered. Within the next five years 600 steam locomotives will be scrapped.



Western Lines of the Long Island

New Shop Agreements Have Novel Features

Union Pacific and Burlington Wage Rates Recognize Varying Degrees of Skill Within the Crafts

Among the railroads which have recently negotiated agreements with newly organized associations of their shop employees, the agreements of the Union Pacific System, effective September 1, and the Chicago, Burlington & Quincy, effective September 15, are of particular interest because of the extent to which they depart from the practice established by Labor Board decisions, both as to working conditions and rates of pay. The new wage rates established by both of these agreements are similar in that the various craft classifications have been subjected to a considerable subdivision based on the degree of skill required in the performance of the work, and each subdivision carries its own wage rate. Generally speaking, these wage rates range from 15 cents above to from 7 to 15 cents below the mechanics' rates established by the last wage reduction of the Labor Board.

In both agreements the minimum rate for work ordinarily assigned to fully qualified mechanics is two cents an hour above that established by the Labor Board. The work of specialists or handy men, requiring more skill than the class of work ordinarily assigned to helpers but not the skill of a fully qualified mechanic, is paid for at rates lower than the mechanics' rates established by the Labor Board but above the rates for helpers.

Wage Rates for the Locomotive Crafts

In the special craft rules of the Union Pacific agreement the mechanics in each craft are divided into two groups: (1) those doing work requiring fully qualified mechanics, and (2) those doing work not requiring the skill of fully qualified mechanics.

In the machinists' rules there are 28 classifications of fully qualified mechanics. The first eight classes each receive a rate of 85 cents an hour and include specialists (who determine the time and methods required for the performance of all operations), layers out, tool makers, die makers, valve setters, large vertical turret lathe operators, special milling machine operators and axle and crank pin lathe men. The next five classes receive a rate of 80 cents an hour. These classes include operators of frame and cylinder planers and frame slotters, air brake specialists, valve gear repair men and inspectors required to sign affidavits under the Federal locomotive inspection rules. The next four classes receive a rate of 76 cents an hour and include air brake repairmen, machinists assigned to such work as power plant machinery and roadway equipment, autogenous welders and operators of horizontal boring and milling machines. The last 11 classes receive a rate of 72 cents an hour. The work in these classes includes that of first-class machinists, locomotive inspectors not required to make affidavits, machine operators not specified in other groups and steam pipe and superheater men.

In the second or less skilled group of mechanics there are 26 classifications. The highest rate in this group is 68 cents an hour and applies to the first 10 classifications. These include operators of semi-automatic machines, operators of lathes and shapers on work not specified under any of the superior classifications and operators of driving wheel lathes, radial drills and ordinary drill presses. Boiler stud men and men assigned to laying out and squaring up engine trucks and trailer frames and fitting up truck brasses are also included in this group. The next nine classes receive a rate of 64 cents an hour. These include engine and trailer truck men who are assigned to repairing trucks and putting up shoes and wedges, car wheel lathe operators, tire setters, men on valve and cock work, spring and brake rigging men, second-class boring mill operators and operators of engine and tender truck axle lathes. The next two classes include operators of rough grinders and tool grinders, and receive a rate of 60 cents an hour. Men repairing tender trucks, and applying and removing couplers, metal bumpers, metal pilots and engine and tender drawbars, are rated at 60 cents an hour if of over one year's experience and 57 cents an hour if of less than one year's experience. Gas and electric cutters and men doing machinists' work on metal cabs, running boards, stack saddles, brackets, etc., receive a rate of 57 cents an hour.

Helpers with over one year's experience are rated at 49 cents an hour and those with less than one year's experience receive 47 cents an hour.

Each of the other locomotive shop crafts is subdivided in a similar manner, although the number of classes from the nature of the work is not as large as in the case of the machinists. But throughout the agreement each classification is so specific as to leave little opportunity for misunderstanding of the jobs to which it applies.

With the exception of the blacksmiths, the first classification under each craft is that of the specialist competent to determine the time and the methods to be used in the performance of all operations in the craft, and rates for the various groups are 85 cents, 80 cents, 76 cents, and 72 cents an hour for men who are fully qualified mechanics. In the case of the blacksmiths, the heavy hammersmith working on material six inches or over receives a rate of 95 cents an hour.

For work not requiring the skill of fully qualified mechanics the rate groups in each of the locomotive shop crafts are 68 cents, 64 cents, 60 cents and 57 cents an hour respectively. The rates for ordinary helpers are the same in all of the crafts, but a rate of 54 cents an hour is applied to certain special jobs such as helpers on hand flanging work and boiler washers in the boilermakers' craft, and first furnace heater helpers, hammersmith helpers, first and second fire helpers, and hammer operators in the blacksmith shop.

Carmen's Rates

Car repairmen are divided into two separate crafts: passenger car men and freight car men. Fully qualified passenger car mechanics receive the same rates as the locomotive crafts. The 85-cent rate applies to specialists, layers out and decorators. Letterers and stripers, pattern makers and first-class cabinet makers receive 80 cents an hour; mill wrights, electro-platers, and autogenous welders, 76 cents an hour; burnishers, first-class painters, paint mixers, upholsterers, wood machine operators, second-class cabinet makers, first-class locomotive carpenters, and carmen working on passenger car bodies, 72 cents an hour.

Of the less skilled mechanics, truck and platform men, second-class locomotive carpenters and air brake men receive 68 cents an hour; passenger car inspectors, 65 cents; hand car carpenters and rough painters, 64 cents; seamsters and seamstresses, 60 cents; gas and electric cutters, 57 cents, and paint removers, oilers and brassers, 54 cents an hour. The same helpers' rates apply as in the locomotive shop crafts.

Starting at 38 cents an hour, coach cleaners receive up to 42 cents an hour depending on the length of service.

Freight car repair men are classified as fully qualified

mechanics and helpers. There are six rate groups among the mechanics, the highest of which receives 75 cents an hour and the lowest 54 cents an hour. The first group includes specialists, layers out, wrecking derricks engineers and autogenous welders. The second group, which receives a rate of 71 cents an hour, includes air brake rack men and triple valve repairers. The third group receives a rate of 67 cents an hour and covers car carpenters and flask makers. Car inspectors and car men on all ordinary car repair work, starting at 54 cents an hour for less than one year's experience, and adding three cents an hour for each additional year's experience, receive a maximum of 63 cents an hour. Stencilers, painters and gas and electric cutters receive a rate of 57 cents an hour, while oilers and brassers are rated at 54 cents. The rates for helpers are the same as in the other crafts.

The wage rates established in the Chicago, Burlington & Quincy agreement are practically the same as those of the Union Pacific, although the classifications are somewhat less specific and less jobs are included in the higher rate groups than in the latter agreement. Like the Union Pacific agreement the Burlington agreement groups passenger and freight car repair men in separate crafts.

Both agreements provide differentials above the standard rates for men employed at certain specified points on the system, and in the case of coach cleaners on the Union Pacific System, those employed at Los Angeles receive a rate from four to six cents below the standard for the system, depending on the length of service.

More Seniority Groups

In general, the working rules of the Chicago, Burlington & Quincy do not differ widely from those established by Decision No. 222 of the United States Railroad Labor Board. In some respects, however, they are more specific. Both the Union Pacific and the Burlington agreement provides considerably more sub-divisions in the seniority group, particularly those for the car men, and both provide that where the requirements of the service justify such assignments, employees may be assigned to work within a spread of twelve hours with one interval of relief of not less than two hours' duration. Both also specify that a mechanic may be required to perform the work of more than one craft when a literal application of the craft classification would require the use of more men than are actually necessary to perform the work.

The Union Pacific agreement provides for 11 seniority groups of mechanics. These are machinists, boiler makers, blacksmiths, sheet metal workers, electricians, pattern makers, upholsterers, painters, mill men, car men (including locomotive carpenters) and coach cleaners.

In this matter the Burlington agreement has gone even farther. Separate seniority lists are maintained for machinists in the machine and erecting shops and wherever forces are under separate supervision separate seniority lists are to be maintained. Sheet metal workers are arranged in two lists, divided between the tinners and copper smiths, and plumbers and pipe fitters. Electrical workers are sub-divided as electricians, power plant electricians, and electric crane operators (two classes). For the car men, separate seniority lists are maintained for pattern and cabinet makers, wood working machinists, upholsterers, silver platers, coach builders, trimmers and repairers and locomotive carpenters; painters (letterers, etc.); painters (plain painting); car inspectors, and freight car builders and repairers. Wood and steel car repairers are carried on separate seniority lists.

Union Pacific Stabilizes Employment

One of the most significant features of the Union Pacific agreement is the article providing for the increase or reduction of expenses with as little disturbance as possible to regularity of employment. Under this article both the managements and the local employees' representatives are charged with the responsibility to so regulate the bulletined hours of assignment as to reduce to the minimum the necessity for increasing or decreasing the number of men employed. For this purpose variations in the bulletined hours may be made by agreement from a minimum of seven hours a day for five days a week, or 35 hours a week, to a maximum of 58 hours a week. The assignments are to be so regulated as to provide as nearly as possible an average of 8 hours a day for the total number of working days in the year.

The overtime rules conform to the requirements of this article and instead of applying to time after eight hours, are made to apply after the normal bulletined hours, whatever they may be.

Stationary Engineers and Shop Laborers

The Union Pacific System has also negotiated a separate agreement with other shop, engine house and power plant workers, who are included in the Shop Employees' Association. This agreement, which is essentially the same as that applying to the mechanic, takes in the employees formerly associated with the International Brotherhood of Stationary Firemen and Oilers and the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers. The same system of detailed classification and varying rates of pay has been worked out for the employees within this group as that which applies to the mechanical trades.

Settling Grievances

By the terms of the agreement an adjustment board is created consisting of an equal number of representatives from the Association and the Union Pacific System lines. All differences of opinion as to the meaning or application of the rule, or as to the innocence or guilt of any employees disciplined, which are not satisfactorily adjusted between the general manager or lower officers and the representatives of the employees are to be referred to the adjustment board, the decision of which is to be final and binding on both parties. Should a dispute arise involving the revision of the rules or rates of pay, the agreement provides that such disputes be referred to the United States Railroad Labor Board for settlement, the decision of the Labor Board to be final and binding on both parties.

The Union Pacific agreement provides for the application of the so-called check off system to the collection of association dues. Provision is made, however, that upon giving 90 days written notice to the other, either party may withdraw from this arrangement.

Strike Situation Continues to Improve

Conditions in the shops of carriers that have adopted the so-called "Willard-Jewell" peace plan and of those that have met the strike issue by forming company associations or by continuing to recruit new forces are rapidly approaching normal. Strikers who returned to work under the settlement terms have done so with less signs of disorder than occurred last week when returning union men demanded the dismissal of non-union workers and the restoration of "bosses," jobs to former union men. Most of the returned men have resumed work in good spirits and there has been comparatively little interference with strike breakers employed by the roads during the course of the controversy.

The use of dynamite and bombs and outbreaks in the form of rioting and slugging continue to decrease as shown by the small number of such cases that have been reported. Among these were a bomb explosion in the Chicago, Burlington & Quincy roundhouse at Kansas City, Mo.; the

destruction of a car by a bomb in the Missouri, Kansas & Texas yards at St. Louis, Mo.; a fight which marked the return of strikers at Knoxville, Tenn., where 14 men received minor injuries and non-union men were driven from the shops before armed guards quelled the disturbance; a clash between guards and alleged strike sympathizers at Gretna, La., in which four were wounded; the bombing of a Central of Georgia trestle near Macon, Ga.; the bombing of the home of a Louisville & Nashville employee at Birmingham, Ala., and the bombing of an Illinois Central bunkhouse at Mattoon, Ill.

Nineteen roads, according to a statement made by John Scott, secretary of the shop crafts organization, have settled with the striking shopmen on the basis of the "Willard-Jewell" agreement. The following are the roads named by Mr Scott: the New York Central lines with subsidiaries, except the Indiana Harbor Belt; the Baltimore & Ohio; the Chicago, Milwaukee & St. Paul; the Chicago & North Western; the Seaboard Air Line; the Chicago, St. Paul, Minneapolis & Omaha; the Southern; the Mobile & Ohio; the Minnesota & International; the Minneapolis, Dakota & Western; the Monon; the Green Bay & Western; the Elgin, Joliet & Eastern; the St. Paul Bridge & Terminal; the Duluth, Winnipeg & Pacific; the Louisville Railroad & Navigation Company; the Macon, Dublin & Savannah; the Buffalo & Susquehanna, and the Western Pacific. Of the 19 roads which have reached a settlement, only 10 are Class I roads and the 19 represent a mileage of but 54,050 miles, or 23 per cent of the total mileage of the country.

In the East

The strike situation in the east changed little during the week. At the time of going to press representatives of the striking shopmen were in conference with officers of the Erie at Youngstown, Ohio, and it was stated that an early agreement was expected. On the other hand, several roads, including the New Haven, the Lehigh Valley and the Norfolk & Western, have definitely rejected the overtures of strike leaders looking toward conferences with them. E. J. Pearson on Monday gave out the following statement telling of his road's rejection of the shopmen's peace move:

Through the source from which the inquiry was received, definite reply has been made that the New Haven would not consider any such settlement. This last statement on behalf of the management of the New Haven should set finally at rest any expectation that the New Haven will depart from the position maintained throughout the strike, that no man who has left its service on strike will be re-employed except as a new man, if re-employed at all, and that no qualified man now or hereafter employed who desires to remain in the service will be displaced to make room for returning strikers.

Settlement of the shopmen's strike under the Willard-Jewell plan was effected last week by the Chesapeake & Ohio; the railroad refused, however, to make any adjustment with striking clerks.

The Association of Railway Executives announced on Tuesday that 372,000 men, approximately 88 per cent of normal forces, were now at work in the railway shops of the country.

Due to the great increase in anthracite production and the importance attached to its movement, the Lackawanna and the Lehigh Valley have extended their embargoes to prohibit the acceptance of all classes of traffic for movement anywhere except priority commodities.

Southern Tells of Terms Made With Striking Shopmen

Fairfax Harrison, president of the Southern Railway, in a statement given out to public officials of the territory served by his company, gave in full the terms of the settlement his road made with strikers. This settlement involved the acceptance of the Willard-Jewell agreement verbatim. Mr. Harrison said, in part:

In accordance with our announced intention, we began on August 15 to recruit forces, and from day to day added to the men in the shops until we had at work 7,599 men, equivalent to 65.7 per cent of a normal shop force. None of the craftsmen we enlisted sought or was promised a permanent job. They were mercenary troops and took service specifically as "strike-breakers." It is significant that many of them were striking shopmen from other railroads.

On September 14 the chairman of the strikers' committee asked us for a conference, advising that he was authorized to negotiate a separate peace. As the result of the ensuing discussion, a treaty was made, adopting verbatim the so-called Chicago agreement. This treaty is quoted in full on the next page.

The agreement speaks for itself. There is no understanding, express or implied, varying the terms of it.

The men return to work upon the reduced wages fixed by the Labor Board.

Willard Addresses B. & O. Employees

Daniel Willard, president of the Baltimore & Ohio, has issued an appeal to officers and employees of the company asking for a genuine spirit of co-operation in handling the heavy traffic which the road is called upon to move. The statement reads in part as follows:

During the past ten weeks, owing to the fact that a large number of the men employed in the shops were on strike, the Baltimore & Ohio Company has been obliged to curtail its service to a considerable extent. Much through freight, which customarily would move over the Baltimore & Ohio rails, has been diverted to other lines. The pressure for coal since the end of the strike of the bituminous coal miners has also added to our difficulties and made it impossible to fully serve shippers located on the lines of the Baltimore & Ohio and at some places dependent wholly upon this company for transportation. Nevertheless, the shippers have shown great patience under trying circumstances.

Now that the Baltimore & Ohio men have returned to work, the public will expect an immediate resumption of normal operations. This will, of course, be impossible, no matter how hard we may try to meet the requirements of the situation. We cannot in a few days recover what was lost in a period of more than two months. However, by a united effort and with a determination on the part of everybody connected with the Baltimore & Ohio System to restore normal conditions at the earliest possible moment, in order that we may give to the public the service it has a right to expect, a remarkably quick recovery can, without doubt, be made.

The officers and men, upon whom an unusual burden has fallen during the strike, have undergone a great strain. The management realizes this and appreciates the efforts and sacrifices they have made. The men who have been idle have experienced a loss in wages equal relatively, perhaps, to the severe loss which the company has sustained in consequence of the strike. To regain the business which naturally and normally belongs to the Baltimore & Ohio, to handle the business which has been held back, but will now move, together with the increase which we must look for, due to a lessened coal production during the past summer, is a task which we must now unitedly attempt to perform. It is a big task, but one which I believe we can accomplish, and accomplish quickly, if there is a genuine spirit of co-operation among all connected with the Baltimore & Ohio service.

Sand and Gravel Producers Want More Cars

WASHINGTON, D. C.

REPRESENTATIVES of the National Association of Sand and Gravel Producers at a hearing before Commissioners Aitchison and Cox of the Interstate Commerce Commission at Washington on September 21 asked that the commission modify its priority orders in favor of coal so as to remove all preference in the use of open top cars except in favor of the most essential users of coal. They expressed appreciation of the modification made in Service Order No. 25 allowing the use of open top cars for other commodities in the direction of the mine, but maintained their objection to any "rules" restricting their use of open top cars.

Most of the witnesses asserted that there was no serious emergency in the coal situation and generally said that there was plenty of coal to be had in their communities, although

at a high price, and they thought that an unreasonable number of cars of coal were held under load. This they were inclined to attribute to speculative holding, although it developed that the principal points they had in mind were those where large numbers of cars are required to keep up a steady movement. It was stated that from 14,000 to 20,000 cars were being held at Cleveland and Commissioner Aitchison said that experience had demonstrated that about that number were needed to avoid delay in dumping at the docks for lake shipment. Whenever a witness referred to the holding of cars under load for higher prices, Commissioner Aitchison asked for specific information, saying that the commission desired to watch that kind of cars because they could be used for other purposes, but in general the testimony along this line was rather vague.

Commissioner Aitchison asked various witnesses if they had not been warned well in advance of the probability of coal shortage and car shortage, to which the reply was that while they had expected these things they had not been warned of a priority order and that in any event it was generally impracticable to ship and store roadbuilding materials in advance. To those who insisted that there was no fuel emergency because they had observed no shortage of coal, Mr. Aitchison pointed out that the exercise of the priority orders had relieved the emergency to a considerable extent and that that was the purpose of the orders.

Commissioner Aitchison also displayed great interest when many of the sand and gravel men stated that they had been told by railroad operating officials that they could meet the requirements both for coal and for roadbuilding and construction materials, if given a free hand. One witness stated that L. W. Baldwin, vice-president of the Illinois Central, had made such a statement, but after Mr. Aitchison had apparently taken a note of the name no more names were forthcoming. Mr. Aitchison said that the commission was interested in finding out which railroad men were talking to shippers in one way while their executives were talking to the commission in another, and said that the Illinois Central had recently come to the commission and stated its inability to get enough fuel for its own purposes and had been given a Class I priority order for coal from the West Kentucky fields. He said that during the many years of his experience as a state and federal commissioner, he had been told thousands of times by shippers of railroad officers who had said they could do various things if the commission would only let them.

A representative of the state highway officials urged that the commission remove all restrictions on the use of cars except for coal necessary for the comfort of the people, saying that no industry should be shut down and that all should be given an opportunity to earn enough to pay their coal bills. Mr. Aitchison pointed out that if the commission should grant the request 100 per cent there was no assurance that the sand and gravel producers would get all the cars they desired, because of the keen competition of other industries for the cars. When the witness said that the shippers expected to take their chances with the general car shortage, but that the commission's conscience would be more clear if it removed all "rules" which created the shortage of cars for any industry, Mr. Aitchison said that his conscience would be clear if he were certain that people would not freeze this winter. He also pointed out that while many governors and other branches of the state governments are flooding the commission with demands for coal, the highway officials representing other branches are presenting a totally inconsistent position and that it would be helpful if the state authorities would get together and help in pointing out to the commission where the public interest lies.

To the repeated statements that there is plenty of coal, Mr. Aitchison said that as soon as the commission is convinced that every one has all the coal they need, it will be very glad to relax its orders. He pointed out that the sand and gravel industry is not the only one that is complaining of car shortage and asked if the witnesses had any figures to demonstrate they were not getting their fair share of the cars, but none were forthcoming. When reference was made to an accumulation of 600 unbilled cars of coal at Chicago, he said the commission had carefully investigated this report and had ascertained that the number was no more than was customary and necessary to handle the business in a community as large as Chicago.

Cab Signals In France

The Paris, Lyons & Mediterranean now has about one-third of its passenger locomotives fitted with audible cab signals for repeating the indications of distant signals; and the management plans to increase this number steadily. This company began its first test with audible cab signals 20 years ago, on four distant signals fitted with contact bars, and in 1908 five new types of audible cab signals were put on 12 engines, and apparatus was fixed at 16 distant signals. From these tests the present type was evolved, which was applied in 1912 on 140 express engines and at the 268 distant signals of a main double track line, 255 miles long.

These experiments came to a standstill during the great war, but they were resumed in 1920; and installations are now being made extensively.

An officer of the road has sent in the following data:

Locomotives in Service

Passenger	1,556
Passenger & freight	831
Freight	2,101
Switching	402
	4,890

Locomotives Fitted and to be Fitted with Cab Signals: Totals to Date

	August, 1922	Dec. 31, 1922	Dec. 31, 1924
Passenger	634	735	1,335
P. & F.	10	346	822
Freight	...	...	1,276
Switching	...	...	...
All classes	644	1,081	3,433

The contact bars (crocodiles) on the roadway are placed at distant signals only; and the number of distant signals equipped with bars at the end of August, 1922, was 1,077. This total will rise to 1,479 at the end of the present year, and up to more than 2,600 at the end of 1924, including every distant signal on all main lines and on the most important branch lines (about 3,000 miles).

When passing over the contact bar of a distant signal which is set against the train, an electro-pneumatic relay on the engine is energized; a pneumatic valve liberates steam so as to sound a larger whistle on the top of the cab, and, at the same time, a special tap is registered on the speed recorder. If the engineman, before passing over the contact bar, sees the visual set against him he must pull a small lever to register another type of special tap on the speed recorder, to show that he has seen the signal and has read it correctly. This arrangement is designed to keep the engineman watchful all the time; he must not depend upon the cab signal.

One of the Six New superheated locomotives which have been put into operation on the Glasgow & South Western Railway (Scotland) during a trial run between Glasgow and Carlisle, attained a speed of 69 miles an hour with a load of 325 tons. The normal maximum load for a single engine on the section at which this speed was attained is 240 tons. The locomotives are of the Baltic type with six coupled driving wheels and a two-wheeled bogie at each end, and are 47-ft. 7-in. in length, with a weight of 99 tons.

President Rea (sixth from left) and a Group of the Associates on the Field Just Before the Awarding of the Prizes

Pennsylvania System Holds Third Annual Field Meet

The Breaking of Nine System Records Was Witnessed by Employees from Thirteen States

THREE LARGE RAILROADS had developed system athletic programs in pre-war years, which culminated each year in system field meets—the Pennsylvania Railroad (Lines East), the Erie and the Missouri, Kansas & Texas. Naturally these were discontinued after our entry into the World War. The Pennsylvania System, after its reorganization following the period of federal control, inaugurated a system athletic program similar to that which had formerly existed on the Lines East; on Saturday, September 23, it held its third annual system field meet at Altoona, Pa. It was a tremendous affair; more than 700 athletes took part in the 35 events; 16 special trains, requiring about 180 passenger cars, brought visitors to Altoona from 13 states; in the afternoon the cricket field, surrounded by grand stands and forming a huge bowl, must have held at least 30,000 spectators; 12 employees' bands, distributed throughout the stands, added to the interest and excitement.

While this represented the climax of the season's efforts, it must be remembered that thousands of athletes had been in training during the season and had taken part in the preliminary events in the various localities, divisions and regions.

The really remarkable thing about the affair was that with the great influx of visitors and the complicated program with many events, there was little if any confusion. The meet was so thoroughly organized and was so capably administered by those in charge of the actual carrying out of the program, that the schedules were closely adhered to. With all of the noise and excitement the best of order was maintained, both among the contestants on the field and the spectators in the stands. The crowd seemed to be particularly good-natured and the 150 uniformed Pennsylvania Railroad police gathered from all over the system, were mainly concerned in helping to make the visitors feel at home by courteously directing or otherwise helping them. Pickpockets and rowdies were notable for their absence and not an intoxicated man was seen during the day. The contestants and their backers showed the best of sportsmanship in spite of close decisions. The weather was perfect and the conditions ideal for making records.

It was necessary to carry on some of the events at a distance from the cricket field, which was the central point of the activities and only a comparatively short distance from the station and the business section of the city. For instance, the swimming events were held at the athletic field at Tyrone, Pa., a special train being required to take the contestants and spectators to and from Altoona. The men's tennis matches were held at the Altoona golf club, golf on the Blairmont Country Club course at Hollidaysburg, trap shooting at South Altoona, and rifle shooting at the East

A Close Finish

Altoona range. This rather widespread distribution of the events might have caused some inconvenience, had it not been that hundreds of the citizens of Altoona generously loaned their automobiles for the day. Prominently displayed signs in the vicinity of the railroad station indicated where automobiles could be found to take the visitors to the particular events in which they were interested.

The large number of special trains which were necessary required special provisions to relieve congestion at the Altoona station. Relief was afforded by having the visitors take their trains several blocks east and west of the station, depending upon the direction in which they desired to travel.

Plentiful traffic signs on buildings and street corners were posted for the direction of visitors. Moreover, special regulations for automobile traffic were put in force for the day and the local police were assisted by Pennsylvania employees in seeing that this traffic was properly directed on the important thoroughfares. The problem of feeding the visitors was relieved by the cordial co-operation of the various

Other events—circling bases, running high jump, running broad jump, shot put, quoits, horseshoes and tug-of-war.

Records Smashed

Nine system records were smashed, as follows:

100-yard dash (open), held by Garland of Harrisburg, :10⅗; won by Eberts, Philadelphia, in :10, flat.

50-yard dash (girls), held by Pauline Kennedy, Pittsburgh, :07, flat, won by Schenkel, Philadelphia, in :06⅘.

220-yard dash (open), held by Garland of Harrisburg, :23⅘; won by Eberts, Philadelphia, :23⅗.

50-yard dash (girls' novice), record was :07; won by Zelda Murphy, Newport, in :06⅘.

Circling bases, held by Plate, Baltimore, :15, flat; won by E. L. Maurer, Pittsburgh, in :14⅘.

880-yard run (open), held by Poor, Harrisburg, 2:05⅕; won by Kelly, Philadelphia, in 2:03⅕.

440-yard dash, held by F. Trout, General Offices, :56, flat; won by Trout, Altoona Middle Division, in :52⅘.

Mile run, held by Poor, Harrisburg, 5:00, flat; won by Siegmund, Harrisburg, in 4:46⅘.

The Middle Division Band

churches and other organizations in providing lunches in the churches or other buildings, or in vacant lots near the cricket grounds.

Several emergency hospitals were provided near the athletic grounds and the railroad station. Comparatively few cases had to be taken care of, except at the athletic field, several of the athletes being overcome because of overexertion and the fact that the weather was more than ordinarily dry and bright.

The various events included the following:

Swimming—100-yd. (novice), 100-yd. (open), 220-yd. (novice), 440-yd. (open), plunge for distance.

Trap shooting, rifle shooting and golf.

Tennis—girls' singles, men's singles, women's doubles, men's doubles.

Track events—100 yd. dash (open), 100-yd. dash (novice), 220-yd. dash (open), 440-yd. dash (novice), 440-yd. dash (open), 880-yd. run (open), 880-yd run (novice), mile run, mile relay. For boys: 50-yd. dash and 100-yd. dash. For girls: 50 yd. dash (novice), 50-yd. dash (open), 75-yd. dash, and quarter-mile relay.

Broad jump held by R. Juday, Ft. Wayne, 20 ft. 10¾ in.; won by R. Juday, 21 ft. 5 in.

Shot-put, held by P. Nesser, Columbus, 43 ft. 5½ in.; won by Thurman, Baltimore, 46 ft. 6 in.

There has been considerable rivalry between the various regions; the Eastern Region, however, won over its competitors by a wide margin. The standing in points at the close of the meet was as follows:

	Points
Eastern Region	181
General Office (Philadelphia)	55⅝
Central Region	55⅓
Southwestern Region	31½
Altoona Works	19⅝
Northwestern Region	18½

After the field events and before the baseball game President Rea personally handed the medals and trophies to the winners of the various events.

Base Ball Game

The final event of the day was the ball game between Altoona works and Fort Wayne; this was the first of a series

of three games to determine the system championship. The Altoona works had a good lead during the first eight innings. Fort Wayne rallied in the last half of the ninth and tied the score, 4-4. No runs were made in the tenth inning, after which the game was called because of darkness.

A progressive story of the field meet was wired direct from the top of one of the grand stands on the field to the important

Winning Team, Girls Quarter-Mile Relay Race. Represents Philadelphia General Office. Miss Betty Schenkle, Left, Also Won the 50 and 75-Yard Dashes for Girls

parts of the system. The newspapers generally in cities with many Pennsylvania System employees gave a generous amount of space to the event. The Pittsburgh Post, in particular, had several representatives at the meet and its profusely illustrated story in the Sunday edition covered several pages.

Coal Production

NORMAL PRODUCTION at the anthracite mines during the week of September 18-23 brought the total output of all coal, anthracite and bituminous, up to about 11,650,000 net tons, according to the weekly bulletin of the Geological Survey. This is still somewhat below the amount required to meet current consumption and lake shipments and at the same time to rebuild consumers' stocks.

The total output of anthracite during the first week after the strike was 1,064,000 net tons and during last week (the second following the strike) it was about 1,850,000 net tons.

Production of bituminous coal last week was estimated at from 9,600,000 to 9,900,000 tons, a slight increase over the week preceding. Loadings on Monday, September 18, were 37,330 cars, the highest since the close of the strike. On Tuesday, however, they dropped to 29,496, on Wednesday to 28,746, on Thursday to 29,483; on Friday to 27,396.

The present output is above that of the corresponding period of the year of depression, 1921, but is below that of the other years shown. The following statement gives production in the second week of September of the last five years:

1918	12,542,000	1921	8,187,000
1919	11,046,000	1922	9,661,000
1920	10,685,000		

The present condition of the coal market resembles the three years 1918 to 1920, more than 1921. In those three years, as now, demand for soft coal was active enough to absorb all the coal that could be transported.

Preliminary returns on daily car loadings at anthracite mines show remarkable speed in resumption of mining. During the first week loadings increased rapidly from less than 1,000 cars on the first day to a total of approximately 20,000 cars for the week. During the second week beginning with 5,179 cars on Monday, loadings increased to 6,767 on Wednesday, but dropped off to 5,912 according to preliminary returns for Thursday. The indicated total for the second week is about 35,000 cars, which compares favorably with the weeks immediately following the "miners' vacation" in the fall of 1920. The average weekly rate before and after the vacation was approximately 36,000 cars with a maximum in the week of October 23, 1920, of 37,300 cars.

The cumulative production to September 16 this year is 23,325,000 tons; with an estimated production of 1,850,000 tons last week the total output to date is approximately 25,175,000 tons as against 67,759,000 tons in 1921. The present year is about 42,589,000 tons behind last year.

The all-rail movement of soft coal to New England through the six principal Hudson gateways increased to 3,009 cars, and of anthracite to 438 cars, in the week ended September 16. In addition there were also shipped through Rouses Point 21 cars of bituminous coal in the week ended September 9, and 69 cars of bituminous and two of anthracite in the week ended September 16.

Statistics collected by the Massachusetts Fuel Administration give the quantity of anthracite received in New England in the present calendar year to August 31 as 3,345,000 net tons, against an average of 7,700,000 in corresponding periods of the six years preceding.

Receipts of bituminous coal from January to August, inclusive, this year were 10,805,000 net tons as compared with 11,020,000 tons in the same period of 1921, and with an average of 14,880,000 tons for the corresponding periods in the six years preceding. The bituminous coal trade this year is notably different from other years in that a larger part of the supply came from tidewater instead of by rail.

Shipments of bituminous coal through Hampton Roads in the week ended September 16 increased slightly over the previous week, but remained as for several weeks past, at about 300,000 net tons. Dumpings for the week totaled 307,426 tons as against 298,697 tons in the week before. Cargo coal for export and for New England decreased whereas coal for other coastwise destinations and bunker coal increased.

The movement of soft coal up the lakes from ports on Lake Erie finally touched the million-ton mark in the week ended September 17. Final returns have not yet been received, but preliminary daily reports on cars dumped indicate an increase of 71 per cent over the week preceding, when the piers handled 683,000 tons of cargo coal and 35,000 tons of vessel fuel, a total of 718,000 tons.

A further increase marked dumpings of lake coal during last week. The total handled at the piers on the three days September 18 to 20 showed an increase of 59 per cent over the corresponding days of the previous week. This indicates that lake coal is now going forward at a rate close to the maximum of any time in the past.

The total cargo dumped from the beginning of the season to September 17 was in round numbers, 7,000,000 tons. This was 10,100,000 tons behind 1921, and even 6,170,000 tons behind 1920, when, as now, priority was given to coal shipped to the lakes.

Final statistics of production as reported to the Geological Survey by the bituminous operators show 415,921,000 net

tons in 1921. The Survey's preliminary estimate, published January 7, 1922, was 407,000,000 tons. The error in the estimate was thus 2.2 per cent. These figures are exclusive of the output of country banks and of some wagon mines. They include, however, many small operations that fall within the definition of wagon mines but that operate steadily year after year. The tonnage not included would amount to little in a year of acute depression such as 1921. Were statistics available for the small mines not included, the total output would be raised by not much over 1,000,000 tons.

Contrary to what might have been expected, the number of employees increased in 1921. There was less work but more men to share it. The total employed at bituminous mines was 663,754—an increase of 24,000 men. This figure is not the average number of men at work at any one time, including the weeks or months when the mine may have been shut down; it is rather the number of men on the working force of the mine when it was in operation. Since the effect of the business depression upon the demand for coal did not become acute until February or March, the great majority of commercial mines got at least a few weeks' operation during the year, and their working forces were thus counted in the total number of employees. By August, 1921, so many mines had closed down that the total number of men drawing wages in one week had fallen to somewhere between 500,000 and 520,000. Examination of the individual returns shows that in many districts the men laid off at small mines found employment at the larger mines. In fact, in some districts, such as Illinois and Pittsburgh, the coal mines absorbed men discharged by the factories or railroads.

The increase in number of employed was confined to the tonnage workers. The number of day-men decreased in almost every state. The total number of surface employees dropped from 110,000 to 96,000, and of underground daymen from 174,000 to 168,000. This shift in occupations reflected, no doubt, the intense competition of a depressed market, as operators sought to eliminate all expenditures not contributing immediately to the mining of coal.

The later revised figures based on complete reports for the week from the railroads indicate a total production of 11,500,000 tons of coal, of which about 10,000,000 tons was bituminous and 1,840,000 was anthracite. The total coal loading for the week was 212,110 cars, or 16,968 cars over the preceding week. Loading on Saturday was 24,756 cars of bituminous and 5,588 cars of anthracite. However, the loading during the last two days of the week was less than it had been during the corresponding days of the week before.

More coal was transported to Lake Erie ports for transshipment up the lakes during the four days ending with Sunday than in any corresponding previous period. An average of 4,081 cars was received and dumped daily. The railroads are now transporting to Lake Erie points considerably in excess of 1,000,000 tons of coal a week, the average fixed by the federal fuel distributor as the amount that should be received at the lake ports to insure an adequate supply in the Northwest this winter. For the week ended Saturday 27,959 cars carrying 1,400,000 tons were received During the week before the receipts were 21,431 cars and during the first nine days of September 16,688 cars. As a result of the increased movement last week the railroads have not only made up for lighter shipments earlier in the month, but have brought the weekly average to more than 1,100,000 tons. Reports received by the Car Service Division on Tuesday indicated that by the close of Wednesday this week 1,-074,000 tons of coal would be received at Lake Erie ports.

It was announced at the White House on Tuesday that reports received by the President indicate that coal is being dumped at the lakes in excess of the ability of the lake carriers to transport it and that while there will be some shortage of coal this winter the situation is being relieved beyond expectations

The Pennsylvania Women's Aid

The Women's Aid of the Pennsylvania Railroad System was described in the *Railway Age* of April 15 last, and in the issue of June 24 there was a notice of its extension to the Northwestern region. The membership has been increased so that now the New Jersey Chapter alone has 10,236 members, and the eastern and central regions together more than 50,000. The New Jersey Chapter will have its second annual entertainment and dance at the Seventy-first Regiment Armory, New York City, on Thursday evening, October 12. The number of employees on the New Jersey Division of the road is more than 26,000 and among these men several thousand tickets for the entertainment have already been sold.

The "Women's Aid" is composed of the wives and daughters of Pennsylvania railroad officers and employees. It is an organization "to organize the women of the families connected with the Pennsylvania Railroad, so that they may know each other, and when occasion may require, to render aid and sympathy in such a manner as may be most helpful."

The Women's Aid succeeded what was formerly known as "The Pennsylvania Railroad Women's Division for War Relief," which was created during the World War as a preparedness society. In July, 1920, a final meeting was held in the Railroad Y.M.C.A. at West Philadelphia, at which time a memorial tribute in honor of the Pennsylvania Railroad hero dead was unveiled. This meeting marked the end of the Women's War Relief.

During the year 1921 over 2,200 families were aided financially and otherwise, and personal calls were made by members upon no less than 11,547 families of employees.

The New Jersey Division Chapter is headed by Mrs. C. I. Leiper, wife of the general superintendent of that grand division. The workrooms at the Pennsylvania Station, New York, constitute the center of activities for New Jersey. Here the members meet each Wednesday and make garments for babies, small children and others left in temporary need through illness or death. Funds for this work are raised primarily from entertainments and by voluntary contributions, as the dues of members are only 25 cents a year. Monthly meetings are held the first Wednesday of each month in the Y.M.C.A. auditorium at the Pennsylvania Station in Manhattan. These meetings have been very enjoyable, promoting the "family feeling" to a marked degree.

A report of ten cases of assistance recently rendered by the New Jersey Division Chapter contains the following:

Case No. 1.—The wife of a freight trainman was sent to the hospital. Her board, nurse and all expenses were paid, including those incident to a serious operation. Visits were continually made to the family, and donations of money extended until the patient was released from the hospital. This woman has now fully recovered.

Case No. 2.—An employee of the master mechanics department was given financial assistance when his child was killed by an automobile, in addition to which suggestions were offered from a legal standpoint.

Case No. 3.—Monthly milk bill is being paid for the widow of a former employee.

Case No. 4.—Flowers were sent to a sick employee of the ticket office.

Case No. 5.—Rent is being paid and monthly allowance given to the family of a ferry employee who was seriously injured.

Case No. 6.—Three months' rent and an allowance extended to a pensioned employee.

Case No. 7.—Six months' rent paid for an employee who is hopelessly ill.

Case No. 8.—A committee has been formed to assure proper recreation being extended to the paralyzed wife of a machinist

Case No. 9.—An employee of the master mechanics department was extended financial assistance, also large box of provisions and groceries sent to his family, in addition to which arrangements were made to send the entire family—father, mother and daughter—to the country in an endeavor to have them regain their health

Case No. 10.—An employee who died recently, left a wife and a three-days' old baby, without adequate means of sustenance. His wife is receiving a weekly allowance, which will be continued for at least one year.

Mrs. W. W. Atterbury, wife of the vice-president (in charge of operation) of the Pennsylvania Railroad System is director of the "Aid" for the entire system.

Federal Court Sustains Daugherty Injunction

Judge James H. Wilkerson's Ruling Upholds Government's Charges—Employees to Appeal Case

IN AN EXHAUSTIVE opinion, buttressed with many Supreme Court decisions, Federal Judge James H Wilkerson on September 23 sustained all of the provisions of the Daugherty injunction restraining striking railroad shopmen throughout the country from committing any acts which might be interpreted as interfering with interstate commerce At the same time the court denied the motion entered by Attorney Donald H Richberg, counsel for B. M. Jewell and John Scott, president and secretary, respectively, of the Railway Employees' Department of the American Federation of Labor, for dismissal of the temporary injunction granted September 1 on the petition of Attorney-General H M Daugherty.

Not one scintilla of evidence, the court held, had been presented by the defendants to refute or deny the abundant proof produced by the government of a nation-wide sabotage plot to destroy commerce. In ruling that any acts committed in furtherance of this alleged conspiracy, whether lawful or unlawful in themselves, might be restrained, the court upheld those provisions of the temporary injunction declared by the strikers to be an abridgment of their constitutional rights of free speech, writing, and assemblage.

In regard to the provisions of the injunction which the defendants complained of as curtailing constitutional rights, Judge Wilkerson said:

"It is asserted by the defendants to permit some of the acts against which the complainant seeks an injunction is to deprive them of fundamental rights guaranteed by the constitution. This contention has been answered by what has been said with reference to the unlawful purpose of the conspiracy.

"'A cardinal error of defendants' position,' to use the language of the Supreme Court, lies in the assumption that 'the right is so absolute that it may be exercised under any circumstances and without any qualification; whereas, in truth, like all other rights that exist in civilized society, it must be exercised with reasonable regard for the conflicting rights of others.'

"The record in this case shows that the so-called peaceable and lawful acts are so interwoven with the whole plan of intimidation and obstruction that to go through the formality of enjoining the commission of assaults and other acts of violence and leave the defendants free to pursue the open and ostensibly peaceful part of their program would be an idle ceremony."

In the preamble of his opinion, Judge Wilkerson reviewed the bill of complaint filed by the government and the vast amount of documentary evidence introduced in support of Attorney-General Daugherty's contention that a nation-wide plot existed to wreck trains, intimidate workmen and cripple rolling stock.

"In disposing of this motion," the opinion reads, "it may be well at the outset to emphasize what this case is not. It is not a case between an employer and employees, or between employers and employees, or between persons employed and persons seeking employment, involving or growing out of a dispute concerning terms or conditions of employment. It is not a private bill to enjoin indirect injury, as one caused by a secondary boycott, to the property of the complainant.

"It is, to use the language of Circuit Judge Baker, 'in the public interest by the government as *parans patric* to enjoin an unlawful conspiracy or combination in restraint of trade.' It is the conspiracy which is inflicting the public injury for which redress is sought.

"The right of the United States to maintain a bill like this under its general equity jurisdiction is no longer open to debate. In the Debs case the court held that the national government is charged with the duty of keeping the highways of interstate commerce, including railroads, free from obstruction."

The Application of the Clayton Act in This Case

Judge Wilkerson quoted various authorities to refute the contention of the defense that the power of the courts to deal with combinations such as Attorney-General Daugherty charges exist has been curtailed by certain provisions of the Clayton act.

"The law is clear," the court continued, "that if the dominating primary purpose of the combination is to restrain trade, or to do things unlawful in themselves and which by reason of their inherent nature operate to restrain trade, the purpose of the combination is unlawful, and that purpose may not be carried out, even by means that otherwise would be legal.

"In cases of this kind the proof is of necessity largely circumstantial. Acts must be taken in their relation to each other. Men must be presumed to intend the natural consequences of their acts. Proclamations of non-participation and exhortations to keep the peace cannot relieve from responsibility for a series of acts so interrelated and interwoven that they bear on their face proof of design and plan."

Judge Wilkerson referred to the fact that not one of the defendants in testifying answered the government's bill of complaint.

"Two have filed motions to dismiss," he said, "and have presented affidavits which leave a large number of averments of the bill unchallenged on the record. The fact that the defendants have been acting in combination is not denied.

"On the contrary, the defendants themselves have produced evidence of the closest association and co-operation on the part of the defendant organizations. That the officers of the unions gave directions concerning the strike from the outset is likewise admitted. The only material question really in dispute on the record is the responsibility in law of the defendants for the large number of unlawful acts shown to have been committed, the most of them by unknown parties.

Judge Cites "Reign of Terror"

"Notwithstanding the warnings against acts of violence set out in the instructions of June 27, 1922, there began throughout the country a series of depredations which rapidly developed, on some portions, into a veritable reign of terror. Railroad bridges were dynamited, spikes were removed from rails, obstructions were placed upon railroad tracks, bombs were exploded on tracks and in railroad yards and hurled at moving trains.

"Regardless of the instructions that no injury must be inflicted upon property, there was sabotage on a large scale. Engines, cars and equipment were tampered with, and innumerable acts of malicious mischief committed which endangered the lives of both passengers and those operating trains.

"These unlawful acts are shown to have been on such a large scale and in point of time and place so connected with the admitted conduct of the strike, that it is impossible on the record here to view them in any other light than as done

in furtherance of a common purpose and as part of a common plan.

"This record does not permit the conclusion that those who are at the head of this combination did not actually know that these things were being done, and that they were the direct result of the methods by which the strike was being conducted. And if they did not actually know, they were charged with such knowledge."

Judge Wilkerson quoted two communications sent out by the strike leaders on Aug. 28, urging the men to continue to fight this "industrial war" with other methods than "kid gloves" and "soft talk."

"These defendants will not be permitted, upon the record here, to deny responsibility for these unlawful acts," the court continued. "They will not be permitted to continue acts which, even though they may be peaceable and lawful in themselves, it has been demonstrated, are only a part of a program of unlawful conduct and are done for the accomplishment of an unlawful purpose.

"Defendants assert," the court continued, "as a ground against the granting of the relief sought by the complainant, that the strike was a defensive measure against a plot of the railway companies to destroy the unions. The argument seems to be that the defendants are justified in inflicting upon the public any injury which it may be proper for them to inflict upon their adversaries in this conflict.

"It must be remembered, however, that this is a suit brought for the benefit of the public. Restraint of trade may not be adopted as a weapon in industrial warfare. The court must act upon the case now before it and give its aid to the removal of the obstructions to commerce which are found to exist."

Judge Wilkerson then referred to the motion presented by Attorney Richberg to dismiss the bill on three grounds, the first two attacking the sufficiency of the bill and the third charging that the relief sought "was obtained for ulterior and unlawful purposes upon misrepresentation and suppression of matters of fact and law, the disclosure of which was required by good faith."

"During the hearing, which has lasted almost two weeks," the court resumed, "the defendants have neither offered nor suggested a scintilla of proof tending to establish this averment in the motion to dismiss. The restraining order was entered after a hearing at which both the averments of the bill and the questions of law involved were fully and fairly presented. It follows, therefore, that the motion to dismiss the bill must be denied."

Federal Judge Enters Formal Injunction Order

Judge Wilkerson on September 25 formally entered the temporary injunction sought by Attorney-General Daugherty. Except for a few minor changes the judge put into effect without modification the draft submitted by the attorney-general.

Immediately following the court's action, attorneys for the shopmen suggested the hearing on the final restraining order be held before three judges of the Circuit Court of Appeals because of the importance of the case as a legal precedent. This plan calls for the filing of a certificate by the attorney-general stating that the case is of supreme public importance and is based on a precedent established in 1903. This certificate then gives the case precedence over all other business before the court. Judge Wilkerson said he had no power to expedite the hearing as suggested, but Blackburn Esterline, assistant solicitor-general, promised to submit the proposal to Attorney-General Daugherty at once.

Respecting the form of the final order, Mr. Richberg refused to make any suggestions. He left a statement with Judge Wilkerson in which he contended that he could make no suggestions as to the form or wording of the order, a move which in his opinion would lend sanction to what he regarded as an unlawful ruling.

The final appeal for the granting of the temporary injunction was made by Attorney-General Daugherty himself, who, appearing before the court unexpectedly on September 21, said:

This order does not question the right of a man or any number of men to strike, but it restrains from the unlawful right to strike back. The enforcement of this decree will not deprive any man of any lawful right. On the other hand, it will afford protection to every man and to all men equally who come within its operation in each and every lawful right.

The law of this country, as applicable to cases of this kind, where transportation and the carriage of the mails are involved, is somewhat different from the law where so-called industrial disputes and strikes are involved. It is the duty of the Government to compel railroads to furnish transportation. If the railroads for any reason are not able to do so because of interference, it is the obligation of the Government to step in and prevent any and all interference.

The life of industry, human life, the life of the Government itself, depends upon industrial peace, and industrial peace depends upon uninterrupted interstate commerce and the transportation of the mails. In case of aggravated and unlawful interference with transportation, when the railroads on account of circumstances conclusively proven to have existed in this case are interfered with, what can the Government do?

First, the Government can, as in this case it did, call on all persons responsible for the interference to cease and desist from interference. That failing, as it did fail, the Government must decide promptly whether it will resort, as it did in this case, to civil proceedings for an injunction to restrain those who persisted in the interference.

Secondly, the Government can step aside supinely in disregard of its duty, thereby contributing to the continuation of the interference and inviting every criminal act destructive of human rights, of property, of life, and of transportation, and let those who bear the torch and hold the dagger proceed in the commission of such crimes against life, property, liberty and government.

That would have involved years of prosecution, and encouraged men to violate the law. It would have encouraged depredations which no civilized country and no Christian people will tolerate.

Third, the Government could call for troops and legally mow down and kill—how many? Nobody knows, how many American citizens!

Fourth, the Government could have adopted a policy of innocuous complacence and let anarchy reign and the mob rule.

Attorney-General Calls Court Decision Victory for Government

In commenting on the ruling Mr Daugherty said:

The decision was a complete and clear cut victory for the Government. It settles the law with respect to strikes which affect the transportation of passengers and property in interstate commerce and the mails. The Government will see to it that any decree entered in pursuance of the decision shall be adhered to. It will also see to it that, as quickly as possible, the railway companies shall comply with the acts to regulate commerce, and any decision or orders of the Interstate Commerce Commission with respect to service or equipment, as well as all decisions of the Railroad Labor Board relating to wages or working conditions.

Erie Piers 20 and 21, New York—Where Practically All Pacific Coast Perishables on the New York Market Are Auctioned Off Each Day

Railroads Oppose Reduced Rate Mileage Book

Would Reduce Revenues and Unduly Discriminate Against Ordinary Traveler

WASHINGTON, D. C.

THE ISSUANCE of interchangeable mileage tickets or scrip coupon books at rates below the prevailing rate of passenger fare was opposed by representatives of the railroads at a hearing before Commissioner Meyer of the Interstate Commerce Commission at Washington on September 26 and 27. Commissioners Cox and Lewis, Chief Examiner R. E. Quirk and M. O. Lorenz, chief statistician of the commission, also sat with Commissioner Meyer. The law recently passed by Congress directs the commission to require the issuance of interchangeable mileage or scrip coupon books "at just and reasonable rates" and to prescribe rules and regulations therefor, but authorizes it to exempt any carrier in whole or in part where particular circumstances justify it. The commission has instituted a proceeding of investigation with a view to the issuance of such order or orders or other requirements as may be proper and necessary to carry the act into effect. At the outset H. W. Bikle, who appeared as counsel for the railroads, stated that the carriers desire to reserve the right to contest the constitutionality of the law or of any order the commission may issue.

C. A. Fox, chairman of the Central Passenger Association, presented a general statement on behalf of 168 roads, operating 225,000 miles of line, and including 149 Class I roads and 19 Class II roads, in the form of answers to seven questions propounded by the commission in announcing the hearing. He was followed by W. P. Rose, auditor of passenger accounts of the Southern Railway, who described in detail the additional accounting that would be required if a reduced rate mileage or scrip book were placed in effect. He estimated this additional accounting expense at $1,680,000 per annum. A large number of roads, principally short lines, also presented testimony in behalf of their applications which have been filed with the commission for exemption from the provisions of the act.

An abstract of Mr. Fox's statement follows:

No Advantage in Sale of Both Mileage and Scrip

"There is no public advantage in the sale of both mileage and scrip tickets. The present forms of scrip coupon tickets, now issued generally in $15, $30, and $90 denominations, fully meet the requirements of the new law, although such forms of tickets have never been satisfactory to the carriers.

"These scrip books are equivalent to currency, coupons being detached to cover the value of transportation furnished at normal one-way fares. The coupons are accepted by conductors on trains; but, if holder desires to travel between two competitive points, by a carrier or carriers whose distance is longer than the direct or short line, coupons of value equivalent to the through fare via the direct or short line are detached by the ticket agent, and a passage ticket of ordinary one-way form is issued in exchange therefor. The coupons are also accepted for baggage charges (excess weight, excess size, excess valuation, storage and transfer).

"There is not a convenience or advantage accruing from the use of mileage tickets that will not be more completely and satisfactorily taken care of, both from the view point of passengers and of the carriers, in the existing forms of scrip books. On the contrary, there are complications and additional expense inseparable from mileage tickets avoided by the use of scrip books. Where rate levels vary, as they do over considerable mileage in different sections of the United States, it would be necessary, if mileage tickets were used, to detach sufficient additional coupons to properly compensate those carriers honoring the ticket, having fares in excess of the basic fare of 3.6 cents per mile, which applies more generally throughout the country.

"The detachment of additional coupons, which represent miles, as applied to a book intended for general interchange between substantially all carriers would make the compilation of covering tariffs involved and expensive. Formerly, where mileage tickets were in use, they were accepted only for passage over individual carrier systems, or, in districts of comparatively small area; or, where the mileage tickets were of joint interchangeable character, good over a number of roads, they were generally restricted in use to the individual systems, with only limited provision for interline application. While it was feasible thus to utilize a mileage ticket good over a single system or a small territorial region, and to compile distance tables, which frequently required computations by both agents and conductors to add two or more distances together to arrive at the total through detachment, it would be impracticable to so apply a mileage ticket for nation wide use. A mileage ticket available for local, interdivision and interline use generally throughout the country, to the same extent as the present scrip books are honored, would have to be supported by underlying distance tables practically equivalent in number of tariffs and in number of pages in such tariffs, to the present system of conductors' and ticket agents' local, inter-division and inter-line tariffs applicable to one-way tickets at normal fares. While the individual carriers now have abbreviated tables of distances, at least between the more important points on their systems, such tables would not meet the requirements of a nation-wide interchangeable mileage ticket.

"As users of scrip books could in no conceivable way derive a greater benefit from a mileage ticket, as distinguished from a scrip ticket of like scope, it is believed that the few foregoing principal objections to mileage tickets should be convincing that a mileage ticket of any type is an unsatisfactory form of ticket, and should not be re-introduced.

"Furthermore, as scrip represents currency, it automatically adjusts itself to any revisions in the basic fare for ordinary tickets that may occur, upward or downward, with no advantage or disadvantage to the holder of the scrip or the carrier."

Should Be No Reduction in Fares

The carriers contend there should be no reduction in fares. The present interchangeable scrip ticket meets all requirements as far as the varying rate levels are concerned.

The present bases of freight rates and passenger fares and charges were fixed by the Interstate Commerce Commission after extended hearings and investigations to determine the revenue which should be realized from the freight and passenger transportation respectively to enable the carriers to perform the service to which the public is entitled, and to yield the net return to the carriers as provided in the Transportation Act. It must, therefore, be assumed that such fares are just and reasonable, as there have been no developments since the date of the commission's order justifying a change, as indicated by the Commission's recent review of the general rate situation.

At no time since the passage of the Transportation Act have the carriers as a whole earned the net return contemplated by that act. Any form of reduced rate mileage or scrip ticket good for nation-wide use on all the railroads of the country will inevitably result in a substantial reduction in passenger revenues, the extent of which will vary accord-

ing to the percentage of reduction from the one-way fare, and the denomination of the ticket. It is practically impossible to accurately estimate the amount of this reduction, because there has never been a reduced rate ticket which was good for use on all roads throughout the entire country. If such a ticket be introduced, a great proportion of the one-way travel between large commercial centers such as Chicago and New York, New York and New Orleans, Chicago and Denver, San Francisco, etc., and theatrical, Chautauqua and other similar traffic will be quick to take advantage of such a ticket. In other words, the larger the scope of territory in which the ticket can be used, the greater will be the inroads upon the passenger revenue of the carriers.

The gross passenger revenues for the year 1921 were $1,152,635,016. The estimated passenger revenues for the year 1922, based on I. C. C. reports for the first six months, will be $1,070,167,869, or a prospective decrease of $82,467,147. These passenger revenues include commutation and surcharge, but exclude mail and express for both years. This showing results in the face of the wiping out of the war tax January 1, 1922.

Some years ago, when mileage tickets were in effect and reductions in various degrees from the basic rate per mile were accorded in different parts of the country, even though such mileage tickets were restricted to smaller territorial limits and were not interchangeable as between all lines in the same territory, an average of not less than 20 per cent of the total passenger revenue in certain sections of the country was derived from mileage tickets; in fact, on some lines as high as 60 per cent of the total passenger traffic was moved.

Confirming these statements, the record shows that for the fiscal year ending June 30, 1917, in Southeastern territory a major portion of the traffic moving between principal commercial centers traveled on mileage tickets.

It is apparent that any reduced rate mileage or scrip ticket will practically supersede the normal one-way fares between all commercial centers of the country, materially reducing the present aggregate revenues which do not now meet the necessity of the carriers, nor the expectation of the commission from a revenue standpoint in their recent general rate investigation.

Another inequitable and discriminating feature of a reduced rate scrip or mileage ticket would be that in view of the long distance covered by journeys in this country, under almost any priced book so far suggested, it would be possible by the use of a scrip book, and with practically the same initial investment, to accomplish a one-way journey between two given points at a less cost than by purchase of a regular one-way ticket, thus producing either a discrimination or a reduction in the one-way fare. The lower the price of the book, the more cases of this kind would be produced.

The cost of handling passengers on reduced mileage or scrip tickets will exceed considerably the cost of performing service for a passenger paying the normal fare and using the ordinary form of one-way ticket, and it is not clear how it can be justifiably concluded that, when the present normal basic fare has failed to produce the results anticipated by previous decisions of the commission, a mileage or scrip ticket sold at a fare below such normal basic fare per mile can be construed as either just or reasonable.

Answer to Arguments Advanced by Commercial Travelers

It has been contended that the purchase of a mileage or scrip coupon ticket involves the wholesale principle, the denominations commonly mentioned being not less than 1,000 nor more than 5,000 miles. In support of this, reference has been made to the fact that a lower freight rate is made for carload shipments than for less than carloads. This comparison is faulty, the difference is not confined to a difference in pay for the service; the cases are not analogous. The rate per hundred pounds is less to move freight in carload lots than to move it in less than carload lots for the obvious reason that the L. C. L. load is composed of a number of shipments involving greater expense in handling and accounting than shipments by carload; for example, carload shipments are loaded and unloaded by the consignor and consignee. Therefore, it is fair and reasonable to fix the carload rate at less than the L. C. L. rate, but there is no reduction in the carload rate on account of the number of carloads shipped, and the commission has opposed every effort to have the principle of a lower rate for a number of carloads than for a single carload.

With mileage or scrip books performance of service is clearly a retail process. A ticket contemplated to cover 5,000 miles would be used for numerous trips. While payment for these trips would be made in advance, the trips would be spread out over the lifetime of the ticket. Each such trip is a separate, complicated transaction involving ticket agents, conductors and ticket accounting departments in a very large amount of additional detail and labor compared with single tickets sold at normal fares. This extra expense for additional employees in auditing and ticket offices and on trains would amount approximately to $1,680,000 annually, which will be explained by the accounting witness who will testify later.

To sum up briefly, the effect of the proposition would be to accord a lower rate to a class of passengers more expensive to handle.

A mileage or scrip ticket sold at a reduced fare would be used between a multiplicity of points within a given period at a preferential fare as against the passenger who travels between the same points, on the same train, in the same car, and in the same seat. Such reduced rate mileage or scrip ticket would impose on the carriers an expense greater than in the case of the passenger holding one-way ticket at normal fare, and to this extent is a discrimination rather than an observance of the principle involved in the construction of carload and L. C. L. freight rates. In fact it would be a direct reversal of the principle applied to freight.

It has been alleged that carriers would derive substantial benefit from the use of the money paid in advance for mileage or scrip books, on which service would not be performed for a considerable time after purchase. A fund created in this manner would be divided into comparatively small totals among the large number of selling carriers. These sums would be constantly changing balances, subject to innumerable withdrawals on account of claims for partially used tickets returned by purchasers for redemption, and subject to hundreds of monthly settlements between roads for coupons of books honored by foreign roads. Of the total mileage revenue only a comparatively small per cent would remain constantly in the possession of the carriers as a daily average balance.

Mileage Tickets "Pernicious and Unbusinesslike"

It has been uniformly recognized by the railroad managements since the inception of mileage tickets that they were the most pernicious and unbusinesslike form of transportation in use, because of their discriminatory character and susceptibility to all kinds of irregularities and manipulations. It was impossible for various reasons for the carriers as a whole to abolish the use of mileage tickets, nevertheless there was a constantly growing restriction in their use to the extent that it was within the power of the carriers to so limit them. Conditions changed when the carriers were operated as a unit by the United States Railroad Administration, and recognizing the discrimination and irregular manipulation of mileage tickets, the carriers were ordered to discontinue them.

The United States Railroad Administration, having ac-

complished during the period of federal control what the carriers themselves were unable to accomplish prior thereto, the carriers did not, upon the return of the properties to private operation, reestablish the mileage ticket at a reduced fare and are strongly opposed to it at the present time.

Any reduction in the basic fare which may be imposed upon the carriers through the installation of a mileage or scrip ticket below the normal fare will deplete the present passenger revenues, and it is the consensus of views that a reduced rate mileage or scrip ticket will not increase the traffic to an extent offsetting the reduction in revenue. The carriers apprehend that a reduced rate mileage or scrip ticket would have a material effect upon the normal basic fare, and desire to call attention to the fact that the reduced mileage fare previously in effect was one of the chief arguments and reasons why the several states forced upon the carriers a reduction in the intrastate one-way fares.

In 1907 the legislatures of a number of western states passed what are commonly known as "two-cent fare acts," reducing passenger fares from three cents to two cents per mile. In the case of one large western railroad (which was the common experience of other roads), passenger fares were reduced in 1907 from three cents to two cents per mile on 75.79 per cent of its total mileage. Notwithstanding the reduced fare, the total number of passengers carried during the fiscal year ended June 30, 1908, increased only 2.16 per cent over the number carried in the preceding fiscal year when the basic rate for passenger fare was three cents per mile.

In April, 1914, the passenger fares on the same lines in South Dakota were reduced from three cents per mile to two and a half cents per mile, a reduction of 16.66 per cent. Notwithstanding that substantial reduction, the number of passengers carried one mile intrastate in South Dakota for the three months immediately following the reduction decreased 5.42 per cent, as compared with the corresponding months in the previous year in which the rate of three cents per mile was in effect.

Further substantiation is furnished by the experience of one of the Southeastern carriers, which also operates in a portion of the territory north of the Ohio river. In Illinois passenger fares were reduced from three cents to two cents per mile, effective July 1, 1907, but the operations of the carrier in question for the last six months of the calendar year 1907 (the first six months after the reduced rate became effective), compared with the last six months of 1906 (when the rate was three cents), showed that while the number of passengers carried in Illinois increased 7.13 per cent, there was likewise an increase in the number of passengers carried by that same carrier in other states where the passenger fare had not been reduced, i. e., in Tennessee, an increase of 19.71 per cent, in Alabama 9.82 per cent, in Georgia 25.67 per cent, and in Florida 14.21 per cent.

Using the experience of this same carrier for further illustration, passenger fares on its lines in Alabama were reduced from three cents to two and a half cents per mile, effective June 1, 1909, but its fare in Georgia remained at three cents per mile. Comparing the nine months' period ended February 28, 1910, with the nine months' period ended February 28, 1909, the number of passengers carried by it in Alabama showed an increase of 12.52 per cent, while in Georgia, with no reduction in the basic rate, the number of passengers carried by it increased 13.45 per cent, and the revenue results for these same periods showed a decrease of 1.35 per cent in Alabama, and an increase of 12.24 per cent in Georgia.

If mileage tickets at a special reduction are sold to the general public, past experience demonstrates that theatrical companies, circuses, concert companies, bands and other public entertainments, and other organized traffic, will demand like special class legislation for their transportation. Wherever a reduced mileage rate prevailed, the traveling public to a considerable extent could not be convinced that the same basis should not prevail for all regular passenger travel. The pressure was always for a downward revision.

The carriers have repeatedly asserted that a reduction in the basic fare through the sale of reduced rate mileage or scrip tickets, or otherwise, would not appreciably stimulate traffic. An outstanding proof of this is furnished by the withdrawal of the war tax of 8 per cent of the transportation charges, effective January 1, 1922. The cancellation of this charge was equivalent to making a horizontal reduction in passenger fares on all carriers in the United States, but, instead of stimulating traffic, the passenger revenues for 1922 will show a decrease of approximately $82,500,000, based upon the decrease already shown for the first six months of 1922.

The Canadian Lines have a form of certificate which they issue to members of the Commercial Travelers' Association of Canada, Dominion Commercial Travelers' Association, Maritime Commercial Travelers' Association, Northwest Commercial Travelers' Association, Ontario Commercial Travelers' Association, etc.

Upon presentation of these certificates, ticket agents issue transportation sold at a reduction from normal tariff fare. To obtain the benefit of these certificates, members of the organization must travel at least three months of the year in Canada, and must have a residence or business connection, or, at least, an office in Canada. Baggage owner's release must be signed by the holder of the certificate. It will be recognized that this is a preferential form of transportation, confined to an exclusive and favored class, which is not permissible under the laws of the United States.

The present interchangeable scrip ticket meets all requirements so far as the varying rate levels are concerned, for the reason it is issued in the nature of currency, in coupon form, the coupons being accepted for transportation upon the basis of normal tariff fares applicable to the line over which the transportation is furnished, and it makes no difference whether the normal fare be 3.6 cents per mile or 8 cents per mile.

The carriers urge that there be no reduction in the present basis of fares, and that there should be no change in present rules and regulations.

The new law requires "All carriers by railroad subject to this act to sell interchangeable mileage or scrip coupon tickets at just and reasonable rates."

The point is raised that there are certain small steam rail lines and electric lines whose responsibility may be in doubt, or with whom the Class 1 roads do not now interchange traffic, and if an interchangeable mileage ticket is issued, then difficulty might be encountered in making collections. It is hoped the commission will give recognition to this condition in their deliberations.

Effect of Scalping

The mileage and scrip forms of tickets, especially those honored on trains, are more susceptible to profitable manipulation by scalpers than any other forms. Mileage tickets have formed the chief stock in trade of scalpers in years past, and their greatest profits have been derived from such tickets. Municipal ordinances, injunctions and state statutes have been disregarded by scalpers, who work through a special clientele, and while a national law against ticket scalping would be of great assistance and protection to the carriers and the public against the manipulations of these malefactors, the greatest protection lies in a system of sale, accounting and espionage, which the carriers themselves must be permitted to follow in handling a form of ticket so susceptible to manipulations. But, surrounded by every safeguard known to the carriers, an important percentage of the revenues will be lost to professional and itinerant scalpers

if a scrip or mileage ticket is ordered on sale at any reduction below the present regular fares.

Discrimination

The testimony of the carriers would be incomplete if they failed to call particular attention to what they consider one of the most important phases of this whole question, namely, discrimination. Any form of mileage or scrip ticket at a reduced fare will discriminate against, and unduly prejudice the interests of 80 per cent of the traveling public, assuming that only 20 per cent will travel on mileage or scrip tickets. Such tickets, sold at a discount, would be used by those best able to pay the normal fares. The farmer, artisan, school teacher, clerk, laboring man and other casual traveler would not, on account of their infrequent trips and the price involved, buy mileage or scrip tickets. The commercial man, who is out on business, earning his living in that way, and the business man and others making frequent trips between commercial centers can afford and would purchase mileage or scrip tickets, thus saving a substantial difference in fare, while the casual traveler would pay the full one-way fare when traveling between the same points, on the same train and in the same car.

Commissioner Meyer asked the witness what he would consider a wholesale transaction in passenger traffic, to which Mr. Fox replied that he knew of no wholesale principle in the passenger business. He said the average commercial traveler travels about 50 miles a day, which at the rate of 3.6 cents a mile would be $1.80 a day. He pointed out that a reduced rate mileage book differs in principle from a reduced rate excursion ticket because it would draw away from the normal one-way business, while excursion tickets create new business and add to revenues rather than detract from them. He also said that a mileage book would be sold to a preferred class and in general a well-to-do class, as indicated by the fact that books in dimensions ranging from 1,000 to 5,000 miles are urged.

J. E. Benton, general solicitor of the National Association of Railway and Utilities Commissioners, brought out that some roads in the West that charge passenger rates higher than the prevailing rate, when mileage books were formerly used, did not require the detachment of an additional number of coupons to represent the higher rate, but Mr. Fox said that a nationwide mileage book would create a different situation and the same reasons that make the basic fares of these roads higher than the regular rate would call for an exemption from the uniform mileage rate. Mr. Fox also said that any mileage book issued should be non-transferable because the use of a transferable book would be substantially equivalent to changing the basic fares. They would be so commonly used that the carriers would sell but few ordinary one-way tickets. He said that if mileage books were sold at reduced rates a burden would be cast on other traffic, either freight or passenger.

Additional Accounting Complications

Mr. Rose said in part:

It has been the endeavor of the carriers for a great many years to equip their agencies with such simple forms of passage tickets as would enable ticket sellers to handle the public with the utmost dispatch to avoid inconvenience and delay to the passenger at the ticket window, and to facilitate the collection of transportation on trains. In carrying out this policy, agents generally are provided with card tickets with printed destinations to all points where the sales justify. Today 90 per cent of the traffic is handled on this form of transportation, which affords the greatest measure of protection against possible loss of revenue, accomplishes the object as set forth above, and produces the utmost simplicity in accounting from every standpoint. Scrip or mileage for general use on trains without exchange at the ticket windows is equivalent to collecting a volume of cash fares with the added confusion of making the computation, and if the scrip became popular, the carriers would find themselves back 50 years, when there were no ticket offices to speak of, and conductors collected the passenger revenue for the carriers.

These facts should be borne in mind in giving consideration to the advisability of adopting a reduced rate scrip book which might, in some directions, suit the convenience of a limited number of travelers, and, on the other hand, place an absolute burden on the carriers, with much added expense.

Exemptions Asked

Ben B. Cain, vice-president of the American Short Line Railroad Association, spoke on behalf of short lines that have filed applications for exemption and expressed the opinion that there should be some classification which would exempt certain roads. J. W. Carmalt, on behalf of the Ulster & Delaware, said that this company's passenger traffic consists mainly of summer vacation travel or local travel and that the use of mileage books at reduced rates would greatly diminish its revenue. J. D. Rahner, general passenger agent of the Florida East Coast, asked exemption on the ground that 65 per cent of the passenger traffic is seasonal winter tourist travel and includes very little commercial travel. When a representative of the commercial travelers asked if lower rates were not made to encourage the winter tourists, Mr. Rahner said that reduced rates are made, but that his road does not participate, but receives its full local rates south of Jacksonville. He also pointed out that the Florida Railroad Commission had approved a higher rate on its oversea line, which is now 4.8 cents a mile. W. J. Craig, passenger traffic manager of the Atlantic Coast Line, and C. B. Ryan, passenger traffic manager of the Seaboard Air Line, also asked exemption of a number of branch subsidiary lines on the ground that they were built to accommodate particular classes of freight traffic and that the additional accounting expense incident to the use of mileage books would in many cases absorb nearly all of the passenger revenue. It was also shown that many of these lines are unprofitable.

Mr. Fox was cross-examined at length by counsel for the commercial travelers' associations regarding the former practices of the railroads in issuing mileage books and as to why the railroads drew a distinction in principle between reduced rates on mileage tickets and special and excursion rates. Mr. Fox said that the use of mileage books had their origin about 1868 as one of the concessions offered by the freight department to large shippers. After giving an annual pass to the head of a company they would often give a mileage book or sell one at a reduced rate to his traveling men. Later the revenue from this source was transferred to the passenger department, but passenger officials always regarded mileage tickets as an unbusinesslike and pernicious form of ticket and constant efforts were made to get rid of them. By 1918 very few were sold, but it was not until the Railroad Administration took control of the roads that they were abolished entirely. In explaining the difference between reduced rates for mileage and other reduced rates, he pointed out that those special rates are restricted either as to dates, trains or destinations and were, therefore, less valuable than the ordinary ticket and that they stimulated traffic which otherwise would not move, whereas reduced rate mileage books would be sold to passengers who would otherwise pay regular fare and whose transactions in no way represented the wholesale principle. He insisted that a reduction of a few cents a day in the railroad fare of a traveling salesman was not of sufficient importance to decide the question how many traveling men would be sent out.

John E. Benton, general solicitor of the National Association of Railway and Utilities Commissioners, presented let-

ters he had received from the railroad commissions of Nevada, New Mexico and Arizona, asking that whatever mileage or coupon rate the commission may require should be honored in the states where the prevailing passenger rate is 4.8 cents a mile. He also read a letter from the North Carolina commission expressing the opinion that the universal rate should be 3 cents a mile, but opposing any plan by which the general public would pay a higher rate than any class.

Commercial Travelers Ask Discount of 33-1/3 Per Cent

D. K. Clink, chairman of the transportation committee of the National Association of Traveling Men, who said he represented 676,000 commercial travelers, urged that the commission order the use of a universal interchangeable scrip coupon ticket in the amount of $100, to be sold at a discount of 33⅓ per cent, good for one year, the unused portion to be redeemable. He asked that these coupons be accepted for all baggage charges and proposed that they be exchanged for tickets at the regular rates, thus automatically adjusting themselves to varying rates of fare in different parts of the country. He said that a discount of 33⅓ per cent appeared just and reasonable in view of the fact that railroads formerly voluntarily sold mileage books at such a discount and because they now make a discount of that amount for excursions and other forms of special travel. Mr. Clink said that excessive passenger rates are driving thousands of commercial travelers out of business, particularly those working on a commission basis, and that commercial travelers are a great national asset and should be encouraged. Mr. Bikle pointed out that prior to federal control the Pennsylvania sold a mileage ticket at 2¼ cents, while its standard passenger rate since 1907 had been 2½ cents, so that the discount was only 10 per cent. He asked if the witness had not proposed a discount representing about the widest spread he could find. Mr. Clink said the railroads sell some tickets at a discount of 50 per cent. He expressed the opinion that such a reduction would so stimulate travel as to more than make up for the loss in revenue, but admitted that he had no idea what the loss in revenue would amount to.

John F. Shea, chairman of the travel bureau of the American Hotel Association, recommended a scrip coupon book to be sold at a discount of one-third in denominations of $50, $100 and $150, with coupons ranging from one cent to $5. He proposed that they should be non-transferable and that identification by photograph and signature should be required at the time of issue. He insisted that any reduction in rates would stimulate travel and cited his own experience in traveling on nine months' tourist tickets to show the reductions in rates which the railroads make voluntarily.

French Records for Weight Per Locomotive Horsepower

By a Foreign Correspondent

RECENT EXAMPLES of locomotive construction in the United States represent very careful study in regard to the design, and to the refinement of details, and to the combination of devices that have proved their worth, into one locomotive, in the endeavor to produce the greatest possible sustained power with the minimum weight of locomotive, and with the minimum consumption of fuel and water.

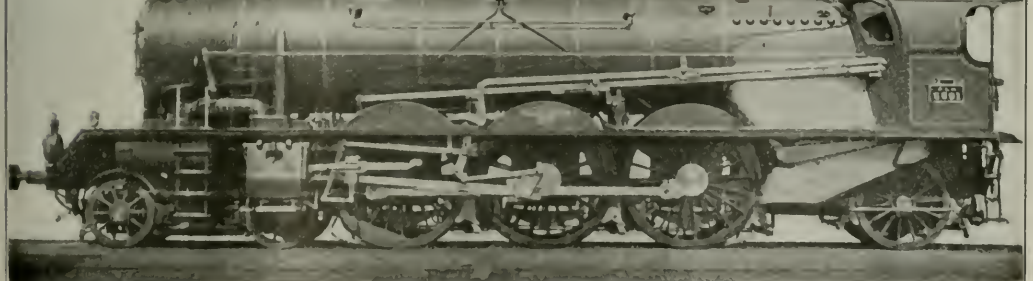
Too much, however, must not be taken for granted, and engineers must not yet be too well satisfied with the results that have been obtained. American locomotives operate in a country where practically there seems to be no limit to the permissible weight allowed on each driving axle, and where the price of fuel has been such that its economy of consumption has not been given its proper consideration.

Turn to Europe, and to France in particular, where the maximum permissible weight on one driving axle *is limited to* 18½ *metric tons* (40,700 lb.) and in very special cases to 20 metric tons, and where the price of fuel is prohibitive in comparison with the price in the United States. It will not be surprising if, from this country, we shall find the locomotive that produces the most power per pound of metal and per pound of fuel consumed.

The Paris, Lyons & Mediterranean has in operation a large number of Pacific type four-cylinder, balanced-compound, superheater locomotives, which handle its heaviest and fastest passenger trains. The locomotive is clearly shown in the illustration and has the following dimensions:

Diameter, h. p. cylinder	17.32 in.
Diameter, l. p. cylinder	25.59 in.
Stroke	25.59 in.
Diameter of drivers	78.74 in.
Working pressure	227 lb. per sq. in.
Loaded weight on driver	122,100 lb.
Loaded weight on one driving axle	40,700 lb.
Loaded weight of locomotive	204,600 lb.
Maximum indicated horsepower on road test	2,405
Weight per indicated horsepower	85 lb.

A sample locomotive of this type was constructed in 1913 and put through the severest kind of tests on the road before duplicates were built. As a matter of fact this locomotive was put in competition against some four-cylinder simple



A French Pacific Type Locomotive Which Developed One Indicated Horsepower for Each 85 lb. of Weight

superheater Pacifics. The locomotive was tested out on the section from Laroche to Dijon, a distance of 98 miles, of which 81 miles are continuously uphill. This is the most difficult section of the P. L. M. Railway in the run between Paris and Marseilles. Road tests were conducted and carried out and complete data obtained with an accuracy to the *nth* degree. On the final trials this locomotive hauled 709 tons of cars on the regular passenger schedule.

Let us consider just what was accomplished. This Pacific type locomotive with a total weight of *only* 204,600 lb. and with *only* 40,700 lb. on each driving axle, produced continuously 2,000 indicated horsepower, and as a maximum over a sustained period of time produced 2,405 indicated horsepower. This represents producing one indicated horsepower for each 85 *lb. weight of locomotive*, a most truly remarkable performance. At the same time this locomotive operated on the average around 14½ lb. of superheated steam per indicated horsepower per hour, and made the low figure of 13½ *lb. of superheated steam per indicated horsepower per hour.*

If this locomotive had been equipped with a feedwater heater, with a booster, with highly superheated steam, its performance would undoubtedly have been still more remarkable.

Although the above figures represent those obtained from a particular set of tests, it is not saying too much to state that the Pacific type locomotives of the other French railways, such as those on the Paris Orleans, on the Midi, or on the French State could, and do, duplicate the same results every day. The figures here quoted may be considered as modern French practice.

In talking about world's records, it is necessary to be very well posted on exactly what results the world has produced.

Endeavors in certain isolated cases, in America, have produced very interesting and very truly creditable results, but until there is produced, over a sustained period of time and on the road one indicated horsepower *per each* 85 *lb. weight of locomotive*, and on a consumption of 13½ *lb. of steam* per indicated horsepower per hour, it is believed that it is more correct to state that the Paris, Lyons & Mediterranean Pacific locomotive, 6201 class, produces the most power per pound of metal and per pound of fuel consumed.

The automobile and the aeroplane have shown what concentration in design can accomplish. The same endeavor is now being made with the steam locomotive, but America has not yet equalled by a good margin, let alone surpassed, what has become an accomplished and every day result on the French railroads. Let us remember that the mere bulk or the size of a locomotive only makes a world's record in brute weight.

Tentative Report Finds Pullman Rates Reasonable

The Interstate Commerce Commission on September 22 made public a tentative report prepared by Robert E. Quirk, chief examiner of the commission, recommending a finding that the sleeping and parlor car rates of the Pullman Company, as increased by approximately 20 per cent on May 1, 1920, are not unreasonable and a dismissal of the complaint filed by the Order of United Commercial Travelers of America, in which other organizations of commercial travelers joined. The report states that the complainants relied to a large extent on the provision of the law requiring carriers to assume the burden of showing that any rate increased since January 1, 1910, is just and reasonable and upon the contention that conditions do not justify the increases, and introduced very little evidence. It says that while statements made by their counsel at the hearings indicated that they were more concerned with the surcharge received by the railroads than with the rates assailed, this point is not in issue in the case up for hearing at the present time.

The report says that the 20 per cent rate advance increased the gross revenues of the Pullman Company by approximately $13,000,000 a year and that the rate reduction sought would, if granted, reduce the revenues by corresponding amount. Any such reduction without reductions in operating expenses more substantial than can now be foreseen would not only unduly impair the defendant's operating income, but would create a deficit. The claim that the rate reduction sought, if made, would stimulate travel in Pullman cars to such an extent as to increase rather than diminish revenues, is dismissed as "too speculative to be accepted as a basis for condemning the rates."

The record does not show, the report says, that the operating department of the Pullman Company has been charged exorbitant prices for the cars constructed by the manufacturing department. The property and facilities set aside for manufacturing are not devoted to public use and may not be considered in this proceeding. Should the manufacturing department incur deficits in its operation, the public could not on that account be expected to pay higher rates for the operation of sleeping or parlor cars. The converse is also true.

No physical valuation of the company's property was on record in the proceeding. The company's estimate of the aggregate value of its property used in common carrier service stated the recorded investment new as $157,878,314 and less depreciation $89,611,407; the reproduction cost new $277,031,929; less depreciation $172,807,185. The reproduction cost new, based on the price levels of the 1910-1914 period, was stated as $194,010,346 and less depreciation, $128,584,858. The report says that whether the defendant's estimate of the value is accurate cannot be determined on the record, but that the record affords no basis for concluding that its estimate of value is excessive.

Of the increase in gross revenue derived from the increased rates, it is stated that approximately four and one-half million dollars accrued to the railroads during the year ended April 30, 1921, as a part of their compensation under their contracts with the Pullman Company. The total amount which accrued to the railroads that year under the contracts was $12,872,650. During the succeeding 12 months the amount which accrued to the railroads was $7,627,375, the decrease being due chiefly to a decrease of more than $15,000,000 in gross revenue and partly to revised contracts with some roads under which the Pullman Company retained a greater share of the gross revenue. The examiner says the existing contracts between defendant and the railroads suggest a question not unlike the one dealt with in the increased express rate case, in which the commission pointed out that for the purpose of obtaining some $12,000,000 needed additional express revenue the increase proposed would yield an additional total revenue of a figure somewhere in the neighborhood of $24,000,000.

In 1920 up to September there was an increase in the number of paying passengers carried in the company's cars in each month as compared with the same month of 1919, but in September the number decreased 5.95 per cent as compared with the preceding month and there was a greater decrease in each succeeding month to May, 1921. The decrease was ascribed in part to the general business depression and in part to the surcharge effective August 26, 1920, which, while collected by the Pullman Company, accrues to the railroads. From November, 1920, to April, 1921, inclusive, there was a deficit in net revenue for each month except that of March, 1921, and for the first whole year under the increased rates ended April 30, 1921, the total net revenue was $4,365,531.

C. E. Spens Appointed Federal Fuel Distributor

Burlington's Traffic Vice-President Takes Over Duties of H. B. Spencer Under 60-Day Furlough

WASHINGTON, D. C.

A CONCENTRATED DRIVE on the part of the railroads for 30 days on the movement of coal and the return of empty coal cars to the mines was suggested by President Harding on September 2 in connection with his appointment of Conrad E. Spens, vice-president in charge of traffic of the Chicago, Burlington & Quincy, as federal fuel distributor, in accordance with the coal priority act passed by Congress, which the President also signed on the same day. Mr. Spens, who was assistant director of traffic of the Railroad Administration and chief of the transportation division of the Food Administration during the war, has been given a 60-day furlough from the Burlington to undertake this work. In a statement to the press following his appointment he indicated that the 30-day drive would be undertaken and he expressed the opinion that with the co-operation of all concerned, particularly the consumers, the result would serve to ameliorate the present apprehension, regarding the country's fuel supply for this winter.

In announcing the appointment it was stated at the White House that the Administration feels that the coal problem is now a problem of transportation rather than production and for this reason especially requires transportation experience in its solution. Henry B. Spencer, who has been acting as voluntary fuel distributor in co-operation with the various departments of the government, had consented to act only until a definite organization could be erected following legislation for the purpose. He requested that he be relieved in order that he might reassume his work as president of the Fruit Growers' Express. The President wrote a letter expressing regret that he was not able longer to continue as federal fuel distributor and to express appreciation for the service performed in tiding over a critical situation. The President said in his letter that the fact that on a small fraction of our normal coal production he had secured its distribution so as to maintain the performance of all of the railways and public utilities is in itself evidence of great service. Mr. Spens took charge of the work at once and announced that F. R. Wadleigh, chief of the coal division of the Department of Commerce, would be his assistant. It is proposed also to make use of the skeleton organization left by Mr. Spencer.

The President also on September 22 signed the bill providing for the creation of a fact-finding coal commission, to consist of seven members to be appointed by the President. It was announced that he would probably not make any appointments for about ten days. In response to the strong demand that representatives of the coal industry and of the miners be appointed on this commission, the President permitted both interests to submit to him a panel of names from which he may, in his discretion, make some selections.

The President's Statement

In a letter to Mr. Spens, the President said:

"I am appointing you to the responsible position of federal fuel distributor under the act just passed by Congress, and I earnestly express the hope that you will direct your first attention to the further extension of the co-operative arrangements with the railways, the coal producing and coal consuming communities and the state authorities which have been initiated by the Secretary of Commerce and Mr. Spencer, the temporary fuel distributor. These arrangements, of voluntary origin, are already having a large effect in mitigating the situation.

"The arrangements set up for the distribution and control of price at last year's levels in the anthracite industry have not been satisfactorily established in co-operation with the state authorities and the coal operators.

"The producing capacity of our bituminous mines is far beyond the public need, but the limiting factor in the supply is solely transportation. The Interstate Commerce Commission has given complete priority on the movement of coal, equal only with agricultural produce and some other necessities. But beyond these provisions I have the feeling that if we could stimulate the enthusiastic and organized personal attention not only of our railway executives, but of the entire operating personnel of the railways, to a concentrated drive for a period of 30 days, on the movement of coal and the handling of 'empties,' we could solve the coal situation not only as to ample supply, but prices would be quickly readjusted.

"The authority of the federal government under the act is limited to coal moving in interstate commerce, and, therefore, can only be effective in control of distribution and prevention of extortion as a supplement to the activities of the state authorities. The governors of the various states already have, at the request of the federal administration, created state coal commissions, and I trust, therefore, you will take up definitely with them plans for co-operating under the new act.

"The federal government is loath to undertake to fix definite prices for coal, because of the objectionable character of such intervention in peace times, because of the difficulty in arriving at fair prices without giving undue favor to some and loss to others, and also because of the incompleteness of an authority which is only supplementary to state action. On the other hand, I wish you to set up such agencies as will vigorously follow up individuals using facilities of Interstate Commerce who are exacting extortion, as defined in the act, in order that we may have relief from such practices, at the earliest moment.

"I trust that the measures initiated to secure co-operation of the responsible coal operators and dealers can be made effective in prevention of such profiteering. Likewise the organization started among the consuming community to co-operate by delayed purchasing of reserves until transportation increases will aid in restoration of normal prices and distribution.

"It would be far more agreeable to our national sense to solve these matters by co-operation rather than by regulation, and I trust you will find that all elements in the community will join with you in this purpose."

Statement by Mr. Spens

Mr. Spens also issued a public statement saying that he was not yet prepared to announce definite plans for execution of the provisions of the recent act of Congress, but inviting the co-operation of the entire public in the solution of the coal situation.

"The coal production capacity of the country is ample to meet all demands. The immediate problem is transportation, and this demand on the railroads for abnormal transportation of coal due to the miners' strike comes at a time when for well-known reasons the physical capacity of the railroads is subnormal, and at a time when the offerings of tonnage of all character are great. We understand, however, that the railroad situation is daily improving, and feel confident that the carriers are exerting and will continue to exert extraordinary efforts so that what otherwise might become a serious situation will be avoided. The result of concerted action during the next 30 days on part of all carriers,—not only the carriers that originate the coal, but also carriers that participate in the haul of loads and empties,—will, we feel sure, serve to ameliorate the present apprehension of the administration as well as of the public.

"The co-operation of the consumer is practically as important as that of the carrier. At the request of the administration, Julius H. Barnes, president of the Chamber of Commerce of the United States, has addressed American industries, commercial and trade organizations urging that purchases of coal under present conditions be confined closely to current needs and that there be no accumulation of stocks of coal moving under contract or otherwise. I would like to add my appeal to that of Mr. Barnes', but will direct my appeal not only to the 'industrial' consumer, but also to the 'domestic' consumer.

"Sufficient coal can be moved for current consumption, but sufficient coal cannot be moved within the immediate future to equalize the deficit that obtains and provide a surplus above immediate needs. The inconvenience of frequent purchases is small compared

with the distress that might be suffered by an unequal distribution due to exaggerated anxiety or lack of neighborly consideration.

"If all consumers of coal,—whether domestic or industrial,—will calmly consider this appeal and will co-operate as suggested, not only will their current needs be taken care of, but the result will be reflected quickly in the price of coal, which, today, in many sections of the country manifestly exceeds a fair profit-basis.

"The administration is not suggesting that the operator in coal shall sell his coal at cost. Nor is it suggested that he shall sell his coal at less than cost. The administration is, however, indicating, and the present act of Congress contemplates that he shall sell his coal on a basis that will not yield an abnormal profit; in other words, that he shall not take an undue advantage of the present unfortunate economic situation.

"Many coal operators are co-operating in a splendid manner. Regretfully I must add that there are some who are not. Is it asking too much that, during these critical times, untoward speculation in an important necessity to comfort,—to life itself,—must cease, and that there be only legitimate merchandising, based on American standards of fair play?"

On September 23 Mr. Spens addressed a telegram to the governors and fuel administrators of the various states pointing out that the federal act provides that it shall be the duty of the federal fuel distributor, among other things, to ascertain in which parts of the United States there shall be a shortage of coal and the extent of such shortage; the fields of production and principal markets to which such production is to be transported and distributed; the prices normally and usually charged for such coal and whether current prices considering the costs of production and distribution are just and reasonable; the nature and location of consumers, and what persons, regions, or community should receive priority in transportation and distribution, and the degree thereof.

He also pointed out that the federal government can exert its influence on distribution and restrain extortion only so far as concerns coal that may be transported from one state to another. It has no jurisdiction as to coal produced and sold within the state of its production or retail or wholesale margins or handling coal within the states. Responsibility as to these features must rest with the state authorities and if profiteering in coal is to be prevented, except as to coal that may be moved across state lines at extortionate prices, the proper remedy in each case must be applied by state authorities.

"Coal production capacity exceeds transportation capacity," he said. "The problem of adequate supplies and diminished prices is therefore primarily a problem of transportation. The federal authorities in co-operation with the carriers, are making every possible effort to expedite movements. Coal today enjoys the same priority in transportation as food and feed. Transportation of coal is ample to meet current necessities, but is not sufficient to permit stocking either by household or commercial consumers and possibly will not be ample for that purpose for another 60 to 90 days. It appears necessary that state organizations or agencies be created in states where they do not now exist that will invite co-operation, that will prevent stocking of coal beyond current necessities and that will establish reasonable margin for retailers and wholesalers.

"As above stated, the constitutional authority of the federal government is limited, but it will gladly co-operate with these state governments as far as it can properly do so. The major responsibility, however, for the price at which the coal is sold to the consumers by the wholesalers or retailers within the state must rest with the state authorities.

"The federal act is, of course, nationwide in its scope and I am, therefore, addressing this communication to the governors of all states and to the State Fuel Administrations, where such agencies now exist, although I understand there is considerable territory in the United States where there is no imminent coal shortage, nor complaint as to the cost of this commodity. We shall depend upon the judgment of the state authorities in each state as to whether or not the aid of the federal government is desired or necessary as to interstate coal. I would appreciate early advices from you as to the situation in your state and the measures taken or contemplated to meet the emergency."

Donald D. Conn, of Minneapolis, has been named as assistant federal fuel distributor. Mr. Conn has been stationed in Washington for some time as chairman of a special committee appointed by the governors of seven northwestern states to represent them in connection with the coal-supply situation.

C. P. White, of St. Paul, Minn., has been designated as assistant to the fuel distributor in handling the fuel situation in the northwest. Mr. White acted in a similar capacity in the later days of the President's fuel committee.

C. J. Hepburn, of Philadelphia, has been retained as general counsel to the federal fuel distributor.

F. R. Wadleigh, chief of the coal division of the Department of Commerce, will act as an assistant to Mr. Spens.

E. M. Durham, of the American Railway Association, went to Philadelphia Monday to represent Fuel Distributor Spens at the sessions of the committee of anthracite operators and Pennsylvania state officials who are considering the problem of the distribution of anthracite.

H. M. Griggs, of the Cleveland Ore and Coal Exchange, who has been handling the movement of lake coal, will continue in this capacity.

It is planned by Fuel Distributor Spens to name special advisory committees, representing the general business and transportation interests of the country.

Federal Fuel Distributor Spens has asked the following named railway executives to serve as an advisory committee on transportation: Daniel Willard, president, Baltimore & Ohio; W. W. Atterbury, vice-president, Pennsylvania; H. L. Byram, president, Chicago, Milwaukee & St. Paul; B. F. Bush, president, Missouri Pacific; Hale Holden, president, Chicago, Burlington & Quincy; C. H. Markham, president, Illinois Central; A. H. Smith, president, New York Central Lines; Carl R. Gray, president, Union Pacific System. Mr. Willard has been invited to act as chairman of the committee, which is expected to consider ways and means for accelerating the expedition of coal traffic.

He also appointed an advisory committee for industry, which will keep in close touch with the distribution of fuel supplies among industrial interests in their respective territories with S. M. Vauclain, president of the Baldwin Locomotive Works, as chairman. Members of the industrial advisory committee will be asked to assist especially in the endeavor to have large industrial consumers confine purchases of coal under present conditions as closely to current needs as safety permits; to suspend accumulation of advance stocks of coal until the present emergency pressure on production is relieved; to unload coal cars immediately and return them to service and to promptly furnish material required for new railroad equipment or repairs.

A committee of the National Coal Association conferred with federal officials in Washington on Wednesday with a view to arranging a plan of co-operation between the bituminous coal producers of the country and the fuel administration.

On Wednesday Mr. Spens issued a set of regulations relative to the designation of 17 bituminous coal producing districts which will be observed as units in the work of the federal fuel distributor and outlining certain data required to be furnished daily by all soft coal producers.

A number of naval officers have been detailed to act as field representatives of the fuel distributor.

Each producer of bituminous coal engaged in the mining and production thereof at any place in any of the designated producing districts is directed to mail daily to the district representative of the federal fuel distributor a written statement or report, signed, setting forth fully and specifically

the following information as to all shipments of bituminous coal made during the previous day

(a) The total number of car loads of each class or grade and size.

(b) Names and addresses of consignees, with car numbers and initials, destinations and amount of each class or grade and size of coal shipped to each consignee

(c) As to each shipment, the prices or prices f. o. b. mine as contracted for, charged and or received for each grade of coal shipped. In the case of coal sold at a delivered price at destination, the destination price less transportation cost shall be used as the mine basis.

(d) A designation of such of said shipments as shall have been made under time (or period) contracts for periods of more than one month's duration.

The Interstate Commerce Commission is considering requiring a modification of the reconsignment practices on shipments in open top cars.

Freight Car Loading

WASHINGTON, D. C.

REVENUE FREIGHT car loading showed another considerable increase during the week ended September 16, but was still below the record figures set in 1920. The total was 945,919, an increase of 103,000 cars as compared with the week before, which included a holiday, and of over 14,000 as compared with the week before the holiday. In the corresponding week of last year the loading was 852,552 and in 1920 it was 991,166. Coal loading amounted to 172,241 cars, an increase of 6,730 over the corresponding week last year and of 22,000 as compared with the week before the Labor Day holiday. Increases as compared with last year were shown in all districts except the Pocahontas and Southern, which showed decreases, and in all classes of commodities except grain and grain products. The largest increase was in miscellaneous freight, which showed a gain of over 40,000 cars. There was also an increase of 24,945 cars in ore, 10,872 in forest products, and 4,831 in livestock. The decrease in the loading of grain and grain products was 3,080 but as compared with 1920 there was an increase of 5,810. Livestock and merchandise, l.c.l., also showed increases as compared with 1920. The summary as compiled by the Car Service Division is given in the accompanying table.

The percentage of open-top cars furnished by the railways to the requirements for such cars continues to show a gradual reduction. During the week ended September 9 the railroads furnished 77 per cent of the requirements as compared with 82 per cent the week before. The number required was 452,355, the number furnished was 346,076, and the number loaded 294,216. For coal loading they furnished 73 per cent of the requirements, for limestone, 83 per cent; ore, 98 per cent; iron and steel, 92 per cent; sand, stone and gravel, 69 per cent; coke, 100 per cent, and miscellaneous, 81 per cent. In the Southern district for that week only 44 per cent of the cars required were furnished, while in the Alleghany district 97 per cent were furnished.

The freight car shortage exceeded the surplus during the period from September 1 to 8 for the first time since 1920, according to the semi-monthly bulletin issued by the Car Service Division of the American Railway Association. For that period the average shortage was 67,899, including 39,032 box cars and 18,555 coal cars, while from other points there were reported surpluses amounting to 43,162, which included 2,187 box cars and 34,685 coal cars. The largest shortage in any district was in the Southern district, 19,333 cars.

More bituminous coal was loaded on Monday, September 25, than on any one day so far this year, or in the year 1921. Monday's loading was only exceeded on six days in the year 1920, during which time there was the heaviest loading ever known in the history of the railroads. The total was 38,804 cars. While loading on that day is always heavy, last Monday exceeded by 1,474 cars the total for Monday, September 18, which had marked the peak up to that time for the period since the miners' strike began on April 1.

For the past two months the Car Service Division of the American Railway Association has been keeping statistics showing the principal freight accumulations, that is, the cars held in greater numbers than can be handled or disposed of currently. By September 8 these accumulations had reached a total of 72,302 for the United States. For the week of September 15 there was a slight reduction to 71,258. Of these, 4,160 were held on account of inability of connections to accept, 1,430 on account of inability of consignees to accept, 57,948 on account of disability of the reporting road, 2,957 for reconsignment, 350 for billing, 1,161 on account of embargoes and 2,847 for export and coastwise shipment. The greatest number of accumulations was in the Southern district, 16,221, while in the Eastern district there were 15,389 and in the Alleghany district 13,941.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, SEPTEMBER 16, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Merchandise L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	8,118	3,201	48,024	1,490	5,550	5,945	65,750	96,269	234,347	.....	.....
	1921	9,288	2,958	44,063	1,321	4,077	1,749	62,060	81,674	.....	207,190	235,794
Alleghany	1922	2,998	3,174	50,488	3,751	3,424	9,129	49,462	75,810	198,236	.....	.....
	1921	3,348	2,947	46,746	2,235	2,401	6,192	46,707	58,830	.....	169,406	209,739
Pocahontas	1922	245	326	17,044	156	1,177	42	5,022	2,954	26,966	.....	.....
	1921	308	390	18,670	154	1,132	224	5,722	4,199	.....	30,799	38,178
Southern	1922	3,550	2,470	19,900	816	17,319	1,147	36,496	37,703	119,401	.....	.....
	1921	3,749	1,921	21,804	319	15,136	308	38,563	38,114	.....	120,512	130,911
Northwestern	1922	18,928	8,789	8,640	1,350	16,049	34,472	29,473	37,116	154,817	.....	.....
	1921	15,742	7,441	9,863	505	11,131	18,376	28,710	34,566	.....	126,334	169,493
Central Western	1922	13,689	13,474	20,316	475	7,405	2,081	32,700	54,478	144,638	.....	.....
	1921	17,789	11,572	19,512	169	6,376	735	32,129	45,567	.....	133,849	139,829
Southwestern	1922	4,562	3,495	7,809	150	6,447	477	15,610	28,964	67,514	.....	.....
	1921	4,946	2,869	4,853	110	6,246	764	15,858	28,796	.....	64,462	67,222
Total Western districts	1922	37,179	25,758	36,785	1,975	29,901	37,030	77,783	120,558	366,969	.....	.....
	1921	38,477	21,882	34,228	804	23,753	19,875	76,697	108,929	.....	324,645	376,544
Total all roads	1922	52,090	34,929	172,241	8,188	57,371	53,293	234,513	333,294	945,919	.....	.....
	1921	55,170	30,098	165,511	4,813	46,499	28,348	229,747	292,346	.....	852,552	.....
	1920	46,280	32,708	196,103	15,827	62,068	84,789	216,995	336,396	.....	.....	991,166
Increase compared	1921	.....	4,831	6,730	3,355	10,872	24,945	4,766	40,948	93,367	.....	.....
Decrease compared	1921	3,080	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1920	5,810	2,221	.....	.....	.....	.....	17,518	.....	.....	.....	.....
Decrease compared	1920	.....	.....	23,862	7,639	4,697	31,496	.....	3,102	45,247	.....	.....
September 16	1922	52,090	34,929	172,241	8,188	57,371	53,293	234,513	333,294	945,919	852,552	991,166
September 9	1922	47,732	29,512	139,570	8,418	51,906	53,833	203,666	298,107	832,744	749,552	883,415
September 2	1922	54,019	31,847	149,487	8,389	58,706	62,354	233,550	333,246	931,598	831,288	961,633
August 26	1922	54,562	32,046	111,030	8,190	60,466	65,041	230,000	329,303	890,838	828,883	1,001,308
August 19	1922	55,893	29,756	81,959	8,201	57,934	67,201	229,925	325,350	856,219	815,147	968,103

Australian Gasoline Rail Motor Car

THE STATE RAILWAYS of Victoria, according to information from Harold W. Clapp, chief commissioner of railways, have placed in service recently a gasoline engine motor-driven rail car with the expectation of materially reducing the cost of operation on branch lines where the traffic is light. At present the car is being run between Merbein, Mildura and Redcliffs, in the irrigated citrus fruit section, and serves a population of 14,000 people, the traffic being in the nature of semi-suburban.

The chassis purchased had an engine developing 45 b.h.p. at 1,000 r.p.m. The frame, which was 14 ft. 9 in. long from the driver's seat to the rear, was cut and spliced out by a 4 ft. addition in the center and an addition of 2 ft 10 in. at the rear and the driving shaft was lengthened between the universal joint and the gear box to suit the extended wheelbase of 18 ft. 2⅜ in.

No change was required in the rear axle to adapt it to use on 5 ft. 3 in. gage railway tracks. A new straight front axle was applied together with 30 in. diameter wheels, having standard steel tires and waste-lubricated journal boxes.

The standard chassis when received had a worm drive, giving a speed of 17 m.p.h. with an engine speed of 1,200 r.p.m. and a gear ratio of 8.25 to 1. In order to provide for speeds of 30 to 35 m.p.h. the gear ratio was changed to 4½ to 1 by introducing a new worm and wheel.

No special alteration was made to the brakes, which are all on the rear axle, but the following items were added: pilot, horn and exhaust whistle, speedometer, electric lighting generator and battery, and a spring on the throttle control to shut off the gasoline in the event of the driver, for any reason, letting go.

The car body, which is 22 ft. 7 in. long, 9 ft. wide overall and 6 ft. 7 in. high inside, is provided with seats for 45 passengers. Two 4 in. by 4 in. stringers are carried directly on the chassis frame channels, and into these are checked transverse bearers at 1 ft. 1⅞ in. centers. The body is of lightest construction and is suitable for use in hot climates. The sides are open above the level of the seat backs and instead of windows, canvas roll curtains are provided in case of bad weather. The seats are of maple battens carried on angle iron frames. There are four electric lights in the body and one in the driver's compartment. Electric headlights are also included in the equipment.

No provision was made on the car for the carriage of heavy baggage or freight. For this purpose and for the accommodation of extra passengers, a trailer has been built. This consists of a body, 16 ft. 2½ in. long over-all, of similar construction to the motor body and divided into two compartments, one of which seats 12 passengers, while the other is simply a parcels compartment. When the trailer is employed, it is in charge of a guard, who is then responsible for the sale and collection of tickets, which is attended to by the driver when a trailer is not in use. The guard is competent to relieve the driver in case of emergency. The trailer is electrically lighted by means of a jumper coupling and bell circuits are installed for exchange of signals between driver and guard.

As the car may be required to pick up and set down passengers at level crossings, hinged steps are provided on each side, operated by a lever in the driver's compartment. This mechanism is interlocked so that the clutch can be thrown in only when the steps are clear of the structure gage. In order to prevent passengers from attempting to alight before the steps are in position, the doors are placed under the control of the driver.

Motor Car for Victoria State Railways—Trailer Attached When Required

The light weight of the motor is 13,900 lb. and the trailer, 8,960 lb., a total of 22,860 lb. The total weight with all 55 seats occupied and allowing 5,150 lb. for baggage, is 30,500 lb. When handling a heavy traffic there is space for 15 standing passengers in the motor car and 6 in the trailer, making a total of 76 passengers, bringing the loaded weight of the two units to 39,380 lb. The speed on the level with a load of 4,480 lb. is 35 m.p.h. and on a two per cent grade, 14 m.p.h.

A MOTION PICTURE to illustrate the manufacture of wrought iron pipe has been prepared by the A. M. Byers Company, of Pittsburgh, Pa., and will be lent to colleges, societies and institutions interested without cost. This film fills three reels and shows the processes from the smelting of the ore to the final inspection of the finished pipe. The Byers Company also furnishes lantern slides of this same process.

General News Department

The Interstate Commerce Commission has announced a resumption of hearings on the subject of railroad consolidations affecting the Southeastern district, before Examiner Healy at Mobile, Ala., on October 16, Jacksonville, Fla., October 18, Atlanta, Ga., October 19 and 20, and Columbia, S. C., on October 21.

The "Rochester-Minnesota Special" of the Chicago & North Western, operating daily between Chicago and Rochester, Minn., has been newly equipped from locomotive to observation car. The new equipment consists of seven steel cars, painted yellow and stamped with the "North Western" trade-mark, including a mail car, a baggage car, two coaches, two Pullmans and an observation buffet lounge car.

W. H. Cundey, assistant general passenger agent of the Denver & Rio Grande Western, was elected president of the American Association of Traveling Passenger Agents at its recent convention held at Calgary, Alta. F. D. Rush, division passenger agent of the Louisville & Nashville, at Cincinnati, Ohio, was elected vice-president and P. C. Benedict, division passenger agent of the Baltimore & Ohio, at Chicago, was re-elected secretary-treasurer. The annual convention will be held next year at St. Petersburg, Fla.

The deficiency appropriation bill, passed by the Senate on September 21, provides an additional appropriation of $100,000 for the car service work of the Interstate Commerce Commission and $66,000 for 15 additional safety appliance inspectors but an amendment proposed by Senator Cummins providing $170,100 for the employment of 35 additional locomotive inspectors for nine months was not accepted by the House conferees and their report without this provision was adopted by both houses on September 22.

Railway Business Association Annual Meeting and Dinner on November 9

The annual meeting and dinner of the Railway Business Association will be held at the Hotel Commodore, New York, on November 9. The subject for discussion will be "Railways as a Factor in General Prosperity and Wise Limits Upon Government Regulation." The list of speakers will be announced later.

Handbook of United States Safety Appliances

In response to demand from the members, another edition of the small Safety Appliance Handbook, covering all classes of cars and locomotives, for use of inspectors and others, similar to that issued in 1915 by the Master Car Builders' Association, revised to date, has been issued by the Mechanical Division of the American Railway Association. These books will be supplied on requisition to members or others by the secretary.

Twenty Passengers Killed at Gonzales, Mexico

By a train wreck, due to a flood, on the National Railways of Mexico, four kilometers south of Gonzales Junction, on September 19, twenty passengers were killed or drowned, as were also all members of the crew except the flagman. About 40 passengers were injured.

The wreck occurred at about 11 p. m. and the train was through passenger No. 2 from Laredo to Mexico City. The track had been washed out by a sudden flood caused by the bursting of a dam some distance up stream, from the railroad. But little rain had fallen in the vicinity of the track.

One account says that two trains were wrecked, a second one colliding with the one first derailed.

Proposed New Highway Crossing Rules in Illinois

Last week the Illinois Commerce Commission and a number of safety representatives of interested railroads met in Springfield, Ill., to discuss nine new grade crossing rulings recently drawn up by that commission. The commission invited suggestions for modifications before the rules are put into effect, and Chairman Smith stated that others interested who did not attend the meeting would have an opportunity of making suggestions in writing. The commission has designated crossings as hazardous and nonhazardous and has formulated rules for the erection of suitable signals. M. A. Dow, of the New York Central lines, advocated placing warning signs at least 200 ft. from every crossing. Of the 207 crossing accidents on his lines last year, 146 occurred at open [unattended] crossings, where the view was unobstructed; and 156 of them were in broad daylight. The commission proposes rules for removing obstructions, leveling approaches and the elimination of growing crops on the right of way which may obstruct the view of crossing. In general the new rules were approved by the railroad representatives.

Suspension of Hydrostatic Tests of Tanks of Tank Cars and Safety Valve Tests

The Mechanical Division of the American Railway Association has announced that upon recommendation from the Committee on Tank Cars, that part of Sections 23 and 24 of the Standard Specifications for Tank Cars, Classes I, II, III and IV, covering the requirements of testing of tanks hydraulically and testing of safety valves, has been suspended as to tanks for which such tests shall become due prior to January 1, 1923, except when such cars are shopped for repairs.

The requirements of Section 23 of each of the specifications named, that new tanks shall be tested before being put into service, and that tanks damaged to the extent of requiring patching or renewal of one or more sheets, or extensive re-riveting or re-calking of seams, shall be re-tested before being returned to service, are not suspended.

The requirements of Section 24 of each of the specifications named, that safety valves on new cars shall be tested and adjusted before cars are placed in service, are not suspended.

Fire Prevention Week

Fire Prevention Week for the railroads of the country has been fixed to begin on October 2, and the Railroad Insurance Association, 80 Maiden Lane, New York City, has issued a bulletin emphasizing some of the nuggets of wisdom which have been evolved in its discussions. We quote:

An Ounce of Prevention Is Worth a Pound of Cure. Do you realize what this means as applied to your own particular work? It means a little thought. A little carefulness each day will prevent destruction by fire of property requiring much labor and great cost to replace. Practicing good housekeeping where your own daily work is done will prevent a fire loss that might take away your present job.

What to Do in Fire Prevention Week.—1. Check up on all property which you are in charge of or which you come in contact with daily to see what fire hazards or dangers may be safeguarded better than at present. 2. Study the fire protection equipment that comes under your daily observation. Is it in order? Is it sufficient? Can you or anyone else use it? 3. Report to the authorities higher up defects, dangers and hazards which you cannot remedy yourself. * * * 4. clean up—Clean Up—CLEAN UP—*Clean Up.* * * *

W. F. Hickey, superintendent of insurance of the New York, New Haven & Hartford, in a circular, calls attention to the fact that "every day is fire prevention day on railroads." He sets forth in particular the special duties of all concerned in connec-

tion with water barrels, heating appliances, electric installations, water lines and hose, and chemical extinguishers. Where liable to freeze (except Pyrenes), chemical extinguishers should be removed to heated buildings and all extinguishers must have been recharged within a year. Clean out record rooms, lockers, attics, basements, under platforms, house tracks, behind radiators and cabinets, locomotive cabs, around wooden bridges and piles of cross ties.

Great Western to Increase Number of Motor Car Trains

The Chicago Great Western considers its recent experiment in gasoline motor driven cars for passenger service on branch lines such a success that it is planning to purchase several additional motor trains mainly for service in the more thickly settled sections of Iowa. The trains consist of a specially constructed motor car, equipped with a high-power gasoline engine and a trailer which resembles an ordinary interurban electric coach, although more heavily built. The motor car has room for freight and baggage just back of the compartment occupied by the engineer.

"My theory is," S. M. Felton, president, is quoted as saying, "that with the low overhead on the gasoline-driven train, we can afford to stop at every crossing, farmhouse or small station, if necessary. In this way we expect to give the kind of service which will be appreciated by the Iowa farmers and build up a good interurban traffic. The interurban trolley systems can do this and make it pay and so should the railroads. We have the tracks, the stations, and all the other equipment of a right-of-way. All that is necessary is to add the trains."

The four trains now in use in Iowa, Mr. Felton added, are running from 100 to 150 miles a day without difficulty. The Russell Company, Kenosha, Wis., supplied the equipment recently placed into service by this company between Des Moines, Ia., and Marshalltown.

The Boardwalk Flyer

The Philadelphia & Reading took the first prize in the parade of decorated rolling chairs and floats in the Atlantic City Pageant of September 7, the main feature of its display being a mode of the "Boardwalk Flyer." This model, a locomotive and two cars, was preceded by the Reading shops' band and the Reading shops' double quartette. The Reading float was in the eighth division of the parade. It won not only the first prize in the entire parade, a handsome gold cup, but also the first prize in the division, a beautiful silver cup.

The model of the "Boardwalk Flyer" was built by Jack Daly, foreman of boiler makers at Reading. The wheels of the train were made to revolve by steam generated in the engine, which gave to the model a realistic appearance of a train in motion. The model is about 30 ft. long and 3 ft. high.

The Boardwalk Flyer, leaving Camden at 4 10 p. m., runs to Atlantic City, 55½ miles, in 55 minutes.

On Thursday evening, September 7, the Reading shops' band in a contest with the Philadelphia band and the Altoona shops' band of the Pennsylvania Railroad on the steel pier, won first prize, a silver cup.

Bridge and Building Convention

The American Railway Bridge & Building Association will hold its thirty-second annual convention at the Hotel Gibson, Cincinnati, on October 17-19. The program for this meeting is as follows:

TUESDAY

Convention called to order 10 a. m.
Reports of officers and appointment of special committees.
Report of Committee on Pile Driving Records.
Report of Committee on Labor Saving Devices in Routine Bridge and Building Work.
Report of Committee on Building Inspection and Records
Report of Committee on Relative Merits of Wooden, Steel and Concrete Tanks.

WEDNESDAY

Address by H. A. Worcester, vice-president, Cleveland, Cincinnati, Chicago & St. Louis.
Report of Committee on the Painting of Structural Steel.
Report of Committee on the Framing of Bridge Timbers Before Treatment.
Paper on the Reconstruction of the Cincinnati Bridge of the Cincinnati Southern by F. W. Henrici, assistant engineer of construction, American Bridge Company.
Report of Committee on the Handling and Driving of Concrete Piles.
Inspection of new bridge of the Cincinnati Southern over the Ohio river.

THURSDAY

Report of Committee on the Construction and Maintenance of Sewers and Drains.
Closing business, including election of officers and selection of meeting place.

On Tuesday evening C. E. Paul, chief engineer of the Miami Conservancy District, will present an illustrated paper on the flood protection work in the vicinity of Dayton, Ohio. The annual dinner of the Bridge and Building Association and the Bridge and Building Supply Men's Association will be held on Wednesday evening. Thursday afternoon will be spent in an inspection of the Cincinnati terminals. On Friday a trip will be made to Dayton where the flood protection work of the Miami Conservancy District will be inspected.

Coal Analyses by Bureau of Mines

The results of analyses of hundreds of coals from 25 states and the territory of Alaska are given in Bulletin 193, "Analyses of mine and car samples of coal collected in the fiscal years 1916 to 1919," by Arno C. Fieldner, Walter A. Selvig, and J. W. Paul, just issued by the United States Bureau of Mines. Information as to the heating values of all coals tested is also given in the bulletin, which should be of interest to all extensive users of coal fuel.

Many mine samples of coal are analyzed each year in the laboratories of the Bureau of Mines. Descriptions of the coal samples collected between the beginning of this work, July 1, 1904, were compiled and published in Bureau of Mines Bulletins 22, 85 and 123.

In order that the material in this bulletin may be used to supplement that presented in earlier bulletins, the same plan of geological classification has been followed, the analyses and descriptions of the samples being grouped in alphabetical order according to the states, county and town near which the mines or prospects sampled are situated.

Model of "The Boardwalk Flyer," Exhibited at Atlantic City, N. J., on September 7

Information regarding coal samples and analytical methods employed by the Bureau of Mines and a bibliography on the coal resources of the world are contained in the bulletin.

The entire distribution of Bulletin 123 will be through the superintendent of documents, Government Printing Office, Washington, D. C., from whom the report may be obtained at a price of 35 cents. Bulletins 22, 85 and 123 are sold by the superintendent of documents at prices of 85, 45 and 50 cents respectively.

California Saved Ten Million by Reduced Freight Rates

According to the Railroad Commission of California, the people of that state have been saved $10,450,000 by railroad rate reductions effected during the past fiscal year. The commission states that on behalf of California shippers it supported the reduction in hay and grain rates before the Interstate Commerce Commission, resulting in a cut of 10 per cent and, in addition, obtained a like reduction on products of the field, orchard and range. As this reduction applied to citrus and dried fruit, it was even more beneficial to California than that affecting the hay and grain movement. When the Interstate Commerce Commission ordered a general reduction amounting to approximately 10 per cent in interstate freight rates in the Western division, effective July 1, the California commission notified the carriers that a like reduction would be expected on shipments entirely within the state, and the roads responded favorably. This saving alone to California shippers on interstate and state freight movement is said to amount to about $10,000,000 a year. Only recently the commission made a reduction in freight rates between Los Angeles and Imperial County points which will result in a saving of more than $200,000 a year. This decision, the commissioners expect, will not only save money to shippers, but more important, will contribute materially to the development of the Imperial valley. The California Railroad Commission also claims to have saved express shippers several million dollars by resisting a proposed increase in rates and to have been the direct means of bringing about a national investigation of express charges, which is expected to result in reductions throughout the country.

Signalmen Ask for Higher Wages

Requests for increases in pay affecting members of the Brotherhood of Railroad Signalmen of America on 42 railroads and their subsidiaries were brought before the Railroad Labor Board on September 25 by D. W. Helt, president of that organization. Mr Helt asked practically for the scale of wages in effect under the Board's Decision No. 2 and for certain rules and working conditions which would result in virtually restoring the old signalmen's national agreement.

In opening his case, Mr. Helt said the signalmen based their action on four premises: (1) The general upward trend of the living wage; (2) that the Board in computing reductions in 1921 and 1922 had not used facts of "sound validity"; (3) that the first reduction was made in error, and (4) that government figures place the living cost of the average family at $2,400 a year.

Mr. Helt also asked for the restoration of punitive overtime after the eighth consecutive hour of work instead of after the ninth hour as is the case under the present rules, and for Sunday and holiday work.

The carriers' side in the controversy was presented by J. W. Higgins, Dr. C. P. Neill, and J. G. Welber, representing respectively the western, southeastern and eastern carriers. The general trend of their testimony was to the effect that the downward trends in industrial wage levels and living costs since Decision No. 2 was placed in effect prohibit the restoration of the rates of pay provided for in that decision and that the present rates of pay of these employees are "just and reasonable" in light of the decreases which have taken place in the cost of living during the past year. Regarding the request of the employees for punitive overtime after the eighth hour the carriers' representative pointed out that the Board had already recognized the peculiar conditions connected with the work of signal and maintenance of way employees and that the application of the provision asked for by Mr. Helt would result in penalizing the railroads for conditions over which they were in a position to exert no control.

Traffic News

The Union Pacific has closed its district freight and passenger agent's office at Santa Barbara, Cal., and this territory will be covered by the general agents at Los Angeles.

Black Hills, South Dakota, is the title of a booklet recently issued by the association of Black Hills Commercial Clubs in collaboration with the immigration department of South Dakota. The book gives historical data concerning the settlement of that country and many descriptions of cities and towns.

The Ocean Traffic Bureau of the Port of Philadelphia has appointed W. H. Reed as manager. Mr. Reed was in the railroad service for years, having begun with the Illinois Central in 1899 and subsequently serving on the Mobile & Ohio and the Missouri Pacific. He was engaged in the foreign freight section of the traffic department most of the time.

The Chicago, Burlington & Quincy, now offers homeseekers' excursion rates from stations on its lines in Illinois, Iowa, Missouri, Wisconsin and Minnesota; Atchison and Leavenworth, Kan., and Omaha, Neb., to many destinations in Minnesota, Montana and North and South Dakota. Tickets are on sale every Tuesday up to and including October 31. Generally speaking the round trip fares will equal the one-way rate plus $2 and tickets will be good for 21 days with some stopover privileges.

There is much concern on the Pacific coast over the present shortage of refrigerator cars to handle the ripening crops. The Pacific Fruit Express which is owned jointly by the Southern Pacific and the Union Pacific has at present less than 1,000 of its total 20,000 refrigerator cars in service located at points west of Ogden, Utah, Portland, Ore., and El Paso, Tex. Urgent calls have been made upon the Eastern roads for the return of the refrigerators, and also upon the car service division of the American Railway Association, supplemented by representations to the director of service of the Interstate Commerce Commission. These appeals have been reinforced by representations to the Interstate Commerce Commission by the California state director of agriculture. In addition to efforts of the roads, everything that state and federal authorities can do is being done to bring about the restoration of normal fruit car service.

Mr. Alfred Pleads for Auto Industry

F. H. Alfred, president of the Pere Marquette, has appealed to the Interstate Commerce Commission "to come and save the automobile industry and its workers." The message was in the form of a suggestion for general effort on the part of all carriers "to utilize to the fullest extent standard box cars for the handling of priorities, so that any surplus will be in the shape of automobile box cars that can be used by that industry." There are at this time, says Mr. Alfred, practically no cars for loading automobiles at plants in Michigan, and unless cars can be provided it will be necessary for these plants to curtail production. He further suggested that the railroads be instructed so far as possible to use automobile cars for shipments destined for Michigan, so that these cars will be available for automobiles.

Central Control of automotive traffic has now become imperative, in the view of J. M. Glenn, secretary of the Illinois Manufacturers' Association. So much business has been diverted from the railroads to the automobile, and transportation by gasoline has become such an important factor, coupled with the inability of the public highway to meet the demands, that it is imperative that the Interstate Commerce Commission and the various state utility commissions assume control of motor truck and auto passenger traffic, says Mr. Glenn. The railroads are trying to meet the competition by introducing gasoline cars, but experts doubt if they will be successful. The state furnishes the automobile carrier a road maintained at public expense, and yet it is plainly inadequate.

Commission and Court News

Interstate Commerce Commission

The commission has changed from September 15 to October 2 the effective date of its order increasing the divisions received by the Kansas City, Mexico & Orient out of through rates with its connections.

State Commissions

The Interstate Commerce Commission, at the request of the Railroad Commission of California, has sent a representative to that state to investigate conditions relative to the shortage of refrigerator cars needed immediately to move a very heavy grape crop. The state commission claims that the grape growers are threatened with financial ruin owing to inability to obtain refrigerator cars.

California Commission Checks Construction of New Crossings

In passing upon a recent application of the Southern Pacific for permission to construct a spur track, the Railroad Commission of California warned industries against the expenditure of large sums of money on plants in anticipation of the granting of spur track permits. In the present case the road was authorized to construct a track at grade across Santa Fe avenue and the tracks of the Los Angeles Railway Company in the city of Vernon, to serve the California Dressed Beef Company, which had expended $250,000 on its plant and $12,000 on the proposed track before the commission had passed on the application.

"We draw particular attention to this circumstance," the commission said, "for in many applications filed with us our reports of inspection on the ground reveal that a large amount of money is expended on buildings which are located to fit in with a particular location of the track in which a grade crossing of a public highway is involved, and this expenditure is used as an argument toward granting the application. It would be better for the carriers to see that proposed industries fully understand the situation and refuse to do any construction work until the proper application has been filed and granted and we wish to announce that expenditures so made will not be considered in connection with applications to construct crossings at grade."

Personnel of Commissions

Ray W. Clarke, attorney-examiner of the Interstate Commerce Commission, in charge of matters relating to certificates of public convenience and necessity and acquisition of control of one railroad by another, has resigned effective on October 31 and will engage in the practice of law in Washington.

Court News

Shipper Limited to Grounds of Negligence Alleged

A shipper suing for damages to goods and setting forth specific grounds of negligence, as unreasonable delay and failure to ventilate car cannot recover on another ground of negligence, such as negligence as to icing the car, which is not specified.—New England Fruit & Produce Co. v. Hines (Conn.) 116 Atl. 243.

No Liability from Clogging of Culvert Without Negligence

The Alabama Supreme Court holds that if a railroad culvert was sufficient to take care of a stream, and became obstructed without the railroad's knowledge or fault, the railroad was not liable to a landowner for damage by overflow, unless it was negligent in not knowing of or in failing to remove the obstruction.—Alabama Great Southern v. Killian (Ala.) 90 So. 906.

Foreign Railway News

Russian Railways in Deplorable Condition

LONDON.

The Russian commissar for education, Dzerjinsky, at a recent conference of the communist party, submitted a report stating that 90 per cent of the railway lines were now dangerous for traffic. He further stated that during the last four years practically no repairs to the lines have been done at all. In pre-war years 40,000,000 ties had been renewed annually. In 1920, the commissar for communications had drafted a scheme for the annual replacement of 18,000,000, a quantity which he stated would be adequate. In fact, however, he was only able to renew 6,500,000 ties. Though orders have been given to reduce the speed of trains and the load limit, unless 44,000,000 ties are renewed during the present year, the Russian railway system will, stated the commissar, become practically useless. The only lines on which no immediate repairs were needed were the Nicolaievsky line, the Alexandrovsky line and the Moscow-Winday-Rybinsk line.

Dzerjinsky, replying to a statement in the Soviet press alleging the concealment of profits, declared that the commissariat had a big deficit and owed an enormous debt to its underpaid staff, and was faced with the danger that the workers would give up in disgust.

China Notes

PEKING.

The Peking-Suiyuan Railway management announces that work upon the Paotou extension has proceeded to such an extent that passengers can now be carried on construction trains three stations beyond Suiyuan.

The Shanghai-Nanking Railway is installing a "train control" system, which is a combination of the "staff" and the "dispatcher" system. Movements of trains will be authorized by delivery of the staff as heretofore, but the arrival and departure of trains at stations will be telephoned to the "train controller" as under the dispatcher system, and records will be kept of train movements similarly. The train controller will also issue orders for the delivery of the staff to trains which are to be given preference, much as train orders are given under the dispatcher system. This is an innovation in China and is an attempt to postpone double-tracking of a portion of the Shanghai-Nanking line. This line has experienced an increase in passenger kilometres of nearly 60 per cent since 1915 and an increase in ton kilometres of nearly 80 per cent during the same period. The busiest section of the line carries about forty trains a day as an average.

Reports have it that the British & Chinese Corporation is offering to advance to the Chinese government sums sufficient to pay supply bills, wage arrears, and forthcoming interest charges of the Canton-Hankow Railway on the condition that the government will yield to the corporation the right to appoint the traffic manager and three traffic inspectors of the line. The finances of this line are further jeopardized by the uncertain future of the Hanyang Iron & Steel Works. Because of business depression and the curtailment in naval expenditures, Japanese firms which have had long term contracts with the Hanyang works are cancelling orders and refusing shipment. Very recently one order for some 6,000,000 taels of billets was refused and this firm has been so short of funds as to be constantly in arrears to the railway on its freight charges for coal. As this coal traffic constitutes the bulk of the freight traffic on the railway, the prosperity of the iron works, for the time being at least, is of profound importance to the railway. Incidentally, many "old China Hands" see a close connection between the fading of Japanese demand for the output of the Hanyang Works and the withdrawal of the Japanese troops from Hankow which lies just across the river.

As predicted in these notes some time ago, the defeat of Chang Tso-lin in the neighborhood of Peking did not mean a final conclusion of hostilities. A battle of several days' duration took place early in the month in the region of the Great Wall at Shanhaikuan. But some influence has deterred Wu Pei-fu from fighting it out to a conclusion as he seemed inclined to do at first. A truce has

been arranged whereby troops of both sides will be withdrawn, and it appears likely that the mandate depriving Chang of his command and his honors will be modified so as to leave him in control of Manchuria. It is stated, however, that he will soon return the rolling stock of the Peking-Mukden Railway, nearly all of which he took with him into Manchuria. The line in the meantime has been operating a very limited train service largely with engines borrowed from the Peking-Hankow line.

It is announced that Wu Pei-fu will cease to collect the revenue of the Peking-Hankow at an early date, thus permitting the Peking-Hankow to begin rehabilitating itself financially. Foreign supply firms have been in despair for several months on bills owed by that line.

The ad interim administration of the ministry of communications which succeeded the flight of Yeh Kung Cho has now been succeeded by definite appointees selected by Wu Pei-fu. For the first time in history, the minister, the vice minister and the director of the railway department are all able to speak English. The minister, Kao Fu-hung, is a man of more than usual directness. When coming to Peking to assume office he refused to have a private car put on to the already heavy train, and finding all the seats occupied stood all the way from Tientsin to Peking. He immediately put into effect further retrenchment orders, and fixed the summer office hours at from seven to one. A few bureau chiefs who came late a day or two later, were summarily discharged. A clean-up order went out. Windows were washed, walls were whitewashed, desks were cleared of accumulated trash, and the appearances of the ministry of communications are very much improved. S. W. Lao, who is acting vice-minister, pending the return of Dr. C. C. Wang from the Chinese Eastern, was formerly assistant director of the Tientsin-Pukow line. S. T. Chao, the director of the railway department, for several years was maintenance engineer of the same line, and more lately has been in charge of the construction of the Chefoo-Weihsien railway line.

The finances of the ministry of communications as well as of the government generally are in such a condition that Kao Fu-hung, as well as the minister of finance, have been giving considerable consideration to the subject of a foreign reorganization loan. In view of the anti-foreign feeling in the country, their enemies have sought to discredit them in this connection. An appeal to Wu Pei-fu brought forth a telegram in which Wu stated that he was not in favor of a foreign loan "until the country was re-united." Wu evidently possesses more of the finesse of a politician than has been credited to him, for this reply has satisfied the "inter-meral" Chinese, and has in no way interfered with or changed the plans of his ministers of finance and communications. Their loan plans have been formulated, insofar as they may have taken shape, only on the assumption of a general re-association of the provinces and an attempt to disband a portion of the present armed forces.

One of the first steps toward meeting the obligations toward foreign creditors has just been taken by the Peking-Suiyuan towards the General American Car Company. The latter has sold some 600 freight cars to the railway which have not been erected because first payments could not be made. By the agreement which has been approved recently by the ministry of communication, the car company will nominate and the railway will appoint a car accountant who will keep a record of the earnings of each of these 600 cars, 50 per cent of which revenue shall be paid by the railway weekly to a depository named by the car company. Penalties by way of increased interest rates are named in case the railway is in default of a specified minimum per month. This is the first approach toward the equipment trust method of financing purchases of rolling stock in China.

The American advisory committee has recently made a grant of $200,000 gold toward the building of a highway in Hunan from Siangtan to Paoking. The road is to be built by famine refugees, and upkeep for ten years has been guaranteed by the deposit of $50,000 gold in a special account to be administered by an engineering committee on which foreigners have an equal representation. This road will traverse one of the Siems Carey routes, and will connect one of the most active iron regions with the Canton-Hankow Railway. In North China, highway projects aggregating nearly 1,000 miles are under various stages of progress—mostly under the direction of forces seeking to rehabilitate famine or flood sufferers. A very considerable popular interest in this particular form of communication has been aroused.

Equipment and Supplies

Locomotives

The Montour Railroad is inquiring for 4 locomotives.

The Green Bay & Western is inquiring for two locomotives.

The Chesapeake & Ohio is inquiring for 2 Mountain type and 6 Pacific type locomotives.

The Chicago & North Western may purchase locomotives in addition to the 50 recently ordered.

The Korean Central has ordered two 2-6-2 type locomotives from the Baldwin Locomotive Works.

The Pacific State Lumber Company has ordered for the Coos Bay Lumber Company, Oregon, one Mikado type locomotive from the Baldwin Locomotive Works.

Freight Cars

The Detroit, Toledo & Ironton is inquiring for 500 coal cars.

The City of Grand Rapids, Mich., is inquiring for 3 flat bottom gondola cars.

Chicago & North Western is inquiring for 800 gondola cars and 200 flat cars.

The Grand Trunk is inquiring for 2,000 automobile cars, 4,000 box cars and 700 refrigerators.

The New York, Ontario & Western is inquiring for 100 steel underframes for 40-ton freight cars.

The New York Central is having general repairs made to 200 stock cars at the shops of the Streator Car Company.

The Seaboard Air Line has ordered repairs to 500 composite gondola cars at the shops of the Virginia Bridge & Iron Works.

The Grey Steel Products Company, New York, has ordered 2 steel hopper cars of 55 tons capacity from the Pressed Steel Car Company.

The West Penn Power Company, Pittsburgh, Pa., has ordered 60 hopper cars of 55 tons capacity from the American Car & Foundry Company.

The General Petroleum Corpotation, Los Angeles Cal., has ordered three insulated tank cars of 10,000 gal. capacity from the Pennsylvania Tank Car Company.

The Grand Trunk, reported in the *Railway Age* of September 23 as inquiring for 250 refrigerator cars, has ordered this equipment from the American Car & Foundry Company.

The New Orleans Great Northern is reported to have ordered 200 flat cars from the Southern Car Company and repairs to 197 gondola cars from the same company.

The Maine Central is inquiring for 350 single sheathed box cars, 150 rack cars and 10 produce cars, all to be of 40 tons' capacity. The company is also inquiring for 50 general service cars of 30 tons' capacity.

The Chicago & Alton has placed orders for repairing 200 steel gondola cars with the Illinois Car Company and 200 steel gondolas with the Mount Vernon Car Manufacturing Company.

The Union Pacific, reported in the *Railway Age* of September 16 as inquiring for 50 caboose cars, has ordered this equipment from the Mount Vernon Car Manufacturing Company.

Passenger Cars

THE MAINE CENTRAL is inquiring for 7 steel combination baggage and mail cars.

THE CENTRAL SUPPLY COMPANY, Philadelphia, Pa., has ordered one private car from the Bethlehem Shipbuilding Corporation, Ltd., Harlan Plant.

THE RICHMOND, FREDERICKSBURG & POTOMAC, reported in the *Railway Age* of September 2 as asking for prices on six cars for passenger service, has ordered four steel passenger coaches and six steel express cars from the Bethlehem Shipbuilding Corporation, Ltd., Harlan Plant.

Iron and Steel

THE VIRGINIAN is inquiring for 300 tons of steel for bridges.

THE MISSOURI, KANSAS & TEXAS is inquiring for 10,000 tons of 90-lb. steel rails.

THE CHICAGO & ALTON is inquiring for approximately 10,000 tons of steel rail.

THE NEW YORK CENTRAL is in the market for 600 tons of steel for bridges at various places.

THE TEXAS & PACIFIC has ordered 15,000 tons of rail from the Tennessee Coal, Iron & Railroad Company.

THE PENNSYLVANIA RAILROAD is in the market for 3,000 tons of fabricated steel for new shops at Juniata.

THE ATLANTIC COAST LINE has ordered 30,000 tons of rail from the Tennessee Coal, Iron & Railroad Company.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS has ordered 13,000 tons of rail from the Tennessee Coal, Iron & Railroad Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered from the American Bridge Company 246 tons of structural steel for a powerhouse at San Bernardino, Cal.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS will receive bids until October 5, for bolts, screws, nuts, iron bars, steel billets, firebox and boiler plates, tank and car plates, steel sheets, nails, fence wire, cable wire, axles, boiler tubes and safe ends.

Machinery and Tools

THE GRAND TRUNK is inquiring for a lathe, radial drill, crank planing machine and valve grinding machine.

THE DELAWARE & HUDSON has ordered a 500-ton double end wheel press from the Niles-Bement-Pond Company.

THE LONG ISLAND will install a number of new machine tools in its Morris Park shop. See item under Railway Construction.

THE NEW YORK CENTRAL has ordered one 23-in. lathe from the Niles-Bement-Pond Company. This company is also inquiring for one 27-in. by 18-ft. lathe.

THE PENNSYLVANIA is inquiring for one combination journal truing and axle lathe to accommodate wheels up to 36 in. in diameter and to be motor driven, 3-phase, 60-cycle, 220-volt current. Necessary electrical equipment also to be included.

THE BALDWIN LOCOMOTIVE WORKS, Philadelphia, Pa., is inquiring for machine tools including 2 rod milling machines, 2 plain milling machines, 2 vertical milling machines, 1 frame drilling machine, 2 frame slotters, 4 frame planers, 14 standard planers, 2 turret lathes and 3, 60-in. horizontal boring and drilling machines.

LIMA LOCOMOTIVE WORKS, Lima, Ohio, has ordered 12, 6-ft. Right line radial drills, 6 Pond planers (5 of 60-in., one of 90-in.); and a 50-ft. triple-head Bement locomotive frame slotting machine. The company divided an order for additional tools among three other builders, including three planers, a vertical rod milling machine, axle turret lathe vertical rod boring machine, four 20-in engine lathes, two tool makers' lathes, a 60 in. wheel press, two 18-in. slotting machines, a horizontal boring and milling machine, cylinder boring machine and two turret lathes.

Supply Trade News

J. W. Floto has been appointed sales manager of the **Globe Steel Tubes Company** with headquarters at Chicago.

The Brown Instrument Company, Philadelphia, Pa., has opened a New England branch at 185 Devonshire street, Boston, Mass., with **George Goodman** in charge.

A. W. Donop, formerly Pacific Coast district manager of the **U. S. Light & Heat Corporation**, with headquarters at San Francisco, has been appointed district manager in the railway department of that company, with headquarters in Chicago, to succeed **E. C. Wilson**. Mr. Donop has been identified with electric car lighting since its inception, having operated and maintained some of the original headend equipment on Pullman cars. He entered the service of the Pennsylvania at the time when that road established a carlighting maintenance department. He later was in the employment of the Gould Storage Battery Company, and the Lehigh Valley, respectively. In 1907, he entered the service of the U. S. Light & Heat Corporation, with which organization he has been chief inspector, traveling engineer, and a district sales representative.

A. W. Donop

Pell W. Foster, Jr., in the sales office of the Power Specialty Company, New York City, has been appointed New England district manager, with office at 50 Congress street, Boston, Mass.

The Consolidated Machine Tool Corporation of America, New York City, has let a contract to the Shoemaker-Satterthwait Bridge Company, Philadelphia, Pa., for building a two-story foundry, 98 ft. by 240 ft. of steel and concrete construction, at its Hilles & Jones plant, Wilmington, Del.

The Prest-O-Lite Company, Inc., New York, announces a complete new line of storage batteries for railway signaling and interlocking, conforming to the specifications of the Signal Section, A. R. A. The railroad sales division of the **National Carbon Company, Inc.**, Cleveland, O., has been appointed to handle the sales and field service of this new line of equipment.

J. G. Carruthers, manager of sales in the Chicago district for the **Illinois Steel Company**, and special sales agent of the **Carnegie Steel Company**, with headquarters at Chicago, has resigned to become general sales manager of the **Otis Steel Company**, Cleveland, O. He will be succeeded by **D. T. Buffington** of the structural and plate bureau, general sales department, Illinois Steel Company.

The Davis Boring Tool Company, St. Louis, Mo., has bought land for a new factory site fronting on Forest Park boulevard at the corner of Spring avenue. Preliminary work is now under way for putting up a modern three-story daylight factory in the near future. This company manufactures expansion boring tools and expansion reamers for all classes of metal boring in railroad shops. The company during the past 18 years has found it necessary to seek larger quarters on account of increased business and during that time outgrew four different factory buildings.

W. Newton Jeffress has severed his connections with the Carnegie Steel Company and other United States Steel Corporation interests with which he has been identified for a number of years, and is now engaged in the railway specialties and supply business, with offices in the International Building, 1319 F street, N. W., Washington, D. C. Mr. Jeffress represents the following companies: Ideal Nut Company, Chicago; Pittsburgh Knife & Forge Company, Pittsburgh, Pa.; Standard Seamless Tube Company, Pittsburgh, Pa.; Union Draft Gear Company, Chicago; Universal Draft Gear Attachment Company, Chicago, and Verona Tool Works, Pittsburgh, Pa.

The Consolidated Steel Corporation, New York, which was formed in 1918 and began business in January, 1919, under the Webb Export Act is liquidating its affairs and it is probable that the Bethlehem-Lackawanna combination will now go after export trade on its own account. The same thing is true of the Midvale-Republic Inland merger. All of these companies with the exception of the Inland have been members of the Consolidated Steel Corporation. The remaining companies according to some reports may form an export company under the Webb law. The liquidation of the Consolidated Steel Corporation may extend over a period of several months. E. A. S. Clarke, president of the Consolidated, recently gave out the following statement: "The company has ceased selling, and will liquidate its affairs as rapidly as consistent with conditions. The member companies are now quoting directly for their own account for export. Liquidation, naturally, involves drastic reduction of personnel. The directors may later consider a modified plan which will enable them to avail of the provisions of the Webb law."

W. S. Rugg, assistant to the vice-president, has been appointed general manager of sales of the **Westinghouse Electric & Manufacturing Company**, East Pittsburgh, Pa. The position of general sales manager is a new one in the Westinghouse Company and Mr. Rugg was appointed to the position because of his long experience in the electrical industry and in sales work. Mr. Rugg was born in Broadhead, Wis., and was graduated from Cornell University. He entered the service of the Westinghouse Electric & Manufacturing Company in 1892 and three years later was transferred from Pittsburgh to the Chicago office as district office engineer. In 1901 he was transferred to the New York office as special sales engineer, and in 1909 was made manager of that office. He was again transferred in 1917 to the East Pittsburgh works and was appointed manager of the railway department and shortly after he became manager of the marine department also. In 1920 he was promoted to assistant to vice-president in charge of sales, and now becomes general manager of sales as above noted.

W. S. Rugg

Trade Publications

ELECTRIC HOISTS.—Sprague electric type WX worm drive hoists are described in a two-page folder issued by the Sprague Electric Works of the General Electric Company, New York, N. Y. The folder includes a sectional drawing of the hoist and furnishes a brief description of each part.

CINDER PLANTS.—The Roberts & Schaefer Company, Chicago, has issued a four-page folder illustrating and describing its N. & W. type cinder plant. The text matter contains a list of 11 advantages of this type of plant while the illustrations show the construction and method of operation.

Railway Construction

CANADIAN NATIONAL.—This company has awarded contracts as follows: To William A. Dutton, Winnipeg, Man., for the construction of dams and the excavation of reservoirs at Pope, Man., Raymore, Sask., Conquest, Maryfield and Mecheche, Alta.; to the Northern Construction Company, Winnipeg, for the construction of a dam and the excavation of a reservoir at Wiseton, Sask.; to C. G. Anderson, Norwood Man., for the construction of a dam and the excavation of a reservoir at Rama, Sask.; to Green & Elsasser, Winnipeg, for the construction of pipe lines at Wiseton, Sask., Rama, Raymore and Maryfield, Alta.; to G. M. Irwin, Stonewall, Man., for the construction of a pipe line at Pope, Man.; to the Jamieson Construction Company, Edmonton, Alta., for the construction of a pipe line at Mecheche, Alta.; to Riley & Reed, Patience, Alta., for the construction of a dam and the excavation of a reservoir at Tilney, Sask.; to Simpson & Shillington, Winnipeg, for the construction of 10,000 ft. of pipe line at Lloydminster, Sask.; and to the Ideal Fence & Spring Company, of Canada, Winnipeg, for the erection of approximately 50 miles of fencing on the Oakland subdivision in Manitoba.

CHICAGO, BURLINGTON & QUINCY.—This company will accept bids until September 29 for a one-story brick reclamation plant 50 ft. by 301 ft. at Eola, Ill.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has been ordered by the Board of Railroad Commissioners of South Dakota to build a freight and passenger station at Beardsley, S. D.

CHICAGO, ROCK ISLAND & PACIFIC.—This company, reported in the *Railway Age* of July 1 as contemplating the construction of a freight station at Omaha, Neb., has awarded the contract for the grading work to Roberts Brothers, Peterson, Shirley & Gunther of Omaha, Neb.

GRAND TRUNK.—This company will accept bids until October 4 for a two-story brick freight house 20 ft. by 32 ft. at Harvey, Ill.

GREEN BAY & WESTERN.—This company has awarded a contract to the Ogle Construction Company, Chicago, for coal handling machinery to be used in a 200-ton frame coaling station at Whitehall, Wis., which the company will erect with its own forces.

HOUSTON & BRAZOS VALLEY.—The Interstate Commerce Commission has issued a certificate authorizing the construction of an extension from a point near Clute to Hoskins Mound in Brazoria County, Texas, 13 miles.

LONG ISLAND.—This company is making some improvements at their repair shops at Morris Park, L. I., to include a new office building and a new storehouse, both to be of reinforced concrete; the installation of new machinery and two new overhead cranes in the locomotive shop; the remodelling of the old office building into a wheel shop with new machinery. The new office building will be 40 ft. by 80 ft. and will have three floors and basement, the basement to accommodate a modern restaurant for supervisory and office forces, rooms for records, and lavatory for men. The first floor will accommodate the superintendent of motive power's general office force and an information and employment bureau. The second and third floors to have offices of the superintendent of motive power and engineering forces. The new storehouse will be 40 ft. by 100 ft. and will have three floors and a basement, to be equipped with electric elevators for freight and an electric dumb-waiter to speed up delivery for light material to the delivery counter located on first floor. The entire building will be equipped with modern type of adjustable steel shelving. On the third floor will be located the office of the storekeeper and his office force. The old office building and present storehouse will be remodeled into a wheel shop and will have installed a complete monorail system for unloading wheels and axles and for handling this material in shop. New axle lathes, boring mills, wheel press and grinding machines will be installed. The locomotive shop will have a number of new machines, among which are a side head boring mill, a slotter, a bushing press, a radial drill, and a 20 ft. by 10 ft. bed engine lathe. To speed up the handling

of locomotives for repairs, the present slow method of unwheeling locomotives by a drop pit will be done away with and the two present 25-ton cranes will be replaced with a new 150-ton crane, running on a new steel runway the entire length of the locomotive shop. The light work will be handled by a new 10-ton crane, running on this same runway. The entire plant will be equipped with automatic telephones.

MINNEAPOLIS, ST PAUL & SAULT STE. MARIE.—This company, reported in the *Railway Age* of August 26 as accepting bids for a 20-stall roundhouse at Gladstone, Mich., has awarded the contract to Smith & Vandanaker, St. Paul, Minn.

MISSOURI PACIFIC.—This company, which was reported in the *Railway Age* of September 9, as closing bids on September 13, for a passenger station 24 ft. by 100 ft. at Lake Village, Ark., has awarded the contract for this building to the Herman & McCain Construction Company.

PENNSYLVANIA.—This company has awarded a contract to W. E. Wood, Detroit, Mich., for the construction of the foundation of a freight house 60 ft. by 700 ft. at Third and Larned streets, Detroit, and for the construction of a frame engine house 60 by 120 ft. at Lincoln Park, in the same city. This company has also awarded a contract to Meredith & McVaugh, Detroit, for the paving of the driveways of the Summit street yard. The principal engine house, which will serve both passenger and freight locomotives, will be built by the Pere Marquette for the Pennsylvania at Nineteenth street and will cost approximately $1,000,000, including a turntable, water tank, coaling station and other buildings.

PENNSYLVANIA.—This company is receiving bids for all the work necessary to complete the Baltimore, Md. (Canton), No. 3 yard. The work will consist of laying additional tracks and rearranging existing ones. The approximate quantities are as follows: 10,000 cu. yd. excavation; 4.2 miles track material unloaded, piled, distributed and laid; 12,000 cu. yd. unloading and surfacing with cinder ballast; 43 turnouts, labor laying; 5 crossovers, labor laying; 2 sets crossing frogs, labor laying; 6,300 lin. ft. track shifted; 6,100 lin. ft. track removed; 11 turnouts removed; 3 crossovers removed. The work will be in charge of J. W. Craig, assistant engineer, Union Station, Baltimore, Md.

THE SAN ANTONIO & ARANSAS PASS.—This company has awarded a contract to the Truscon Steel Company, Youngstown, O., for the construction of a one-story steel freight house, 40 by 130 ft., with a second story at one end for offices, to cost $15,000, at Waco, Tex.

THE REPUBLIC OF POLAND has purchased 7,504 European type freight cars from the United States War Department, according to an announcement made in Washington on Wednesday. These cars were ordered during the war for use by the American army.

British Troops Leaving for Turkey

Railway Financial News

ALGOMA EASTERN.—*To Pay Interest.*—This company announces that interest on the 5 per cent 50-year first mortgage gold bonds, which fell due on March 1 last, and which was deferred, will be discharged in full on October 1 through the Bank of Montreal.

BALTIMORE & OHIO.—*Authorized to Acquire Control.*—The Interstate Commerce Commission has authorized the acquisition by this company of control of the Indian Creek & Northern by purchase of its capital stock.

BARNEGAT RAILROAD.—*Application to Discontinue Operation.*—This company has made application to the Interstate Commerce Commission for permission to discontinue the operation of its railroad, which is one of the smaller subsidiaries of the Pennsylvania Railroad System. The line runs through the upper end of Long Beach from Barnegat City Junction, New Jersey, to Barnegat City, a distance of a little over eight miles, and is used chiefly for Summer travel.

The line has never been a paying proposition since the original incorporation in 1883. The Pennsylvania Railroad has been called upon to make up the resulting deficits, in addition to advancing sums, from time to time, for betterments. During this long period the local interests also tried to make the Barnegat Railroad profitable and formed the Manahawken & Long Beach Transportation Company to operate the road, but that was a failure and the road was surrendered. Later the Tuckerton Railroad Company operated the line for the Barnegat Railroad Company, but it could not make it self-sustaining, and was obliged to terminate the arrangement. The Barnegat Railroad Company, therefore, is obliged to abandon its railroad as a total loss.

The immediate cause of the application for abandonment is that not only is the road unprofitable, but there has not been any notable development of the territory sufficient to offer any hope of future net revenue, and this railroad and territory it serves have suffered heavily from tidal washouts. The transportation necessities of this section of Long Beach have been provided for by the construction of a State highway paralleling the Barnegat Railroad, and connecting, near Barnegat City Junction, with the highway bridge across Barnegat Bay to the main shore road at Manahawken.

Further, there has been a very rapid growth of the automobile traffic for commercial and recreational purposes to and from the portion of the New Jersey coast served by the line, and there is also jitney service which runs the entire length of Long Beach. While this commercial and private motor car serves the convenience of the population, the result has been to reduce traffic on the Barnegat Railroad to negligible proportions so that the line is practically a total loss.

CHESAPEAKE & OHIO.—*Increases Capital Stock.*—The stockholders at a special meeting in Richmond, Va., on September 26 approved the plan of the directors to increase the capital stock by $30,000,000, making a total of $185,000,000. Of the 300,000 shares increase, stockholders of record September 1 have been given the right to subscribe at par, on or before October 2, to the extent of 20 per cent of their holdings for new 6½ per cent cumulative preferred stock, series A.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—*Guaranty Certified.*—The Interstate Commerce Commission has certified the amount of this company's guaranty for the six months period of 1920 as $2,460,096, of which $368,096 remained to be paid.

DENVER & RIO GRANDE WESTERN.—*Interest Payments.*—Judge Robert Lewis of the Federal Court at Denver, Colo., has ordered Joseph H. Young, receiver for this company, to pay interest due in October on the Rio Grande Western consolidated mortgage four per cent bonds of 1949.

HOCKING VALLEY.—*Equipment Trusts Offered.*—Hambleton & Co. and E. Lowber Stokes & Co. are making a new offering of $819,000 stamped equipment trust 6 per cent gold notes, dated January 15, 1920, and maturing $63,000 each January 15, 1923 to 1935, inclusive. The notes are offered at prices ranging from 100.49 to 102.19, and yield from 4.50 to 5.75 per cent according to maturity. They are secured, together with $1,638,000 unstamped notes, by 20 Mallet type freight locomotives and 50 composite gondola cars.

ILLINOIS CENTRAL.—*New Director.*—Vincent Astor has been elected a director to succeed R. E. Connelly, resigned.

INDIAN CREEK & NORTHERN.—*Acquisition.*—See Baltimore & Ohio.

MANILA RAILWAY.—*Bonds Offered.*—Hallgarten & Co. and the Chase Securities Company are offering, at 112¼ and interest, to yield about 5.75 per cent, $1,485,000 Manila Railroad Company 7 per cent sinking fund bonds, guaranteed principal and interest by the government of the Philippine Islands.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Defers Dividends.*—The directors have decided that no further dividends payable in 1922 will be declared out of surplus until the appeal of two preferred stockholders in the suit over the question of rights of preferred and common stockholders is decided. The appeal will be heard in St. Louis in the next term beginning December 4.

The company has declared dividends of $2 a share on both the preferred and common stocks, payable April 15, 1922, out of surplus accumulated during 1920 and prior years. The payment of these dividends was enjoined by the United States District Court of Minnesota until the decision on the appeal.

MISSOURI, KANSAS & TEXAS.—*Sale Postponed.*—The sale of this railway, which was set for September 21, has been postponed.

Extension of time until October 16 has been granted for the deposit of bonds with reorganization managers, J. & W. Seligman & Co. and Hallgarten & Co.

MOBILE & OHIO.—*Guaranty Certified.*—The Interstate Commerce Commission has certified the amount of this company's guaranty for the six months period of 1920 as $1,930,735, of which $605,735 remained to be paid.

NEW YORK, NEW HAVEN & HARTFORD.—*Operating Ratio for Seven Months.*—Owing to a typographical error the operating ratio for the seven months' period was shown in the *Railway Age* of September 16, 1922, page 531, as 89.80. This figure should have read 79.80.

NORFOLK & WESTERN.—*To Redeem Notes.*—The directors at Philadelphia on September 26 authorized the calling for redemption at 103 its 6 per cent equipment trust certificates on January 15 1923. Funds for this purpose will be provided from the company's treasury. No new financing will be necessary.

These certificates, originally amounting to $6,885,000, were issued to the United States Railroad Administration in 1920. There are at present $5,524,500 outstanding.

PENNSYLVANIA.—*Subsidiary Company Asks Authority to Discontinue Operation.*—See Barnegat Railroad.

READING COMPANY.—*Time for Depositing Bonds Extended.*—The protective committee of the Reading Company and the Philadelphia & Reading Coal & Iron Company general mortgage 4 per cent bonds has extended the time for depositing bonds to December 1.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out to or received from the several roads the following amounts:

Illinois Terminal	$50,000
Pacific Coast	40,000
Direct Navigation Company	40,000
St. Johnsbury & Lake Champlain Company paid Director General	80,000
Short Lines	
Liberty-White	9,000
Indian Creek Valley paid Director General	7,800

Dividends Declared

Norfolk & Western.—Adjustment preferred, $1.00, quarterly, payable November 15, to holders of record October 31.

Northern Pacific.—$1.25, quarterly, payable November 1 to holders of record October 2.

Reading Company.—Common, 2 per cent, payable November 9 to holders of record October 17; 2nd preferred, 1 per cent, quarterly, payable October 12 to holders of record September 26.

Trend of Railway Stock and Bond Prices

	Sept. 26	Last Week	Last Year
Average price of 20 representative railway stocks	72.01	73.45	57.23
Average price of 20 representative railway bonds	89.34	89.80	77.17

Railway Officers

Executive

A. L. Grandy, chief engineer of the Pere Marquette with headquarters at Detroit, Mich., has been promoted to assistant to the president and general manager with the same headquarters.

R. S. Logan, vice-president of the land, tax and claims division of the Grand Trunk, has at his own request after 27 years of service, been relieved from active duty and retired under the pension rules of the company. Mr. Logan was born at St. Louis, Mo., in 1864 and he began his railroad career in 1885 as clerk in the office of the St. Louis & Pacific. In 1890 he became secretary to the general manager of the Wabash. In 1896 he entered the service of the Grand Trunk as secretary to the general manager and five years later was promoted to assistant to the general manager. In 1901 he was appointed vice-president and general manager of the Central Vermont and in 1902 to assistant to the vice-president and general manager of the Grand Trunk. In January, 1910, he was appointed assistant to the president of the Grand Trunk and the Grand Trunk Pacific. In 1911 he was promoted to vice-president, which position he held at the time of his retirement.

A. B. Atwater, assistant to the president of the Grand Trunk with headquarters at Detroit has, at his own request after 48 years of service, been relieved from active duty and retired under the pension rules of the company. Mr. Atwater was born at Sheffield, Ohio, in 1845, and entered railway service as a telegraph operator on the Cleveland & Erie, being transferred shortly thereafter to the engineering department of that road. He was later advanced to engineer of construction for the Canada Southern; assistant engineer for the Port Dover & Lake Huron; chief engineer of the Stratford & Huron; general superintendent of the Georgian Bay & Lake Huron division of the Grand Trunk; chief engineer of the Chicago & Grand Trunk. From June, 1885, to July, 1898, he was superintendent of the Grand Trunk, Western Lines, and from the latter date until July, 1902, he was assistant general superintendent of the Michigan Central. From July, 1902, until the time of his retirement Mr. Atwater has served as assistant to the president of the Grand Trunk, Western Lines.

Financial, Legal and Accounting

J. P. Pratt has been appointed assistant general solicitor of the Grand Trunk. **E. McDonald** has been appointed solicitor of the land and tax division.

H. A. Palmer, assistant land and tax commissioner of the Grand Trunk, has been appointed property commissioner to deal with all matters connected with the purchase, sale and lease of the company's lands, reporting directly to the vice-president and general manager.

In announcing the appointment of **J. R. Turney,** assistant general solicitor of the St. Louis Southwestern, as acting general solicitor, in the issue of September 23 (page 591), the statement was made that Mr. Turney succeeded **D. Upthegrove,** deceased. This statement was in error insofar as the death of Mr. Upthegrove is concerned, Mr. Turney's appointment having been brought about by the promotion of Mr. Upthegrove to the position of acting president to succeed J. M. Herbert, deceased.

Operating

B. J. Roberts has been appointed trainmaster of the East Carolina division of the Seaboard Air Line, with headquarters at Charleston, S. C., succeeding **A. L. Pritchett,** who has been transferred to the North Carolina division, with headquarters at Hamlet, N. C.

S. H. Osborne, division engineer of the Nebraska division of the Union Pacific with headquarters at Omaha, Neb., has been appointed acting assistant superintendent of the Nebraska division with the same headquarters.

C. H. Brown, superintendent of transportation of the Alberta district of the Canadian National, with headquarters at Edmonton, Alta., has been appointed assistant superintendent of the Biggar division, with headquarters at Biggar, Sask., succeeding M. H. Stuart, and has been succeeded temporarily by **J. T. Armstrong,** chief dispatcher, with headquarters at Edmonton, Alta., who in turn has been succeeded by **T. S. Sullivan** who has been transferred from Biggar. Mr. Sullivan will be succeeded by **F. H. Keefe.**

J. E. Mulick, whose promotion to superintendent of the Wyoming division of the Union Pacific, with headquarters at Cheyenne, Wyo., was reported in the *Railway Age* of September 16, was born on April 3, 1872, at Davenport, Ia. He was graduated from Creighton University in 1888 and entered railway service in December of that year as a train caller for the Union Pacific in which capacity he was engaged until September, 1889, when he became a brakeman on the Wyoming division, which position he held until May, 1890. On the later date he was employed as a switchman at the Omaha terminal and in June, 1892, he became a freight brakeman on the Nebraska division, which position he held until October, 1900, when he was promoted to freight conductor which position he held until July, 1910, when he was promoted to passenger conductor. In October, 1916, he was promoted to train master and in November, 1919, he was again promoted to assistant superintendent of the Wyoming division with headquarters at Cheyenne, Wyo., which position he was holding at the time of his recent promotion.

Traffic

C. P. McGhee, traveling freight agent of the Minneapolis, St. Paul & Sault Ste. Marie, with headquarters at Los Angeles, Cal., has been appointed district freight agent, with the same headquarters.

E. H. Batchelder, assistant general passenger agent of the Chicago & Eastern Illinois, with headquarters at Chicago, has been promoted to general passenger agent, succeeding W. H. Richardson, deceased. Mr. Batchelder was born on September 30, 1870, at Chicago, Ill. He entered railway service in September, 1883, as an office boy of the Chicago & North Western. In 1896, he was employed by the Chicago, Burlington & Quincy as division clerk in the passenger department at Chicago, which position he held until July 1, 1897, when he left to enter the service of the Atchison, Topeka & Santa Fe in the same capacity at Topeka, Kan. Two years later he entered the employment of the Chicago, Rock Island & Pacific as chief clerk to the auditor in the passenger department at Chicago, which position he held until July 1, 1903, when he left to become chief rate clerk in the passenger department of the Chicago & Eastern Illinois. On May 1, 1904, he was promoted to chief clerk and, on April 1, 1920, to assistant general passenger agent, which latter position he was holding at the time of his recent promotion

E. H. Batchelder

J. F. Brady has been appointed foreign freight agent of the New York Central Lines East, with headquarters at New York city, succeeding T. Y. Newman, who has resigned to engage in other business. **W. P. Kohler** has been appointed export agent with the same headquarters.

F. R. Newman, assistant general freight agent of the Michigan Central with headquarters at Detroit, Michigan, has been appointed general traffic manager of the Minneapolis, St. Paul & Sault Ste. Marie with headquarters at Minneapolis, Minn.

R. G. McNeillie, whose appointment as general passenger agent of the Canadian Pacific with headquarters at Winnipeg was announced in the *Railway Age* of September 23, page 591, was born at Lindsay, Ontario, on July 1, 1883, and entered the service of the Canadian Pacific in October, 1901, as a stenographer in the general passenger department at Winnipeg. He was promoted to district passenger agent at Nelson, British Columbia, in October, 1909, and remained there until April, 1910, when he was transferred in a similar capacity to Calgary, Alberta. On July 1, 1913, he was advanced to the position of assistant general passenger agent at Winnipeg and remained in this position until the time of his recent promotion. In his new capacity Mr. McNeillie's jurisdiction will cover the Field lines, Kootenay Landing and East.

R. G. McNeillie

H. W. Brodie, whose appointment as assistant passenger traffic manager of the Canadian Pacific, Eastern Lines, with headquarters at Montreal, was announced in the *Railway Age* of September 23, page 591, was born at Fredericton, New Brunswick, on June 8, 1874, and was educated in the public school at St. John. He entered railway service with the Manchester, Robertson & Allison in St. John in 1899 as an office boy and went with the Canadian Pacific in 1895 as a clerk. Shortly thereafter he was transferred to Boston and then to Toronto, where after a few months he was advanced to the position of chief clerk. In 1899 he was transferred to Winnipeg in the same capacity and in 1903 he was promoted to assistant general passenger agent at that place. In 1910 he was appointed general passenger agent at Vancouver and remained in that position until the time of his recent promotion.

H. W. Brodie

J. C. Hext, commercial agent of the Southern, with headquarters at Charleston, S. C., has been promoted to foreign freight agent, with headquarters at New Orleans, La., succeeding L. E. Wetterau and will be succeeded by E. L. Brown. **W. B. Graham** has been appointed commercial agent, with headquarters at Hattiesburg, Mo., succeeding T. W. Brahan.

C. H. Ryan, Jr., division freight agent of the Louisville & Nashville with headquarters at Memphis, Tenn., has been

promoted to assistant general agent with headquarters at Louisville, Ky., succeeding C. R. Brett, assigned to other duties. Mr. Ryan will be succeeded by **W. C. Dillars**, division freight agent of the Pensacola division, with headquarters at Pensacola, Fla.

W. H. Howard, whose appointment as assistant general passenger agent, Eastern Lines, of the Canadian Pacific with headquarters at Montreal, was announced in the *Railway Age* of September 23, page 592, was born at Chatham, Ontario, on September 15, 1877. He entered the service of the Canadian Pacific as a junior clerk in the district passenger department at St. John, New Brunswick, in August, 1897. Two years later he was appointed traveling passenger agent and in February, 1902, he was appointed chief clerk to the district passenger agent at St. John. In June, 1906, he was promoted to acting district passenger agent with headquarters at St. John, and in the following January became district passenger agent at the same place. In February, 1916, he was transferred in a similar capacity to Toronto and held this position until the time of his recent promotion.

W. H. Howard

L. S. Wickes, whose promotion to assistant general freight agent of the Oklahoma Southwestern was reported in the *Railway Age* of September 23, was born in 1890, at St. Louis, Mo. He entered railway service on February 1, 1909, in the freight traffic department of the St. Louis-San Francisco. Prior to his service with the Oklahoma-Southwestern he was employed by the Pere Marquette.

Walter Maughan, whose appointment as assistant to the general passenger traffic manager of the Canadian Pacific was announced in the *Railway Age* of September 23, page 591, was born at Toronto on September 4, 1876, and entered the service of the Canadian Pacific as a clerk in the passenger traffic department at Toronto in 1892. In September of the same year he was transferred in a similar capacity to Hamilton, Ont., and remained there until July, 1895, when he was transferred again to Toronto. In March, 1897, he was promoted to assistant passenger agent at Toronto and in November, 1912, was appointed assistant district passenger agent with the same headquarters. In December of the following year he was promoted to assistant general passenger agent with headquarters at Montreal and remained in this capacity until the time of his recent promotion.

Walter Maughan

F. P. Cruice, manager of the agricultural and industrial departments of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., has been promoted to assistant general freight agent, with headquarters at Los Angeles, Cal., taking over the duties of W. G. Barnwell, deceased. He will be succeeded by **F. Jarrell**, who was in charge of publicity matters and editor of the company's magazine, "The Earth."

W. R. Des Brisay, whose appointment as assistant general passenger agent of the Canadian Pacific with headquarters at Winnipeg, Man., was announced in the *Railway Age* of September 23, page 591, was born in Minneapolis in 1888 and entered the service of the Canadian Pacific as a stenographer at St. John, N. B., in 1904. Shortly thereafter he was appointed ticket agent on the C. P. R. steamer "Empress of Ireland." He then served for a time in a similar capacity at Halifax, N. S., and in May, 1910, was promoted to cashier at Quebec. In February, 1913, he was advanced to traveling passenger agent with headquarters at St. John, and in July of the following year he was transferred in a similar capacity to Montreal. In January, 1916, he was appointed traveling passenger agent at New York and in October, 1916, was promoted to district passenger agent at St. John, which position he held at the time of his recent promotion.

W. R. Des Brisay

Mechanical

N. B. Garrett has been appointed master mechanic of the Montgomery district of the Mobile & Ohio with jurisdiction extending from Montgomery, Ala., to Artesia, Miss., inclusive, with headquarters at Tuscaloosa, Ala.

T. C. Raycroft has been appointed master mechanic of the Seaboard Air Line, with headquarters at Hamlet, N. C., succeeding **G. W. Gilleland**, who has been transferred in a similar capacity to Howells, Ga., succeeding J. J. Hamlin, promoted.

Engineering, Maintenance of Way and Signaling

F. D. Lakin, division engineer of the Meadville division of the Erie with headquarters at Youngstown, Ohio, has been appointed acting regional engineer with the same headquarters, succeeding H. Knight.

H. A. Cassill, engineer maintenance of way of the Pere Marquette, with headquarters at Detroit, Mich., has been promoted to chief engineer with the same headquarters, succeeding A. L. Grandy, promoted.

T. J. Bivens, assistant engineer of the Colorado division of the Union Pacific with headquarters at Denver, Colo., has been appointed acting division engineer of the Nebraska division with headquarters at Omaha, Neb., succeeding S. H. Osborne, promoted.

C. E. Dare, whose promotion to engineer maintenance of way of the Richmond, Fredericksburg & Potomac with headquarters at Alexandria, Va., was announced in a recent issue, was born at Rising Sun, Md., on September 2, 1870. Mr. Dare was graduated from Lafayette College in 1892, entering railroad service as a rodman in the construction department of the Pennsylvania Railroad in February, 1893, remaining in that department until 1901 when, as an assistant to the assistant engineer, he was transferred to the Philadelphia division with headquarters at Philadelphia. In 1903 he was promoted to chief draughtsman of the Philadelphia Terminal division, remaining in this position for a year when he was promoted to assistant supervisor with the same headquarters.

In 1906 he entered the service of the Richmond, Fredericksburg & Potomac as a supervisor with headquarters at Alexandria. In 1919 he was promoted to resident engineer with the same headquarters, remaining in this position until his recent promotion to engineer maintenance of way.

Special

Walter S. Thompson, whose appointment as publicity agent of the Grand Trunk was announced in the *Railway Age* of September 9, page 492, was born at Newcastle-on-Tyne, England, on October 22, 1886, and was educated at Rutherford College, Newcastle-on-Tyne. He began newspaper work as a reporter on the St. James Gazette, London, and later served as sub-editor on the Evening Star, the Daily Express and the Observer—all London newspapers. During the years 1909 and 1911 he was engaged in newspaper work in Australia and New Zealand and in 1912 became city editor of the Daily Witness, Montreal, and later of the Daily Telegraph, published in the same city. In 1913 he entered the service of the Montreal Herald as city editor and left that position in March, 1914, to become chief of the press bureau of the Grand Trunk, a position which he held until his recent appointment as publicity agent.

W. S. Thompson

Obituary

C. T. Ames, superintendent of the Des Moines Valley division of the Chicago, Rock Island & Pacific, with headquarters at Des Moines, Iowa, was killed in an accident on September 25.

J. R. Dickinson, assistant general solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, whose death at his home in Winnetka, Illinois, on September 17, was reported in the *Railway Age* of September 23, was born on July 17, 1866, at Pittsburgh, Pennsylvania. He entered railway service in September, 1890, as a court reporter and attorney for the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, and held this position until 1900, when he was promoted to assistant general solicitor, with the same headquarters, in which capacity he was employed up to the time of his death. Prior to his connection with the railway company, he was employed in the office of Edwin Walker, Illinois solicitor of the Chicago, Milwaukee & St. Paul.

J. R. Dickinson

R. B. Angus, who was one of the organizers of the Canadian Pacific Railway, died in Montreal on September 17. Mr. Angus was born at Bathgate, Linlithgoshire, Scotland, in 1831, and emigrated to Canada in 1857, where he entered the employ of the Bank of Montreal. In 1879 he entered the railway field as a representative of several Canadians who had bought out the Dutch interests in the St. Paul, Minneapolis & Manitoba Railway (a forerunner of the Northern). He was a member of the original syndicate which was formed to construct the Canadian Pacific, and to his ability as a financier the success of the enterprise in its early stages was largely due. He remained a director of the company until the time of his death.

A. D. Lightner, formerly general executive agent of the St. Louis-San Francisco, died on August 18, at Birmingham, Ala. Mr. Lightner was born on February 2, 1866, at Vincennes, Iowa, and entered railway service as an agent and operator of the Atchison, Topeka & Santa Fe in Kansas, which position he held until 1890. In the latter year he became joint traveling freight agent of the Atchison, Topeka & Santa Fe and the St. Louis-San Francisco, with headquarters at Chanute, Kan., and Carthage, Mo., and remained in this capacity until 1896. Then until 1899, he was general agent of the St. Louis-San Francisco, with headquarters at Dallas, Tex., and from 1899 to 1904, he was general agent of the St. Louis-San Francisco and the Chicago & Eastern Illinois, with headquarters at St. Louis, Mo. He was then general agent of the St. Louis-San Francisco and general manager of the Birmingham Belt, with headquarters at Birmingham, Ala., for eight years. From 1912 to 1914, he was general agent of the St. Louis-San Francisco and the Gulf, Mobile & Northern, also vice-president of the New Orleans, Texas & Mexico and president of the New Orleans Terminal Company, with headquarters at New Orleans, La. He was then general manager and chief traffic officer of the New Orleans, Texas & Mexico, with headquarters at New Orleans, La., until 1916 following which he was in the operating and executive department of the St. Louis-San Francisco at Enid and Tulsa, Okla. From 1917 to 1920, he was engaged in war work as superintendent of terminals, railway construction and operation with the Willys-Overland Company at Toledo, Ohio. From 1920 to 1922, he was general agent of the Southeastern Express Company at Birmingham, Ala.

Burns D. Caldwell, president of Wells, Fargo & Company since October, 1911, and chairman of the board of the American Railway Express Company since July 1, 1918, died on the night of September 24 in a Pullman stateroom just before his train reached Burlington, Vt., while he was on his way home to Orange, N. J., from a fishing trip in Canada. Mr. Caldwell was born at Placerville, Calif., on April 27, 1858. He was graduated from high school at Chambersburg, Pa., in 1873 at the age of 15 and in the same year began railway work as a clerk in the auditor's office of the Vandalia at Terre Haute, Ind. In 1881 he was promoted to chief clerk in the general passenger and ticket department of the Vandalia at St. Louis, Mo., and remained in that position for about four years. In 1885 he was appointed chief clerk in the general passenger and ticket department of the Missouri Pacific in the same city and, in 1888, was appointed assistant general passenger agent of this company. In June, 1892, he was appointed chairman of the Western Passenger Association, with headquarters at Chicago. This position he held until July, 1899, when he went to the Delaware, Lackawanna & Western as traffic manager and later he became vice-president of the same road. In 1911 he resigned to become president of Wells Fargo & Company. Mr. Caldwell has been a director of a number of railroad companies and is a member of the Sub-Committee on Transportation of the International Committee of the Y. M. C. A.

B. D. Caldwell

EDITORIAL

Railway Age

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Increase in Railroad Stockholders

The total number of stockholders of Class I railroads for the calendar year 1921 was 752,967, according to the Preliminary Abstract of Statistics of Common Carriers just issued by the Interstate Commerce Commission. This was an increase of 43,172 over the number reported by the commission for the year 1920. It included 342,258 in the Eastern district, 73,187 in the Southern district and 337,522 in the Western district. While at first glance an increase in the number of stockholders in a business might seem to indicate an increase in its popularity as an investment, it is probable that a different explanation would prove truer to fact in this instance. The number of railroad stockholders has been increasing for several years, as it was somewhat over 600,000 before the war, but since there has been very little new stock issued in that time the changes in the stockholders' lists must mean that former owners have sold part of their holdings and they have been taken—generally at lower prices—by a larger number of new purchasers whose average holdings are less. The wide distribution of railroad securities is a good thing from many points of view, but the 1921 statistics represent conditions in a year of depression and great uncertainty and it is very likely that a different condition is being substituted as the financial condition of the railroads has improved during 1922. Recent statements of the number of stockholders of the Pennsylvania have shown a decrease.

New Agreements with Shop Employes

The Union Pacific and Burlington have been the first railways to make public the agreements they have negotiated with their shop employees following their defeat of the striking shop crafts' unions. The managements and the employees' associations on both these railways have agreed to reclassifications of shop employees which recognize much more clearly than those previously in effect the differences in the skill required to do the different kinds of work for which the men are paid. The wage scales fixed give the most skilled men higher pay than the wages fixed by the Railroad Labor Board, while in some cases relatively unskilled labor is to receive wages lower than those awarded by the Labor Board. It seems not improbable the result will be that on both railways the shop employees as a whole will receive as high, or even higher, average wages than those awarded to shop employees by the Labor Board. On the other hand, the new scales of wages place such a premium upon the acquisition and use of superior skill that it seems certain they will have a stimulating effect upon the work of all the employees and in consequence will increase the efficiency of all the work done. The ultimate result probably will be that the employees as a whole will receive higher average wages and that at the same time the railways will secure a larger amount of good work at a reduced total cost. The Burlington and Union Pacific seem to have made good use of their victory in the strike—a use that will be beneficial both to their employees and to the railways. It will be interesting to see what plans for dealing with labor matters are adopted on other railways.

Equalizing Traffic and Facilities

It is in periods of heavy traffic such as this that the inadequacy of facilities becomes most apparent. This condition is, of course, more pronounced at some points than at others. In general the terminals are the first points of congestion, although in many cases line capacity is the limiting factor. In either case facilities which may handle a normal traffic without delay are becoming blocked with the overload, the effects of which may extend far beyond the limits of the division affected if not remedied quickly. The problem of the operating officer now is to distribute the work to be done among the facilities available so that each may be used to the best advantage and an excessive load at any one point may be avoided. This involves closer supervision than is normally exercised. It may call for the rearrangement of switching operations between terminals and other expedients to reduce the danger of congestion in order that traffic may be kept moving.

Manufacturers' Engineering Service

With definite prospects of the railroads being able, and indeed compelled, to fill some of their machine tool needs in the immediate future, it is in order to urge a more general use of the engineering service offered by progressive machine and tool manufacturers. This is a valuable service, never fully utilized in the past. It is offered gratis by the manufacturers who naturally know best what can be accomplished with their respective machines and are anxious that these machines shall prove of maximum value. Few railroad shops are operated on as efficient a production basis as is possible or desirable, and industrial engineers with their extensive and intensive knowledge of modern machine methods, can be of great assistance in an advisory capacity. It is advisable where new machines are being bought to send blueprints, or work details, to the manufacturer who can then make a study of the requirements and recommend the tooling arrangement, or method which will give the most satisfactory results. Not only should advice be sought in the case of new tools, but every progressive machine manufacturer will be glad of a chance to speed up the work on his older machines already installed, retooling them so that they can earn more. Recently a prominent manufacturer of turret lathes sent a practical man to eight or ten different railroad shops and found that many of his machines were running on too small work to be efficient. In practically none of the shops were these machines producing more than 50 or 60 per cent of what they should. The railroad master mechanic or machine shop foreman at each shop had so many irons in the fire that he could not specialize on machinery and, as a result, the operators ran the machines and tooled them in any way they saw fit with no check on the performance. Admitting that certain machine shop operations are too simple to require special tooling arrangements, the fact remains that a considerable proportion of the machinery, especially in large shops, is capable of operation on a highly productive, efficient basis and in these cases it will pay the railroads to utilize the engineering service of machine tool manufacturers to the fullest possible extent.

Checking Signaling with Traffic

Railroads equipped with automatic block signaling should be able to check the efficiency of their signal systems under the heavy traffic conditions which will prevail for some time. Not all automatic block signals are located to the best advantage and some are not maintained efficiently. A signal protecting a busy passing track switch may be so far out as to cause repeated stops and delays to following trains that could be eliminated by the installation of another signal or the relocation of some of them. At certain stations the relocation of a signal or the installation of a starting signal will save considerable delay in getting trains moving. On one road the introduction of three additional signals for upgrade traffic on a long hill increased the capacity of that section of track sufficiently to remove a limitation to the operation of the entire division. Operating officers and signal engineers may now well co-operate in studying the causes of numerous train stops and delays, especially around water tanks, coal chutes, passing tracks and on grades. Slight changes in signal controls or locations may produce economies.

Yardmasters and the B. of R. T.

Reports from various sources show that the Brotherhood of Railroad Trainmen is trying hard to get all the yardmasters and assistant yardmasters of the railways to become members solely of the trainmen's union. W. G. Lee, head of the Brotherhood of Railroad Trainmen, is one of the ablest and fairest labor leaders in the United States. He has insisted always upon the members of his union faithfully carrying out their agreements with the railroads. But the yardmasters ought not to belong to the Brotherhood of Railroad Trainmen. If they are to belong to any organization it should be one of their own. The yardmaster is a supervisory officer who directs the work of trainmen. Neither he nor any other officer can issue and enforce orders without the way in which he exercises his authority sometimes being questioned and resented by his subordinates. A yardmaster who belongs to the Brotherhood of Railroad Trainmen is subject to discipline by that organization. This means that he is subject to discipline by the very men whose work he directs. He is their superior in the yard and they are his superiors in the lodge room. This creates a condition of affairs that is bad for all concerned. It can hardly fail to interfere with the yardmaster performing his duties with fairness and firmness and an officer who cannot thus perform his duties cannot perform them efficiently. An officer who cannot perform his duties efficiently cannot serve his railway well and will imperil his chances of promotion. The railways should treat their supervisory officers so that they will have no incentive to belong to unions composed of their subordinates; and supervisory officers who desire to serve their companies well and at the same time further their own interests will keep out of unions composed of their subordinates.

Bridges Over Navigable Streams

In a letter to the editor, General Lansing H Beach, chief of engineers, United States War Department, presents some specific criticisms of an editorial appearing in the *Railway Age* of May 27, 1922, entitled "The Needs of Water Transportation," which called attention to the large expenditures being made by the railroads in fulfilling the requirements imposed in bridges crossing navigable streams. The specific case cited in the editorial was a 365 ft. lift span provided in the new superstructure of the Cincinnati Southern bridge, which, according to the evidence available, will probably never serve any useful purpose. General Beach calls attention to the fact that the provision for a movable span is one imposed by law and that it is unjust to criticize the War Department or any of its officers for insisting upon the fulfillment of requirements which they have no authority to modify. The facts presented in General Beach's letter have been confirmed in full in a letter received from T. C. Powell, vice-president of the Erie, who was vice-president of the Cincinnati, New Orleans & Texas Pacific at the time that the negotiations concerning this bridge were under way. Mr. Powell testifies also to the spirit of fairness manifested by General Beach and his assistants in all their dealings with respect to this structure. It is, therefore, clear that the editorial in question was in error insofar as it directed any criticism at the War Department. However, the fact remains that the railroad was required to make a large expenditure for no useful purpose. There are many other places in the United States where railways have provided movable spans over streams that have been declared navigable, but where no navigation exists and while, no doubt, the War Department in these cases places an interpretation on the law, such that only the very minimum requirements are imposed, it is extremely difficult for the railroads to obtain the necessary federal legislation to relieve them of the needless expenditure. However, relief is now in sight from a rather unexpected source. The great expansion of highway construction and improvement is causing the shoe to pinch on another foot and because public pressure is being brought to bear a number of streams which have long borne the stamp of navigable waters, because of mythical transportation in the dim past, have been removed from the list.

Highway Crossing Protection

With the steady increase in the number of licensed motor vehicles operating on the highways from 4,983,340 in 1917 to 10,608,128 on July 1, 1922, the railroads have an increasingly difficult problem to protect the occupants of the automobiles as well as their own passengers and employees at the more than 250,000 highway grade crossings in the United States. In 1920 1,201 occupants of automobiles were killed in collisions with trains at grade crossings, while during the first nine months of 1921 873 occupants of automobiles met death in grade crossing accidents as compared with only 99 in all other classes of vehicles in such accidents. In Canada approximately 58 persons were killed and 142 injured in the 85 automobile accidents at railroad crossings involving fatalities during 1921. Another serious phase of this problem was emphasized recently by the derailment of a passenger train on the Minneapolis, St. Paul & Sault Ste Marie at Annandale, Minn., by a motor truck, resulting in the death of the two men on the truck and six passengers and two railroad employees.

With the continued expansion of manufacturing facilities, especially for cheap cars, a glance five or ten years into the future will indicate a dense highway traffic, those interested in which, if organized, can influence legislation on the grade crossing question that may be very detrimental to the interests of the railroads. There is already a tendency among state legislators to introduce bills requiring the roads to install devices for the protection of the highway traffic. The majority of the automobile traffic may be considered more of a luxury than a necessity and should pay its share of the new protection demanded. It is time that the railroads of the country should co-ordinate their efforts to counteract this tendency to require the railroads to stand the expense of all such proposed protection. Some of the problems involved in the location, installation and maintenance of automatic highway grade crossing protection are explained in an article elsewhere in this issue which serves to emphasize the importance of the railroads organizing to combat the demands of the millions of automobile drivers

The Changing Problem of Railway Accidents

COMPLETE STATISTICS regarding railway accidents in 1921 which have just been issued by the Interstate Commerce Commission confirm the conclusion drawn by the *Railway Age* from preliminary statistics issued some months ago. They show that on the whole the accident record made by the railways in 1921 was the best in their entire history. The Commission in its report says: "The number of fatalities resulting from railway accidents of all kinds, industrial included, in 1921 was less than for any other year since 1889. This is a remarkable showing when it is considered that the annual transportation service, measured in ton-miles, was about five times as large at the end of this period as at the beginning."

The total number of persons killed in 1921 owing to railway accidents of every kind was 5,996. The corresponding figure for 1920 was 6,928, and for 1919, 6,997.

Of this number 116 were passengers and persons carried under contract. This compares with 169 in 1920. The total number of employees killed in train and train service accidents in 1921 was 1,032. This includes not only employees at work, but those who were not on duty and even those who were trespassing. The corresponding figure for 1920 was 1,855. The total for employees and passengers declined from 2,024 to 1,048. In proportion to the total business handled, the accident record of 1920 was the best up to that time, and yet it will be seen that the fatalities to passengers and employees due to train operation in 1921 were only 57 per cent as great as in 1920. This fact helps to give an adequate idea of the increase in the safety of railway operation which has occurred.

But the problem of preventing or at least reducing accidents on railroads is far from solved. While the railways have been so greatly increasing the safety of their own operations, other developments over which they have little or no control have been tending to nullify their efforts to reduce the sum total of accidents. Within recent years the great increase in the number of automobiles crossing the railways on highways has been causing a formidable increase in highway crossing accidents. The number of people killed at highway crossings in 1921 was 1,702, or 554 more than the total fatalities to passengers and employees due to train operation. The Interstate Commerce Commission in its annual accident report says: "It will be noted that of all casualties sustained at grade crossings in 1917, 59 per cent involved occupants of automobiles and motor trucks, as compared with 80 per cent in 1921."

The railways of the United States in the months of June, July, August and September, 1922, carried on throughout the country a "National Careful Crossing Campaign" to try to reduce accidents at highway crossings. They placarded the entire country, especially at highway crossings, with warnings to automobilists to be careful when crossing railway tracks. The total results of this campaign are not yet known. Such information as is now available indicates, however, that the number of automobile accidents at highway crossings did not decline, and may actually have increased while this campaign was being carried on. The Pennsylvania Railroad System reports that in June, July and August, the first three months of the campaign, the number of casualties at its highway crossings increased 30 per cent. There were 85 automobile accidents at Pennsylvania System highway crossings in the three months in question. They caused the deaths of 56 persons, which was almost one-half as many as the total number of passengers killed on all the railroads of the United States in 1921.

There was an increase in 1921 in still another class of accidents. The total number of trespassers on railway property killed was 2,106 in 1920 and 2,481 in 1921. Prior to the war the number of trespassers killed annually averaged about 5,000. During and immediately following the war the number was greatly reduced, apparently owing to the fact that there was almost no unemployment in the country. The increase in the number of trespassers killed in 1921 is attributed by the Commission mainly to increase in unemployment due to business depression. The number of men who "beat" their way on the railways from place to place in periods of depression always is greater than at other times.

The facts about railway accidents indicate that the actual operation of the railroads themselves has been made so much more safe that the great problems with respect to accidents have become those of educating or compelling people not to trespass upon their properties and to cross them on highways with reasonable care. In the solution of these problems the railways must have the co-operation of public authorities and the organizations of automobile manufacturers and users.

Britain Succeeds Where America Fails

THERE IS PEACE and good feeling between labor unions and railway managements in Great Britain. This condition obtains in spite of the readjustments in wages which have been brought about in Great Britain as well as in the United States. Why should England have succeeded where we have failed?

One of the most obvious reasons is the sliding scale of wages. This plan is a product of the war period and provides, first, a basic wage which is not subject to change and, second, a substantial bonus which is increased or decreased at a predetermined rate with every increase or decrease in the official index number of the cost of living. The advantage which this method has over ours is plain. As the cost of living fluctuates continually, with our lack of provision for automatic adjustments of wages, we may expect either the railroads to be asking for wage reductions or the unions to be demanding increases most of the time. Consequently, we may look forward to more or less constant friction between the railroads and at least some of their employees. The British are to be congratulated that they have practically done away with controversies of this character.

Another institution on British railways which, although of recent adoption, has already proved its value in promoting cordial relationships, is the railway council. Under the provisions of the Railways Act of 1921 there is at least one of these councils, comprised equally of representatives of employees and managements, on each railway. Subsidiary to these councils are district councils and local committees, the personnel of which is similarly made up. The primary function of the council is the adjudication of disputes between employees and the railway companies, and it has already proved its value as a point of contact between the officers of the railways and their men. Moreover, the councils and committees seem to have awakened the interest of employees in the efficient operation of the railways and deliberations have not been confined solely to matters of wages and working conditions, but have included methods for increasing efficiency and building up traffic as well.

The provision for local committees, district councils and railway councils was not forced upon the railways or the unions from any outside agency, although their establishment has been required by law. On the contrary, the railways and the three operating and traffic department unions, viz., the National Union of Railwaymen, the Association of Locomotive Engineers and Firemen and the Railway Clerks' Association, agreed among themselves upon the formation of these bodies and their agreement was incorporated into the law of the realm.

The points which have been mentioned here about the

British method for dealing with the railway labor problem are only the most obvious and outstanding, yet they should be sufficient to awaken the interest of any railway officer who is not satisfied with labor conditions in this country and who is casting about for methods of dealing with the problem which have proved successful elsewhere.

Reduced Rates for Commercial Travelers

It would be difficult to characterize with moderation the request made of the Interstate Commerce Commission last week by the organizations of commercial travelers for a discount of 33⅓ per cent in passenger fares, were it not for an appreciation of that fairly common aspect of human nature, particularly associated with the calling of the salesman, which so frequently leads men to ask for more than they expect to get in order that they may be better satisfied if the request is granted only in part.

We are inclined to believe, however, that very clever salesmanship would be required to sell to the commission or to the public the idea advanced by the witnesses before the commission who, on behalf of 676,000 commercial travelers, asked that the railroads be ordered to sell to any one willing to advance $66.67 at one time a book of coupons good for $100 worth, of passenger or baggage transportation during the next year.

Less opposition will undoubtedly be expressed on the ground of discrimination to the proposal of the representative of the American Hotel Association that the potential customers of its members be accorded the 33⅓ per cent discount for buying as little as $50 worth of coupons at one time and submitting to the formality of being identified by photograph and signature, because more people would naturally see its possible advantages to themselves, although it would have an even greater effect in railroad revenues.

A good many laws have been placed on the state and federal statute books because in the old days railroads used to pay rebates to large shippers to keep them from sending their freight by some other road that would rather haul the freight for less than the regular rate than not haul it at all, and it is easy to imagine the howls of protest that would be incited by a proposal to allow a rebate of 33⅓ per cent today to all shippers who paid a freight bill of say $1,000 at one time. It would be strange logic that would expect an order that the same thing be done on a smaller scale from the regulating body created to administer the same laws that were directed against the former kind of discrimination under authority of an act of Congress.

It is, of course, perfectly true that railroads formerly issued mileage books at reduced rates for the benefit of the commercial travelers and it was done more or less voluntarily. That fact, however, constitutes no more valid an argument for their being required to resume the practice on a nation-wide scale than would be a contention by the Standard Oil Company that railroads should be required by law to pay it rebates. Chairman Fox of the Central Passenger Association testified before the commission that mileage books had their origin as far back as 1868 in a concession offered by the freight departments of the railroads to shippers in the same way that they used to give annual passes to favored shippers. After concessions in freight rates were made illegal the railroads also sought to get rid of the concessions still made to a limited extent to a class of travelers and they were only freed of the practice when the Railroad Administration had put an end to competition during the war.

It is also true, as contended by the commercial travelers, that railroads make lower rates for carload freight than for smaller shipments and that they make special fares at a discount from the regular rates for conventions, excursions, tourists and commuters, but there is a difference in the character of service rendered for such rates which does not exist between the service rendered to a commercial traveler or any other purchaser of a mileage or discount rate coupon book and that furnished the purchaser of an ordinary one-way ticket. The reduced rates accorded for carload freight and for special classes of travel may be justified on the basis of both the cost of the service and the value of the service. It costs the railroad less to handle shipments in carload lots than it does to handle a multitude of small shipments; it costs less to handle passengers in special suburban trains, often crowded, in the way that commutation traffic is handled, than it does to handle ordinary traffic on through or branch line trains, and it costs less to carry crowds of people to a convention or on an excursion that is planned for in advance than it does to run trains for the ordinary day to day travel for which schedules are maintained. Similarly, the purchaser of a special reduced rate ticket receives a less valuable or less desirable service than does the passenger who pays the standard rate, because the service for which he pays a reduced rate is usually restricted to certain dates, trains or destinations, but they tend to stimulate travel by offering a somewhat less desirable service as a by-product to those who could perhaps not afford or who would not care to pay standard rates for the regular service.

That they represent less of a concession than is desired by the commercial travelers is indicated by the fact that these "discount" rates which the commercial man points to are not satisfactory to him. The excursion ticket or the convention fare good on certain days is available to him and he sometimes takes advantage of it, but *he wants something more.* He wants to travel when he will and where he will at a reduced rate. While he contends that the reduction he seeks is justified on the wholesale principle, he is not asking for a wholesale service. His purchase of a mileage or coupon book ticket to cover exactly the same service that is given the ordinary passenger would not represent a wholesale transaction. It would represent merely payment in advance for a number of retail transactions yet to be completed and the interest on his advanced money would be easily eaten up by the additional cost of printing, collecting and accounting for his coupons.

Averaging approximately 50 miles a day, for which at the regular fare of 3.6 cents a mile the cost would be $1.80, the commercial traveler is no more entitled to wholesale rates for his transportation than are his customers entitled to wholesale prices or freight rates based on the aggregate of the goods sold by the traveler on his entire trip.

It is very easy to claim and somewhat difficult definitely to disprove, that a 33⅓ per cent or any other reduction in passenger fares would stimulate travel. It cannot be denied that any reduction would have at least some *tendency* in that direction, but the fact remains that there must be some point below which a reduction could not possibly pay. The question is whether a given reduction would cause enough more people to travel to make up for the loss in revenue from those who are now traveling. If the railroads believed it would, it would not be necessary to ask them to reduce rates. Those who say that they would travel on railroads more if rates were lower frequently forget that the first effect of a rate reduction would be to cut down the revenues now being collected. In fact, the chief witnesses for the commercial travelers at the hearing were sure that the railroads would more than get back any loss in revenues while admitting they had no figure in mind as to the amount of that loss.

The contention that business houses would send out more traveling men if the fares were lower attaches a rather magnified importance to the amount of money involved in the passenger fare as compared with the much larger other

factors. It is not to be presumed that a house would pay a large number of additional salaries, together with hotel bills and other expense accounts, to send out men at a time when for various reasons merchants are curtailing their buying, merely because the passenger fare is reduced 60 cents a day. Yet it requires no stretch of the imagination to foresee that most people who make even a single round-trip as far as Chicago to New York and return would buy a coupon book if it were available on the terms proposed at a rate 33⅓ per cent less than they now pay.

The commercial travelers often claim to perform an important service as indirect freight solicitors for the railroads, but if allowed to have their way they would prove to be rather expensive as passenger solicitors.

Heavy Electric Traction

THE HEAVY ELECTRIC traction committee of the American Electric Railway Association presented a report this week at the annual convention of that association. The report was of particular value to everyone concerned because it carried one step farther the work of compiling the available data on the subject of heavy electric traction. The report consists of a chart showing the growth of electrified track and of electric locomotive tonnage in the United States and Canada, a list of foreign electrified railroads with data covering the kind of equipment used, and a bibliography on heavy electric traction. The bibliography was orginated by the Association of Railway Electrical Engineers and has twice been revised and brought up to date by the A. E. R. A. In fact these two organizations should have the credit for doing more than their share of the association work on this subject during the past few years and for being the only ones to effect any sort of co-operation. The following statement included in the A. E. R. A. report is particularly noteworthy:

"The question of general co-operation in the study of heavy electric traction has been taken up with the various technical organizations which are actively interested in the several aspects of electrification. Your committee did not have in mind any premature attempt at standardization or discussion of questions which might embarrass the managements of electrified railroads or of railroads contemplating electrification, but did suggest a central organization to co-ordinate the work of studying electrification problems and of collecting information, in order to avoid duplication of effort.

"While many of the organizations with whom the matter was taken up expressed interest in the proposal, and while all agreed in the value of co-operation, it now seems evident that if such a movement is to be successful it should be under the leadership of the steam railroads."

All of the following associations are interested in the subject of heavy electric traction: The American Institute of Electrical Engineers; the American Society of Mechanical Engineers; the Mechanical Division of the American Railway Association; the American Railway Engineering Association; the American Electric Railway Association; the International Railway Congress; the Association of Railway Electric Engineers and the National Electric Light Association. Practically all of these organizations are dealing with the subject independently and in some cases there has been much duplication of effort. As a whole, these organizations include a wide variety of interest and afford an unusual opportunity for compiling complete information on heavy electric traction. What is needed is leadership. Petty jealousies must be forgotten.

The A. E. R. A committee in its statement has made an excellent suggestion with a generous spirit and has put the matter directly up to the steam railroad men. Is there any better way than for A. R. A., Division V, Mechanical, and the A. R. E. A. to get together and arrange a plan by which the various societies can co-operate. It is entirely possible that all of the associations would not agree to such affiliation, but if only a few collaborate, much duplication of effort will be eliminated and all phases of the work can be studied intensively.

Letters to the Editor

A Bonus System for Train Service Employees

CENTRAL STATES

TO THE EDITOR:

To promote efficiency in train service the following plan for a bonus system was suggested some time ago:

Pay to engine and train crews in productive service, a bonus on a minute basis at a pro rata rate for all time less than the established zero time (the maximum time before overtime commenced, based on a speed of 12½ miles per hour) for each class of service. Dead-heading and light sections are not to be governed by this plan. In computing, the total time on duty will be considered, and if less than the established minimum, payment will be made at pro rata rate on a minute basis for the time on duty less than the minimum.

To establish the time from which to figure, it will be necessary to classify the service as between fast freight, slow freight and local trains. For fast freight the time limit will be the minimum schedule from the time a train is due out of the initial terminal to the time of arrival at the final terminal, directions to be separated if necessary on account of differences in schedules of fast freights because of loadings. In slow freight service, use the time after which overtime is paid. In local service, the time limit will have to be determined from a study of the conditions peculiar to the division adopting the plan.

This plan will (1) expedite the movement of locomotives out of the roundhouse, and to and from trains at initial and terminal yards; (2) reduce materially the delays on account of engine and car failures; (3) speed up the movement of trains on the division, and increase the gross ton-miles per train hour; (4) reduce the number of crews and engines in service, making possible a greater service by more experienced men; (5) reduce the overtime expense and increase the earning capacity of men in this service; (6) increase train tonnage; (7) maintain fast freight schedules.

To illustrate, on a certain division of 134 miles the fastest schedule of fast freight is 6 hr. 29 min. eastbound. With this plan a train crew handling a fast freight and on duty six hours would be paid a bonus of 29 min. In slow freight, overtime is paid after 10 hr. 40 min., so that a crew on duty 10 hr. would be paid 40 min. bonus. The same would apply in local service after the time limit was established.

To show just how this should work out in slow freight service, note the following: A crew going on duty at 7 a. m. and off duty at 5:40 p. m. would not be paid a bonus. If off duty at 7:40 p. m. there would be two hours' overtime at penalty rate, which in the case of an engine crew would be $4.70. If the crew went off duty at 3:40 p. m. a bonus of two hours pro rata would be paid which would be $3.14. The difference between the two would be a saving of $1.56 to the road while it would also be an inducement for the men as they would have to work four hours to get $1.56, or about 39 cents per hour. On a basis of 20 trips per month, this would reduce the working time of a crew about 40 hr. per month, giving them a chance to make two or three more trips and increase their earnings accordingly, and also more time at home while reducing the time away from home.

On a basis of 250 trains per month, each saving two hours and a charge of $15 per engine hour, the saving on account of engine hours would be about $7,500, not including that due to decreased yard delays and improved time in freight movement, increased car miles per day or the advantage of

a more nearly maximum train loading, with a corresponding decrease in the aggregate number of trains run.

On a basis of a saving of 30 min. per train for 500 trains per month, the bonus for engine crews would cost about $392 and on the same basis the saving in engine hours, based on engine rental per hour, would be about $3,750 per month, or a net saving for engines and crews of $3,358. The bonus to the train crews on the basis of 30 min. to the engine crews would be about $461, which would leave a net saving of $2,897 per month. OPERATION.

The Needs of Water Transportation

WASHINGTON, D. C.

TO THE EDITOR:

I noted your editorial, "The Needs of Water Transportation," on page 1209 of your issue of May 27, 1922, at the time the paper appeared, but have, however, been prevented from writing to you earlier in regard to the matter. I have no reason to believe that you intended to do an injustice to myself or to the department which I represent, but it is nevertheless a fact that you have done so when you charge us with requiring other people to spend their money unnecessarily. I note your particular expression, "this attitude is frequently manifested by the War Department in its control over railway crossings of navigable streams. The building of new bridges, or the reconstruction of old ones, usually calls for extravagant requirements as to the clear width and height of channel openings, with apparently no effort to balance the pecuniary advantage to be derived by the existing or potential river transportation, with the enormous burden placed upon actual and thoroughly established rail transportation."

The case of the Southern Railroad bridge over the Ohio river at Cincinnati which serves as the text of your editorial, is one where it would have been better, in justice to those concerned and for your paper's reputation for accuracy, if you had ascertained the facts before issuing the statement which you have made. You say that the requirement in regard to the drawbridge "was made in spite of the fact that there is no record of the swing span ever having been turned following the test made at the time of its completion 45 years ago." It happens that I am personally acquainted with all features of this case, as I was the division engineer at Cincinnati, having supervision over the Ohio and its tributaries at the time the Cincinnati Southern Railroad first took up the question of remodeling its bridge.

The requirement to which you object concerning the drawbridge is one imposed by law, under the Act of Congress approved December 17, 1872. When the officials of the Cincinnati Southern presented their plans they were told that the requirement for the swing span was obsolete and in our opinion no longer necessary in the interests of navigation, and that we would do what we could to assist them to secure legislation repealing it or at least waiving it in their case. Their reply was to the effect that the bridge in its then present condition was a great hindrance to the traffic of the road and that it was more important to them to make their plans immediately and proceed with their work at the earliest possible date rather than to wait for legislation before making their plans even if they should save some money on the bridge, as the saving on the bridge would not compensate them for the loss due to the delay in the time.

You will notice that the law requires a swing bridge giving two clear openings 160 ft. each, the swing bridge being practically the only type of opening in a large bridge which was in existence at the time the Act was passed. When the engineer of the railroad company stated that another type of bridge would be more economical than the swing span, owing to the difficulty of enlarging the top of the turntable pier, or entirely rebuilding the pier, we told him that we believed the War Department would consent to another form of construction and permit the bridge to be built in any way that was more economical to them, provided the clearance called for by the law was maintained. After this statement to that effect the company modified its plans for this portion of the bridge and adopted the lift span as more economical and practical. No difficulty was experienced in obtaining the consent of the War Department to this change. I might add that at the hearing certain prominent vessel interests asked that the piers be changed when the bridge was rebuilt to which request we declined to accede on the ground that the expense to the railroad would be greater than the existing or prospective commerce justified.

I feel that your editorial has done not only the engineer department of which I am at the head, but myself, personally, a great injustice. I feel, however, that it was written on superficial knowledge without taking the pains to ascertain the facts. I am sure that the whole truth of the case completely absolves both myself and the department which I represent, from "the spending of other people's money . . . . all too lightly." LANSING H. BEACH,
Chief of Engineers, United States War Department.

The Santa Fe Reading Rooms

ON SANTA FE LINES

TO THE EDITOR:

In the *Railway Age* of September 9, page 455, I find these words: "There is unquestionably something wrong seriously in the industrial and transportation world today. No one will deny this." Following this you say: "We have suggested that conditions on the railways might be improved substantially through the development of something corresponding to the personnel departments that have given such an excellent account of themselves in certain of the larger and more progressive industrial organizations."

This conception has been carried out on the Santa Fe system, as originating in the active brain and warm heart of the late E. P. Ripley and most cordially supported by his successor and all his staff, in the widest and broadest and largest method of operation.

As you know, but seem at present to have overlooked, we have 30 buildings on the Santa Fe, where every comfort is provided for the employee, and where he is surrounded by educational influences.

We have invested close to a million dollars in this enterprise, which has for its object the closing of the gap between the official and the employee, and awakening aspirations towards the true, the beautiful, and the good. The librarians or caretakers of these reading rooms are taken from the ranks of the company, and have an intimate understanding of a railroad man's life and work.

The employee has the privilege of ordering books for his own private library which are delivered to him free at publisher's rates, or which may be added at once to the shelves of the reading room for his use and that of his family.

During the season entertainments of all kinds—musical literary and educational—are held in these reading rooms, for which no charge is made, and which bring the employees and their families into familiar association with many of the leading scholars and scientists. Each year for 20 years the Santa Fe has been appropriating from $10,000 to $20,000 for these entertainments. The Santa Fe has been carrying out the conception of the statements at the head of this letter for 24 years.

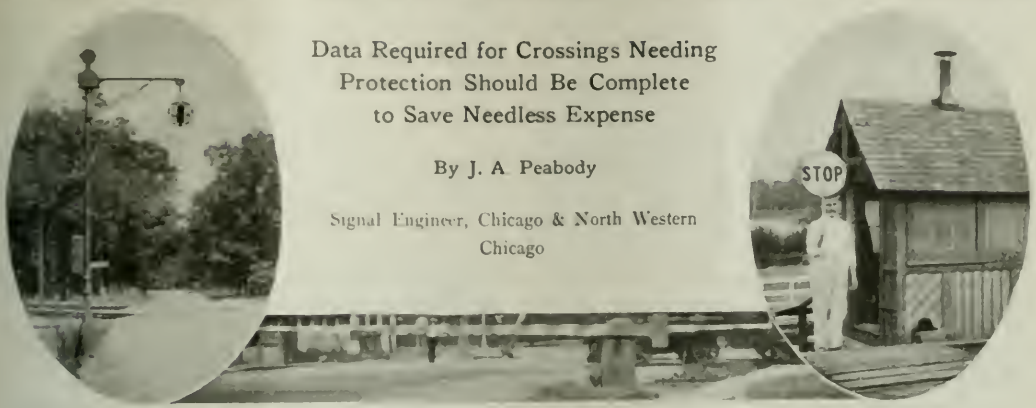
The object is to give the employees an uplift educationally and morally, to bring them into closer and more friendly relations with the executive and operating officials, and to develop a personal interest in the welfare of the company and make them proud to be on its payroll. S. E. BUSSER.

Highway Crossing Protection, Theory and Practice

Data Required for Crossings Needing Protection Should Be Complete to Save Needless Expense

By J. A. Peabody

Signal Engineer, Chicago & North Western
Chicago



A Movable Visible Audible Signal; Crossing Gates and a Flagman with Hand Target

A NUMBER of investigations have recently been made to ascertain the care used by travelers in passing over railroad crossings. One made in St. Louis for a period of 48 hr. showed that of 1,216 pedestrians, only one stopped and looked in both directions before proceeding over the crossing, two persons looked in both directions but did not stop; 9 per cent looked in one direction only, while 88 per cent did not stop or look to the right or to the left; also 91 per cent of the drivers of 2,931 automobiles

Highway Protected by Signs and Movable Visible Audible Signals

failed to stop or look in either direction. Tests made on crossings in other parts of the country have shown similar results. These conditions may account for the numerous highway crossing accidents. Information from the National Safety Council shows that one person has been killed and three people injured for every two accidents. Because of the numerous accidents the problem of protecting highway grade crossings is one of first importance.

The ideal method of eliminating the danger of two objects coming in contact with each other, is to provide paths which do not conflict. This means separation of grades. However, a recent estimate made for one state indicated that the average cost of separating grades would be $50,000 and the cost thereafter for maintenance, depreciation, interest on investment, etc., $4,000 a year. If applied to all crossings in the one state in question this would involve an expense of $170,000,000 which would more than double the investment in those railroads.

In recommending other protection, people forget that they are building up a cost which in some cases may approximate that of grade separation in the way of operating expense. In comparing the costs of different types of protection we find that a crossing sign approximates $20 expense and practically nothing for maintenance; a crossing bell, $1,050 for installation and $200 for maintenance and operation; an automatic flagman and bell, $1,200 for installation and $250 for maintenance and operation; an eight-hour flagman costs an average of $1,070 per year, chargeable to operating expense, while 24 hr. flagman service costs $3,170. At this point the cost of grade separation is being approached rapidly.

Crossing gates with flagmen, at an annual cost of $3,315, may be compared with $4,000 for the average annual cost of grade separation. The public has no compunctions at all about requiring a railroad to put on flagman service, but it feels no obligation whatever towards paying a portion of that expense. It is becoming educated to a certain extent to the fact that grade separation is a joint benefit to the public and to the railroad and in some instances is willing to pay a portion of the expense. New York and some of the New England states for some years have had laws requiring the railroad to pay one-half the expense of grade separation, the municipality or township one-quarter and the state one-quarter. Under those circumstances, the cost to the railroad would be considerably less on an average for grade separation than it would be to put in a 24 hr. service flagman or gate protection.

Preliminary Study of Each Crossing Necessary

The question of how best to protect a crossing is a problem. I was given charge of that work about two years ago and found no uniformity in making reports and as a result I had great difficulty in convincing my superior officers of the necessity for the protection recommended. Therefore

*Abstracted from paper given at Kansas City Sectional Committee meeting, Signal Section, A. R. A.

some data was outlined which I insisted should be obtained.

The railroad data should show all of the tracks and indicate whether they are main, passing, house, yard or industrial. The alignment of the main tracks, right of way lines, width of crossings, planking, the nearby buildings and any obstructions to the view should also be shown.

The highway data should include the alignment and width of the highway, width of traveled way, sidewalks, street car or interburban tracks, surface material, fences, and signs with their location and kind including crossing, approach warnings, advertising and other signs between the approach warning signs and crossing signs. There should also be an approximate profile of the roadway on each approach to the crossing for at least 300 ft. and the obstructions to view within 300 ft. of the crossing along the traveled way.

Where railroad cars are customarily left on the tracks so as to obscure the view from the highway, these should be indicated in their usual location. The lines of the maximum vision to the tracks from the street or highway at critical points within 300 ft. from the crossing should be shown. Information regarding the existing protection, giving data as to apparatus now in place, men employed, rates of pay, etc., should be supplied.

A count of traffic on the highway and on the railroad should be given by hours for a three-day period. The count for the first day should be for the full 24 hours unless there is known to be either no railway or no highway traffic during a part of this period, in which case the reason should be given. The count of the remaining days should cover the number of hours necessary to corroborate the count of the heavy traffic periods on various days as, particularly in the country, there are differences because of market days, Sundays, etc.

It is often necessary to go back and make complete additional 24-hr. period checks in order to know that such variations are covered. For this reason days should be selected carefully and should not necessarily be consecutive. If there is a greater or less traffic on the railway or highways at any season of the year or during some particular period, as when country fairs are being held or when adjacent highways are undergoing repairs, such information, if available, should be given.

Points for Consideration in Making Recommendations

When making the plans and recommendations the following points may well be kept in mind: The clearing away of shrubbery on the right of way, on the highway or on private property; the moving of poles, fences or buildings; the relocation of signs; the installation of additional signs and the removal of advertising signs; widening the approaches; reducing grades to avoid stalling of automobiles, and cutting away knolls and widening cuts to improve the view. Some states have taken the stand that the property owners have a certain responsibility in clearing away shrubs, trees, etc. It is unfortunate that other states do not take the same view. In Wisconsin the railroad and adjacent property owners, if called on to do so, must clear away shrubs and trees to leave a clear view for 325 ft., along the track from the same distance along the highway. In Illinois, if there is not a clear view for 550 ft along the railroad for 200 ft. on the highway, the crossing is considered hazardous and this space must be cleared out or protection may be required. Either one of these requirements will allow an automobile running at 30 mi. an hr. to stop if the train is in sight or to clear the track if the train is out of sight, even if the train is running 60 miles an hour.

The railroad companies have been very careless in the past in leasing their properties for industries with the result that buildings are often erected close to the highways, which require cars to be set near them. This is a point the railroads must consider in the future, not only when making new leases, but in re-leasing their property, because those industries, particularly coal sheds, and even elevators, can often be moved to other points where they do not create a dangerous condition. In some cases we are being penalized to the extent of being required to put on flagmen because industries which do not come anywhere near paying for the expense, are located so close to the crossings that standing cars create conditions which require protection.

Possible Methods of Protection

When it is decided that some protection is required, the question arises as to the advisability of installing (1) one or two automatic flagmen with a bell or without a bell (if

Audible Warning, Crossing Signs and Gates Protect This Crossing

more than one automatic flagman is desirable the number needed and the reasons should be given). (2) Human flagmen with the number needed and between what working hours. (3) Crossing gates, number and between what hours they should be operated. In considering the possibility of installing gates it is often cheaper to give first-class protection with gates than with a flagman, where protection for two or more streets close together is required or when two railroads are close together and one man can operate the gates for both.

A detail which may be somewhat aside from the point is the location of gates for the protection of streets in the vicinity of depots or team yards to give the proper protection and at the same time not unduly delay vehicles. There should also be included a statement of the accidents that have occurred at the particular crossing being investigated and the manner in which they happen. Other conditions should also be reported which occur to the observer and which may influence the decision.

The above outline will not be found to be such a burden as it appears when it is considered that an improper installation may cost the company unnecessary money. When a report is made complete but little difficulty is experienced in securing approval of the recommendations.

All of the possible methods of protecting a crossing have not been mentioned above and additional ways will unquestionably be developed in the future. The use of signs is perhaps the least expensive protection that can be given. The joint committee of the American Railway Association and the state railroad commissioners has decided on certain signs which are coming into quite general use. Unfortunately, however, some authorities oppose them.

It seems very desirable that the forms and the use of certain signs and signals should be uniform throughout the

country so that the driver of an automobile may know just what each means as he approaches it. On a railroad it is feasible to have two or more types of signals controlling the engineman on his run and to use them with perfect safety, but the engineman is thoroughly acquainted with the physical characteristics of the line over which he operates and knows and recognizes these differences at once. This is not true with people driving over highway crossings which are strange to many of them.

A short time since I noticed a book describing the "International Road Signs." These signs are so clear in their meaning that they can be understood on first observation. It is unfortunate, inasmuch as such signs have been adopted, that they are not in use in the United States as there are signs, not only for approach and warning, but also for sharp turns, grades, etc., for which there are now none in general use in this country.

With the proper location of signs, some crossings may be given sufficient protection at a very small expenditure; however, more attention should be paid to their uniform location to the right of the driver for whose information they are installed. The barber pole effect on gates came from an accident that happened on the Long Island Railroad. There is a shale road parallel with the track (which is electrified) running six miles out of Long Beach. It was a general practice of automobile drivers to start from Long Beach and race electric trains to that particular crossing. One night seven of them tried it. The fourth one was hit but,

Three-Position Wig-wag and Audible Warning Signal Located in Center of Street

even with the proof of the drivers before and behind this car, the railroad was blamed by the jury because the crossing was not properly protected. The railroad then protected the crossing by placing across it telegraph poles 8 in. in diameter at the top and about 12 in. at the butt, counterweighted and painted barber pole effect. The railroad advertised what it had done and there were no more accidents.

It is necessary to put the fear of God in the automobile driver's heart. I know of no other way to cure some of them. The hump has that idea in view. It can be built so that a man running at moderate speed will hardly feel it, but if he is speeding it will throw him through the top of his automobile—as did actually occur in one place.

Other Forms of Protection

In one state before the wig-wag was developed we were asked to install illuminated signs and there are a good many in service yet as they have proved to be fairly effective devices. A number of reflecting signs have been used in Ohio and elsewhere; it seems that they have their place, particularly in giving approach information for a crossing. The crossing sign itself should not be moved out for it belongs where it is; it is similar to the stop signal used in railroad signaling. However, automobile drivers in many instances have not been furnished with signs serving the same function as a distant signal on the railroad. Various railroads are developing signs; for example, one railroad uses a two-light signal which it claims is distinguishable.

The automatic flagman, the waving light and the flashing light are designed to attract attention by motion, but varying uses are made of them on railroads and on highways in different parts of the country; for instance, flashing lights not connected to track circuits are in service on some railroads at certain places to indicate dangerous points without reference to the approach of a train. Flashing lights are also being placed at dangerous highway road crossings, or at curves where there are no railroads. Therefore, their effect is lost in indicating a railroad crossing specifically.

Two types of automatic flagmen are installed. (1) The two-position flagman with the banner hanging down when no train is near and waving when a train is approaching, and (2) the three-position flagman with the banner hid from view when no train is close, waving when a train is approaching and hanging straight down when the mechanism is out of order.

Automatic flagmen installed on the C. & N. W. have a small box locked with a switch lock and containing a test switch attached to the relay case. Section foremen at outlying points are required to use the test switch daily to test the bell or wig-wag. The maintainer tests the apparatus in automatic signal territory.

Sometimes it is necessary to install more than one automatic flagman. At heavy traffic crossings automobiles often follow so closely that the attention of a driver is taken up in watching the car ahead of him and he may overlook warning signs. When a road angles at or close to the railroad it may not be possible to locate one automatic flagman so that it can be seen readily at all times from both directions. The red light on the device should never be placed so that it can confuse enginemen; to avoid this on sharp angle crossings it may be necessary to use long hoods or to locate the automatic flagman a considerable distance from the track.

A peculiar condition exists on double track where only one flagman is used as it may be located across the track from an approaching automobile driver. Should a train pass on the track nearest him, he is likely to start across immediately behind it when there may be another train approaching from the opposite direction. Therefore, on angle crossings particularly, it is advisable to use two wig-wags so that one will be waving directly in front of the driver and at least give him food for thought before he starts across.

The Human Flagman

The human flagman is placed on many crossings during hours when traffic is heaviest. A great improvement was made in this protection when the "stop" sign, in place of the flag, was put into the hands of the watchman. Under the old conditions with the flag, it was hard to determine just what the watchman meant by his signal, whereas now it is almost impossible for it to be misjudged.

When the "stop" sign was first adopted I felt that it should be used with a very short handle but we have now adopted the long handle because of the careless manner in which some flagmen held up the "stop" sign and because

it was practically impossible to compel a man to hold up his sign for any great length of time even though he was not careless.

Automatic Gates

Automatic gates have been advocated and two different types have been designed, viz. (1) the high type, with an arm so high above the level of the road that it will not be struck by a passing vehicle even when in the horizontal position, this type having whips attached to it to indicate that it is down, and, (2) the low type, which is practically the ordinary gate but operated with track circuit control on the approach of trains. Neither of these types has apparently proved successful, and I believe the reasons may be briefly stated as follows: The high type does not attract sufficient attention nor does it prevent the driver from going across the tracks even though it is in the "stop" position; with the low type, there is nothing to prevent it from coming down on top of a vehicle or in such a way as to hold the vehicle on the track between the gates.

Manually operated gates perhaps give the best protection at crossings where there is sufficient traffic to warrant their use. Sometimes it is economical to install gates where the traffic is comparatively light when two or three sets can be operated by one man rather than to put in flagmen at each crossing.

When called as a witness once in a crossing protection case I was asked the relative efficiency of a manual flagman (human flagman) as compared with an automatic flagman and after due consideration, stated that perhaps the human flagman was the better at that particular place. After the case was settled I happened to meet the judge and he took me to task for my testimony on the basis that a human being was never as reliable as a piece of machinery and that in view of the conditions at the crossing which was under consideration, the automatic flagman would be much more reliable because there was nobody except perhaps an officer on an occasional train to see whether the flagman was performing his duty properly. The judge's criticism should be taken into consideration when studying crossing protection.

No one type of crossing protection is best adapted for all crossings nor is any one type the most efficient for all; machinery is often more reliable than a man and is on duty 24 hours a day, whereas the man may be on duty but a few hours. Therefore, from a signalman's viewpoint, each crossing must be studied separately and only after considering fully all of the conditions surrounding it can a decision be reached as to proper protection needed or whether that already in is sufficient.

The uniforming of flagmen is a point that should be considered, particularly in protecting crossings in cities, because the average automobile driver will recognize a man who wears a policeman's uniform when he will not recognize others. Very often it is possible to get the watchmen sworn in as special policemen.

A point which has not been touched on is the confusion of drivers when they are in danger. Their brains seem to get scrambled whenever they get in a machine. I was told of an incident by one of our flagmen, who said that he never attempted to push an automobile off of a crossing any more but instead went down the track to flag the train. In two or three instances he could have pushed automobiles off as they stood on a down slope but the drivers had applied their emergency brakes.

Education

The railroads are spending considerable on education. For some years the North Western has had a car traveling over the road with a man in it educating its enginemen and trainmen not only in obedience of signals but regarding the information they can obtain from them. It takes this man a year to cover the road. He is not allowed to report any man, no matter how ignorant he may find him. As a consequence he has obtained their confidence and they come to him with questions relative to signaling which they should know from the book of rules. After the lectures are over they ask for additional explanations and the instructor has found the greatest ignorance in some cases among enginemen who have long been running locomotives. When this is a fact it is seen how much more necessary it is to educate the automobile drivers, and at present it is impossible for automobile drivers to tell what some of the signals put up at crossings for crossing protection mean.

Automobile Disasters Unchecked—Need of a More Extensive Campaign

The Pennsylvania Railroad reports that in spite of the most extensive educational campaign against crossing accidents ever carried on, its records show that in June, July and August, such casualties increased 30 per cent, as compared with 1921. The railroads of the United States have joined in efforts to make plain the deplorable results of carelessness, yet during three months, on the Pennsylvania System alone, there were 107 crossing accidents, in which 71 persons were killed and 115 injured. That this large increase is chargeable almost entirely to growth in the reckless and inexperienced driving of automobiles, is shown by the fact that casualties at crossings from all other causes decreased. Eighty-five automobile accidents caused the death of 56 persons, and injury to 107 others; and 12 of the accidents resulted in 39 deaths; four caused the death of 20 persons, or an average of five for each car involved. In two of the accidents, entire families were wiped out; though in both instances the drivers lived close to the scenes of the accidents and were familiar with the layout of the railroad tracks and roads.

The company has issued a circular, from which we quote:

"As against these lives lost in three months there were no passengers killed in train accidents anywhere on the Pennsylvania Railroad System during the entire year ended May 31, last; 152,000,000 passengers were carried safely. The chief reason for this striking contrast is that locomotive enginemen are thoroughly trained in every detail of their work, and are required to demonstrate knowledge and ability to operate trains safely before being entrusted with their handling. On the other hand, the vast majority of motor car casualties are attributable to a comparatively small percentage of inexperienced and irresponsible drivers who have neither the knowledge, training or judgment required for the safe operation of such machines.

"Moreover, reckless driving of automobiles is not confined to highway crossings. Every day the newspapers report accidents caused by driving automobiles into telegraph poles, or stone walls, and by skidding, sideswiping, turning over and colliding. From this running chronicle of death and injury, the conclusion would seem warranted that what is needed at the present time is not merely a Careful Crossing Campaign, but a national campaign, carefully planned and directed against all forms of careless automobile driving. In this way possibly some impression may be made on the automobile accident record which shows 12,500 persons killed and 300,000 injured, in the United States for the year 1921."

The Accounting Department Offices of the Lake Erie & Western at Indianapolis, Ind., have been closed and the work has been combined with that of the New York, Chicago & St. Louis at Cleveland, Ohio.

The Design of Steel Freight Car Equipment*

Various Viewpoints That Must Be Considered—Importance of Limiting Speed at Impact in Switching

By John A. Pilcher
Mechanical Engineer, Norfolk & Western

THE IMPORTANCE of the proper design of modern freight car equipment to the car owners, as well as the economic interests of the country at large, cannot be overestimated. It is only within a little over 20 years that steel cars have come into general use. This development has been hastened by the increase in the price of lumber, the decrease in the price of steel and the demand for cars of greatly increased capacity. The use of steel makes it possible to build a car of any desired capacity, so far as the structure itself is concerned, the limitations upon size being only such as are placed by the clearances and strength of the roadway and other physical conditions surrounding operation.

The car constructed of wood, with the draft timber attached to the bottom of the center sills, equipped with the single-spring draft gears and the cast-iron link-and-pin drawbar, is a very resilient structure. This resilience was demonstrated by the fact that it was possible for so many years successfully to use the cast-iron drawhead. We cannot imagine the use of a cast-iron drawhead in a modern steel freight car with any expectation of having it moved any distance. This resilience of the old car was, in a measure, a protection to the lading in the car.

Steel Equipment Introduces New Condition

The introduction of steel into car construction, while it allowed of any capacity and any strength necessary, developed a rigidity in the car construction which reflected itself in local damage to the car itself, as well as the lading, and made necessary the development of the modern shock absorbers, known as friction draft gears, so that one of the greatest problems we now have in car design and upkeep is to get and maintain sufficient and proper shock absorbers and coupler attachments.

When we look about us and see the large variety of steel car designs that have been developed we can appreciate that there are many points from which the important features of the design can be viewed. The primary feature to every design is, of course, the production of a vehicle to haul the freight and produce revenue for the owner and user, but there are also various other features that have to be considered, and they present themselves in as many different phases as there are different minds working on the problem. It is my desire to point out some of the many important features that need be given consideration in the design of a steel car.

Stresses Due to Impact Complicate Problem of Design

If a railway car were subject to no other stresses than those of carrying the load the problem would be a simple one, and could be worked out on the same basis as bridges where the conditions are more or less fixed. There would then be no reasons for not reaching a proper strength of construction for the definite loading. The fact, however, is that the car has to be started, moved and stopped without there being any definite speeds of acceleration and retardation or without there being any certainty as to the character of the roadway over which it is to pass.

The design of the car needs to be studied from many points of view. Among these I will mention the following:

The Owner and User.—This involves the weight of the car itself, cost, maintenance and the possible earning capacity, based upon the cost of the investment and the cost of repairs.

The Transportation or Operating Department.—Its idea is a strong car so as to relieve it of all the burden of the supervision of yard switching crews. In this way it can cut down to a minimum the cost of switching service, which is a very large item in the cost of transportation.

The Claim Department.—It desires a car built in such a way that it will protect the lading from all possible weather conditions and be so resilient of itself that whatever is put in the car will never be damaged by any hurry-up movement in the yards.

The Car Builders.—The car builder desires a car that is very easy to build, one that can be put through the shop with the least amount of supervision; one that will allow the maximum of output in shop production. He is willing to sacrifice a great deal to these considerations.

The Manufacturers and Sellers of Specialties.—These look upon the car as a structure upon which they can hang something that they have to sell. A large duplication of cars of the same type offers a wonderful field for exploitation for the specialty man.

Car Design from the Standpoint of the Owner and User

For the owner and user the car must be constructed primarily to carry the most freight with the least deadweight, so as to bring up the revenue load and enable the car to earn the largest amount of revenue during its life. This feature can hardly be given too much prominence. Of course, like all good things, it is possible to carry it too far.

Lightness of structure does not necessarily mean weakness of structure. The car should, of course, be designed so that it will last through a reasonable period of years, or so it will not be everlastingly on the repair tracks, as a car on the repair tracks is a charge against interest and depreciation during that period without any corresponding income.

So far as the load-carrying capacity of the car is concerned, it is not a difficult matter to fix definite limits of stresses for its proper design. If the designer were given fixed definite limits of speed of acceleration and retardation of the car in its movement and definite conditions of the track over which it is to be moved, it would not be a hard matter to fix the definite requisite strength of the car in every other way. It is at this point where different interests in railroad operation clash. It is the man in charge of moving the cars who is responsible for the speeds at which the cars are brought in contact in the classification yards. His idea is that he can save in the cost of classification by rushing the car movement. He should not fail to remember that every car he damages in this way costs him money in switching charges in that he has to take the car to the repair tracks and bring it back. In addition it also costs the company the loss of the time of the car and the cost of repairs, all charges coming from the same treasury.

It is possible to construct a car and make it strong enough to stand any kind of service to which it is liable, even without having the limits fixed for this service, but if a car

*From a paper presented before the Railway Club of Pittsburgh, September 28, 1922.

should be made strong enough to stand any possible yard service it would be so heavy and so costly as to be of little value to the owner.

Impact Speeds in Switching Should Be Limited

You will readily agree that every car should be made strong enough to stand any accelerating and retarding force that can happen to it while in train service or any type of brake application, but we do not believe it should be made strong enough to stand any kind of service that can be given to it in classification yards. Certain definite limits should be placed upon the rate of acceleration and retardation in the classification yards, or rather a definite maximum speed limit at the time of contact should be set and a large amount of supervision given in the education of the men to see that these provisions are carried out.

A great many of the car details have already been standardized. Through the instrumentality of the Master Car Builder's Association and the Mechanical Section of the American Railway Association, such items as wheels, axles, brasses, boxes, brake beams, brakes, couplers and parts, etc., have been definitely agreed upon. Certain other fundamental features of the car construction affected by impact have also been agreed upon, such as the standard cross-section of center sills, the minimum size and quality of draft yokes, and other features in connection with the draft gear, as well as definite dimensions affecting the fundamentals of the design. Studies are now being made as to the standard method of assuming the loading on the car and of the maximum allowable fibre stresses under such assumptions which will be allowed in the car framing itself, as well as the truck side frames, bolsters and other parts. This will be a wonderful step forward in unifying the art of car construction. It cannot, however, result in any permanent good unless there are some limitations put upon the usage of the car in the classification yard service. We can hardly conceive of anything that cannot be damaged or destroyed if handled sufficiently roughly.

The strength of the cars has been gradually built up in its power to resist end shocks, due to over-speed impact, from the old resilient wooden car through a series of modifications of the composite cars with various strengths of metal center and draft sills until we have reached the full steel car with a minimum of 24 sq. in. cross-section of center sills, which until the recent increase to 30 sq. in. was the maximum.

Center Sills Now Stronger Than Couplers

A recent examination shows that cars constructed with the old limit of 24 sq. in. of center sills (which had been in use for several years) are sufficiently strong between the back stops to furnish reaction against which the shanks of the most modern 6 in. by 8 in. coupler can be upset. It is interesting to note that an examination of a group of such cars, 16 cars being taken just as they were reached, showed three coupler shanks upset 1 in.; two 7/8 in.; three 3/4 in.; four 1/2 in. and the rest of the group from 1/4 in. to 1/2 in. A later examination checking up these same cars indicated that one of these coupler shanks was upset as much as 1 1/4 in. From this we draw the deduction that no cars should be brought together at a speed exceeding that which will bring the draft gear solid, as any excess of such speed is nearly always liable to damage the cars, draft gears and couplers.

The old wooden cars with the wooden draft sills were all fitted up with dead-blocks of some form. Through these the final shock on the car came directly on the end of the wooden end sills to the center sills and they were resilient enough to sustain these shocks for a long time. Doing away with the dead-blocks brings the final shocks on the couplers, and with a clearance between the coupler horn and the striking face of the end sills these forces act directly upon the couplers, upsetting the shanks and driving the coupler heads back into the car and damaging the draft gears.

The damaging of the draft gears and the upsetting of the couplers, which allows the coupler head to be driven back into the car body, has made heavy repairs around the ends of the cars necessary, even though the sills are not damaged between the back stops. The general development of trouble at the end of the car has of late brought into evidence many efforts to overcome this damage by building on to the end of the sills very heavy steel striking castings against which the coupler horn and head will land without going back into the car. If these castings are made sufficiently strong they will, of course, protect the shank of the coupler and, in a measure, the draft gear, at least to the extent of not allowing them to be compressed more than the slack between the horn of the coupler and the striking plate, but it will necessarily be at the expense of the coupler head containing the movable parts.

If there is no limitation placed upon the speed of the cars at the time of impact, these heavy striking plates will simply be anvils against which the coupler heads will, in a short while, be destroyed. Already the coupler horns have been suffering.

Suggested Change in Coupler Design

If the dead-block, which was used in the days of the link-and-pin coupler and for a long time afterwards, is to be considered entirely a thing of the past, even though the danger from its use is also largely passed, because no one is allowed to go between the cars in making the coupling, would it not be a good thing if the coupler head were made with a rim all around to come against the heavy cast-wheel striking faces on the ends of the sills, rather than depending upon the horn of the coupler alone?

I am offering in this a method of distributing these heavy loads to all parts of the coupler head rather than to concentrating them on the striking horn of the present couplers, which never was originally intended to be a striking part, but simply a projection through which the lift-hook lever protrudes.

Even if we should replace the dead-blocks which, with resilient material behind them, would, in their shock absorbing capacity for heavy shocks, be equivalent to an additional draft gear, would we not still have to place some limitation on the speed at the time of impact? Protecting the cars from destruction would not protect the lading enclosed within a rigid car from serious damage.

The continual adding of material to the car adds to both the cost and weight. These very seriously reflect in the dividend of the owning and operating corporation.

Comparative Costs of Heavy and Light Cars.

I wish to illustrate just what this means by making a comparison of three groups of cars, built at the same time, coming under our observation not many years back. One group of these cars was built with the idea of increasing the revenue load to the maximum which, of course, meant keeping the deadweight to the minimum and correspondingly decreasing the cost. In connection with the design of these cars, a reasonable strength was not neglected, as they were made sufficiently strong to upset the couplers previously mentioned, and up to the present time have not developed any defects that call for extensive repairs that would in any way attract attention. The other two groups of cars are very much heavier, due to the character of the design and to the additional equipment with which they were loaded.

Considering a train of different groups of cars of 5,500 tons gross, including the cars and lading, the lighter cars have $759.10 more revenue in the train in the case of one group and $516.49 more revenue in the train in the case of the other group. Taking the cost of the train into consid-

eration, the lighter cars cost $[illegible] less than the one group and $74,212.50 less than the other group. If we allow interest and depreciation on the additional cost of 10 per cent and allow 20 round trips per year with the equipment, it means that the lighter cars had an interest and depreciation charge of $479.17 less, per trip, than one group and $371.56 less, per trip, than the other group. If we add together the difference due to the interest and depreciation and the difference in revenue per train we have a difference in one group of $1,238.77, which is 12.32 per cent of the gross revenue of the train, and in the other a difference of $888.03, or 8.62 per cent of the gross revenue of the train.

These figures are startling and show clearly that great saving to the railroads can be made by so regulating the handling of cars in classification yards that the adding on of extra material in the hope of preventing break-downs, due to over-speed impact, will not be needed. The fact that the lighter car in question was sufficiently strong between back stops to upset the shank of the latest A.R.A. coupler and strong enough to furnish the anvil against which the draft gears are being damaged, shows that the car is sufficiently strong in its present state, unless the couplers and draft gears are to be further strengthened.

Damage in Yards Responsible for Failures on Road

Is it not a fact that this over-speed impact in yards, which is upsetting the shanks of couplers and damaging the draft gears and creating in the trains a large amount of unresisted slack is the primary cause of the damage to trains in transit from the emergency brake application and the passage of long trains over humps and through dips?

It is my belief that trains of heavy cars properly equipped with modern draft gears, that have not been damaged and put out of commission or partially put out of commission by improper handling in classification yards, cannot be handled in ordinary train service in such a way as to bring about a sufficient differential in speed between the parts of the train at the time of impact to do any damage to either the equipment or the lading. I have recently been on very long, heavy special trains of new equipment, when the draft gears and attachments are in good condition, and have been impressed with the absence of these internal collisions. While these trains were equipped with special brake appliances which were being tested, I personally give credit for this admirable feature of operation to the condition of the couplers and draft gears and the absence of any great amount of unresisted slack.

This statement may lead to some difference of opinion and may open a way for considerable discussion, but I believe that practically all of the break-in-twos of trains in service when the cars are equipped with modern draft gears and connections is entirely due to damage previously done in classification yards, either to the couplers, knuckles and pins themselves, or else in the fact that the compression of the coupler shanks and damage to draft gears has developed sufficient unresisted slack so there is opportunity for a considerable internal collision in the trains during movement.

Little Gained by Further Increasing Strength of Cars

To show how little can be gained by increasing the strength of cars, we have considered the impact test made by the United States Railroad Administration on the cars on the test track at Rochester, N. Y. At this time they not only tested various types of friction draft gears, but also made impact tests of cars without any draft gears. Drawing an analogy from these to show how little can be gained by increasing the strength of the cars, I call your attention to the following:

1—Assuming a 40-ton car weighing gross 132,000 lb., with a center sill of 24 sq. in. cross-section, fitted with a draft gear that will go solid at an impact speed of four miles per hour, we find the reaction between the cars just as they go solid will be 1.6 times the weight of the car, or 211,000 lb.

2—If we consider the cars going together at 4.4 miles per hour, the force will be 3½ times the weight of the car, or 462,000 lb. With 24 sq. in. cross-section, considering only direct stresses, this will give us 19,250 lb. per sq. in. If the sill of this car were increased to 30 sq. in., and using the same fibre stress, the force of reaction would have to be 580,000 lb., which is 4.4 times the weight of the car and lading. This will represent an impact speed of 4.55 miles per hour for the same car. We could, therefore, by increasing the sill of this car from 24 to 30 sq. in., or 25 per cent, increase the impact speed of the two cars from 4.4 to 4.55 miles per hour, or .15 miles per hour, which is 3.4 per cent. These figures are given that you may see how little increased speed at time of impact is gained by a very large increase in the cross-section of sills. This gives a proportionate increase in strength and unfortunately a proportionate increase in weight. It also gives an increase in interest and depreciation charge, and a proportionate decrease in earning capacity, and nothing like a proportionate increase in impact speed. It has only a very minor effect in the decrease in the cost of car repairs.

In recent years great efforts have been made to reduce the cost of transportation by large increases in the tonnage of the trains, primarily to increase the revenue per train. To do this very large locomotives have been built. This has been largely brought about by those in charge of transportation, who also have control over the equipment in the classification yards where, according to my belief, 97 per cent of the damage to both equipment and lading is done. With more care in the handling of cars in the classification yards the expense and upkeep of equipment can be very materially decreased and the expense of the claim department materially reduced.

How far do you suppose the transportation officer would be willing to go in his efforts in the reduction of the cost of hauling freight if he could bring about a saving equivalent to as much as 10 per cent of the gross revenue of the railway company he is serving? I should think he would be willing to undertake most anything. I have shown in a previous statement as between two groups of cars—one heavy and expensive and the other lighter and correspondingly less expensive, that there is a difference amounting to as much as 12.32 per cent of the gross revenue of the train.

Protecting Against Corrosion

One of the serious features in connection with steel cars, and particularly open top steel freight cars, is corrosion. While the outside of the car can, in a measure, be protected by the use of coatings, the inside portion of the open top car is subject to the corrosive influence of the contents of the car. The dumping and handling of the loads prevent the use of protective coatings on the inside. After the car has been designed so as to carry the load and withstand the shocks of impact, it would last indefinitely, but for this corrosion.

Its final destruction can only be retarded by adding thickness to the material at certain points where corrosion is liable to be excessive, and at certain points where corrosion will weaken the structure, particularly as for instance, in the framing. It is very hard to determine just how much the designer is justified in adding at these points, because any amount added decreases the hauling capacity of the car.

It is very desirable in the construction of large open top cars for use on dumpers to use inside stakes. When the stakes are placed inside they are subject to the extra corrosion which must be allowed for in fixing their size. Shapes should be used offering the least surface for corrosion.

During recent years there has been considerable experiment

made as to the value of copper-bearing steel for the purpose of retarding corrosion, using steel of approximately .20 per cent copper. The special tests that have been conducted and observations that have been made of former steel structures built of copper-bearing metal indicate that we may have a very considerable lengthening of the life of the car by the use of copper-bearing steel.

Every car must be looked upon as a package in which merchandise is being shipped. Any increase in the cost of the package, whether it is a car or a separate package going into the car, is a charge against the transportation of that particular article. Every additional expense to the cost of these packages is an additional burden on the transportation of the article and may, in some cases, prevent its being moved at all by the railways. It is just on account of such additional charges in order to protect freight that the automobiles on highways are cutting so deeply into the revenue of the railways, alongside of which they operate. The high cost of cars and the high cost of packages can kill transportation just as easily as high freight rates, because all three go together to make up the cost of transportation.

The designer, above all things, wishes to produce a car that has a large margin over its light weight for lading and for earning revenue, but to get this there must be some limitation put on the speed at which cars are brought together, and this should not be in excess of that which will bring the draft gears solid.

The Transportation Point of View

I have already touched upon this point of view in the preceding paragraphs. The transportation man always wishes a car designed so strong that it does not have to be repaired and one that can be handled without undue care. The transportation people are responsible for keeping down the cost of handling, but it is also their method of handling that, to a large extent, brings about the necessity for repairs. If any compromise is to be arrived at as between the cost of handling and the cost incident to indifferent handling, and the cost of interest and depreciation and loss of revenue in the train due to heavy construction, some definite limitation of speed at the time of impact will have to be fixed, otherwise the designer has nothing definite to which to work and will continue to build cars, making each one stronger than the other. This tendency to make the parts that break a little bit stronger has resulted in each new design being built coming out a little stronger and having power to inflict damage upon the older cars. Such new cars only await their turn to be smashed up by cars of a still heavier design and less carrying capacity coming out later. It is to be hoped that a campaign of education will be brought about to prevent any cars being put together at a greater speed than that which will bring the draft gears solid. Unfortunately there are a great many cars equipped only with twin-spring draft gears, which on the 40-ton loaded car would go solid with an impact speed just a little less than two miles an hour. There are a large number of such cars in use which must be considered in any study of this important phase of the problem.

It would be a good study for the transportation man to find out what percentage of switching movement he would save in his yards if he did not have to set aside damaged cars. Would he not be very much like the telephone operator who is in such a hurry that she gives the wrong number two out of five times, and as a consequence, gets so many calls that she cannot reduce her speed and so continues to make errors that are not only a source of annoyance to her but more so to her patrons? I cannot help thinking that if more time is taken in the handling of cars in switching there will be so much less time given to cutting out damaged cars that there would be little or no increase in the cost of the service.

Point of View of the Claim Department

The stronger and stiffer the car is designed and the heavier, the more liable it is to go solid on the draft gears, and the more liable it is to bring about damage claims due to the rigidity of the car itself. Damage claims, while very small in proportion to the cost of the car repairs, bring about a great deal of friction with outside patrons and develop dissatisfaction which is often of greater moment than the actual cost. The real cure for this is the educational campaign against over-speed impact.

The Car Builder's Point of View

The car builder, of course, desires a car so designed that it is easy to build. This is a consideration every designer should have in mind, since the simplicity in construction reflects itself in the price of the car to the owner and user, and in the cost of transportation, in that it reduces the interest and depreciation charge against the equipment. Too much study cannot be put in the design in order to increase the facilities for building along with decreased weight.

I recently had my attention called to two cars of the same weights and approximately the same number of rivets to drive, and was told by one builder that with the same working force, 25 cars of one design could be delivered from the shop a day as against 20 of the other design. This is mentioned to show the value of giving attention to this feature of the design. Particularly should attention be given to the possibilities of using machine as against hand-driven rivets, not only to save in the cost of rivet driving, but in getting better driven rivets.

The Specialty Man's Point of View

These men who have felt themselves called upon to develop and sell specialties for railway cars have taken a great part in the constructive development of the car-building industry of the country. They are to be highly commended for their efforts. The car building industry, on account of the large duplication of the same design, is a wonderful field for the efforts of such men. There are a great number of these specialties which are exceedingly useful and they should be used, because they are helps in reducing the weight, reducing the cost and reducing the maintenance of the cars. Great care, however, must be taken in selecting them, to be sure that the designer is not being muddled by having the advantages of the specialty overstressed to the neglect of its final value as an economic device, in comparison with others, when the cost is taken into consideration. It requires a large amount of careful analysis not to fool one's self as to the real value of these devices when they are presented, as they often are, in such a pleasing and convincing manner.

In general I do not believe it is possible to go to too much expense in the preparation of the design for steel freight equipment where there is such a large duplication from the same design. This is true for an individual company purchasing any large number of cars for their own use. It is true in a much larger proportion for the railways of this country, as a whole, when they can standardize cars for use on all railways. I have always felt that the American Railway Association, Mechanical Section, could not do better than to organize an engineering department for this purpose.

Every car for which a design is to be prepared should not have simply one design furnished and passed upon, but a dozen or more qualified designers should each work up a design following his own bent or views of construction, each along different lines, each bringing his design to completion, making all of the necessary diagrams, showing methods of loading, weights, details of construction, estimated costs, and then these designers should themselves

select either the best two or three to be finally passed upon, or the best types of construction that can be put together, considering weight, cost of construction, relative strength, ease of construction and other pertinent features, and in this way get the advantage of the very best that it is possible to produce to be presented to the country at large. The engineering cost of such a method would be insignificant compared to the advantages to be gained.

The final results will be that the car builders themselves will not find it necessary to maintain such large engineering forces, the cost of which enters into their overhead, which naturally has finally to be passed on to the purchaser and user of the cars.

Strike Situation Clears

That the shopmen's strike is practically over is demonstrated by the number of roads with which agreements have been reached, the success of the other roads in restoring normal shop operation, the marked decline in the number of cases of violence reported and the fact that the Car Service division of the American Railway Association has notified the railroad companies that they no longer need honor the commission's request for daily information as to the number of new employees taken on in place of strikers. The latest reports indicate that about 376,417 employees have been engaged by the railroads, which is approximately 90 per cent of the normal force. The majority of the old shopmen are back and the resumption of normal operations is beginning to be seen in the decline in bad order equipment.

Eighty-two railroads, it is claimed by Mr. Jewell, have signed the so-called "Willard-Jewell" agreement. These include the 19 roads which, with their subsidiaries, were among the earliest of the roads to reach a peace settlement. The following is a list of the roads, furnished by the Railway Employees' Department of the American Federation of Labor:

The Ann Arbor; the Alabama Great Southern; the Baltimore & Ohio, the Baltimore & Ohio-Chicago Terminal; the Bellingham & Northern; the Belt Railway of Chicago; the Boston & Albany; the Buffalo, Rochester & Pittsburgh; the Buffalo & Susquehanna; the Buffalo Creek; the Chicago, Milwaukee & St. Paul; the Chicago & North Western; the Chicago, St. Paul, Minneapolis & Omaha; the Chicago, Indianapolis & Louisville; the Chicago, Kalamazoo & Saginaw; the Chicago, Peoria & St. Louis; the Cincinnati Northern; the Coal & Coke; the Chesapeake & Ohio; the Chesterfield & Lancaster; the Cleveland, Cincinnati, Chicago & St. Louis; the Cincinnati, New Orleans & Texas Pacific; the Cincinnati, Burnside & Cumberland; the Dayton Union; the Davenport, Rock Island and North Western; the Duluth, Winnipeg & Pacific; the Des Moines Union; the Elgin, Joliet & Eastern; the Erie, Evansville & Indianapolis; the Fort Smith & Western; the Georgia, Southern & Florida; the Green Bay & Western; the Gallatin Valley; the Harriman & Northwestern; the Kanawha & Michigan; the Kanawha & West Virginia; the Kankakee & Seneca; the Lake Erie & Western; the Lake Superior & Ishpeming; the Louisiana Railroad & Navigation Co.; the Michigan Central; the Mobile & Ohio; the Missouri Valley & Blair Ry & Bridge Co.; the Macon, Dublin & Savannah; the Milwaukee Terminal Co.; the Muncie Belt; the Minnesota & International; the New York Central; the New Orleans & North Eastern; the Northern Alabama; the New Jersey & New York; the New Orleans Public Belt; the New York, Susquehanna & Western; the Pacific Railroad; the Pittsburgh & Lake Erie; the Pierre & Fort Pierre Bridge; the Pierre, Rapid City & North Western; the Pittsburgh & West Virginia; the Puget Sound & Willapa Harbor; the Seaboard Air Line; the Seattle, Port Angeles & Western; the Sandy Valley & Elkhorn; the Sharpsville; the Staten Island Rapid Transit Co.; the St. Paul Bridge & Terminal Co.; the San Antonio & Aransas Pass; the Texas Midland, the Tacoma Eastern; the Toledo & Ohio Central; the Tennessee Central; the Toledo Terminal; the Uintah; the Western Pacific; the Wyoming & North Western; the Wilkes-Barre & Eastern; the Zanesville & Western, and the Chicago & Western Indiana.

Readjustments both of forces and wages have occurred during the past week. The Chicago, Burlington & Quincy decided to reduce its shop forces at Plattsmouth, Neb., by 40 per cent, discontinuing the brass foundry and the freight car department, with the exception of the steel car shops and cutting down its planing mill and lumber yard forces. Increased wages have been granted the Great Northern shop workers through negotiations between the management and delegates who perfected a new system organization of shop workers. The scale of wages is higher than that established by the Railroad Labor Board and the new working rules, it is declared by the delegates, are more favorable than those prevailing previously. An increase in pay has also been granted to all signalmen including foremen, by the Chicago & Alton. The increases range from one to five cents an hour with the proviso that the men will purchase their own motor cars.

Violence was reported at Belle Plaine, Iowa, where several striking shopmen were arrested by federal authorities for violating the Daugherty injunction and at St. Louis, Mo., where a bomb was thrown at the residence of a mechanical superintendent of the Missouri Pacific.

The Erie last week reached an agreement with representatives of the striking shopmen which brought the strike to an end on that road. The details of the agreement were not made public, but it is rumored that they differ considerably from the Willard-Jewell plan of settlement. Strikers have been returning to work, under this agreement, all during the week.

Reports from the anthracite mining region of Pennsylvania indicate that the striking shopmen on some of the anthracite roads are endeavoring to interest the miners and municipal officials in their cause. Indeed, some of the reports stated that mayors of some of the large anthracite cities proposed calling upon officers of the anthracite carriers to urge them to reinstate the strikers. The facts of the case are, however, that miners and public officials have taken little interest in this move. It has been a shop crafts' proposition from start to finish and there seems little likelihood that there is any considerable sentiment on the part of anthracite miners to take any vigorous steps to aid the cause of striking shopmen. There is, of course, considerable congestion of traffic in the anthracite region but little of this can be charged definitely to the shopmen's strike. The roads are moving a heavy traffic of anthracite out of this region every day and some congestion may under such circumstances reasonably be expected.

The shopmen's strike is now so nearly over that the railroad companies were notified on September 27 by the Car Service Division of the American Railway Association that they need no longer honor its request for daily information as to the number of new employees taken on in place of the strikers. On Tuesday, September 26, the figures filed with the Car Service Division showed that the railroads reporting had approximately 363,417 employees engaged in the maintenance of cars and locomotives. Adding to this approximately 13,000 employees for some 50 non-reporting roads, gives a total of approximately 376,417 employees or approximately 90 per cent of a normal force. Starting on July 10 with 155,685 employees, the railroads up to September 26 had added 220,732 employees. Of these, approximately 71,417 have been added since September 1.

Tentative Valuation of Big Four

WASHINGTON, D. C.

THE INTERSTATE COMMERCE COMMISSION on September 28 made public its tentative report on the valuation of the properties of the Cleveland, Cincinnati, Chicago & St. Louis, including also its subsidiaries, the Vernon, Greensburg & Rushville; the Columbus, Hope & Greensburg; the Cincinnati, Lafayette & Chicago; the Peoria & Eastern; Saline Valley; the Cincinnati, Sandusky & Cleveland; the Findlay Belt, and Mount Gilead Short Line, as of June 30, 1915. The commission reports the final value of the property owned as $139,620,322 and of the property used, included leased lines and joint facilities, as $164,163,042.

The total outstanding capitalization of the Cleveland, Cincinnati, Chicago & St. Louis as of the valuation date is reported as $158,947,021. While this is in excess of the final value found for the owned property, it is less than that for the property used. The leased lines which are included in the property used have a total capitalization of about $41,000,000, of which approximately $18,000,000 is owned by the carrier. The owned property, which is given a final value of $139,620,322, includes 1,687 miles of first main track and 3,184 miles of all tracks, while the used property includes 2,221 miles of first main track and 3,946 miles of all tracks. The investment in road and equipment, including land, was stated on the books of the carrier to be $144,375,812. If certain readjustments were made, as detailed in an appendix, the report says, this would be increased to $149,170,011. Entering into this is an amount of $60,333,426 which represents the par value of securities issued or assumed by the carrier, the money value of which at the time of entry is not known and cannot be determined. The report says that the original cost to date of all the common carrier property cannot be ascertained as the necessary details are not shown in the accounting records.

The cost of reproduction new of common carrier property other than land owned is given as $142,369,120 and that for the property used as $165,578,068. The cost of reproduction less depreciation is given as $112,516,329 for the property owned, and $130,580,201 for the property used. The carrier also owned 24,136 acres of land, which is given a present value of $15,486,414. The land used, amounting to 30,378 acres, is given a present value of $20,851,832. Non-carrier lands of a present value of $3,502,837 are also reported and the carrier had investments in other companies and notes of individuals and miscellaneous investments having an aggregate par value of $42,758,486 and a record book value stated as the net investment of the carrier of $19,564,875. The final value stated includes $5,000,969 on account of working capital, including materials and supplies.

The commission has also issued tentative valuations of a number of smaller roads giving the final value as follows:

	Owned	Used
Augusta Southern, 1916	$919,976	$922,190
Barnegat, 1916	86,282	91,782
Durham Union Station, 1916	101,644	160,259
Amador Central, 1916	361,456	361,584
Hillsboro & Northeastern, 1917	96,395	.....
Due West, 1916	28,500	37,000
Bingham & Garfield, 1916	5,894,183	5,830,443
Beaver, Meade & Englewood, 1918	75,000	.....
Laurel Fork, 1916	366,396	.....
Kentucky Midland, 1917	214,455	.....
Lacrosse & Southeastern, 1917	640,581	.....
Little River, 1916	226,961	191,961
Manchester & Oneida, 1916	121,415	121,607
Muscatine, Burlington & Southern, 1918	846,095	.....
Mountain Central, 1917	58,005	.....
Moscow, Camden & San Augustine, 1918	76,456	.....
Mascot & Western, 1917	133,717	180,067
Philadelphia & Beach Haven, 1916	250,000	.....
Nevada Copper Belt, 1917	721,112	724,112
Stanley Merrill & Phillips, 1916	571,789	.....
Willamette Valley & Coast, 1917	95,033	.....

Graphic Presentation of Railway Earnings and Expenditures

THE Bureau of Railway Economics has prepared bar diagrams showing railway operating revenue and how it was expended and distribution of each dollar of operating revenues during 1921. Similar bar diagrams for years back to and including 1916 are given for the purpose of comparison. These bar diagrams are reproduced on the opposite page and the data from which they were drawn are given in the table below. In spite of the unfavorable traffic conditions of 1921 it is to be noted that return on investment, the measure of the success of the railways from a business point of view was much greater in 1921 than in 1920 which was a banner year as far as traffic is concerned. The diagrams make this and similar comparisons easy.

STATISTICS UPON WHICH CHARTS ON OPPOSITE PAGE ARE BASED

Item	1916	1917	1918	1919	1920	1921
Total operating revenues	$3,596,865,766	$4,014,142,747	$4,880,953,480	$5,144,795,154	$6,178,438,459	$6,516,556,462
Labor (salaries and wages) *a*	1,365,776,046	1,617,718,392	2,430,846,416	2,644,109,442	3,424,075,109	2,585,329,497
Fuel (locomotive)	250,544,862	393,929,538	560,225,205	474,174,792	674,836,361	523,724,146
Loss and damage, injuries to persons, and insurance	71,175,856	91,396,709	110,688,906	154,408,092	219,405,759	161,199,699
Depreciation and retirements	119,785,157	115,404,686	119,233,705	126,292,105	144,046,781	156,372,133
Material, supplies and miscellaneous	550,913,977	611,575,880	821,687,786	1,001,647,973	1,366,538,753	1,138,224,388
Taxes	157,113,372	213,920,095	223,175,379	232,601,396	272,061,453	275,883,596
Hire of equipment and joint facility rents	41,471,979	36,128,668	36,527,480	56,576,401	60,247,341	75,276,779
Net ry. operating income (return on investment)	1,040,084,517	934,068,770	638,568,603	454,984,953	17,226,003	600,546,224
Distribution expressed in cents per dollar of Gross Revenue						
Total operating revenues	100.0	100.0	100.0	100.0	100.0	100.0
Labor (salaries and wages) *a*	38.0	40.3	49.8	51.4	55.4	46.9
Fuel (locomotive)	7.0	9.8	10.1	9.2	10.9	9.5
Loss and damage, injuries to persons, and insurance	2.0	2.3	2.3	3.0	3.6	2.9
Depreciation and retirements	3.3	2.9	2.4	2.5	2.3	2.8
Material, supplies and miscellaneous	15.3	15.2	16.8	19.5	22.1	20.6
Taxes	4.4	5.3	4.6	4.5	4.4	5.0
Hire of equipment and joint facility rents	1.1	0.9	0.7	1.1	1.0	1.4
Net ry. operating income (return on investment)	28.9	23.3	13.1	8.8	0.3	10.9

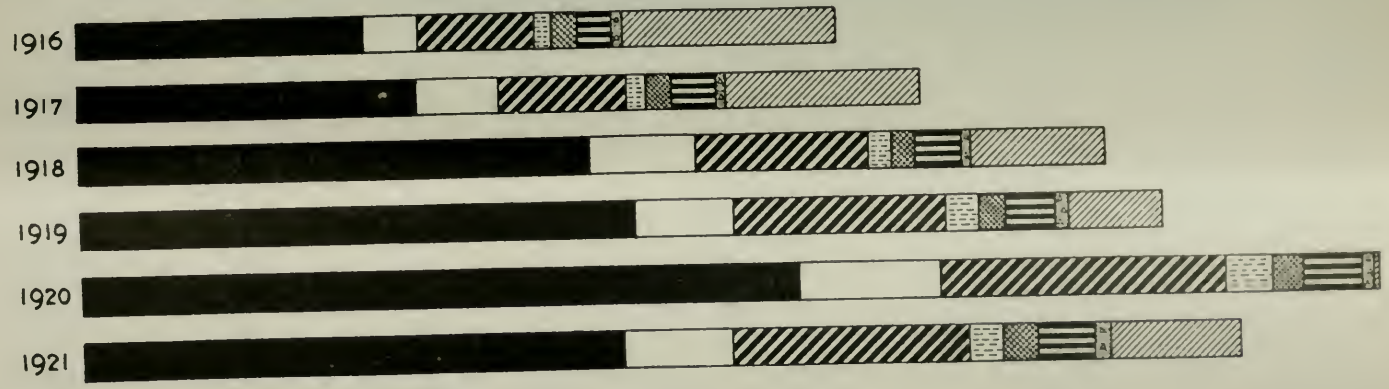
a Labor expenditures do not include that portion of the pay roll chargeable to *Capital Account*.

NOTE—Data for the years 1918, 1919, and 1920, represent the combined results of the Federal and Corporate operations of the Class I roads under Federal Control, also data for Class I roads not under Federal Control, but do not take into account the general administrative expenses of the U. S. Railroad Administration. Switching and terminal companies are excluded from statement throughout.

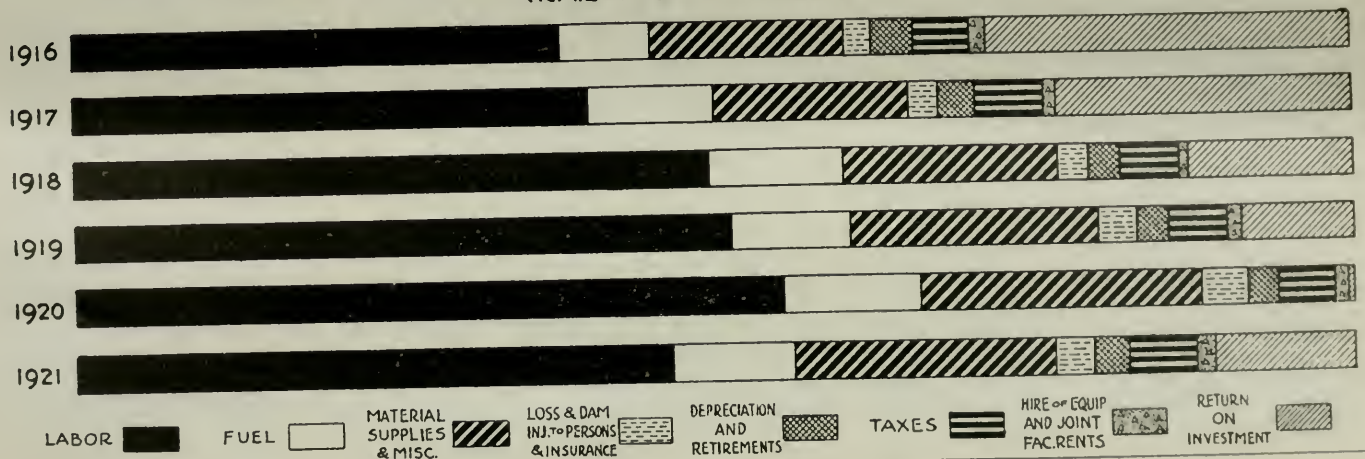
Bureau of Railway Economics.

Washington, D. C.,
August, 1922.

RAILWAY OPERATING REVENUE AND HOW IT WAS EXPENDED, 1916-1921
(RAILWAYS OF CLASS I)



DISTRIBUTION OF EACH DOLLAR OF RAILWAY OPERATING REVENUE, 1916-1921
(RAILWAYS OF CLASS I)



Accident Bulletin No. 82—Annual Report, 1921

THE INTERSTATE Commerce Commission has issued Accident Bulletin No. 82, containing the record of collisions, derailments and other accidents on the railroads of the United States for the last quarter of 1921 and also for the 12 months ending with December. The total number of casualties shown in the annual tables is 126,681; made up of 5,996 killed and 120,685 injured. The principal totals making up this aggregate are shown in our double column table, with comparisons for the preceding three years. In the first line of this table, the most important from a passenger standpoint, there is no marked change as compared with the preceding two years except that in 1921 the number of passengers injured was about 44 per cent less than in 1920. The number of employees killed in train accidents and train service accidents shows a diminution of 48 per cent, due, in large measure, no doubt, to the smaller volume of business done in 1921 and secondly, to the fact that with a smaller volume of business, the competency and efficiency of the individual employees is higher.

The total number of train accidents in 1921 was 21,251, or about 41 per cent less than the total in 1920. The principal items in these tables for the two years are as follows:

TOTAL NUMBER OF TRAIN ACCIDENTS—TWO YEARS

	1921				1920			
	No.	Damage	Killed	Injured	No.	Damage	Killed	Injured
Collisions	5,102	$4,657,290	130	1,839	10,110	$9,078,110	253	3,840
Derailments	13,615	16,51[illegible],440	132	1,854	22,477	[illegible],987,790	194	3,549
Other train accidents	2,534	1,577,520	47	231	3,726	2,063,960	89	743
	21,251	$[illegible],753,350	309	3,924	36,313	$34,129,860	536	8,132

The bulletin contains the usual full and detailed analyses of all the tables in the record, with some of the comparisons carried back 30 years and more. About 20 pages are occupied with tables showing totals of casualties on individual roads. Of the persons killed or injured at highway grade crossings (1,705 killed and 4,868 injured) 80 per cent were occupants of automobiles. This figure has gradually increased from the year 1917, when it was 59 per cent.

The number of passenger train enginemen killed in train and train-service accidents, 37, is equal to 2.86 per thousand in service, the lowest ratio in five years. This is only half as bad a ratio as that recorded for 1920 (69 killed; 5.27 per 1,000) but now, as in the earlier year, it is more than twice as bad as the average for freight enginemen (32 killed; 1.13 per 1,000). Evidently the speed of trains is an important element in the degree of safety enjoyed by locomotive enginemen. The ratios for firemen are about the same as those for enginemen.

In the year now covered, the number of train accidents is smaller than it would have been under former regulations, a rule having been adopted that when a person is killed or injured in a train accident which damages railroad property not more than $150 the casualty will be classed as caused in a train-service accident. A collision, for example, is not a reportable collision if the damage to cars, engine and roadway amounts to less than $150.01.

CASUALTIES TO PERSONS IN RAILROAD ACCIDENTS—FOUR YEARS

	1921		1920		1919		1918	
Passengers—	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
In train accidents	110	2,601	95	4,631	110	4,549	286	4,655
In train service accidents	116	3,543	169	3,825	191	3,598	233	3,427
Total	226	6,144	264	8,456	301	8,147	519	8,082
Employees on Duty—								
In train accidents	195	1,296	422	3,385	359	2,955	547	4,179
In train service accidents	901	27,228	1,685	43,535	1,334	33,325	2,212	42,782
Total	1,096	28,524	2,107	46,920	1,693	36,280	2,759	46,961
Total passengers and employees on duty	1,322	34,668	2,371	55,376	1,994	44,427	3,278	55,043
Employees not on duty	41	223	91	314	66	321	169	595
Other Persons, not Trespassing—								
In train accidents	3	16	11	86	9	61	117	433
In train service accidents*	1,740	5,346	1,856	5,642	1,873	5,134	1,878	5,268
Total	1,743	5,362	1,867	5,728	1,882	5,195	1,995	5,701
Trespassers†—								
In train accidents	49	141	48	77	32	63	39	67
In train service accidents	2,432	2,930	2,118	2,291	2,521	2,595	3,216	2,738
Total	2,481	3,071	2,166	2,368	2,553	2,658	3,255	2,805
Total of the above	5,587	43,324	6,495	63,786	6,495	52,601	8,697	64,144
Non-train accidents	409	77,361	463	104,522	483	96,452	589	110,431
Grand total	5,996	120,685	6,958	168,308	6,978	149,053	9,286	174,575

*Includes persons struck by trains at highway crossings, of whom, in 1921, there were 1,702 killed, including 106 classed as trespassers. The injured numbered 4,818. The total killed in the year preceding was 1,790.
†A small percentage of the persons classed as trespassers represents employees.

Railroads Urged to Concentrate Efforts on Coal Traffic

WASHINGTON, D. C.

AN URGENT APPEAL to concentrate on a drive for the expedition of coal movements, especially during the month of October, has been addressed by Fuel Distributor Spens to the executives of the various coal-carrying railroads.

"I appreciate fully the current conditions on the railroads; the ravages of the strike, and the fact that today the offerings of tonnage of all character are large, and the further fact that, in spite of these circumstances the carriers, in the aggregate, are making a splendid showing in the transportation of coal," says Mr. Spens. "In these circumstances I am somewhat loath to suggest the possibility of even better performance.

"Due to the dual strikes there is, of course, a dearth of coal. Consumers, domestic as well as industrial, have been urged only to purchase coal for immediate requirements. Current transportation is adequate for current needs, but not sufficient to permit of reserves. An early cold snap would play havoc with consumers, as well as with the power of the railroads. There might be actual distress. It has been suggested that, perhaps, there should be a temporary cessation in transportation of certain other classes of traffic, that more equipment and power might be applied to coal. In my judg-

ment, it would be regrettable if any action in that direction should become necessary.

"Are you willing to see if something can possibly be done to increase the coal movement over your lines?

"As suggested by the President, we are extremely anxious to make October the banner month. A personal word directly from you to each member of your operating staff, down, if you will, at least to the division superintendent that coal shall, so far as practicable, be moved through to destination or junctions with connecting lines, without set-outs, and that empties shall not be delayed at terminals or junctions, but shall be promptly returned to mines will, I am confident, accomplish all that could be reasonably expected. Your traffic department could undoubtedly also be of great assistance by urging prompt unloading by consignees.

"Extraordinary movement of coal, loads and empties, during the next few weeks, in view of the heavy traffic in all commodities, will probably tend to increase the cost of handling, but I believe this additional cost might prove to be a good investment as compared with a much greater cost that might be incurred in the event it should become necessary to adopt more drastic measures to care for the situation.

"Very possibly to accomplish increased handlings of coal, delays to other traffic may occur, but this is contemplated, or at least should be expected, under the existing orders of the Interstate Commerce Commission which provides priority in transportation on coal, equal only with food and feed and some minor public necessities."

The first meeting of the Advisory Committee on Transportation, recently appointed by the American Railway Association at the request of Federal Fuel Distributor Spens, was to be held in Washington on Thursday. At this meeting the committee, which is headed by Daniel Willard, president of the Baltimore & Ohio, was expected to formulate the practical details for accomplishing the heaviest movement of coal possible during the month of October.

In response to an inquiry from the Interstate Commerce Commission regarding the advisability of modification of the reconsignment practices on shipments of coal in open-top cars, Fuel Distributor Spens has declared that, unless there should be an unfavorable change in the present situation as to reconsigning, the existing rules should, in his opinion, be permitted to stand without revision. "It is true," he said, "that at about the time the coal strike was ended there was at certain terminals quite a quantity of coal on hand awaiting disposition, but this was due largely, I think, to the fact that this coal had been purchased at high prices, with the result that the breaking of the strike made it difficult for the operators or jobbers to find customers. Today there appears to be an exceedingly small percentage of the total loading of cars held for reconsignment, approximately one-third of one per cent, and I am inclined to the opinion that, with the big demand for coal that now exists and with the instructions that you have extant that consignees must unload within 24 hours or be embargoed, that we need not, just at this time, have much apprehension that the privilege will be dangerously abused. As a matter of fact, in many instances it perhaps works toward a reduction in prices, and likewise in many instances, actually makes for a more prompt disposition of the coal and release of the equipment than might otherwise be the case. In the event the views of the Interstate Commerce Commission should coincide with my own, this department can, perhaps, be of some assistance by cautioning handlers of coal that unless cars are promptly released it might become necessary for us to recommend to the Interstate Commerce Commission the cancellation of the present privileges, or drastic restrictions."

The 15 naval officers who will act as field representatives of the federal fuel distributor in as many districts into which the territory east of the Mississippi river has been divided for administrative purposes connected with coal distribution, have left Washington and began their duties at their new stations on October 2. The points to which these officers have been assigned are as follows: St Louis, Mo.; Cincinnati, Ohio; Knoxville, Tenn.; Pittsburgh, Pa.; Columbus, Ohio; Louisville, Ky.; Evansville, Ind.; Birmingham, Ala.; Springfield, Ill.; Charleston, W. Va.; Fairmont, W. Va.; Norton, Va.; Bluefield, W. Va.; Altoona, Pa.; and Greensburg, Pa. These officers have been instructed to keep Federal Fuel Distributor Spens informed daily relative to local conditions as to the production and distribution of coal and the prices obtained for coal and other fuels in their respective districts. They are expected to watch closely for acute fuel shortages that may develop, to keep posted as to markets to which coal is moving, to note carefully the transportation conditions prevailing, and to collect information as to whether prices obtained for fuel are justified.

In the south and middle west, bituminous lump coal is the principal domestic fuel, and the field representatives have been instructed to watch carefully the prices and distribution of this grade or size of coal. The principal factor in the coal situation, outside of the distribution, or domestic consumption, existing at the present time is the charge being made by the operators and the delivered price to the consumers. In order that an accurate check may be kept on this situation, the district representatives of the federal fuel distributor have been instructed to make an analysis of the prices being received on contract and spot coal and the general markets in which coal from each of the producing districts is flowing.

Field representatives are expected to keep in close touch with the various trade associations, the officials of coal-carrying railroads, and the chambers of commerce in their representative territories. Periodical visits are to be made to various points in the coal producing districts to ascertain the local conditions. As the car supply situation at coal mines is of particular importance, field representatives will watch particularly the effect of reduced car supply upon the cost of producing coal.

Data regarding the distribution and marketing of coal consumed within the state in which it is mined are desired by the federal fuel distributor as being essential to the proper distribution of coal moving across state lines. Information is needed as to the prices obtained for the first-named class of coal because of the possibility of its being reconsigned to points outside of the state and being resold.

In cases where the coal produced by a mine is sold exclusively through a marketing agency located in an entirely different territory, the price data desired will be arrived at through sales reports made to the mine operator by the selling agent, the cost of transportation being deducted from the sales price in order to determine an approximate price at mine.

A statement of the stocks of coal on hand on the docks of Lake Superior ports on September 15, illustrates vividly the difference in conditions prevailing in that region this year and last. On the Duluth-Superior docks there were on hand 6,786 tons of anthracite and 269,951 tons of bituminous coal compared with stocks of 826,436 tons of anthracite and 5,618,948 tons of bituminous on these docks in September, 1921. On the Ashland-Washburn (Wisconsin) docks 877 tons of anthracite and 44,177 tons of bituminous coal were on hand September 15 of this year as against 22,619 tons of anthracite and 238,923 tons of bituminous on hand a year ago. From these docks, coal is supplied to the states of Minnesota, Wisconsin, North and South Dakota and Iowa. On upper Lake Michigan docks, there were on hand September 1 of this year 49,102 tons of anthracite and 158,978 tons of bituminous compared with stocks of 502,921 tons of anthracite and 2,162,149 tons of bituminous on these docks on October 1 of last year.

Since these figures were compiled heavy shipments of coal

have been received at these docks. The estimated dumping of coal at lower Lake Erie ports Saturday and Sunday for trans-shipment to upper lake ports is 6,555 cars, which would make a total of 1,200,000 tons for the week. On Saturday, September 30, a total of 22,788 cars of coal were on hand at Lake Erie ports or in transit within 48 hours.

Priority orders for the movement of coal are being employed only rarely. The federal fuel distributor is asking the Interstate Commerce Commission to issue such orders only in cases of real distress where it is impossible to relieve an acute fuel situation by any other means.

Assurances of cordial co-operation in the execution of measures deemed necessary to insure an equitable distribution of coal in the present emergency are being received from the governors and fuel administrators of the various states.

Mr. Spens has received inquiries from the diplomatic agents of certain foreign countries relative to the policy to be pursued in providing bunker coal in American ports for vessels sailing under foreign flags. Mr. Spens has informed these inquirers that, while it is expected to make the best provision possible for bunker coal supplies it is strongly urged, in view of the fuel emergency prevailing in the United States, that foreign-owned vessels take on all coal supplies possible to obtain at foreign ports. For the present, such vessels will be expected to stow in American ports coal supplies sufficient only to provide for reaching the next port.

Freight Car Loading

WASHINGTON, D. C.

THE NUMBER OF CARS loaded with revenue freight showed another large increase during the week ending September 23 and the figures are rapidly approaching the high record set in 1920. The total for the week was 973,291 as compared with 873,641 in the corresponding week of last year and 1,008,109 in the corresponding week of 1920. This was an increase of 27,372 over the week before, in and merchandise, l.c.l., showed increases as compared with the preceding week, while increases as compared with the corresponding week of 1920 were shown in grain and grain products, livestock, merchandise and miscellaneous. The summary as compiled by the Car Service Division of the American Railway Association given in the table.

The car shortage for the period September 15 to 23 was 107,666, which included 55,827 box cars and 32,148 coal cars. The surplus was reduced to 11,292, including 1,338 box cars and 7,018 coal cars. During the corresponding week of 1920 the car shortage was only 89,947 but in that year the shortage came earlier and reached its high point during the week ended August 31, when it was 147,309.

The car shortage for the period September 8 to 15 averaged 85,906 cars, including 26,000 coal cars and 46,128 box cars. For the same period the surplus was reduced to 22,969, including only 1,831 box cars and 17,614 coal cars.

The percentage of locomotives out of service for repairs requiring over 24 hours increased from 22.6 on August 1 and 23.8 on August 15 to 25.3 on September 1, according to reports just issued by the Car Service Division of the American Railway Association. The percentage out of service for repairs requiring less than 24 hours was the same on September 1 as on August 1, 5.6 per cent, but less than on August 15, when it was 5.7. The number of serviceable locomotives was 44,501 on September 1 as compared with 46,195 on August 1 and the number of serviceable locomotives stored was 2,842 as compared with 4,939. The number requiring over 24 hours repairs was 14,505 and the number requiring less than 24 hours was 3,573.

Fewer freight cars were in need of repairs on September 15 than on either July 1 this year, when the shopmen's strike began, or on September 15 last year, when there was no strike, according to reports compiled by the Car Service Division. Freight cars in need of repairs on September 15 this year totaled 304,548, or 13.4 per cent of the cars on line. This was a decrease of 20,035 cars compared with July 1, when the total was 324,583 cars or 14.3 per cent of

REVENUE FREIGHT LOADED. SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, SEPTEMBER 23, 1922

Districts	Year	Grain and Grain Products	Live Stock	Coal	Coke	Forest Products	Ore	Mdse L. C. L.	Miscellaneous	Total Revenue Freight Loaded: This Year 1922	Corresponding Year 1921	Corresponding Year 1920
Eastern	1922	7,868	3,334	57,123	1,612	6,053	4,832	65,177	96,898	242,887	....	....
	1921	9,801	3,278	44,436	1,358	4,616	2,208	63,973	83,039	.....	211,709	249,605
Allegheny	1922	3,068	3,350	56,054	4,114	3,466	9,359	50,514	78,387	208,312	....	....
	1921	2,849	3,061	46,740	2,254	2,806	6,242	47,463	58,678	.....	170,093	213,151
Pocahontas	1922	250	386	16,263	192	1,382	35	5,039	3,270	26,817	....	....
	1921	287	447	20,687	170	1,314	171	5,674	4,054	.....	32,804	39,073
Southern	1922	3,548	2,577	20,059	799	12,737	1,128	37,451	40,824	124,123	....	....
	1921	3,998	2,222	21,718	340	15,104	362	39,640	40,431	.....	123,815	130,470
Northwestern	1922	19,432	9,115	9,195	1,412	15,942	31,785	28,706	38,795	154,472	....	....
	1921	14,003	8,575	10,447	552	11,603	19,744	28,589	36,154	.....	130,587	168,073
Central West	1922	13,587	14,559	1,723	397	7,325	1,095	31,259	55,646	147,491	....	....
	1921	16,079	12,178	21,448	177	6,427	753	32,488	47,689	.....	137,235	140,451
Southwestern	1922	4,626	3,575	7,479	145	6,948	463	15,135	30,818	69,189	....	....
	1921	4,089	3,008	4,680	240	6,498	815	15,897	31,751	.....	67,398	67,286
Total Western Districts	1922	37,645	27,249	38,397	1,954	30,215	34,243	76,190	125,259	371,152	....	....
	1921	35,971	23,761	36,575	969	24,524	21,352	76,974	115,094	.....	335,220	375,810
Total All Roads	1922	50,379	36,896	187,896	8,671	58,853	49,587	234,371	344,638	973,291	....	....
	1921	52,906	32,760	170,156	5,091	48,364	30,335	232,724	301,296	.....	873,641	.....
	1920	44,769	33,474	115,433	15,648	63,525	83,059	209,606	342,645	.....	.....	1,008,109
Increase Compared	1921		4,127	17,740	3,580	10,489	19,252	1,647	43,341	99,650	.....	.....
Decrease Compared	1921	2,527	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Increase Compared	1920	5,610	3,422	.....	.....	.....	.....	24,765	1,993	.....	.....	.....
Decrease Compared	1920	.....	.....	7,537	6,977	4,672	33,472	.....	.....	34,818	.....	.....
Week Ended—												
September 16	1922	51,379	36,896	187,896	8,671	58,853	49,587	234,371	344,638	973,291	873,641	1,008,109
September 16	1921	52,000	34,979	173,241	8,188	57,371	53,793	234,513	333,294	945,919	852,552	991,166
September 9	1921	47,730	29,512	139,570	8,418	51,906	53,833	203,666	298,167	833,744	749,555	883,415
September 1	1921	51,019	31,847	149,487	8,389	58,706	63,351	33,550	333,746	931,598	831,288	961,633
August 26	1922	54,562	32,046	111,070	8,390	60,466	65,014	206,000	129,163	890,838	828,883	1,001,308

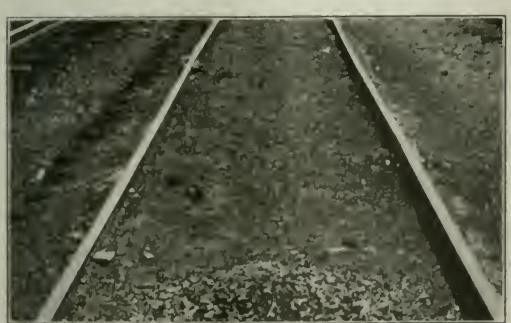
spite of the fact that the car shortage also showed an increase and was greater than it was in the corresponding week of 1920. In that year the peak shortage was reached earlier in the year, during the last week in August. Coal loading was larger than during any previous week since the strike—187,896—and all classes of commodities except ore the cars on line. On September 15 last year, 374,431 or 16.3 per cent of the cars on line were in need of repairs, 69,883 more than on the same date this year. A reduction of 17,126 was reported in the number of cars in need of repairs on September 15, compared with September 1. Comparisons showed a decrease in every district

The Arrangement of the Equipment

Cleaning Track With a Power Driven Sweeper

Pennsylvania Railroad Develops a Labor Saving Unit to Lower Maintenance Costs on Mountain Sections

ONE OF THE LATEST forms of mechanical labor saving equipment for maintenance of way work is a power-driven track sweeper now in use on the Central region of the Pennsylvania Railroad. This unit sweeps up and loads into cars the dirt, chiefly ashes, cinders and coal dust, which fouls the track and ballast with extreme rapidity in the heavy traffic, mountain sections of the road where pusher



A Stretch of Track Before Sweeping

locomotives are used regularly. An average speed of about four miles an hour is maintained and the track is well cleaned. Tests indicate that the cost is approximately one-half of what it normally would be with hand labor.

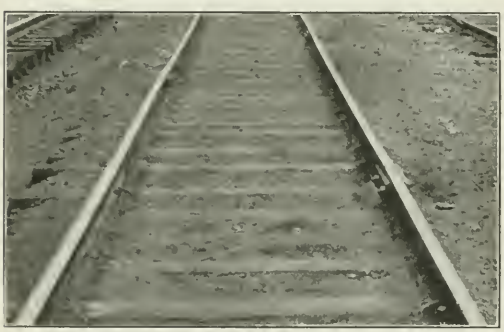
The sweeper unit is used chiefly on the pusher grades of the Pennsylvania main line through the Allegheny mountains, i.e., on the westbound tracks from Altoona, Pa., to Gallitzin and on the eastbound tracks from Johnstown, Pa., to Gallitzin. In some instances, sidings and yard sections are also cleaned by this equipment. The dirt accumulates very quickly on this part of the line, there being about 102 miles of track which require cleaning from four to six times annually. This is necessary primarily to keep the signals working properly as well as to keep the track in such condition that a proper inspection of the rail fastenings can be made periodically and that the ballast does not become badly fouled with consequent interference with good drainage.

The sweeper consists fundamentally of a rotary steel broom 3 ft. in diameter and 7 ft. long built up from steel splints measuring 1/32 in. by 3/16 in. in cross-section. This broom is suspended beneath the frame of an old flat car by special hangers which permit it to be raised or lowered at will. This is accomplished through the use of an air brake cylinder connected with the train air line. The broom turns at about 100 r.p.m., and is chain driven from a gasoline engine mounted on the car deck. A steel pan hinged and shaped to fall over the two rails is attached slightly ahead of the rotary broom which sweeps the accumulations up this pan onto a conveyor belt 7 ft. wide. This belt operates over two rollers spaced 8 ft. 9 in. center to center and is chain driven. The dirt and ashes are retained on it by 2-in. angles riveted to the belt across the full width of the belt and spaced 1 ft. 8 in. apart.

The debris which has been elevated by this belt is discharged into a hopper which in turn discharges it upon another conveyor belt mounted in an extension boom and running over rollers 24 ft. 2 in. center to center. This permits the final discharge of the accumulations at a convenient distance from one end of a hopper gondola or other type of open top car which is coupled next to the sweeper. The entire arrangement is housed over for protection from the weather and to secure maximum results in operation. The sweeper unit and car is handled by a locomotive, which can be one of the lightest engines in service as little power is

required. The work is generally carried on under traffic and the best results are obtained with the device after a light rain has fallen.

When the unit was constructed an obsolete flat car was procured which was somewhat narrower than the more modern cars. This limited the length of the broom to seven feet. The unit is thus able to sweep out towards the end of the tie for only about 6 to 8 in. from the rail. It does, however, do good work, removing deep accumulations easily and thoroughly. This can be seen in the photographs, where an accumulation of about three inches or more was removed down to or slightly below the top of the ties. All rail fastenings were uncovered and freed from contact with the dirt. The experience to date after about 50 miles of sweeping has shown that the broom wears but little, there having been only about $1\frac{1}{2}$ in. wear for that amount of sweeping. Heavier splints are being considered, however, not only with the idea of decreasing the wear but to secure a greater depth of cleaning between the ties. Another change contemplated involves the use of shallow buckets in a staggered arrangement on the main conveyor belt instead of the present angles. The broom itself picks up practically everything which may be on the track. Ordinarily about one car of dirt is secured per mile of track swept and this is picked up at a compara-



The Same Section of Track After Sweeping

tively low cost. A recent test made on a badly fouled section of track where the dirt was mixed with engine sand and well compacted, to determine the costs involved produced the following results:

Cost When Using Sweeper

Engine service (including engine and train crews' time, fuel, oil, enginehouse expense and water) 8 hours @ $5.79	$46.32
Sweeper operator—8 hours @ $0.535	4.28
Laborers, three—8 hours 24 hours @ $0.40	9.60
Gasoline—9 gal. @ $0.29	2.61
Motor oil—1 gal. @ $0.72	.72
Total	$63.53

3,828 ft. of track cleaned and dirt disposed of.
Cost per lin. ft. $0.0167

Cost for Manual Labor

One foreman—9 hours @ $6.28	$ 5.62
14 laborers—9 hours, 126 hours @ $0.40	50.40
Total	$56.05

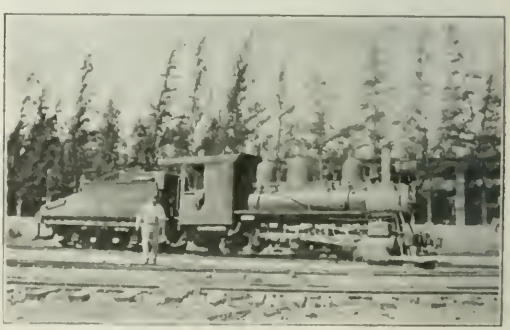
1,650 ft. of track cleaned and dirt disposed of.
Cost per lin. ft. $0.034

The new sweeper has been developed in the maintenance of way department of the Central region; W. D. Wiggins, chief engineer maintenance of way, and R. Faries, division engineer. The sweeper was designed and constructed by George Ehrenfeld, supervisor of track

Conductors' and Trainmen's Wages to Stand in West

An agreement was signed in Chicago on October 3 between the Conference Committee of Managers, representing 34 western railroads, and the chief executive officers of the order of Railway Conductors and the Brotherhood of Railroad Trainmen. The present schedule of rules governing rates of pay and working conditions for trainmen and conductors will, under the agreement, continue until October 31, 1923, and thereafter subject to 30 days' written notice by either party. The eight-hour day basis will be maintained; time and a half will be paid for all work performed after eight hours. The managements and the unions' committees will consider eliminating or modifying local rules that have an important bearing on the efficiency and economy of operation but have little effect on compensation or that result in inequitable compensation, either high or low, to the end that such adjustments as may be mutually agreed for will be made. All questions as to wages and working conditions now before the United States Railroad Labor Board submitted by either party for decision will be withdrawn. This does not include disputes which have arisen over the interpretation of present rules on rates. The railways were represented by W. M. Jeffers, general manager, Union Pacific; the Brotherhood of Railway Trainmen by W. G. Lee, grand president; and the Order of Railway Conductors by L. E. Sheppard, grand president. The roads, including subsidiaries, represented by Mr. Jeffers were:

Atchison, Topeka & Santa Fe, including the Gulf Colorado & Santa Fe; Baltimore and Ohio Chicago Terminal; Belt Railway of Chicago; Big Fork & International Falls; Chicago & North Western; Chicago & Eastern Illinois; Chicago, Burlington & Quincy; Chicago, Milwaukee & St. Paul, including the Chicago, Milwaukee & Gary, Chicago & Western Indiana; Chicago, Rock Island & Pacific; Colorado & Southern; Chicago St. Paul, Minneapolis & Omaha; Davenport, Rock Island & North Western; Des Moines Union; Denver & Rio Grande Western; Duluth, South Shore & Atlantic; El Paso & South Western; Fort Worth & Denver City; Great Northern; Illinois Central and the Yazoo & Mississippi Valley; Minneapolis, St. Paul and Sault Ste. Marie; Minneapolis & International; Missouri Pacific; Spokane, Portland & Seattle; St. Joseph Belt; St. Paul Bridge & Terminal; Terminal Railroad Association of St. Louis; Texas Midland; Trinity & Brazos Valley; Union Pacific; Union Stockyards Company of Omaha; Western Pacific.



A Switch Engine in the Honolulu Yard of the Oahu Railway, Hawaii

Commission Concludes Mileage Book Hearing

Merchants and Jobbers Join Commercial Travelers in Urging Discount of 33 1/3 Per Cent

WASHINGTON, D. C.

THE MERCHANTS ASSOCIATION of New York, the Chicago Association of Commerce, the National Wholesale Grocers' Association and the American Wholesale Grocers' Association joined with representatives of the commercial travelers' organizations in urging the Interstate Commerce Commission to require the railroads to issue scrip coupon books at a discount of 33⅓ per cent, at the concluding session of the hearing on mileage and scrip tickets before Commissioner Meyer at Washington on September 28. The railroads, while opposing any reduction in the present rates, urged that if any such request were complied with by the commission, the tickets should be restricted to six months from the date of issue and be issued in denominations no lower than $200.

A. M. Loeb, president of the National Council of Traveling Men's Associations, was the concluding witness for the commercial travelers. He said the consensus of opinion of his associations is that scrip coupon books are preferable to mileage tickets and that they avoid the confusion incident to varying rates of fare in certain sections of the country. He expressed the opinion that a sale of such tickets at a discount of 33⅓ per cent would stimulate both freight and passenger traffic of the railroads, but said that if he felt it would result in a loss of revenue, as claimed by the railroads, he would not favor it. He insisted that a large share of the business depression and unemployment of 1921 was due to the increased cost of transportation rather than that the falling off of passenger travel was due to the business depression and insisted that lower fares would be an inducement to business houses to send out more traveling salesmen, who would increase the volume of business and reduce unemployment. He said that firms had been very reluctant to send men into new territory and had also greatly reduced the number of smaller towns covered by their salesmen.

On cross-examination by H. W. Bikle, counsel for the railroads, he admitted that the average life of a coupon book such as he proposed would be only about 60 days and that the interest on the average amount of money advanced to the railroads by the sale of such a book would be only about 27 cents. He said that from 25 to 33⅓ per cent of a traveling man's expenses consist of railroad transportation, amounting to $300 to $400 a year, and that the average travel per day would range from 50 to 100 miles after a man reaches his territory; but he said the average would be increased by the fact that his first jump and his return trip home would range as high as 3,000 miles in some instances. He said that the cost of travel is borne largely by the salesman himself because he works on a commission basis, but that business houses were also influenced because they could not ask their salesmen to make trips on a losing basis. He read letters from a number of firms, in reply to a questionnaire he had sent out, in which the majority stated that they had reduced the number of their salesmen in 1921 and that they would increase both the number and the mileage traveled if the passenger rates were lower.

Commissioner Lewis asked the witness if he had made any calculations to show whether 2.4 cents a mile would be a remunerative rate for the railroads, saying that in freight rate cases the shippers generally attempted to justify the rates proposed. Mr. Loeb said he had not done so, but that in proposing the 33⅓ per cent reduction he had in mind the rates formerly made by the railroads and those still made for special fares. Commissioner Lewis said it is necessary that the commission have some basis for making the calculation so that the rate will not be placed below actual production cost.

Business Houses Want Reduction in Travel Expense

J. C. Lincoln, traffic manager of the Merchants' Association of New York, said that the association has been cooperating with the commercial travelers' organizations because the merchants and jobbers feel that the high cost of transportation has reduced the number and the travel of their salesmen and that a lower rate would result in a more extensive use of commercial travelers, which would mean renewed business activity. He thought that a scrip form of ticket would be preferable to a mileage book, but suggested that they be issued in denominations equivalent to 2,000, 3,000 and 5,000 miles. He suggested that a 2,000 mile book could be confined to intra-territorial travel and that 3,000 or 5,000 books be used for inter-territorial travel. He said he had been asked by the Chicago Association of Commerce to express its sentiment in favor of an interchangeable mileage book, on the ground that the present cost of keeping salesmen on the road is almost prohibitive and only necessary travel is being done.

Mr. Lincoln also presented a letter from the National Wholesale Grocers' Association, which favored the adoption of interchangeable mileage books for salesmen, asserting that any saving in the cost of doing business would naturally be reflected in the cost to the consumer and an increase in the volume of business. It would be satisfied, however, with either an interchangeable mileage book or a scrip coupon ticket at a flat reduction of about 33⅓ per cent and had suggested a denomination representing 3,000 miles or from $100 to $150. It was also suggested that the tickets be made transferable among the employees of the company that purchased the books, but Mr. Lincoln said that personally he thought the books should be non-transferable. Former Senator Hoke Smith filed a letter setting forth the views of the American Wholesale Grocers' Association, which he said were along the same lines as the testimony that had been presented.

Railroads Propose Regulations.

C. A. Fox, chairman of the Central Passenger Association, was recalled to the stand to give some estimates as to the loss in revenues that would result from the use of various forms of tickets and to offer some suggestions as to the form of regulations that should be issued if the commission orders a reduced rate. In reply to the assertions of representatives of commercial travelers that the railroads had formerly made a reduction of 33⅓ per cent mileage books, Mr. Fox said that before federal control the reductions in normal fares and increases in the mileage ticket rates had reduced the discount to approximately 10 per cent in New England territory, 10 per cent in Central and Trunk Line territory, 20 per cent in Southeastern territory and 16⅔ per cent in the majority of the Western territory and that there was no reduction below the intrastate basis where the State fares were two cents a mile.

Counsel for the traveling men's organizations and the representative of the American Hotel Association protested against the proposal to restrict the proposed coupon book to six months and $200, outlined by Mr. Fox, on the ground that this would defeat the purpose of the book. Mr. Fox said

that these figures were based on the testimony of representatives of the commercial travelers that traveling men spend nine months of the year on the road, averaging 50 miles per day, or 13,500 miles per year. A $200 book would be equivalent to 5,555 miles and would, therefore, more than fulfill the average time requirements. Mr. Bikle also pointed out that any less amount of travel than this could hardly be called intensive travel sufficient to justify a reduced rate. Mr. Fox said the carriers desire to make it entirely clear that in complying with the request of the commission for a statement of the rules and regulations which they would deem reasonable if the commission should decide to require the issuance of a reduced rate scrip, the submission of these suggestions is not to be construed as in any way an indication on their part that such reduced rate scrip was justified. Mr. Fox also proposed that a photograph signature form of ticket shall be used.

Mr. Fox said that the coupons should be good only when exchanged for one-way tickets, issued at face value, representing full normal one-way fares, and not be good for any other services or charges. Where passenger boards train at a non-agency station, or at a station not open for the sale of tickets, it should be honored by conductor on trains within the run of the initial conductor only. Exchange train tickets issued by agents in exchange for scrip coupons should be accepted by conductors only when presented in connection with the scrip ticket.

The requirement that coupons be exchanged at ticket offices for train exchange tickets is considered an item of paramount importance to the carriers, he said, as the only means by which they may be assured in an accounting way of securing the revenues to which they are entitled in the use of any form of an interchangeable scrip ticket. It would be primarily a dangerous procedure to interfere with a conductor's safe operation of his train by compelling him to assume the complicated detail and burden of handling a large number of passengers holding mileage tickets, the percentage of which, while fluctuating constantly, might reasonably range from 20 per cent to 50 per cent or even more of his total passengers. A system of honoring tickets directly on trains would be equivalent to establishing a traveling ticket office. It ordinarily requires about two years to educate a ticket seller to render that character and degree of service that the railroads endeavor to afford at their ticket counters, so it will be seen what a task will be put on a conductor who is not skilled in the sale of interline tickets. Even if the acceptance on trains were confined to the line of a single system or to through car runs there would be many serious complications, difficult and expensive to overcome. Moreover, hundreds of thousands of short trips are made where the detachments would be represented by minute slips of paper. Conductors have not the facilities for carrying and safeguarding these detachments which have a direct money value to the honoring railroads. Ticket offices are equipped with safes and the employees are bonded, which is another reason why the business should be conducted at the ticket offices instead of on trains, if any form of reduced rate scrip is to be introduced.

The question of the regulations to be adopted in connection with a scrip ticket is a complicated matter of serious difficulty, Mr. Fox said. This difficulty is enhanced by the fact that the carriers do not know whether the commission will require any reduction in the present basis of fares, and if a reduction should happen, they do not know what the measure of the reduction would be.

For this reason they have felt seriously handicapped in making the suggestions and, accordingly, express the belief that they could deal with the matter more adequately and satisfactorily at a later stage of the proceeding after they have been apprised of the commission's conclusion as to the primary question, whether there is to be any reduction in the scrip ticket fare.

In the formulation of the precise regulations it will be necessary to go into greater details and to give more careful consideration to phraseology than has been possible in the time available at the present hearing; and while the carriers think that their suggestions cover the matters of greatest moment they are fearful that they have overlooked other matters which are of importance to them as well as to the traveling public.

Estimated Reduction in Revenues

As to the request made by the commission that the carriers submit approximations of the percentage of travel that would be handled on mileage and scrip books, and as to the amount of the reduction from the sales of such books in the several denominations of 5,000, 3,000, 2,500 and 1,000 miles as to mileage books, and $180, $108, $90 and $36 as to scrip books, Mr. Fox said that, except as to facts which had already been presented and as previously alluded to in the hearing, the carriers have at command no data of a statistical character as a result of experiences of the past in the sales of books over individual carriers and those of a joint character good in a restricted region that would afford foundation for definite, accurate conclusions as to what would happen if the commission should, contrary to the earnest representations of the carriers, urge the sale of a reduced rate scrip ticket. They have avoided mentioning specifically the extent of the possible losses because of this lack of dependable data. In deference, however, to the request of the commission a tabulation had been made in the form requested by the commission, and for the purpose of making the statement plainer, in addition to showing the percentage of travel that would likely avail of the use of a mileage book, there is also shown the total revenue that would be realized from such books. To simplify the computations, the carriers have assumed roughly that in round figures the total average revenue derivable from ordinary one-way tickets sold at full normal fares to be about one billion dollars annually; this omits revenues from commutation, surcharge, and all forms of reduced rate tickets.

While detailed statistics are not available, it is known that prior to federal control, when mileage was actively on sale in the several regions of the country, about 18 per cent of the total revenue was obtained from holders of mileage tickets of limited scope; about 20 per cent in Trunk Line territory, 20 per cent in Southeastern territory, 15 per cent in Southwestern territory. In Central Passenger and Western Passenger Association territories, where the 2-cent fare laws existed intrastate during the past 15 years, sales were practically negligible because of the fact such books as were on sale were only available for interstate transportation, the reduction in Central Passenger Association territory at the time being only 10 per cent; therefore the recent experiences in those regions would be of no value as contributing light on this question.

Prior to the 2-cent fare laws, however, mileage tickets were sold very extensively throughout Central Passenger and Western Passenger Association territories, and their utilization was constantly increasing from year to year. "In the extreme Western part of the United States percentages as a territorial proposition are not available, but it is known that in certain instances in those regions the use of mileage was not so extensive as in the other sections referred to.

"While the carriers have never had effective a nation-wide interchangeable mileage or scrip book of any character, except the present scrip book sold at full normal fare," Mr. Fox said, "it is the universal view of the carriers that the sale of such a book would be far in excess of any experiences of the past, and therefore the percentages which are submitted in the statement take cognizance of this fact and are increased with due consideration therefor. The approximations are the very best judgment of and represent the consensus of views of the carriers. In making these submissions, however, it was

desired to reiterate that they are purely speculative. The commercial travelers themselves, by reason of their experience and knowledge of the extent of travel of the traveling men, have made some speculations which the commission will no doubt deem worthy of careful consideration in this relation, and without the thought of making comment one way or the other concerning their accuracy, it is desired to point out that it was testified in one of the hearings by one of their representatives that the traveling men spend nine months of the year on the road, averaging 50 miles per day, or 13,500 miles per year. It was also stated that the number of commercial travelers identified with the affiliated organizations represented number 676,000. The total distance they would travel, based on these figures, would amount to 9,126,000,000 passenger miles, which, computed at the normal tariff of 3.6 cents per mile, would in round figures amount to about $325,000,000. As this does not take cognizance of the considerable additional travel that would move on mileage tickets, it is obvious that the traveling men themselves consider that the railroads would receive a very large percentage of their total revenue from passengers holding such a form of transportation. It is also manifest that any per cent whatever that might be applied to these figures would result in a material reduction in revenues."

The tabulation estimating the amount of reduction, on the basis of a book identified by photograph and autograph, use limited to purchaser, time limit, one year, was as follows:

Reduction	Mileage Book	Scrip Book	Estimated per cent of all travel using Mileage Book %	Scrip Book	Total Amount of Reduction (Estimated) Mileage Book $	Scrip Book $
30%	5,000 M	$180	24% $240,000,000	do	$72,000,000	do
25%	"	"	21% $210,000,000	do	$52,500,000	do
20%	"	"	18% $180,000,000	do	$36,000,000	do
15%	"	"	15% $150,000,000	do	$22,500,000	do
25%	3,000 M	$108	30% $300,000,000	do	$75,000,000	do
20%	"	"	25% $250,000,000	do	$50,000,000	do
15%	"	"	20% $200,000,000	do	$30,000,000	do
25%	2,500 M	$90	35% $350,000,000	do	$87,500,000	do
20%	"	"	30% $300,000,000	do	$60,000,000	do
20%	1,400 M.	$36	40% $400,000,000	do	$80,000,000	do

When asked whether it was the purpose of the carriers to retard or accelerate the sale of such tickets, Mr. Fox said that the carriers only desire reasonable protection, and if such a ticket were adopted it was his thought that there should be conferences among the representatives of the railroads and of the travelers for the purpose of working out regulations that would be satisfactory and make the use of the book as convenient as possible. Asked why the railroads desire to throw further restrictions around the use of the books than they did in the past, Mr. Fox said that possibly the carriers consider that they made some mistakes in the past which should not be expected to govern them for the future.

Briefs are to be submitted by November 1 and it is expected that oral arguments will be held before the full commission some time in November.

DAN HEALY, one of the best known dining car conductors in the United States, died at his home in Chicago on September 25. Mr. Healy has been steward in charge of the dining car on the Pioneer Limited of the Chicago, Milwaukee & St. Paul, between Chicago and Milwaukee, Wis., for about 20 years and has been in the service of that company since 1898.

Progress In Valuation Work

WASHINGTON, D. C.

THE RAILROAD valuation work, on which the Interstate Commerce Commission has been engaged during the past eight years, is now rapidly coming to a head and it is expected that considerable time of the commission during the next 12 months will be devoted to various phases of the work. Tentative valuation reports have been issued by the Bureau of Valuation in greatly increased numbers since the centralization of the forces of the commission at Washington and its reorganization, which was effected about January 1 of this year.

Up to August 31 there had been served 504 accounting section reports, covering 134,272 miles, or 54.14 per cent of the inventoried main line mileage; 584 land section reports, covering 132,067 miles, or 53.25 per cent of the total; and 593 engineering section reports covering 168,750 miles, or 68.03 per cent of the total. In February the three sections began synchronized work on definite six-month programs. Each section is now bringing forward its work on selected carriers. From now on the work will primarily be focused on the roads having annual revenues of $25,000,000 or over, work on the less important roads being carried on at the same time. The present six-month program calls for the completion of underlying reports by the three sections on practically 190,000 miles by the end of 1922. It is the expectation that by the end of the fiscal year (June 30, 1923) underlying reports will have been issued on all except six of the so-called $25,000,000 roads, and that these six will be included in the program for the succeeding fiscal year 1923-24. It is the hope of those directly in charge of the work to carry it to a stage of completion which will be marked by the service of all underlying reports before the expiration of the next succeeding fiscal year.

The commission has now issued 258 tentative valuation reports. They cover a total of only 37,008 miles, or 14.92 per cent of the total mileage. Thus far, tentative valuation reports, as a rule, have been on the smaller carriers, though the tentative reports are out for the Chicago, Rock Island & Pacific, the Kansas City Southern, and several other large carriers. The next few months will see the issuance of tentative valuation reports covering some of the larger companies. According to the plans, the tentative valuations will be rapidly advanced so that the mileage covered by them will be brought up more nearly to that of the underlying reports. To facilitate the production of tentative valuation reports, a new standardized form of report was put into effect on September 15.

The valuation law gives to the carrier or other interested party 30 days after the service of the tentative report in which to file protest, and provides that in case of no protest the tentative valuation becomes final. Ordinarily none but the smaller and less important carriers have failed to file protest. In 99 cases, however, neither the carrier nor any one in interest has protested.

The commission has actively begun hearings on these protests. Fourteen hearings were set for the spring and summer and the fall dockets will carry an impressive list of such hearings. The underlying work is thus being moved to that stage where it can reasonably be expected that final valuation reports will begin to appear. Among the important cases which now stand submitted on final argument are the Kansas City Southern, the San Pedro, Los Angeles & Salt Lake, the Atlanta, Birmingham & Atlantic and the Winston-Salem.

Great interest will attach to the final reports of the Kansas City Southern and Atlanta, Birmingham & Atlantic because of the nature of the arguments made by S. W. Moore in the Kansas City Southern case, laying insistence on the element of earning power as a most important, if not determining, factor in railroad valuation. On the other hand the Atlanta, Birmingham & Atlantic has been notorious as a deficit road.

It is expected that the commission will devote a considerable part of its time this fall or early winter to these and other final valuation considerations. The final determinations in the first few cases will, of course, be accepted by the public as indicating the policy of the commission and as precedents. On the other hand, they will be accepted by the staff of the commission as indicating its policy.

There has been a growing disposition in the last two or three years, and especially in recent months, both around the Capitol and at the commission offices to push the valuation to a definite stage of completion, though necessarily the valuation of the railroads can never be called completed. This is recognized by the law, which charges the commission with the duty of keeping the valuation, once determined, up to date. Even after the final values have been placed on every railroad there will remain the considerable work of keeping valuations current for utilization in the diverse regulatory activities of the commission. The commission in reaching its decision both in Ex Parte 74 and Reduced Rates, 1922, under the Transportation Act of 1920, brought impressively before the country the needs of valuation. The larger the percentage of railroad property covered by reports the greater is the assurance imparted to the commission in the adoption of values for general rate cases. It is the expectation that by the time another rate investigation occurs the commission will have available for guidance not only the underlying reports covering most of the mileage of the country but also a considerable number of final reports. The commission also realizes the value of reports carrying what is termed "a large diversity factor." It will obtain this by having a large number of reports covering large as well as small roads located in all parts of the country and constructed and operated under all conditions.

Certain divisions of the commission, particularly Division 4, which deals with financial matters, abandonments, etc., are constantly finding an increasing need of valuation reports. For these reasons as well as others, the commission is now insistent on pushing along the valuation work at the greatest speed consistent with thoroughness.

The valuation work falls under the jurisdiction of Division 1, composed of Chairman McChord and Commissioners Meyer, Aitchison and Lewis. It is thought that after the full commission has disposed of a few representative leading cases in which the controlling principles will be enunciated, this division will decide practically all valuation cases.

The Bureau of Valuation has, since January 1 of this year, been under the administrative control of Commissioner E. I. Lewis. Charles F. Staples is acting director, having succeeded the late Director Prouty. T. P. Artaud is executive assistant, and is also supervisor of land appraisals; H. M. Jones, supervising engineer; J. M. Willey, supervisor of accounts; and C. W. Needham, solicitor. The force of the bureau numbers 548. The concentration of the employees in Washington is regarded by the commission as having been attended with very gratifying results.

Mr. Artaud recently gave to the House Committee on Appropriations, when the bureau's appropriation for 1922-23 was under consideration, an estimate that all underlying reports and tentative valuations would be completed by June 30, 1924. Obviously, it would be hazardous to attempt an estimate of the length of time which will be consumed by the hearings and rehearings on the protests which the commission must hold before arriving at its conclusion as to final values. It is a very difficult matter to foretell the length of time any litigation will consume. No one expects the carriers to leave any stone unturned to secure a recognition of all the elements of value claimed by them to inhere in their properties.

Up to the end of June, 1922, the working cost to the government of the valuation work was $23,266,000. According to the Presidents' Conference Committee, the organization looking after the carriers' side of the valuation work, the railroads had expended up to June 30, 1921, $54,120,957 in protecting their interest. It is understood that the estimate to date is in excess of $60,000,000.

The field work was practically completed in the fall of 1921. The district offices in Chattanooga, Chicago, Kansas City and San Francisco were moved to Washington in the plan of centralization for the second step in the work, which consists of collating the data obtained by the field parties which first reaches the carriers and the public in the underlying reports of the land, engineering and accounting sections, after which follow the tentative valuation reports.

Pennsylvania to Make Extensive Additions to Altoona Works

THE PENNSYLVANIA SYSTEM has announced the program for extensive improvements to be made at Altoona, Pa., including the construction of two extremely large repair shops and the electrification of the heavy grades west of Altoona. The first of the improvements will be made at Juniata shops and includes the building of a new erecting and machine shop, 340 ft. by 670 ft., including a midway crane runway with a 105 ft. span and 715 ft. long. This large shop will be devoted to repairing and building locomotives, and will accommodate 49 locomotives at one time. The framework will be of steel and the walls of brick. The locomotives erecting bays will have two 250-ton capacity electric traveling cranes for lifting locomotives, and six 15-ton capacity cranes for lighter work. The machine bays will have two 25-ton capacity cranes, together with jib cranes of from 1 to 8 tons capacity.

There will also be erected a reinforced concrete storehouse, three stories high, with basement, which building is to be 60 ft. by 400 ft. A crane runway for handling material will also be erected with a 95-ft. span and about 600 ft. long.

The building of the shop and storehouse will necessitate changes in the existing buildings as follows: the scale shop will be moved to a new location and will be changed to a flue shop, the machinery now in the scale shop being transferred to the present paint shop. The present storehouse building will be moved to a new location and will be used as a cab shop. The present erecting shop will be changed to a paint shop, while machinery will be installed in the present paint shop and the name changed to Machine Shop No. 2.

At the Altoona car shops will be located facilities for preparing repaired locomotives for service. The present circular building, known as the freight car shop, will be remodelled and 15 stalls will be used as a finishing shop. East of this shop will be located the necessary ash pits and coal handling facilities.

Further additions to the shops at Altoona will be made following the electrification of the heavy grade west of the city. After the electrification is completed, the roundhouse at Sixteenth street, Altoona, will be abandoned. On the site of the roundhouse a duplicate of the erecting and machine shop at Juniata will be built and the present erecting shop at the Altoona machine shop will be fitted up for the use of other departments.

FREIGHT CLAIM PAYMENTS of the Illinois Central were reduced by more than $1,000,000 during the first seven months of 1922, as compared with the first seven months of 1921, and there was also a decrease of 23,524 in the total number of claims presented for this same period. In the first seven months of this year the Illinois Central paid out in freight claims an average of $2.27 per minute, as compared with $5.64 per minute in the corresponding period of last year.

Railroad Employment Bureau Functions in Strike

The Advantages of Such a Bureau Were Strikingly Demonstrated in the Emergency

By An Employment Officer

BECAUSE ITS VALUE is not well understood, comparatively few railroads maintain employment bureaus charged with the responsibility of recruiting personnel. The practice of most roads is for the various departments and divisions to receive applications for employment and to hire men as needed, there being little co-ordination of effort between the departments.

A western railroad, as a part of its experiment in personnel activities, about four years ago established an employment bureau which, together with its complementary activities, was placed in charge of a general officer. At the request of the chief engineer this bureau has employed all maintenance of way forces and in addition has been active in securing clerical, mechanical and train service employees.

As the entire matter was being treated experimentally, no effort was made to force the services of the bureau upon the heads of departments or division superintendents, but they were from time to time kept advised that the services of the bureau were at their disposal at any time they cared to avail themselves of them. The way this worked out was that whenever an employing officer needed men and did not have desirable applicants, he called upon the employment bureau for assistance. This has resulted in the bureaus gaining experience in the employment of men of all occupations.

Pre-Strike Forcast

Realizing that a strike of shopmen was imminent, the officer in charge of the employment bureau planned his campaign for recruiting a new corps of mechanical workers upon its occurrence. The preparatory work consisted of a survey of the local field and adjacent territory to determine the possibility of recruiting a new force quickly and of maintaining this force after it had been recruited. A similar survey was made of outlying territory and the employment bureau force of four people was so organized as to function efficiently during the strike period.

During the latter days of June the employment bureau had kept the road's management advised of the possibility of recruiting mechanical workers, but on June 30 it was decided not to depend upon the employment bureau in the emergency of the strike, but to use an outside organization for that purpose. Therefore, when the strike came on July 1 this organization of professional strike-breakers was placed in charge of recruiting, but on the morning of July 5, the failure of this method having become apparent, the entire responsibility for recruiting was placed upon the road's own employment bureau.

Recruiting During First Days of Strike

Upon assuming this responsibility, the employment bureau took over from the strike-breaking organization such men as it was thought could function efficiently in its pre-determined plan and these men were used as special agents to locate men in the city in which the road's headquarters is located. Men were also sent to towns served by the railroad to, if possible, recruit men there.

Although it was found impracticable to employ men in the towns along the road, 18 men were employed in the headquarters city July 5; 29, July 6; 22, July 7; 21, July 8; and 38, July 9. This was an unexpectedly good showing but an increase in the daily average was necessary to build up an efficient working force.

While men were being recruited in the headquarters city a survey was being made in large off-line cities within a radius of 500 miles from the headquarters city to determine whether conditions warranted sending agents to prospect these places. The survey was made through the aid of blind advertisements carried in newspapers in these cities. These advertisements read, "Experienced Railroad Shop Mechanics Required for Small Railroad in the Northwest. Apply to Box —— Times Office." Arrangements were made with the newspapers to forward replies as received and if and when it was found there were sufficient applicants to justify it, a special agent was sent to the city to interview these applicants. At the same time instructions were wired to the newspapers to insert display advertising reading thus, "Special Agent of North and South Railroad will be in Salt Lake Thursday to Interview Applicants for Employment. Apply Smith Hotel."

Where an applicant's reply seemed to warrant it, a telegram was sent advising him to call upon the special agent and in all cases letters were written to what appeared to be desirable applicants to call upon the special agent upon his arrival. In prospecting one city early in the strike, the special agent employed an automobile and called upon all persons from whom applications had been received. The results in two cities warranted maintaining headquarters and special agents, one for a period of several weeks and the other throughout the strike. Special agents were sent to other cities for short periods of time.

Unusual Methods of Recruiting

During the period of these out-of-town activities the employment bureau staff at headquarters was engaged in prospecting various possibilities for the securing of mechanics. The officer in charge was fortunate in securing the co-operation of the personnel officers of street railway companies, other public utilities and large corporations who permitted members of his staff to go through their application files and to copy therefrom data as to what appeared to be desirable employees. Wherever a telephone number was given, the applicant was phoned to and asked if he cared to consider employment under strike conditions. Where no telephone number was given individual letters were addressed to the applicants. During this same period the names of all mechanics appearing in the city directory were abstracted and a circular letter individually addressed was mailed to each of them. This letter read:

> "You have been recommended to us as a skilled (appropriate craft filled in). We are in need of skilled mechanics for our shops at various points.
>
> "Our road is being operated under rates of pay fixed by the United States Railroad Labor Board under the protection of an injunction of the United States Court and all workers are fully protected from any danger or interference. While strike conditions exist, board and lodging are furnished free of charge. All positions are permanent.
>
> "We should be glad to have you call at our office, 2 North street, in the morning to talk it over."

This was on the company's official letterhead, bore the facsimile signature of the general officer in charge and the

postscript, "All applications treated confidentially." While a great many of these letters were mailed, not very many were responded to, but as the expense involved was small, the effort was worth while.

Several shipyards and industrial plants were about to reduce forces because of the general business depression and especially selected mechanics were placed in these plants by the employment bureau to inform mechanics of the possibility and desirability of securing employment with this particular railroad. Prospective applicants were supplied with the address of the employment bureau by these representatives and quite a few mechanics were secured by this means.

Many other "kinks" were used by the employment bureau, the staff of which held itself receptive to any suggestion as to possible means of obtaining men. On July 31 the working force was nearly 60 per cent of the normal force and on August 31 over 80 per cent.

Selection of Employees

During the early part of the strike no effort was made to separate desirable from undesirable employees, the whole effort being to build numerical strength rather than an efficient working force. This was done for strategic reasons and in the hope which afterwards proved true that in striving for quantity rather than quality at least some good mechanics would be secured. As numerical strength was gained greater emphasis was placed upon the selection of desirable employees and the mechanical department was called upon for a series of questions and answers applicable to each craft which were used in determining whether men applying for work were actually the kind of men they represented themselves to be.

The use of the examination system produced excellent results and permitted of the weeding out of the men who had misrepresented themselves during the early part of the strike and their replacement with experienced mechanics. It probably would have been better if mechanics or mechanical department officials could have been assigned to the employment bureau from the very commencement of the strike, but the services of every man in the mechanical department were required to maintain the road's motive power and rolling stock and this was therefore impossible. As a matter of fact, probably the greatest value of using the organized employment service for recruiting purposes was that it relieved the mechanical department of all responsibility for securing men. The men were recruited by the employment bureau and turned over to the mechanical department at its principal shops so that the motive power department officers could give their entire time to shop and road affairs.

The strike-breaking organization that had been originally engaged to recruit working forces was also to take charge of the employment of guards and the supervision of property protection. It was able to supply but a few guards from its own organization and the some hundreds of guards that it was necessary to employ were also engaged through the railroad company's employment bureau. The delegating of this duty to the employment bureau had the same effect upon the guard service as the employment of mechanics had upon the mechanical service. The chief special agent and his lieutenants were relieved of the necessity of recruiting men and were able to give their entire time to the supervision of protection to company property and employees.

Maintenance of Records

In connection with the employment of maintenance of way men, the employment bureau some years ago adopted to its own use the card system described by William S. Wollner in an article entitled, "Maintenance Labor Turn-over Statistics" in the June, 1921, issue of the Railway Maintenance Engineer, and as the bureau's activities widened into the employment of other classes of men, this same system was used. The purpose of this card system is, as is fully described in the article mentioned, to furnish an office record of all men employed, a notification to the foreman that the man has been employed, acknowledgment to the employment bureau that the man has arrived on the job and a record when he leaves the service.

Upon taking over the recruiting work at the commencement of the strike, the employment bureau merely continued the use of this system, applying it to the new condition. This gave an office record of the men employed and a notification to the foreman of his employment. It was realized that the mechanical department force was far too busily engaged otherwise to return the card notifying the bureau of the employee's arrival, or the card notifying it of his leaving the service. However, as all men were delivered to the shops under escort this was of no importance. This system of employment records has proven itself extremely easy of execution while working under pressure of time, the four cards being filled out at one impression on the typewriter, the office record portion being available for reference in the employment bureau and the notification portion proving of great value in the mechanical department in making up pay rolls, handling mail for employees, and work of a kindred nature.

In addition to the card system just mentioned, the only other record maintained was a form hastily prepared at the commencement of the strike and which each new employee signed, stating that he knew that he was employed under strike conditions. This was done to comply with the state law. Regular passengers' tickets were used for the moving of strike-breakers in order to lessen the possibility of their identification and friction with trainmen and other employees who were not involved in the strike.

Value of Employment Bureau Demonstrated

As stated earlier in this article, this employment bureau was maintained upon an experimental basis insofar as others than the maintenance of way department was concerned. While the justification of the expense of conducting the bureau and the associated personnel activities has never been questioned by the road's management, it is possible that this value would have been questioned by other railroad officials who were not familiar with the objective and the results obtained. In view of the part taken by this organization in breaking the strike, there can now be no question but that the money spent in its maintenance was not only fully justified but that it has proved an excellent investment.

New Development in Traveling Cranes for Shops

One of the most formidable problems imposed in the design of a locomotive shop concerns the means provided for moving the locomotives in and out of the building, or for shifting them from one position to another. This not only involves the character of the crane provided but also the arrangement of the track and the shape and size of the building. These considerations lend interest to a recent development in shop cranes embodying an added feature, namely: a facility for turning the locomotive through a horizontal angle of any desired amount. A crane of this type was recently installed in the River Rouge repair shop of the Detroit, Toledo & Ironton, and is illustrated in the photographs. A shop designed to take full advantage of a crane of this type is said to embody many of the advantages of shops of both the longitudinal and transverse type without introducing some of the disadvantages peculiar to each.

The transverse shop, having the locomotives arranged

crosswise to the longitudinal axis of the building, offers more economical use of the floor space, is convenient to work benches along the building walls and facilitates the floor traffic for handling material. The locomotives are placed on the transverse tracks either by means of an outside transfer table, which requires almost as much ground space as the shop

Fig. 1. The Locomotive in the Position That It Was Received on Longitudinal Track

itself, or with the assistance of overhead traveling cranes of the double trolley type, which in turn necessitate a building high enough so that one locomotive can be carried above the others.

In the longitudinal shop the construction tracks run parallel with the axis of the building and the locomotives are placed on these tracks one behind the other. They are handled by two single trolley cranes and to economize space the buildings should preferably be wide enough to keep one or more tracks clear for carrying the engines to and from their different locations. The selection of either type of shop, is, of course, dependent upon many local conditions as well.

If, instead of providing either the strictly longitudinal or transverse type of shop, one could be designed with a grid of transverse tracks supplemented by one longitudinal track, upon which the locomotives would be brought into the building, and with facilities for turning each engine 90 deg as it is brought in so as to place it on any one of the transverse tracks, it would be possible to realize the working advantages of the transverse shop without being confronted with the expenses and awkward means required to bring in or take out the locomotive. This is accomplished with the aid of the new crane by incorporating a turntable in the crane trolley so that the crane has four different movements, namely: hoisting, cross travel, longitudinal travel and horizontal rotation. Thus it is practical to lift the locomotive off the longitudinal track, carry it down the shop and swing it into transverse position wherever there is a vacant repair pit. At no times is it necessary to lift one locomotive above another, in fact it is sufficient simply to raise it high enough to clear the track.

By reference to illustrations it will be noted that the crane trolley consists essentially of two parts; one upper revolving frame and one lower or trolley frame proper. The upper frame carries the hoisting machinery only. Two sets of ropes, spread well apart, carry a lifting beam which is provided with adjustable slings to accommodate different sizes and shapes of locomotives or boilers. On the underside of this frame is attached a combination ring gear track or "roller path," which in turn rests on conical rollers set in the lower frame. This lower frame also is provided with horizontal guide wheels to keep the roller path central. Motor-driven turning machinery is mounted on the lower frame, having a large pinion meshing into the rack of the roller path. The lower trolley frame also is equipped with customary motor-driven machinery for cross travel. The crane bridge is practically standard.

The speed of rotation of the turntable is one and one-half revolutions per minute. The crane in the D. T. & I. shop has a span of 56 ft. and the two falls or hoisting tackles each have a capacity of 50 tons. No auxiliary hoist is provided in this crane but it could be readily added to a crane of this type if desired. The distance between the two hoist connections to the lifting beam is seven feet, provision being made to insure that the center of gravity of the locomotive lies between these limits by facilities for eight different positions of the front end sling and two alternate positions of the yoke on the lifting beam. This lifting beam can easily be detached and replaced by a short beam with a simple hook for use in ordinary crane service. This new crane is built by the Shaw Crane Works of Manning, Maxwell & Moore, New York.

Fig. 2. The Locomotive Turned Into Position to Set on One of the Transverse Tracks

Lehigh Valley Reaches Agreement with Employees' Association

THE LEHIGH VALLEY has made public the text of its agreement with the newly formed Association of Maintenance of Equipment Employees of the Lehigh Valley Railroad. In general, this agreement provides for three separate classifications viz., craftsmen, promoted helpers and helpers. The rates of craftsmen vary from 72 cents to 80 cents per hour; of promoted helpers from 53 cents to 63 cents an hour; helpers receive 47 cents the first year and 49 cents thereafter. Passenger carmen, gang leaders on freight car repairs, etc., receive regular craftsmen's wages, but freight carmen and inspectors are rated from 63 cents to 65 cents per hour. Promoted helpers in the car department are rated at from 53 cents to 60 cents and car cleaners at 37 cents an hour. Regular apprentices begin at 27 cents an hour and helper apprentices at 47 cents.

The eight hour day is recognized as standard for all employees whose work requires continuous application. Normal working hours for all employees, however, are bulletined and overtime rates apply only for work done in excess of normal bulletined hours. Overtime rates are paid for Sunday and holiday work except for employees who are regularly assigned for work on these days. Employees called to work in emergency before or after bulletined hours are allowed a minimum of three hours pay for two hours work or less. Employees called upon to do road work are paid straight time for traveling and waiting and for the first eight hours of work and time worked in excess of eight hours is paid for at overtime rates.

It is provided that seniority will govern only when ability, loyalty and fitness are equal, the employer to be the judge. Employees transferred from one point to another, except when reductions in forces are made, will carry their seniority with them.

Grievances, if they cannot be satisfactorily settled by the employees and officers concerned, are entrusted to the employees' association for adjustment. The starting point of this adjustment is the local committee. There is one local committee representing each craft on every operating division of the road and at the general shops at Packerton and Sayre. The members of these committees are elected on the basis of one representative for each 100 employees or a major portion thereof. If on any division or in either of the shops there should be less than 100 employees in any craft, the committee representing these employees will consist of two members elected from their number. The committeemen must be in the employ of the company and adult American citizens. Nominations are by petition which must be signed by 25 voters in each craft or by 25 per cent of the voters in that craft. Above the local committees is the general committee, which is comprised of a general chairman together with a general craft chairman from each respective craft. The general chairman is elected by the local committee chairman of all crafts. The general craft chairman of each craft is elected by the local committee chairman of that craft.

For purposes of meeting with the management the general committee, acting with an equal number of representatives appointed by the management, constitutes what is known as the joint board. The officers of this board are chairman and vice-chairman. The office of chairman is to be filled alternately by a representative of the employees and a representative of the management. The employees and the management have equal voting power on the joint board and a two-thirds vote is necessary for a decision. The joint board has a secretary whose pay is assumed by the management.

When a dispute has been referred to the local committee which it cannot settle satisfactorily with the master mechanic or shop superintendent, a joint submission is made by the local committee to the general committee and by the master mechanic or shop superintendent to the superintendent of motive power, covering the following points:

(1) Question at issue.
(2) Statement of agreed upon facts.
(3) Position of local committee.
(4) Position of master mechanic or shop superintendent.

In the event that the general committee and superintendent of motive power are not able to reach an agreement, the point at issue is placed before the joint board.

The agreement contains no provisions against piece work or bonus payments, which leaves the company free to establish this system of payment wherever it sees fit.

New Electric Locomotives for the Norfolk & Western

AS NOTED in the September 9, 1922, issue of the *Railway Age*, the Norfolk & Western has placed an order for four electric locomotives for use on its mountain division known as the Elkhorn grade. The new locomotives will be of the same general type as those which have been in use since the commencement of electric operation, namely the "split-phase," which operate from a high tension single-phase a.c. trolley and are provided with a static transformer and rotary phase-converter for supplying low voltage three-phase power to the induction type traction motors. Each locomotive will consist of two units coupled together by a short rigid bar or link. The wheel arrangement is 2-8-2 + 2-8-2. The pony trucks on each unit will be equalized with the drivers, the whole arrangement of wheels and spring suspension being similar to a Mikado type steam locomotive. There will be four motors geared to jackshafts, connected in turn to driving wheels by side rods, two single-motors being provided per unit (one per jackshaft). This arrangement is different from the present locomotives which are 2-4-4-2 + 2-4-4-2 and have two twin motors for each cab.

Preliminary Drawing of Double-Unit Locomotive, Showing Wheel Arrangement and Location of Traction Motors

The motors and jackshafts will be located between the pony truck wheels and the driving wheels, the main motor

rods being connected to the second pair of drivers, the first and second pair of drivers being coupled.

The cab of each unit will be rigidly secured to the main engine frames, and the main apparatus, such as motors, phase-converter, transformer, etc., will be supported directly on the engine frames and cross-tie castings.

The motors are rated at 1,000 hp. each, and have a pinion at each end of the rotor shaft with collectors outside of the pinions. The locomotives will have about 30 per cent greater capacity than the present locomotives.

Principal Characteristics

Weight on drivers	560,000 lbs.
Total weight, approximately	380 tons
Tractive effort, continuous at 14 M. P. H.	90,000 lbs.
Tractive effort, one hour at 14 M. P. H.	108,000 lbs.
Tractive effort, starting	168,000 lbs.
Horse power, continuous at 14 M. P. H.	3 330 h. p.
Horse power, one hour at 14 M. P. H.	4,000 h. p.
Speeds—14 and 28 M. P. H.	

The order for the electrical equipment has been placed with the Westinghouse Electric & Manufacturing Company and for the mechanical parts with the American Locomotive Company.

Illinois Central Adopts Electrification System

THE COMMISSION appointed by C. H. Markham, president of the Illinois Central, in December, 1920, to consider and report upon the electrification of the Chicago terminals of the Illinois Central in accordance with the requirements contained in the Lake Front ordinance of the city of Chicago of July 21, 1919, has recommended the adoption of the 1,500-volt direct current system with an overhead contact system of current collection. The Lake Front ordinance, to which the city of Chicago, the Illinois Central and the South Park Commission were parties, settled the common boundary lines so long under discussion, provided for additional subways and viaducts across the railroad north of Fiftieth street, and bound the railroad company to extensive improvements, including a new station at East Roosevelt Road and the electrification of certain services.

The electrification requirements are as follows: (a) The entire suburban passenger service to be operated electrically on or before 1927; (b) the entire freight service north of East Roosevelt Road on or before 1930; (c) the entire freight service within the city limits on or before 1935; the through passenger service within the city limits may with certain provisions be electrified by 1940.

Since the electrification of steam roads has been undertaken to any great extent, that is, within the last 15 years, there has been a great deal of honest difference of opinion among the engineers and manufacturers both in this country and abroad as to the best system to be used for each particular installation. The Illinois Central problem, involving as it does a heavy suburban passenger service, freight transfers between yards, switching in congested yards and eventually through passenger movements, all within terminal limits only, is quite different from any electrification so far undertaken either in this country or abroad.

The suburban passenger service will cover the main line from Chicago to Matteson, 28 route-miles; the South Chicago branch, 4.5 route-miles, and the Blue Island branch, 4.4 route-miles. The track miles involved are 125. In a short time after electrification is completed it is estimated that 240 cars, electrically equipped, will be required. These cars as equipped will cost in the neighborhood of $35,000 each. The number of trains per day will be about 350, making about 5,000 train-miles daily. The freight service north of East Roosevelt road, next on the program, will cover more than 40 miles of track, and as this is mainly yard trackage, involves difficult problems to properly electrify it.

The commission considered three possible schemes which were early eliminated from discussion. These were the three-phase alternating current system which requires a double overhead contact and which was eliminated on account of complications in construction without any advantages over the single-phase alternating current system; the storage battery locomotive, which had to be eliminated on account of prohibitive operating charges; the Diesel engine locomotive or some other form of self-contained unit to meet the ordinance requirements as to noxious gases and noises. Some form of the latter type of unit may be developed for freight and through passenger movements, but the development is in such a stage that it could not be depended upon for the Illinois Central.

This investigation left four systems for consideration: (1) 750-volt direct current with third rail; (2) 1,500-volt direct current with overhead contact; (3) 3,000-volt direct current with overhead contact; and (4) 11,000-volt alternating current with overhead contact.

First cost estimates and maintenance and operation estimates covering these four systems were made.

Although the 750-volt system did not differ materially in first cost and annual cost from some of the other systems considered, it was eliminated because of the large mileage of freight yard tracks involved where the third rail was considered undesirable, and also on account of the track location where Chicago climate conditions would seriously hamper operation with the third rail.

Of the three systems using an overhead contact, the 1,500-volt system seemed best to the commission for this particular problem, the electrification of the Chicago terminal, no main line divisions being involved.

Before actual electrification construction work can be started a large amount of preliminary track work must be done. At the present time work totaling about $1,000,000 is under contract and in progress. This consists of track depression work between Twenty-fifth and Forty-fourth streets which involves the moving of over 600,000 cu. yd. of earth; elevation work between Forty-fourth and Fifty-first streets; and the construction of sewers at Rhodes avenue and Woodland Park, a dam at Twenty-third street to allow the filling of the property north of the dam, and a new breakwater between Twenty-ninth and Thirty-first streets. This will be followed by the rearrangement of tracks as the suburban tracks will be consolidated on the west part of the right-of-way; the erection of the new through passenger terminal at East Roosevelt Road; a new suburban passenger terminal at Randolph street; changes and additions to present suburban stations and platforms with entrance and exit subways where needed; and the elimination of grade crossings with other railroads.

In the meantime the design of the new electrification work covering a power-house, with a proposed location on the Calumet river near Riverdale, the sub-stations to be located at various points on the terminal, and the extensive overhead construction work for contact and transmission wires will be prosecuted. At the same time the selection of the electrical equipment for the multiple unit cars will be made. These cars will be similar in design to the 20 new all-steel suburban cars purchased in 1921 and now in use in steam service, which cars were built with the plans for the electrification in mind.

The changes in tracks and electrification of tracks will require several new interlocking plants and a complete new signal system, as the present one is not adapted to tracks where electric propulsion is used. Furthermore, extensive improvements must be made in the telephone and telegraph system involving several miles of underground conduit construction, to suit the new physical and operating conditions.

Changing a Road From a Liability to an Asset

Receiver of Louisiana & North West Has Converted Property from Bankruptcy to a Dividend Basis

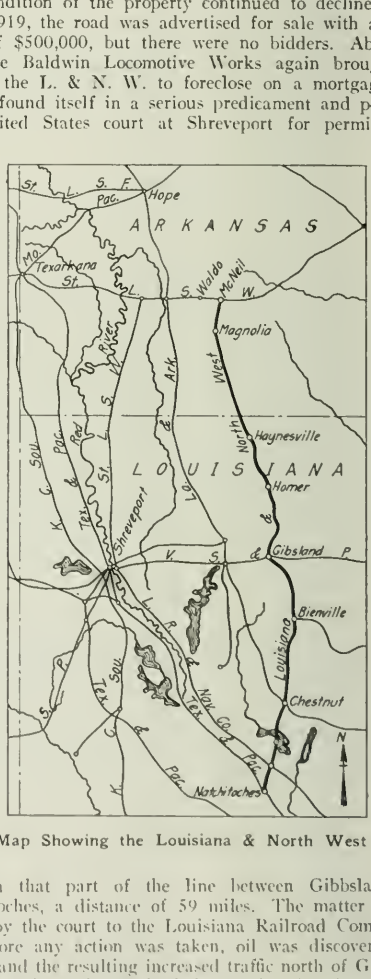
The Louisiana & North West, a railroad extending from McNeil, Ark., to Chestnut, La., a distance of approximately 100 miles, has been converted from a financial failure to a solvent condition within a period of two years. An attempted sale of the property at public auction in 1919 did not bring out a single bid at even the set minimum purchase price of $500,000, while its value is now estimated at $5,000,000. This change has been effected under the direction of E. R. Bernstein, formerly mayor of Shreveport, La., and vice-president of the Commercial National Bank of that city, who was appointed receiver of the road in October, 1920, after it had been out of operation for four days due to its inability to pay its employees.

The troubles of this road had reached a climax in 1919, when suit was brought by the Baldwin Locomotive Works to foreclose on a mortgage. This precipitated litigation in the course of which application was made to junk the entire line. This action was strongly opposed by the railroad commission of Louisiana, which eventually succeeded in its efforts to prevent this step being taken. In May of this year the receivership was terminated and the road was acquired by a syndicate headed by former Governor N. C. Haskell of Oklahoma. Since his acquisition of the road there has been some talk of extending the line from Magnolia, Ark., through Waldo to a connection with the Missouri Pacific at Hope, although no announcement to this effect has been made as yet. Some consideration is also being given to the extension of the line from Haynesville, La., to Eldorado, where Mr. Haskell is interested in timber as well as oil lands, but this is likewise still in abeyance. While it is said that the present liberal policy of additions and betterments to the line will be continued, the L. & N. W. is now in good operating condition and earning a substantial profit. It has not been hindered by the recent general strikes and the relations with its employees are harmonious.

History of the Road

In 1885, Maj. J. D. Beardsley petitioned the state of Louisiana for a charter to construct a railroad from Gibbsland, La., a station on the Vicksburg, Shreveport & Pacific, to Homer, to give rail facilities to the latter town; also to provide an outlet for lumber originating in the territory which this line would traverse. Work was begun in August, 1887, and track laying was completed in the latter part of that year. The road was opened for traffic early in 1888 under the name of the Louisiana North & South railway. The line was projected from Alexandria, La., to a connection with the St. Louis, Iron Mountain & Southern in Arkansas, a total distance of 225 miles, but the year 1890 found the line completed only between Homer and Bienville, 35 miles. At about the same time it was found that the charter of the old company was defective, and the road was reorganized under a new name, the Louisiana & North West, which was leased to J. D. Beardsley, its constructor, for a period of 50 years. In the course of a few years thereafter the road was extended north from Homer, to Magnolia, Ark., through the towns of Haynesville, La., and Emerson, Ark., and arrangements were made with the St. Louis Southwestern to lease its Magnolia branch between Magnolia and McNeil, a distance of 6.4 miles. This part of the line was opened for traffic in 1898. Within a few years another extension was completed which gave the road a through line from McNeil, Ark., to Natchitoches, La., a distance of about 121 miles, this last extension traversing a sparsely settled country and reaching the towns of Chestnut and Grand Ecore.

In August, 1913, upon the application of the Baldwin Locomotive Works and other creditors, the United States District Court at New Orleans, La., placed the road in receivership under G. W. Hunter of St. Louis, Mo., who had been president of the corporation for a few years preceding. The condition of the property continued to decline and in July, 1919, the road was advertised for sale with an upset price of $500,000, but there were no bidders. About this time the Baldwin Locomotive Works again brought suit against the L. & N. W. to foreclose on a mortgage. The carrier found itself in a serious predicament and petitioned the United States court at Shreveport for permission to



Map Showing the Louisiana & North West

abandon that part of the line between Gibbsland and Natchitoches, a distance of 59 miles. The matter was referred by the court to the Louisiana Railroad Commission, but before any action was taken, oil was discovered near Homer and the resulting increased traffic north of Gibbsland warranted the withdrawal of the petition for abandonment.

Mr. Bernstein Appointed Receiver

On October 1, 1920, E. R. Bernstein was appointed receiver to succeed G. W. Hunter, who had resigned. The road had ceased to operate for the four days prior to the new receivership on account of its inability to pay employees and to meet its current obligations. The roadbed and equip-

ment were in a serious condition and wrecks occurred at frequent intervals. The equipment at that time included nine locomotives, several of which had been purchased second hand in 1898, and through lack of proper care, were unfit for service. The freight and passenger cars were in a similar condition. It is said that the service of the carrier was so poor that when oil companies were preparing to drill large oil wells in the vicinity of Homer they shipped their equipment from Shreveport, La., to Minden on the Louisiana & Arkansas, and then transported it by motor truck to Homer. When the highways became impassable between Minden and Homer, fleets of caterpillar tractors were employed, and later when the oil was found, two companies constructed pipe lines, tank forms and loading racks to connect with railroads whose tracks were located 20 to 30 miles distant.

The first official action taken by the new receiver was to borrow $8,000 from the Homer National Bank with which he paid the employees and purchased fuel. On the day following, the employees returned to work and operation was resumed on the entire line. The new receiver also set about to reestablish the road's credit and to obtain the confidence of the public and shippers in the territory which the L. & N. W. served. To carry out his plan of rehabilitation, he directed his activities in two separate fields of endeavor.

First, he saw the necessity of practically reconstructing the property. Therefore, during the few months following his appointment, 100,000 ties, principally of white oak, were inserted and much rail was relaid. The entire right-of-way was cleared and ditched and the bridges and trestles were reconstructed. In addition to improving the roadway, the road's equipment was given attention. Seven new locomotives were purchased, one of the old engines acquired in 1898 was sold for $5,000, and the remaining eight locomotives were thoroughly overhauled. Six additional passenger coaches were bought and other coaches placed in good condition. The carrier's shops at Homer were reconstructed, additions built, and new machinery installed. The freight equipment was repaired in these shops and, in addition, some new equipment was purchased. Water tanks were erected, freight warehouses constructed and passing tracks laid.

The receiver's second method of procedure in the reconditioning of this road was to build a list of satisfied patrons. He appealed to his employees for the necessary co-operation and to date he has not had to contend with a single strike on that line. Prior to his administration there was no regular passenger service with the exception of a shuttle train which ran between Magnolia and McNeil, a distance of 6.4 miles. There were only two mixed trains, one running south from Gibbsland, and the other north, and two local freight trains. In addition to the above, six exclusive passenger trains are now operated as well as two regular freight trains and an average of eight extra freight trains daily. While the L. & N. W. had formerly failed to provide adequate facilities to serve the oil developments near Homer, when oil was discovered recently in the vicinity of Haynesville, industrial spurs were constructed, pipe yards, tank forms, loading racks, etc., were installed. Since October, 1920, train service has been uninterrupted and notwithstanding a large increase in business due to the oil traffic, at no time has the railroad resorted to a freight embargo.

That part of the line between Chestnut and Natchitoches, a distance of about 22 miles, having been unprofitable from the beginning, the receiver secured permission from the Interstate Commerce Commission to abandon it. From almost the start of his service, he also gained the co-operation of the railroad commissions of Louisiana and Arkansas in the settlement of taxation matters and other claims against the company. Having secured the support of federal and state commissions, and regained the confidence of the public, the problem was then to earn enough net revenue to make it worth keeping the L. & N. W. in operation.

From Deficits to Profits

During most of this road's life deficits have accumulated annually. The road had never paid dividends in its 35 years of existence. In 1907 there was a deficit of $39,000; in 1909, $85,752; in 1911, $109,250; in 1915, $168,223; in 1918, $114,717, and for the year ending December 31, 1919, $35,654. In contrast with this record, the only money borrowed under the 1920-22 receivership was the $8,000 loaned on the first day, which amount was repaid within a few months. The sum expended for maintenance of way during the receiver's tenure has exceeded $700,000, which was several times any sum that had ever been applied to maintenance of way during any equal previous period.

The gross revenues for the month of March, 1922, were $215,022.12, whereas for September, 1920, one month prior to the appointment of the receiver in question, they were only $61,404.33. The total operating expenses for March, 1922, were $105,177.86, while for September, 1920, they were $84,276.50. Thus, while the gross revenues for the month of March, 1922, amounted to $153,617.79 more than for the month of September, 1920, the increase in operating expenses was only $20,896.30. The number of passengers carried increased from 12,071 in September, 1920, to 35,521 in March, 1922, while the freight traffic increased from 18,916 tons in the earlier month to 81,828 tons in March of this year.

The operating revenues per mile in March of this year amounted to $2,148 as compared with $505 in September, 1920, while the operating expenses per mile increased from $525 in September, 1920, to $861 in March, 1922. The net operating revenues in March, 1922, amounted to $1,287 per mile, whereas the loss in operating revenues in September, 1920, was $17.80 per mile. At the time of Mr. Bernstein's appointment the cash on hand amounted to $5,841 while an audit completed on May 15, 1922, showed a cash balance of $311,767. While a large part of this increased revenue is, of course, due to the development of the Haynesville oil field much is the result of the improved relations with the shipping and traveling public. That the public is well satisfied with the results of the recent receivership is evidenced by resolutions adopted by the Louisiana Public Service Commission and the Arkansas Railroad Commission, expressing their approval of the improvement of both the physical and the financial condition of the property.

A London & North Western Locomotive Derailed at King's Langley, Hertfordshire

General News Department

The New England Railroad Club announces that its October meeting is postponed owing to the conditions in the transportation field, and that the next meeting will be held on November 14.

The Car Foremen's Association of Chicago will hold a smoker meeting in the Great Northern hotel in that city on October 11, at which time officers will be elected and other business transacted.

A representative from every railroad in the country is the expectation of the officers of the Railway Fire Protection Association in connection with their plans for their annual meeting which is to be held at the New Willard Hotel, Washington, D. C., beginning on Tuesday, October 17. Programs are to be sent to members this week.

The Chicago, Rock Island & Pacific has issued for October a special seventieth anniversary number of its monthly "Rock Island Magazine." This number contains 225 pages, of which 100 are devoted to reading matter. The material consists largely of reminiscences and historical data surrounding the life of that railroad since the date of its founding.

The American Association of Passenger Traffic Officers will hold its annual meeting in Louisville, Ky., on October 10. The meeting of the association will be devoted largely to receiving the reports of the committee on ticket paper, the joint committee of the association and the Railway Accounting Officers' Association, the committees on standing forms of tickets, digest of fares and divisions, and adjustments and disputes relative to passenger fares and kindred subjects.

Donald R. Richberg, of Chicago, counsel for the striking unions, received assurance of readiness to co-operate with counsel for the railway shop craft organizations in any endeavor to expedite further judicial proceedings in connection with the government's strike injunction when he conferred with officers of the Department of Justice on October 2. Attorney General Daugherty said the government would not oppose or seek to delay an effort to bring the Chicago injunction or any of its collateral issues before a higher tribunal.

The riding characteristics of one of the Baldwin-Westinghouse electric locomotives used on the Chicago, Milwaukee & St. Paul have been improved by dividing the cab in two parts, according to a report called the "Log of the Manhattan" issued by the Baldwin Locomotive Company which describes a trip made through the west by President Vauclain and party. The report states: "Engines 10306 and 10307 took the curves easily and rode well. It is only in comparison with engine 10301 that they suffer, because engine 10301 seems to leave nothing to be desired." The last mentioned locomotive has a divided cab, while the other two have not.

New Members on Executive Committee of Railroad Division, A. S. M. E.

The balloting for members of the Executive Committee of the Railroad Division of the American Society of Mechanical Engineers recently held resulted in the election of the following members, re-elected for one-year term, W. H. Winterrowd, chief mechanical engineer, Canadian Pacific; James Partington, estimating engineer, American Locomotive Company; new members elected for a two-year term, William Elmer, division superintendent Pennsylvania System, and B. P. Flory, superintendent of motive power, New York, Ontario & Western. E. B. Katte, the present chairman of the Railroad Division, serves another year on the Executive Committee, according to the rules of the society.

Maintenance of Way Brotherhood Meets in Detroit

The United Brotherhood of Maintenance of Way Employees met in Detroit, Mich., on October 2, in its triennial convention. Approximately 1,200 delegates, representing 300,000 brotherhood members in all parts of the United States and Canada, are in attendance. One of the important questions to come before the convention relates to the removal of the union's headquarters to a more central location.

Freight Claims Continue to Decrease

According to the recently issued classified summary of freight claim expenditures for the first six months of 1922, as prepared by the Freight Claim Division of the American Railway Association, a decrease of 50.7 per cent has been shown as compared with a like statement for the same period in 1921. The total sum expended in the payment of freight claims for the first six months of this year was $27,380,061.

A. R. A. Washington Committee

The Board of Directors of the American Railway Association has appointed a conference committee of eight of its members for consultation and conference, as a necessity may arise, in Washington, consisting of the following: Daniel Willard, chairman, (B. & O.); W. W. Atterbury, (Penn.); B. F. Bush, (M. P.); H. E. Byram, (C. M. & St. P.); C. R. Gray, (U. P.); Hale Holden, (C. B. & Q.); C. H. Markham, (I. C.); A. H. Smith, (N. Y. C.).

A Train Control Program

The Western Society of Engineers, Chicago, will present a symposium on Automatic Train Control on Monday evening, October 23. Among the speakers will be C. F. Giles, superintendent of machinery of the Louisville & Nashville, Louisville, Ky., who will discuss the subject from the mechanical standpoint and Thomas S. Stevens, signal engineer of the Atchison, Topeka & Santa Fe System, Topeka, Kan., who will speak from the standpoint of the signal engineer. Other speakers will trace the history of train control and will discuss it from the standpoint of the operating department.

Missouri Pacific to Terminate Van Noy Contracts

The Missouri Pacific will not renew its contract with the Van Noy Interstate Company for the operation of its restaurants and hotels following its expiration on February 26, 1923. President Bush of the Missouri Pacific states that no plans for the future have been decided upon. It is said that, although relations with the Van-Noy organization have been cordial, the carrier is making the change to insure a more uniform service for its patrons. The Van-Noy Company has had a contract with the Missouri Pacific for 15 years.

Labor Board Considers Wages of Maintenance of Way Employees in Executive Sessions

On October 2 the Railroad Labor Board, in executive session, began the consideration of the demands of the United Brotherhood of Maintenance of Way Employees and Railroad Shop Laborers for increases in the rates of pay of all classes of maintenance of way employees and for a minimum basic wage of 48 cents an hour. Present indications are that this decision will be handed down about October 15 and that the living wage principle so strenuously advocated by the representatives of the maintenance of way employees will not be recognized at this time by the Board, but that the workers involved will be given an increase.

Thornton to Head Canadian National

Word came as we were going to press that Sir Henry W. Thornton, at present general manager of the Great Eastern of England and formerly general manager of the Long Island, had been appointed head of the Canadian National Railways System, with which the Grand Trunk is now consolidated, at a salary of $50,000 a year. Sir Henry is at present in Canada but is leaving at once for England and hopes to return in 30 days to take up his duties.

The following directors will be associated with him: J. H. Sinclair, New Glasgow, N. S.; Richard P. Gough, Toronto; James Stewart, Winnipeg; Ernest R. Decary, Montreal; Frederick G. Dawson, Prince Rupert; Tom Moore, President Canadian Trades and Labor Congress, Ottawa; G. A. Bell, Deputy Minister of Railways; G. G. Ruel, general counsel, Toronto.

Three of these directors are business men, one is a representative of the wheat interests of the west; one represents labor; one is a member of Parliament and one is the present deputy minister of railways. The inclusion of a representative of labor on the board of directors is of special interest and significance.

Net Operating Income in August

Preliminary compilations show that 139 out of the 197 Class I railroads had a net operating income in August of $39,104,000, compared with $70,028,000 for the same roads for August, 1921. The 139 roads represent 176,953 miles. Complete reports for all Class I roads are expected to be available in about a week.

Operating revenues for the 139 roads totaled $382,711,000, a decrease of 6.22 per cent under those for the same roads in August last year, while operating expenses for those roads totaled $316,356,000, an increase of 2.2 per cent over one year ago.

The Burlington Pension Badge

In the shape of a shield, three-quarters of an inch in height, bearing the words "Burlington Service" in the familiar oblong shape of the company's trade mark in the upper part, and a number indicating the years of service just beneath it, the Chicago, Burlington & Quincy has provided an unusual and unique badge of honor for its retired employees who are on the pension roll. The first shield goes to J. R. Wood, a passenger conductor who has just completed 65 years of continuous service, and who was the oldest employee in length of service. Mr. Wood began in 1857 as a waterboy. W. L. Hippert, another passenger conductor, has completed 56 years of continuous service for the road, having begun as a brakeman in 1866.

Only Four Wooden Mail Cars

The wooden railroad car is almost gone, says a statement issued by the Post Office Department. "It is about ready to fade into the past, joining the passenger pigeons, the wild west, the horse drawn carriage and ginger-bread houses." According to the figures of the Post Office Department there are only four wood mail cars now in use out of about 5,000 cars formerly employed to transport United States mail. In 1913 a law was passed by Congress, later reenforced by a law passed in 1916 requiring that no more mail cars be admitted for postal service unless they were all steel or steel under-frame. Those wooden cars which were in use were allowed to remain in service. With the gradual replacement of wooden cars with steel, injuries and deaths of post office employees are said to have greatly decreased. During the last year only two clerks were killed in accidents and 26 seriously hurt. Almost 20,000 railway postal clerks now are employed in the railway mail service.

Later, in order to correct any false impression which might be gained from the statement to the effect that there were only "four wood mail cars now in use," the department issued a statement giving the following statistics on the kinds of cars used in the service. Of the 1,087 Railway Post Office cars 862 are all steel, 154 are steel underframe, 67 are wood steel reinforced, and four are all wood construction. Of the 4,074 apartment cars in use 1,104 are all steel, 641 are steel underframe, 1,947 are wood, steel reinforced, and 382 are all wood construction.

Cab Signals on the Orleans Railway

The Orleans Railway of France, operating 2,969 locomotives, now has 547 of these equipped with apparatus for giving an audible signal in the cab. This system is of the ramp type and "crocodiles" (ramps) have been installed at 987 distant signals. By the end of this year the total number of locomotives equipped will be increased to 802. The Orleans is the railroad which for years has had torpedo machines in service at home signals—apparently throughout the whole of its more important lines—and concerning which an officer of the company has said that not for 50 years have trains been in serious collision because of an engineman overrunning a fixed stop signal.

California Blames East for Lack of Much Needed Cars

With the shippers receiving less than a third of refrigerator cars that they deem necessary to save the California grape crop, the Railroad Commission of that state last week again wired the Interstate Commerce Commission urging action to facilitate the westbound movement of empty cars, as follows:

"Refrigerator car situation in California not improving. Demands for 900 cars daily, with average of 250 to 275 received. Grape crop harvest now at peak and unless equipment furnished, losses will be tremendous. Our information and investigation indicate cars delayed in East account embargo and local loading. Can you advise situation of westbound empty refrigerator cars?"

Priority orders in favor of coal movement are declared to be largely responsible for this situation. Diversion of cars by brokers and delay in loading are also contributing factors. The state commission has strongly urged upon the federal commission an order against circuitous diversion and that demurrage rates be increased.

Accident Report for Second Quarter, 1922

The Interstate Commerce Commission has issued a summary of railroad accident statistics for the months of April, May and June of this year, from which we take the following figures, *those in parentheses being, in each case, the totals for the same quarter in* 1921.

In train accidents 7 (21) passengers, 63 (42) employees and 24 (25) other persons were killed, and 552 (569) passengers, 286 (285) employees and 83 (88) other persons were injured. Adding to these the train service accidents we have totals of 1,279 (1,180) persons killed and 9,015 (8,569) injured. These last include 402 (336) persons killed at highway crossings and 1,201 (1,015) injured. These grade crossing statistics, including also some casualties reported under the head of derailments of trains, show an increase over the same months of 1921 of 20.8 per cent in fatalities, and of 24.2 per cent in injuries not fatal.

I. C. Calls for Co-operation in Movement of Coal

The Illinois Central, through a recent advertisement published in a large number of daily newspapers, urges public co-operation in the speedy movement of coal. If the mine operators, coal dealers and coal consumers work together the pressure on the railroads will be lightened. The advertisement reads, in part:

"The Illinois Central is facing the problem of providing coal cars for fall and winter bituminous coal supplies. During this strike the side tracks of the railroads were crowded with many thousands of idle coal cars. Every informed person will appreciate that no railway system could keep itself adequately equipped to meet such a situation as the present. By the prompt loading and unloading of cars and by direct billing of cars to avoid delays occasioned by reconsignment operators, dealers and consumers can aid materially in accelerating the coal movement. We believe that,

if we receive 100 per cent co-operation from operators, dealers and consumers, no one dependent upon the Illinois Central for transportation will suffer from cold this winter. The Illinois Central System owns 30,667 open top cars suitable for coal and 5,000 new coal cars are being delivered."

Labor Board Holds Hearings on Train Dispatchers' Rules

On September 28 and 29 the Railroad Labor Board held hearings in disputes regarding certain rules and working conditions at the instance of the American Train Dispatchers' Association, the two most important questions in dispute on practically all of the railroad involved being, (1) should chief despatchers, night chief despatchers and assistant chief despatchers be included in the agreement with that organization and (2), should despatchers be allowed vacations and sick leaves with pay. In addition, there were some miscellaneous disputes involving the questions of relief days, calls, overtime, etc., but these were subsequently remanded to one of the Labor Boards' bureaus for a later hearing. After testimony bearing on the two important disputes had been given to the Board by J. G. Luhrsen, president of the train dispatchers' organization, and J. W. Higgins, Dr. C. P. Neill and J. G. Walber, representing respectively the western, southeastern and eastern carriers, the Labor Board took the case under advisement.

Master's Report Favors I. & G. N. in Big Suit

The International & Great Northern will be awarded $2,000,000 in a judgment against the Pierce Oil Corporation, New York, if a master's report to Judge Hutcheson is upheld. The road originally sued for $2,555,625 for failure to fulfill contracts for delivery of 750,000 barrels of oil at 83 cents a barrel at Fort Worth, Tex., and 750,000 barrels at 70 cents at Texas City Junction. The road asserted that it had been forced to purchase oil in the open market at $3.50 a barrel, and it sued for the difference between the two prices. The receiver for the railway sustained damages aggregating $771,350 on Mexican oil and $1,026,462 on domestic oil, a total of $1,797,812; and interest of more than $200,000 was added. A counter judgment for $28,219, with interest at 6 per cent from April 1, 1920, was recommended by the master in favor of the Pierce Oil Corporation for oil furnished during March of that year which would reduce the main judgment to that extent. The judgment will be reviewed by Federal Judge Hutcheson, Jr.

Prevents Orient's Increased Divisions Becoming Effective

A restraining order preventing the carrying out of a recent decision of the Interstate Commerce Commission granting the Kansas City, Mexico & Orient an increase in the division of joint through freight rates, was issued on October 2, as a result of a special hearing in the United States District court, at Denver, Colo. Action brought by 13 carriers whose lines connect with the Orient, on the grounds that the order was confiscatory of their revenues, arbitrary and without evidence to support it, led to the restraining order. The plaintiffs contended that the commission misconceived its powers under the interstate commerce law and that it sought to take arbitrarily the revenues of strong lines and use them for the aid of a carrier unable to earn operating expenses, instead of prescribing a fair and equitable division of the revenue from joint rates. This is said to be the first case under the Transportation Act of 1920 in which the order of the Interstate Commerce Commission making divisions in rates has been enjoined. In New England recently a similar order of the commission was upheld.

Cab Signals on the Northern of France

The Northern Railway of France, as is well known, has used an audible cab signal for 40 years or more, the simple contact apparatus known as the "crocodile." From an inquiry which has been made in connection with the action of the French Government in calling upon all the railroads of the Republic to adopt some kind of cab signal it appears that the Northern now has in service 2,906 locomotives of which all but 43 have the cab signals. These 43 are at present in the shops. Of the engines fitted, 752 are in the passenger service, 1,726 in freight service and 385 are switching locomotives.

The other railroads of France are now making this improvement, and a statement of the conditions on the Paris, Lyons & Mediterranean was given in the *Railway Age* of September 30, page 606. These other roads are not in all cases using the same design as that of the Northern but it appears that there is a general understanding that the principle of operation and the location of apparatus on the roadways are to be sufficiently in conformity to the practice of the Northern to make it practicable to interchange locomotives, if necessary, throughout France.

Mr. Loree on Labor Unions

State supervision of all voting which may result in a strike or lockout was advocated by L. F. Loree, president of the Delaware & Hudson in an address on "Labor Unions" before the clearing house section of the American Bankers Association convention in New York this week. He proposed that laws be enacted to this effect. Such control, to insure a secret ballot free from intimidation or misrepresentation, and its honest count was declared necessary to rescue the American worker from what he termed the tyranny of labor professionally organized. Mr. Loree urged his hearers to devote time and thought to ways and means of helping the laborer "in his safety and comfort * * * intellectually and spiritually." He would have laws enacted—

1. To provide that voluntary associations of seven or more members may sue or be sued.

2. To make the records and accounts of such associations subject to public authority, and to make political use of union funds a criminal offense.

3. To give State authorities better facilities for labor dispute investigation through the power to subpœna witnesses; also to make available to the public full reports of such investigations, then to compel fourteen days' notice of intention to strike or lockout.

Railway Real Estate Association to Meet

The fourth annual meeting of the Railway Real Estate Association will be held at La Salle Hotel, Chicago, on Tuesday, Wednesday and Thursday, October 10, 11 and 12. By the resignation of President F. C. Irvine, James T. Maher (Great Northern) has become president of the association, and Chicago has been fixed upon as the place of meeting instead of Pittsburgh. Mr. Maher will deliver the presidential address on Wednesday morning.

The principal papers on the program are the following: Railroad insurance, by K. T. Krausch (C. B. & Q.); How to buy right of way, by O. F. Scudder (C. B. & Q.); Purposes for which railroad land should be leased, by J. L. Watson (Nor. Pac.); Crossings, and use of railroad land by telephone companies, etc., by W. L. Mattoon (Hocking Valley); The relation of federal valuation to taxation, by A. J. Rooney (C. & O.); Methods of assessing railroad property, by Hon. N. P. Haugen, formerly chairman of the Wisconsin Tax Commission; Can government valuation of railroad lands be made an influencing factor in condemnation proceedings? by W. R. Tarbet (Ill. Cent.); Can the multiple studies made in connection with federal valuation be used as a basis of determining cost of acquiring lands? by W. B. Thomson (W. & L. E.)

Our Duty to Home and Industry

The foregoing is the title of a circular which the Buffalo, Rochester & Pittsburgh has addressed to its employees, calling attention to the crisis in coal transportation. It says, in part:

The Buffalo, Rochester & Pittsburgh is favorably spoken of in every community it serves, and will stay in favor just so long as it continues to serve. We as railroad men have never had an opportunity to show our ability for real railroading such as confronts us today. The jobs of those in many industries depend on us to move coal. The lives of children, babies and the infirm depending on fuel for warmth demand that we do our utmost to move coal. That the public may be adequately served there must be the utmost harmony, co-operation and endeavor all along the

line. The *Railway Age* says: "Coal cars should be unloaded promptly regardless of the free time allowance. For a consignee under present conditions to delay the unloading of cars merely because he has the legal right to do so, would be a crime against the public welfare * * *" This company now calls on every employee to give patrons transportation facilities never before equalled. We have the men who can do it, and with enthusiasm and team work we are out to set a record for every other railroad to try and equal. We must make a record for brilliant railroading. We must move the coal and with the co-operation of mines and consignees we are going to do it.

Effect of Strike on the Mails

Statistics issued by the Post Office Department show that during the period of the railroad strike upheaval 1,269 mail trains were annulled by the railroads, representing a mileage of 112,540. Transferring mail pouches to other trains, re-routing mail and apartment cars, substituting automobile trucks for railroads and other emergency measures were adopted so that there was no serious congestion of the mails at any point for any length of time. Except for slight interruptions at isolated points and a slowing up in the operation of the postal system in certain sections regular delivery of the mails continued as if no serious strike was in existence, according to a statement issued by the department. In only extreme cases was it found necessary to substitute motor trucks to carry the mails, and in these emergencies automobiles were immediately placed in commission, making regular runs both daily and tri-weekly to points cut off from railroad transportation.

Postmaster General Work early completed plans for the mobilization of the Army and Navy air service to carry the mails, and also inaugurated a complete survey of the motor vehicles, both publicly and privately owned, that might be available to secure the safe and complete delivery of mails in case of thorough break-down of railroad service. Scores of messages from every part of the country were received offering the use of airplanes, motor trucks and other vehicles.

The Careful Crossing Campaign in Chicago

At a recent meeting of the Steam Transportation Committee of the Chicago Association of Commerce, a report was made of the work of the Safety Council in connection with the "Careful Crossing Campaign." It was stated that approximately 6,000 large posters, 1,500 small posters and 100,100 "stickers" have been used, this material being distributed to, and by the aid of motor clubs, the Cartage Exchange of Chicago, public and parochial schools, Boy Scouts of America, Association of Commerce, members of the National Safety Council and the Motor Truck Owners' Association and otherwise. Many industries in Chicago were supplied with this material, including the International Harvester Company, which distributed it to its branch agencies and drivers throughout the United States. Also a radio address was made preceding the campaign by E. M. Switzer, superintendent of safety, Chicago, Burlington & Quincy, and during the campaign by J. E. Gorman, president of the Chicago, Rock Island & Pacific, these addresses reaching about 50,000 people (in each instance) in a territory extending 800 miles from Chicago, besides being accorded wide press publicity.

Extensive publicity was accorded the campaign by "Chicago Commerce," the official publication of the Chicago Association of Commerce; in the magazines of the motor clubs and in trade journals and house organs. Approximately 200 reports of carelessness exhibited by motorists at railway crossings have been acted upon individually by the Highway Safety Committee of the council. The Chicago Motor Club and the Illinois Automobile Club carried notice of the campaign in their several electric signs about the city and three large billboard advertisements were located at prominent locations in the city. The plan was explained by A. W. Smallen before the Motor Drivers' School; by E. M. Switzer at C. A. C.'s Foremen's Instructions Course, and M. A. Dow at the Safety Supervisors' School, in addition to which co-operation was solicited on the part of the several hundred companies in Chicago directly interested in the Safety Council's operation.

A special pamphlet, prepared under the direction of the committee, was distributed to all school teachers and by them read to the children to explain the plan and urge their co-operation, thus directly instructing about 550,000 school children. (Several roads also distributed this pamphlet or a revision of it to the schools along their lines.) Publicity was accorded the subject in the newspapers of the city and the subject was presented at sundry public meetings by members of the Speakers' Bureau of the Safety Council. The slogan "Cross Crossings Cautiously" has been made a part of the safety textbook about to be placed in use in Chicago public schools.

During June and July, 1922, there were only four fatalities in automobile-railway crossing accidents in Chicago and Cook county, as compared with five in the same period of 1921. Attention was called to an editorial on the results of the campaign published in the *Railway Age* of September 9, wherein it is shown that on 66 class I roads in June and July, 35 more persons were killed in grade crossing accidents than in the same period of 1921; that the campaign, nevertheless, is counted as a success, and that enthusiasm so developed should be maintained. The committee appeared before the Illinois Commerce Commission on September 20, and urged that body to undertake a campaign for the education of motorists, with particular regard to railway crossing accidents.

R. B. A. Asks President to Let Rate Provisions Stand

The Railway Business Association has addressed a letter to President Harding asking him to preserve intact the income provisions of the Transportation Act. These provisions, the letter says, are in a position different from the labor provisions. The letter, which is signed by Alba B. Johnson, president of the association, follows in part:

"Your attention is invited to the importance of so restricting railway legislation that for some time to come changes may be avoided in the sections which assure the roads an opportunity to earn an adequate income. As we view it, the labor provisions and the provisions embodying the rule of rate making are in two distinct positions.

"Those who urge amendments to the labor clauses state that the object of those sections was to prevent interruptions in railway service through strikes and there have been strikes. Such advocates assert their conviction that a sufficient consensus of public approval for strike remedies has crystallized to warrant serious consideration of amendments. The purpose of the clauses affecting the regulation of rates, on the other hand, was to find a level which would yield the average road sufficient income for it to finance adequate additions and betterments. Nobody can yet say advisedly that these sections have failed. Proof requires trial over a period longer and more fully representative of average normal conditions than has thus far been possible. No observer has asserted that there is a consensus of public opinion as to the sufficiency of these clauses or as to desirable modifications.

"We respectfully suggest that before Congress reconvenes you emphasize to that body and to the country the vital stake of all concerned in the stability of these vast railway purchases and how essential for the continuance of prosperity it is to postpone amendments of the clauses affecting railway revenue and thus preserve confidence in adequacy of railway income as a permanent aim of government regulation."

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—F. M. Nellis, 165 Broadway, New York City. Next convention, May 1-4, 1923, Denver, Colo. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—J. F. Gettrust, The Ashton Valve Company, 318 W. Washington St., Chicago. Meeting with Air Brake Association.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—E. A. Pontious, Supervisor of Demurrage and Storage, C. & N. W. Ry., Chicago.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—L. A. Stone, C. & E. I. Ry., Chicago. Annual meeting, Oct. 17-20, San Francisco, Cal.

AMERICAN ASSOCIATION OF ENGINEERS.—C. E. Drayer, 63 E. Adams St., Chicago.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 So. Michigan Ave., Chicago.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 10 and 11, Seelbach Hotel, Louisville, Ky.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rothschild, Room 400 Union Station, St. Louis, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—J. W. Welsh, 8 W. 40th St., New York.

AMERICAN RAILROAD MASTER TINNERS, COPPERSMITHS AND PIPE FITTERS' ASSOCIATION.—C. Borcherdt, 202 North Hamlin Ave., Chicago, Ill.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, General Secretary, 75 Church St., New York, N. Y. Annual meeting, November, 1922.

Division I.—Operating. J. C. Caviston, 30 Vesey St., New York, N. Y.

Freight Station Section (including former activities of American Association of Freight Agents). R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.

Medical and Surgical Section. J. C. Caviston, 30 Vesey St., New York, N. Y.

Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association). J. C. Caviston, 30 Vesey St., New York, N. Y.

Safety Section. J. C. Caviston, 30 Vesey St., New York.

Telegraph and Telephone Section (including former activities of the Association of Railway Telegraph Superintendents). W. A. Fairbanks, 30 Vesey St., New York, N. Y. Annual meeting has been indefinitely postponed.

Division II—Transportation (including former activities of the Association of Transportation and Car Accounting Officers). G. W. Covert, 431 South Dearborn St., Chicago, Ill.

Division III.—Traffic, J. Gottschalk, 143 Liberty St., New York.

Division IV—Engineering, E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Exhibit by National Railway Appliances Association.

Construction and Maintenance Section. E. H. Fritch.

Electrical Section. E. H. Fritch.

Signal Section (including former activities of the Railway Signal Association). H. S. Balliet, 30 Vesey St., New York, N. Y. Next meeting, November 21 and 22, Hotel McAlpin, New York.

Division V—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Exhibit by Railway Supply Manufacturers' Association.

Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill.

Division VI—Purchases and Stores (including former activities of the Railway Storekeepers' Association). W. J. Farrell, 30 Vesey St., New York, N. Y.

Division VII—Freight Claims (including former activities of the Freight Claim Association). Lewis Pilcher, 431 South Dearborn St., Chicago, Ill.

Car Service Division—C. A. Buch, 718 18th St., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Next convention, October 17-19, 1922, Hotel Gibson, Cincinnati, Ohio. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—A. Leckie, Industrial Agent, Kansas City Southern Ry., Kansas City, Mo.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(Works in co-operation with the American Railway Association, Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Exhibit by National Railway Appliance Association.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—(See American Railway Association, Division V.)

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—R. D. Fletcher, 1145 East Marquette Road, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.

AMERICAN SHORT LINE RAILWAY ASSOCIATION.—T. F. Whittelsey, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY FOR STEEL TREATING.—W. H. Eiseman, 1600 Prospect Ave., Cleveland, Ohio. Annual convention, Oct. 2-7, 1922, General Motors Building, Detroit, Mich.

AMERICAN SOCIETY FOR TESTING MATERIALS.—C. L. Warwick, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Prof. J. H. Dunlap, University of Iowa, Iowa City, Ia. Regular meeting 1st and 3d Wednesdays in month, except July and August, 33 W. 39th St., New York. Fall meeting, October 4-9, Palace Hotel, San Francisco, Cal.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

Railroad Division—A. F. Stuebing, Manager Editor, Railway Mechanical Engineer, Woolworth Bldg., New York.

AMERICAN TRAIN DISPATCHERS' ASSOCIATION.—C. L. Darling, 1310-1311 Mallers Bldg., Chicago, Ill. Next convention, June 18, 1923, Chicago.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—S. D. Cooper, A. T. & S. Fe R. R., Topeka, Kan. Next meeting, January 23, 1923, New Orleans, La.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, Northern Pacific R. R., St. Paul, Minn.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Annual convention, October 30-November 3, Hotel La Salle, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Thomas De Witt Cuyler (chairman), 61 Broadway, New York, N. Y.

ASSOCIATION OF RAILWAY SUPPLY MEN.—A. W. Clokey, 1658 McCormick Bldg., Chicago. Meeting with International Railway General Foremen's Association.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—(See American Railway Association, Division I.)

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railway Association, Division II.)

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—D. J. Higgins, American Valve & Meter Company, 332 S. Michigan Ave., Chicago. Meeting with convention of American Railway Bridge and Building Ass'n.

CANADIAN RAILWAY CLUB.—W. A. Booth, 53 Rushbrook St., Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 676 North Pine Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—Thomas B. Koeneke, 604 Federal Reserve Bank Bldg., St. Louis, Mo. Meetings, first Tuesday in month at the American Hotel Annex, St. Louis.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 2d Tuesday in January, March, May, September and November, Hotel Iroquois, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. F. Elliott, Terminal Railroad Association of St. Louis, East St. Louis, Ill. Annual convention, November 6-8, Hotel Sherman, Chicago.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—D. B. Wright, 34th St. and Artesian Ave., Chicago, Ill. Meeting with Chief Interchange Car Inspectors' and Car Foremen's Association.

CINCINNATI RAILROAD CLUB.—W. C. Cooder, Union Central Bldg., Cincinnati, Ohio. Meetings, 2d Tuesday in February, May, September and November.

EASTERN RAILROAD ASSOCIATION.—E. N. Bessling, 614 F St., N. W., Washington, D. C.

FREIGHT CLAIM ASSOCIATION.—(See American Railway Associations, Division VII.)

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—C. H. Treichel, Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Friday in month, Room 1414, Manhattan Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—George P. White, 747 Railway Exchange, Chicago. Meeting with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, 702 E. 51st St., Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—C. W. Sullivan, Garlock Packing Co., 326 W. Madison St., Chicago. Meeting with International Railway Fuel Association.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Division V.)

MASTER CAR BUILDERS ASSOCIATION.—(See A. R. A., Division V.)

NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—Warren C. Nixon, Western Tie & Timber Co., 905 Syndicate Trust Bldg., St. Louis, Mo.

NATIONAL ASSOCIATION OF RAILWAY AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Annual convention, November 14, Hotel Tuller, Detroit, Mich.

NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, People's Gas Bldg., Chicago. Annual exhibition at convention of American Railway Engineering Association.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Next meeting, November 14.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3d Friday in month, except June, July and August, at 29 W. 39th St., New York.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 600 Liberty Bldg., Broad and Chestnut Sts., Philadelphia, Pa. Annual meeting and dinner, November 9, Hotel Commodore, New York.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, General Electrical Co., Chicago. Annual meeting with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—R. J. Himmelright, 17 East 42nd St., New York. Meeting with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md. Annual meeting, October 17-19, Willard Hotel, Washington, D. C.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, C. & O. Ry., Richmond, Va. Next meeting October 10-13, 1922, Pittsburgh, Pa.

RAILWAY SIGNAL ASSOCIATION.—(See A. R. A. Division IV, Signal Section.)

RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A., Division VI.)

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meeting with A. R. A., Division V.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 19 and 20, Battery Park Hotel, Asheville, N. C.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W. Ry., Sterling, Ill. Annual convention, November 21-23, 1922, Hotel Statler, Cleveland, Ohio. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—P. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. I. Merrill, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—L. L. Carrier, Car Serv. Agt., Tenn. Cent. Ry., 319 Seventh Ave., North Nashville, Tenn. Next meeting, October 19, St. Augustine, Fla.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—H. S. White, 9 N. Jefferson St., Chicago.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Annual convention, October 31-November 3, Hotel Sherman, Chicago. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—Bruce V. Crandall, 14 E. Jackson Boulevard, Chicago. Regular meetings, 3d Monday each month except June, July and August.

Traffic News

The Buffalo, Rochester & Pittsburgh has opened a city ticket office in Pittsburgh, Pa., 529 Smithfield Street. The city passenger agent is H. B. Herrick.

The Northern Pacific has restored 58 passenger trains to service, the operation of which was discontinued during the first part of the summer due to the shop crafts' strike and the fuel shortage.

A committee of freight traffic officers of the trunk line railroads will begin a meeting in New York on October 23 for the purpose of hearing shippers on a plan for a uniform scale of class rates for trunk line territory which has been under consideration for some time.

Freight Commodity Statistics to June 30

The Bureau of Statistics of the Interstate Commerce Commission has compiled a statement showing by districts the freight tonnage transported by Class I steam railways for the quarter ended June 30, 1922, with comparisons between 1921 and 1922:

	Number of tons originated		
Class of commodities	Quarter ended June 30, 1921	Quarter ended June 30, 1922	Per cent of increase 1922 over 1921
Products of agriculture	21,373,939	19,965,391	*6.59
Animals and products	5,775,453	6,150,416	6.49
Products of mines	124,036,608	101,404,725	*18.25
Products of forests	19,746,413	22,779,953	15.36
Manufactures and miscellaneous	41,894,693	57,258,094	36.67
Merchandise—all l.c.l. traffic	10,628,424	11,036,921	3.84
Total	223,455,530	218,595,500	*2.17

	Total tons carried.		
Class of commodities	Quarter ended June 30, 1921	Quarter ended June 30, 1922	Per cent of increase 1922 over 1921
Products of agriculture	44,639,283	43,583,656	*2.36
Animals and products	10,146,292	10,846,813	6.90
Products of mines	208,779,616	180,471,075	*13.56
Products of forests	36,858,931	45,913,216	24.56
Manufactures and miscellaneous	81,054,733	112,557,162	38.87
Merchandise—all l.c.l. traffic	16,770,520	18,057,427	7.67
Total	398,249,375	411,429,349	3.31

* Decrease.

Coal Production

Production of both bituminous coal and anthracite appears to have found a temporary level, bituminous at around 9,750,000 net tons, and anthracite at 1,850,000 tons a week, said the Geological Survey in its bulletin on coal production for the week ended September 30. The total of all coal raised is therefore about 11,600,000 net tons, still somewhat less than the amount required to meet current consumption and the heavy movement up the Lakes, and at the same time to rebuild consumers' stocks.

The total production of anthracite during the week was estimated at from 1,800,000 to 1,900,000 net tons as against 1,856,000 tons in the week preceding.

The output of bituminous coal for the week was estimated at from 9,600,000 to 9,900,000 tons. The returns indicated a slight increase over the week preceding. The following statement shows the number of cars loaded daily during the past three weeks:

	Sept. 11 to	Sept. 18-23	Sept. 25-30
Monday	35,919	37,986	38,804
Tuesday	30,737	29,926	33,396
Wednesday	29,478	28,403	27,404
Thursday	26,571	29,036	26,862
Friday	28,468	27,139	27,177
Saturday	25,418	25,300	26,848

Under the stimulus of active demand soft coal is now being offered for shipment up to the ability of the rail and water carriers to transport it. The present weekly rate of production is nearly a million tons above that of the year of depression, 1921, but is from one and one-half to three million tons below the other preceding three years.

Preliminary returns on daily car loadings at anthracite mines during the week September 16-23 increased from 5,449 cars on Monday to 5,900 on Thursday but fell off on Friday and on Saturday to 5,506 cars. Loadings on Monday of last week increased to 5,952 cars, and on Tuesday were about the same. On Wednesday there was a slight decrease but on Thursday loadings reached 5,983 cars, the largest number since the end of the strike. On Friday 5,854 cars were loaded and on Saturday 6,144. Shipments for the week will be about 30,000 cars which compares favorably with weeks of normal production in recent years.

The mine reports for the week ended September 16 show a gradual but widespread increase in losses ascribed to transportation disability. In only five districts—Tug River, Logan, Virginia, Iowa, and Wyoming was there any marked improvement in car supply. In the strongly organized fields where the Cleveland agreement has been accepted or made the basis of subsidiary agreements production has reached the limit of transportation facilities. Even in the Pittsburgh and Central Pennsylvania districts transportation is now the chief factor limiting production. No agreement has yet been reached in the former non-union fields in Pennsylvania, nor in the Chesapeake & Ohio section of Kanawha and a part of the Georges Creek—Upper Potomac region. When compared with losses through transportation all other factors limiting production in the week of September 11-16 were of small importance.

The all-rail movement of coal to New England through the six principal Hudson gateways increased to 3,255 cars of bituminous and 1,507 cars of anthracite in the week ended September 23. In addition there were also forwarded through Rouses Point 76 cars of bituminous coal and 2 cars of anthracite.

Shipments of bituminous coal through Hampton Roads increased slightly during the week ended September 23. Dumpings for the week totaled 312,003 net tons as against 307,426 tons on the week before. The tonnage of cargo coal for export and for New England increased whereas tonnage for other coastwise destinations decreased.

Soft coal shipments from the mines to Lake Erie ports, under stimulus of priority orders increased 52 per cent during the week ended September 17 over the preceding week and 34 per cent in the week ended September 24 over the week before that. The Ore and Coal Exchange reports a total of 1,453,684 tons dumped during the week of September 24 as against 1,095,919 the week before. Of the total, 1,409,648 tons were cargo coal and 44,036 tons were vessel fuel. The rate of dumpings last week was 137 per cent greater than that in the corresponding week a year ago, and 60 per cent above the rate in the corresponding week of 1920. The total quantity of cargo coal forwarded during the present Lake season now stands at 8,487,318 tons, but of this 962,198 tons has gone to destinations not ordinarily taking Lake coal. The quantity sent to regular Lake markets was only 7,525,120 tons as against 17,690,177 tons in 1921 and 14,025,734 tons in 1920.

Dumpings of coal at Lake Erie ports continued at high rates during last week. The tonnage handled at the piers in the three days, September 25-27, showed a slight increase over the corresponding days of the week before. Lake coal is now going forward at the maximum rate in the history of the traffic.

More cars were loaded with coal during the week ended September 30, than during any week since that of April 1, this year, according to reports issued by the American Railway Association. The total for the week was 216,212 cars. This exceeded by 4,102 cars the preceding week which had been the high mark. Coal production for the week, on the basis of this loading, approximated 11,713,000 tons, including about 9,927,000 tons of bituminous and 1,786,000 of anthracite. Production for the previous week was approximately 11,500,000 tons for both kinds of coal.

Loading of bituminous coal totaled 180,491 cars and 35,721 cars were loaded with anthracite. Loading of anthracite on Saturday, September 30, amounted to 6,144 cars.

For the third successive week more than a million tons of coal were dumped during the past week at Lake Erie ports for shipment to upper lake points. The total dumped during the past week amounted to 24,380 cars or 1,219,000 tons. On Saturday and Sunday 7,083 cars were dumped, the largest unloading in the history of the docks, except on the preceding Saturday and Sunday one week ago, when the total was 8,052 cars. According to advices received by the Car Service Division, the strike on lake carriers up to date has not interfered to any noticeable extent with coal shipments on the lakes.

Commission and Court News

Interstate Commerce Commission

The Commission has suspended until February 2, 1923, the operation of certain schedules published in supplements to F. A. Leland's tariffs which propose to increase the rates on fresh fruits, melons and vegetables, from points in Arkansas, Louisiana, Missouri, Oklahoma and Texas to points in C. F. A. and Trunk Line territories.

Court News

Defective Running Board

The Oklahoma Supreme Court holds that where a defective running board on a car contributed to cause a brakeman to fall from the car, receiving injuries, the railroad is liable under the Supplementary Safety Appliance Act of April 14, 1910.—New v. Saunders (Okla.), 206 Pac. 600.

Live Stock Shipper Overloading Cars Cannot Recover for Loss

The New Mexico Supreme Court holds that a shipper who agrees to load live stock at his own risk, and who overloads the cars, cannot recover against the carrier for losses which would not have occurred but for the overloading.—Spence v. El Paso & Southwestern (N. Mex.), 207 Pac. 579.

Contract Periods of Limitation Not Affected by Transportation Act

The Circuit Court of Appeals, Second Circuit, holds that the provision in the Transportation Act that the period of federal control shall not be computed as part of the periods of limitations applies only to limitations fixed by statute and not to limitations fixed by the bill of lading.—New York Central v. Lazarus, 278 Fed. 900.

Shipper by Acquiescence Held to Assume Risk of Inadequate Unloading Facilities

Where it is shown that alleged inadequate facilities for unloading stock were known to the shipper, but he nevertheless undertook through his own special agent to unload the animals himself, the Georgia Court of Appeals holds that the risk of their being injured must be taken to be assumed by the shipper.—Payne v. Duncan & Nelms (Ga. App.) 111 S. E. 209.

Inconsistent Provisions in Tariff

The Texas Court of Civil Appeals holds that a general provision in a freight tariff item established by the Interstate Commerce Commission, giving the railroad right to carry cotton to any other compress if that designated is not available, must yield to an inconsistent provision in the immediately following item as to shipments on designated routes.—King v. Chicago, R. I. & G. (Tex.), 241 S. W. 180.

Carrier's Negligent Failure to Collect Freight Bill Does Not Prevent Recovery from Consignor

The Georgia Court of Appeals holds that where a railroad transports goods and negligently fails to collect or even to attempt to collect freight charges from the consignee, although it could have collected if it had acted promptly, the consignee then becoming insolvent, the carrier can nevertheless recover the charges from the consignor. It is immaterial that at the time of delivery of the goods there existed an agreement between consignee and the carrier that consignee should have one week in which to pay freight bills.—S. A. L. v. Montgomery (Ga. App.) 112 S. E. 652.

Foreign Railway News

Bolivia Invites Tenders on Big Railway Project

The Bolivian government is calling for tenders for the construction of a railway from Cochabamba to Santa Cruz de la Sierra, according to the Wall Street Journal. The new line will be 388 miles long with a 37-mile branch line and will cost from $40,000,000 to $50,000,000. Gage will be one meter, maximum gradient 3 per cent and 60 lb. rail will be used. Santa Cruz is at the headwaters of the Amazon and Cochabamba is connected with the Pacific and the rest of Bolivia by rail.

Construction must begin 60 days after contract is signed and must be completed within six years. Contractors are guaranteed an 8 per cent return on the investment for 25 years, secured by duties on imports into certain sections of Bolivia. Contractors will be given a concession to operate the property for a period of 99 years.

Sealed tenders will be received by the ministry of public works, La Paz, until June 30, 1923.

China Notes

PEKING.

In these notes published in the *Railway Age* of September 30, report was made of a contract between the representatives of the General American Tank Car Company and the Peking-Suiyuan Railway for the gradual amortization of the indebtedness of the railway to the supplier for a large consignment of rolling stock and sleepers out of the earnings of the rolling stock. This contract bears some resemblance to the familiar equipment trust in America. It provides that an accountant acceptable to the supply company be appointed to keep a record of the car movements and the revenue therefrom,—the latter being the basis of the payments to be made on the indebtedness. The accountant appointed is a Chinese recently returned from Columbia University. The employees of the railway, however, have represented that the contract contemplates the appointment of a foreign accountant, thus permitting of the beginning of foreign control of the Peking-Suiyuan, which up to the present has been the pride of the Chinese people as being Chinese built and Chinese owned. An appeal has been made to the president and to parliament which began its sittings on the first of the month.

A strike was accordingly organized among the trainmen which was extended to the clerks in the head office. The strikers drove off the chief accountant, he being one of the signers of the contract. Following this the managing director took fifteen days' "sick leave" and the employees of the line declared independence of the ministry of communications. A few days later a squad of cavalry surrounded the offices of the railway and attempted to arrest the ring-leaders of the disturbance, but these had been warned and fled. The director of the railway department of the ministry of communications, however, took possession of the offices and installed an acting managing director. An effort is now being made to persuade the American firm to modify its contract.

This incident is significant in several directions. This contract is the first which any American interest has been able to obtain which would place any officer of an operating road under any sort of American influence since the China American Development Company was bought out from its position on the Canton-Hankow line. Every American attempt to build railways in China has been thwarted by some kind of opposition, either native or foreign. But this is the first time any native opposition has developed toward the payment of mere debts due to an American firm. There are many who profess to see in it the usual intrigue which has always attempted to make difficult American trade in a large way with the Chinese government. Those who believe that the education of large numbers of Chinese in America—to be made possible by the remission of the remaining installments of the Boxer indemnity—will promote favorable trade relations will need to explain why it is that these affairs always defeat

Americans, but do not thwart other [illegible]. However, the probable explanation of this [illegible] is to be found along entirely different lines.

Ever since the present cabinet was [illegible], there has been a [illegible] drive on the part of the old Peking political [illegible], principally the Chihli [illegible], the [illegible] of Wu Pei-fu. Tang Kang, the minister of [illegible], [illegible] had [illegible] his report that [illegible] minister [illegible] department had "[illegible]" [illegible] as they had turned over to the [illegible] [illegible] was [illegible] to such an attack as to [illegible], and he has [illegible] the [illegible]. The minister of [illegible] has been [illegible] to a similar [illegible], but being [illegible] for a Chinese, was not [illegible] by it. However, on August 17 a body of teachers from the government schools, whose salaries are long in arrears, [illegible] the ministry of communications, surrounded the minister and forced him to sign an undertaking to pay over to them the sum of a million [illegible] before the end of the month. It would be as easy to [illegible] the moon as a million dollars in the present condition of the ministry, so the minister took a night train for the summer colony at Peitaiho. The following day the bureau chiefs of the railway department went on strike as a protest against the behavior of a contemporary department. The minister of war, at the instigation of the president, immediately tendered apologies, a delegation was dispatched to persuade the minister of communications to return, and to the surprise of those who sent the persuaders the minister returned to Peking on August 22. However, he has not reopened office at this writing, evidently waiting word from Wu Pei-fu.

This word has now arrived, so it is reported, and is to the effect that Wu will support his minister with force if necessary. This incident must be coupled with the Peking-Suiyuan affair if either is to be interpreted correctly.

The rolling stock in the hands of Chang Tso-lin has not been returned as yet. The British interests tried the bluff of recalling all of the British employees of the line stationed in Manchuria, but Chang would not and these men were finally sent back to their posts. But Chang will not allow them to resume duty now, and has put them on his own pay roll in different capacities. Chang now offers to return the rolling stock if the Peking-Mukden line is made neutral for its entire length, neither party to be allowed to carry more than one train load of troops per day. In case of violation, the foreign garrisons along the line would be empowered to remove rails, or otherwise put the line out of commission. The effect of such an agreement would be to make safe the frontiers of Manchuria and confirm Chang's position of independence. This, Peking is hesitating to do. In the meantime some careful feelers have been put out to ascertain if the present financial extremities of the Peking government are sufficient to influence them to accept a bit of assistance. Chang appears to be ready to furnish the cash to redeem the whole British loan on the Peking-Mukden line. This amounts to only a little over a million and a quarter sterling. A premium of twenty per cent must be paid if the loan is retired ahead of maturity. But allowing for this, at the present rate of exchange the total cost would be only a little over 15,000,000 Mexican dollars. Allow 20,000,000 to cover "commissions, etc.," and a line worth between seventy and a hundred millions would be freed entirely from British interference. A half of this line would then fall to Chang,—or between thirty five and fifty millions of property for twenty millions of cash. This half could then be easily disposed of by consolidating it with the South Manchurian, thus putting under one management all of the railway in Manchuria, except the Chinese Eastern with which favorable traffic arrangements have been made,—as previously reported in these columns.

In spite of all these political disturbances, construction continues. Three more stations have been opened during the month on the Paotou extension of the Peking-Suiynan line. The earthwork on the double tracking of the Peking-Mukden line is completed and the bridgework is under way. Tenders are being advertised for by the Taokow-Chinghua Railway Administration for supplies preparatory to the beginning of construction of a westward extension. A loan from the Peking Syndicate (British) has been arranged in this connection.

Equipment and Supplies

Locomotives

The Green Bay & Western, reported in the *Railway Age* of September 30 as inquiring for two locomotives, has ordered this equipment from the American Locomotive Company.

The Erie has ordered 10 Mikado type and 20 Pacific type locomotives from the Baldwin Locomotive Works. This is in addition to the 30 Mikado type ordered from the same builder as reported in the *Railway Age* of August 19.

The Atchison, Topeka & Santa Fe, reported in the *Railway Age* of September 16 as contemplating the purchase of 100 locomotives, has ordered 26 Santa Fe type, 8 Mountain type, 15 Mikado type, and 10 Pacific type locomotives from the Baldwin Locomotive Works.

The New York, New Haven & Hartford has ordered five 181-ton electric locomotives from the Westinghouse Electric & Manufacturing Company. These locomotives will practically duplicate the ones now in use for high speed passenger service. They will be equipped for operation on either alternating or direct current, the direct current equipment being used to permit operation into the Grand Central Station, New York.

Freight Cars

The Erie is inquiring for 1,000 gondola cars.

The Chesapeake & Ohio is inquiring for 50 cabooses.

The Delaware & Hudson is inquiring for 1,000 gondola cars.

The Pere Marquette is inquiring for repairs to 1,000 wooden box cars.

The Lehigh & New England is inquiring for 100, 55-ton hopper cars.

The Buffalo, Rochester & Pittsburgh is inquiring for 1,000 gondola cars.

The Cudahy Packing Company, Chicago, is inquiring for 200 40-ton refrigerator cars.

The Cincinnati, Indianapolis & Western has placed an order for 209 composite gondola cars with the American Car & Foundry Co.

The Pennsylvania has bought trucks of 70 tons' capacity for 10,000 freight cars. These trucks are to be placed under 50-ton cars at the Altoona shops.

The Hocking Valley has equally divided an order for repairs to 500 composite gondola cars between the shops of the Pressed Car Company and the Greenville Steel Car Company.

The Atchison, Topeka & Santa Fe, reported in the *Railway Age* of September 23 as inquiring for 50 caboose cars, has ordered this equipment from the American Car & Foundry Company.

The Chicago, Rock Island & Pacific has awarded a contract to the Western Steel Car & Foundry Company for repairs to 100 furniture cars, 100 wooden box cars and 200 steel frame box cars.

The Chicago & North Western, reported in the *Railway Age* of September 30 as inquiring for 800 gondola cars and 200 flat cars has ordered this equipment from the General American Car Company.

The Atlantic Coast Line reported in the *Railway Age* of September 16 as inquiring for 2,000 box cars of 40 tons' capacity has ordered this equipment from the Standard Tank Car Company.

The Atchison, Topeka & Santa Fe is expected to soon place orders for 2,000 refrigerator cars of 40 tons' capacity, 1,000 auto-

mobile cars of 40 tons' capacity, 500 double-deck stock cars of 40 tons' capacity, 1,000 box cars of 40 tons' capacity, and 500 coal cars of 50 tons' capacity.

Passenger Cars

THE BALTIMORE & OHIO is inquiring for 30 baggage cars.

THE CENTRAL OF GEORGIA is inquiring for 50 coaches, 10 baggage-express cars and 5 combination passenger and baggage cars.

Iron and Steel

THE ERIE has placed orders for 37,500 tons of 100-lb. rail.

THE LEHIGH VALLEY has ordered 20,000 tons of 136-lb. rail from the Bethlehem Steel Company.

THE CHICAGO, BURLINGTON & QUINCY has ordered 15,000 tons of rails from the Illinois Steel Company.

THE ILLINOIS CENTRAL has made reservations divided with various steel companies for 60,000 tons of rail.

THE UNION PACIFIC is inquiring for 135 tons of structural steel for a storage tank at Council Bluffs, Iowa.

THE NEW YORK, ONTARIO & WESTERN has ordered 4,000 tons of 90-lb. rail from the Bethlehem Steel Company.

THE DELAWARE & HUDSON has ordered 10,000 tons of 90-lb. rail from the Bethlehem Steel Company for 1923 delivery.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE has placed an order with the Illinois Steel Company for 3,000 tons of steel rails.

THE NEW YORK, CHICAGO & ST. LOUIS has issued an inquiry for its requirements in axles and steel bars for the next six months.

THE DELAWARE, LACKAWANNA & WESTERN has ordered 15,000 tons of rail from the Bethlehem Steel Company, including 101-lb. and 105-lb. sections.

THE NEW YORK, NEW HAVEN & HARTFORD has reserved space with the Bethlehem Steel Company for 25,000 tons of 107-lb. rail, for delivery in the early part of 1923.

THE VIRGINIAN RAILWAY, reported in the *Railway Age* of September 30 as inquiring for 300 tons of steel for bridges, has ordered this tonnage from the Virginia Bridge & Iron Co.

THE PERE MARQUETTE has divided an order for 15,000 tons of rails equally between the Bethlehem Steel Company, the Illinois Steel Company and the Inland Steel Company.

THE UNION PACIFIC has placed orders for 60,000 tons of rails of which the Colorado Fuel & Iron Company received a contract for 20,000 tons and the Illinois Steel Company, 40,000 tons.

THE CHICAGO & EASTERN ILLINOIS, reported in the *Railway Age* of September 23, as about to place an order with the Illinois Steel Company for 5,000 tons of rails, has placed this order.

THE GREAT NORTHERN has placed an order for 10,000 tons of steel rails with the Illinois Steel Company and 5,000 tons each with the Inland Steel Company and the Bethlehem Steel Company.

THE SOUTHERN RAILWAY has ordered 40,000 tons of rail from the Tennessee Coal, Iron & Railroad Company. Most of the rail will be 100-lb. sections for delivery during the first six months of 1923.

THE CHESAPEAKE & OHIO has placed orders for 24,500 tons of rail for 1923 delivery as follows: Inland Steel Company, 7,500; Illinois Steel Company, 7,500; Carnegie Steel Company, 4,500; and Bethlehem Steel Company, 5,000 tons.

THE ATCHISON, TOPEKA & SANTA FE has ordered 64,000 tons of rails, divided as follows: 25,000 tons, Illinois Steel Company; 25,000 tons, Colorado Fuel & Iron Company; 11,000 tons, Inland Steel Company; and 3,000 tons, Bethlehem Steel Company.

THE ILLINOIS CENTRAL has placed an order with the American Bridge Company for 177 tons of structural steel for its bridge over the Tradeover river, Sturgis, Ky. This same company has been inquiring for 178 tons of structural steel for deck plate girder spans to be used at Paducah, Ky.

THE BALTIMORE & OHIO has placed orders for 52,000 tons of steel rail for delivery during 1923, as follows: Carnegie Steel Company, 23,000 tons; Illinois Steel Company, 7,000; (2,000 tons included for Baltimore & Ohio Chicago Terminal Railroad) Cambria Steel Company, 12,000, and Bethlehem Steel Company, 10,000.

THE NEW YORK CENTRAL reported in the *Railway Age* of September 23, as inquiring for 200,000 tons of rail has placed orders for 194,300 tons for New York Central lines as follows: Illinois Steel Company 74,500 tons, Carnegie Steel Company 16,464, Bethlehem Steel Company 85,036, Inland Steel Company 15,800 and Cambria Steel Company 2,500 tons.

THE PENNSYLVANIA RAILROAD has ordered 170,000 tons of rail for 1923 delivery as follows: U. S. Steel Corporation 78,000 tons, Cambria Steel Company 37,000, Bethlehem Steel Company 37,000, Lackawanna Steel Company 9,000, and Inland Steel Company 9,000. Most of the above will be 130 lb. sections and 8,000 tons are for use on the Long Island Railroad and the balance are for use on the Pennsylvania Lines.

Machinery and Tools

THE CHICAGO, MILWAUKEE & ST. PAUL has ordered two 3-ton hoists from the Shepard Electric Crane & Hoist Co.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered a 36-in. planer and a 36-in. lathe from the Niles-Bement-Pond Company.

THE CRUCIBLE STEEL COMPANY has ordered a 90-in. driving wheel lathe, also a 96-in. 600-ton wheel press from the Niles-Bement-Pond Company.

THE ILLINOIS CENTRAL has placed orders for about $70,000 worth of machine tool equipment in addition to that reported in the *Railway Age* of September 16.

THE ILLINOIS CENTRAL'S orders for machine tools placed recently include a car wheel lathe and two combination turning and axle lathes from the Niles-Bement-Pond Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered a 150-ton overhead electric traveling crane for its Albuquerque, N. M., shop from the Morgan Engineering Company, Alliance, Ohio.

Track Specialties

THE SOUTHERN PACIFIC is inquiring for approximately 15,000 tons of tie plates.

THE BALTIMORE & OHIO is inquiring for 7,000 tons of tie plates and 15,000 kegs of track spikes.

Signaling

THE BROOKLYN RAPID TRANSIT COMPANY has placed an order with the General Railway Signal Company for a 36-lever interlocking machine to be installed at Queensborough Plaza, Brooklyn, N. Y. This order also includes motor train stops, color light signals, relays, transformers, etc.

THE PHILADELPHIA & READING has awarded a contract to the Union Switch & Signal Company for the complete installation of an electro-pneumatic interlocking plant at Harrisburg, Pa. The plant will ultimately control all of the switches and signals governing movement approaching and passing through the terminal area, and the interlocking machine has 32 working levers, but is of sufficient capacity to take care of both the present trackage arrangement and the future layout.

THE CHICAGO, BURLINGTON & QUINCY has awarded a contract to the Federal Signal Company for the complete installation of two sections of automatic semaphore signaling and two sections of color light signaling, the first consisting of 48 semaphore signals between Arapahoe, Neb., and Indianola, 28 miles, and 32 semaphore signals between Bluff Siding, Wis., and Lytle, 17 miles; and the latter, consisting of 64 color light signals between Hannibal, Mo., and Louisiana, 27 miles, and 17 color light signals between Quincy, Ill., and Eubanks, 7 miles.

Supply Trade News

The Bridgeport Brass Company, Bridgeport, Conn., has opened an office in the General Motors building, Detroit, Mich., with Frank H. Longyear as district manager.

The F. S. Pearson Engineering Corporation, New York City, has reestablished its department for industrial management and technical auditing of industries and public utilities.

The Brown Hoisting Machinery Co., Cleveland, Ohio, has placed its conveyor sales in charge of **E. P. Sawhill**, who has had nearly 30 years' engineering and selling experience on this type of equipment.

The Pan-American Equipment Company, New Orleans, La., has been organized by **R. L. Wilson**, formerly of the Mid-Continent Equipment & Machinery Company, St. Louis, Mo., to engage in the sale of general equipment including cars, locomotives and track accessories.

John J. Kehoe, until recently in the railway sales department of the Texas Company, New York, has been appointed New York representative of **Warren Corning & Co.**, Chicago. Mr. Kehoe's headquarters are in the company's office which was recently opened at 1 Madison avenue, New York City.

The Pawling & Harnischfeger Co., Milwaukee, Wis., has appointed new agents for its machine tool line as follows: The Cadillac Machinery Co., Detroit, Mich.; the Cleveland Duplex Machinery Co., Cleveland, Ohio., and the Seifreat-Woodruff Company with offices at Dayton and Cincinnati, Ohio.

Herbert C. Follinger, manager of the Chicago office of the Chain Belt Company, Milwaukee, Wis., died of pneumonia at his home in Chicago, on September 27, at the age of 38. Mr. Follinger became associated with the Chain Belt Company in 1914, and in 1916 was appointed district manager for the Chicago territory.

The Johns-Manville, Inc., New York City, has been appointed joint selling agents by the H. H. Robertson Company, Pittsburgh, Pa., and in future all asbestos protected metal roofing, siding accessories and ventilators will be manufactured and shipped from the plant of H. H. Robertson Company at Ambridge near Pittsburgh. Hereafter, in the manufacture of asbestos protected metal products by H. H. Robertson Co., Johns-Manville asbestos saturated felts will be used. Asbestos protected metal is largely used by all industry for conditions where an unprotected metal or other equally perishable roofing would quickly disintegrate.

Trade Publications

ELECTRIC FURNACES.—Baily electric furnaces for melting nonferrous metals are described in a six-page folder issued by the Electric Furnace Company, Salem, Ohio. The folder also lists and illustrates a large number of products, for the manufacture of which the electric furnace is most suitable.

MULTI-SPEED MOTORS.—Applications of Watson multi-speed motors for adjustable speed control on alternating current polyphase circuits are described in a two-color, illustrated, 12-page bulletin issued by the Mechanical Applicance Company, Milwaukee, Wis. These motors are designed to run at any one of four different speeds namely, 600, 720, 900 or 1,200 r.p.m.

DAYLIGHT THE NATURAL ILLUMINANT.—The principles of natural illumination are presented in an attractive manner in a 48-page booklet published by the Skybryte Company, Cleveland, Ohio. This treatise also combines the discussion of methods of illumination with its influence on the efficiency of workmen. The book is well illustrated and carefully written.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company has awarded a contract to Joseph E. Nelson & Sons for the construction of a lavatory building at San Bernardino, Cal., at an estimated cost of about $60,000.

ATCHISON, TOPEKA & SANTA FE.—This company will construct a 20,000-ton storage ice plant at Bakersfield, Cal., which works will include the purchase of some additional property and rearranging of tracks to extend the yard facilities. The work is estimated to cost $466,837. This company is also contemplating rebuilding its ice plant at Needles, Cal.

ERIE.—The Interstate Commerce Commisssion has issued a certificate authorizing the construction of a line from a point on the main line near Sparrowbush, N. Y., to a connection with the main line near Lackawaxen, Pa., 20.8 miles.

GULF, COLORADO & SANTA FE.—This company will construct a two-story fireproof freight house 60 ft. by 301 ft. with structural steel frame, fireproofed with concrete, concrete floors, brick wall and steel doors and sash at Dallas, Tex., to cost $200,000.

ILLINOIS CENTRAL.—This company has awarded contract to Joseph E. Nelson & Sons, Chicago, for the laying of pipe lines and the construction of a tank for water service facilities at Ramsey, Ill.

ILLINOIS CENTRAL.—This company, which was reported in the *Railway Age* of September 23 as contemplating improvements to its water facilities, has awarded contracts as follows: At Peosta, Iowa, to Miller Artesian Well Company, Chicago; at Kinmunday, Ill., and Pana, to Fairbanks, Morse & Co.; at Ramsey, to Joseph E. Nelson & Sons; at Memphis, Tenn., and Champaign, Ill., to Layne & Bowler. A contract for the extension of passing tracks at Marissa, Ill., has been awarded to M. L. Windham, Centralia, Ill. A contract for passing tracks at Dowell, Ill., has been let to Blythe Brothers, and at Lenzberg, to Windt. The company will construct passing tracks at Marion, Ill., and Cambria with its own forces. A contract for additional storage tracks at Manchester, Iowa, has been let to P. E. Schugart, Freeport, Ill. This company has also awarded contracts for the extension of passing tracks as follows: At Baton Rouge, La., $50,000, to Colley-Allelo; at Gardere, $12,000, and at Burnside, $18,000, to J. W. Garig; at Gramercy, La., $20,000, to Fred Gardner; and at Harriston, Miss., $30,000, to J. W. Noble. A contract has been let to F. Gardner for the construction of passing tracks at Reserve, La., to cost $46,000, and to W. L. Hicks for the construction of yard tracks and engine tracks at Natchez, Miss., to cost $12,000. This company has also awarded a contract to Woods Brothers Construction Company of Lincoln, Neb., for the construction of six standard current retards and 27 Bignell anchor piles to protect embankment and bridge abutments across the Mississippi river at Council Bluffs, Ia.

ILLINOIS CENTRAL.—This company has awarded a contract to B. F. Davis, Memphis, Tenn., for the alteration and addition to the frame passenger and freight station at Ponchatoula, La.

LOUISIANA SOUTHERN.—This company has been ordered by the Louisiana Public Service Commission to reconstruct and rehabilitate approximately two miles of its line which was destroyed in April by a break in the Mississipper river levee near Poydras Junction, La.

MISSOURI, KANSAS & TEXAS.—This company has awarded a contract to the Sumner Sollitt Company, San Antonio, Tex., for the extension of the freight station at Fort Worth, Tex.

MISSOURI PACIFIC.—This company, reported in the *Railway Age* of September 23 as receiving bids for the construction of a car repair shop at Kansas City, Mo., has awarded the contract to Jerome Moss & Co., Chicago.

PENNSYLVANIA.—See article on another page entitled "Pennsylvania System to Make Extensive Additions to Altoona Works."

Railway Financial News

CHICAGO & ALTON.—*Call for Deposit of Bonds.*—F. H. Ecker, chairman of the protective committee representing the 3½ per cent first lien 50-year bonds, has issued a statement calling attention to the announcement of the receivers of the road that an application will be made to the court for the issuance of receiver's certificates and that payment of the October 1 interest instalment on the 3 per cent bonds will be deferred temporarily. The committee requests the immediate co-operation of the holders of the 3½ per cent bonds and the deposit of these bonds with the Farmers Loan & Trust Company under the deposit agreement which has been prepared.

CHICAGO, ROCK ISLAND & PACIFIC.—*Equipment Trusts Offered.* Hambleton & Co. are offering $1,279,000 6 per cent equipment trust certificates, due 1925-35, at prices to yield from 5.50 per cent to 5.75 per cent.

DELAWARE, LACKAWANNA & WESTERN.—*30,000 Shares Sold Privately.*—A syndicate headed by Charles D. Barney & Co., New York has bought and resold privately a block of slightly over 30,000 shares of stock. The purchase involved more than $5,000,000. The disposition of this stock is believed to have been a major factor in the seven-point rise to 142 in Lackawanna stock in Tuesday's market.

GREEN BAY & WESTERN.—*Authorized to Abandon Branch.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of operation of a branch line between Marshland and La Crosse, Wis.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $747,000 of first consolidated mortgage 5 per cent gold bonds to be sold at not less than 98, to provide for the payment of a like amount of bonds maturing January 1.

NEW YORK, CHICAGO & ST. LOUIS.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized the issuance of $3,150,000 of 5 per cent equipment trust certificates to be sold at not less than 98.

NEW YORK, NEW HAVEN & HARTFORD.—*Interest on Debentures.*—The Listing Committee of the New York Curb Exchange has been notified by the Equitable Trust Company that accrued interest, due October 1, 1922, on the New Haven extended 7 per cent debentures of 1925 (European franc issue) will be paid on and after that date at the office of the Bankers' Trust Company.

PERE MARQUETTE.—*Dividends Declared.*—This company has declared an extra dividend of 1 per cent on the 5 per cent preferred stock and the regular quarterly dividend of 1¼ per cent on the 5 per cent prior preference and the 5 per cent preferred stocks all payable November 1 to stock of record October 14.

The declaration of 1 per cent extra by the Pere Marquette on the 5 per cent preferred stock is made on account of the arrears of the cumulative dividend on said preferred stock. This reduces the amount of such arrears to 2 per cent.

SEABOARD AIR LINE.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority for the issuance of $2,500,000 of 5½ per cent equipment trust certificates which have been sold to Freeman & Co., New York, at 96.63.

ST. LOUIS-SAN FRANCISCO.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to issue $6,000,000 of 5 per cent equipment trust certificates to be sold to a number of banks at 96.

TENNESSEE.—*Authorized to Issue Securities.*—The Interstate Commerce Commission has authorized an issue of $600,000 of first mortgage 6 per cent 15-year gold bonds, part to be pledged as security for certain promissory notes and the remainder exchanged for outstanding first mortgage bonds and matured interest coupons. The company was also authorized to issue $100,000 of general mortgage bonds and three promissory notes amounting to $142,249.

TENNESSEE CENTRAL.—*Authorized to Issue Securities.*—The Interstate Commerce Commission has authorized this company to issue $937,000 of first mortgage 6 per cent gold bonds to be pledged with the Secretary of the Treasury as part collateral for a loan from the government and to assume obligation and liability in respect of $636,866 of equipment trust certificates also to be pledged with the Secretary of the Treasury.

Treasury Payments to Railroads

Since last announcement, dated August 31, 1922, payments under Sections 204, 209, and 210 of the Transportation Act, 1920, as amended, have been made by the Treasury as follows:

Section 204:	
Bridgton & Saco River Railroad Company	$15,359.93
Cazenovia Southern Railroad Company	7,187.52
Illinois Northern Railway	202,509.43
Intermountain Railway Company	20,[illegible]
Lime Rock Railroad Company	10,441.[illegible]
Moscow, Camden & San Augustine Railroad Company	7,168.[illegible]
New Castle & Ohio River Railway Company	1,128.[illegible]
Sandy River & Rangeley Lakes Railroad Company	52,585.11
Statesville Railway Company	7,178.[illegible]
Susquehanna & New York Railroad Company	20,271.48
Wabash, Chester & Western Railroad Co.	[illegible]
Section 209:	
Central West Virginia & Southern Railroad Company	8,574.[illegible]
Central Vermont Railway Company	[illegible]
Chicago, St. Paul, Minneapolis & Omaha Railway Company	368,[illegible]
Detroit & Mackinac Railway Company	61,[illegible]
Ft. Smith, Subiaco & Rock Island Railroad Company	5,[illegible]
Georgia, Southern & Florida Railway Company	[illegible]
Minneapolis Eastern Railway Company	[illegible]
Mobile & Ohio Railroad Company	[illegible]
New York, Ontario & Western Railway Company	[illegible]
Osage River Railway	[illegible]
Susquehanna & New York Railroad Company	[illegible]
Tennessee, Alabama & Georgia Railroad Company, Receiver	[illegible]
Trans-Mississippi Terminal Railroad Company	[illegible]
Section 210:	
The S[illegible] Company	1,[illegible]
Total	$3,133,151.62

Total payments to September 30, 1922:		
(a) Under Section 204, as amended by Section [illegible] for reimbursement of deficits during Federal Control:		
(1) Final payments, including partial payments previously made	$[illegible],185.18	
(2) Partial payments to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	[illegible].34	
Total payments as reimbursement of deficits		34,727,[illegible].52
(b) Under Section 209, as amended by Section 212 for guaranty in respect to railway operating income for first six months after Federal Control:		
(1) Final payments including advances and partial payments previously made	[illegible]	
(2) Advances to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	[illegible]	
(3) Partial payments to carriers as to which a certificate for final payment has not been received, as stated above	127,[illegible]	
Total payments account of said guaranty		448,055,813.23
(c) Under Section 210 for loans from the revolving fund of [illegible] therein provided		315,821,[illegible]
Total		$768,[illegible]

Repayments of loans have been made to the amount of $83,945,336.

Dividends Declared

Delaware, Lackawanna & Western.—[illegible] per cent, quarterly, payable October [illegible] to holders of record October 7.

El Paso & Southwestern.—1½ per cent, quarterly, payable October [illegible] to holders of record September [illegible].

Meadville, Conneaut Lake & Linesville.—[illegible] per cent, payable October 1 to holders of record September 20.

New London Northern.—2¼ per cent, quarterly, payable October 2 to holders of record September 16.

Pittsburgh & West Virginia.—Preferred, 1½ per cent, quarterly, payable February [illegible] to holders of record February 21.

Trend of Railway Stock and Bond Prices

	Oct 3	Last Week	Last Year
Average price of 20 representative railway stocks	72.58	72.01	57.16
Average price of 20 representative railway bonds	88.70	89.34	76.58

Railway Officers

Executive

Edgar P. Earle has been elected president of the East Tennessee & Western North Carolina with headquarters at Johnson City, Tenn. **J. E. Vance** has been elected vice-president and treasurer.

D. Upthegrove, whose promotion to acting president of the St. Louis Southwestern with headquarters at St. Louis, Mo., was reported in the *Railway Age* of August 19, has been elected president to succeed J. M. Hurst, deceased.

G. C. Jones, assistant to the president of the Grand Trunk, with headquarters at Toronto, has been assigned to perform such work as may be designated by the vice-president and general manager and the position of assistant to the president has been abolished.

E. L. Whitney, assistant general freight agent of the New York Central, with headquarters at Chicago, has been appointed assistant to the vice president in charge of industrial developments of the Indiana Harbor Belt, the Chicago Junction and the Chicago River & Indiana, with the same headquarters.

E. E. Nash, formerly vice-president and general manager of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., who resigned on June 15, 1922, to become western representative of the American Locomotive Company with headquarters at Chicago, and whose photograph and sketch appeared in the *Railway Age* of June 17, has returned to the Minneapolis & St. Louis as vice-president in charge of operation and maintenance.

Financial, Legal and Accounting

H. R. Martin, whose promotion to general attorney of the Grand Trunk Western lines, with headquarters at Detroit, Mich., was reported in the *Railway Age* of September 16, was born February 15, 1881, in Attica township, Lapeer county, Mich. He was graduated from the Detroit College of Law in 1901 and was admitted to the Bar by the Michigan Supreme Court in June of the same year. He practiced law with H. Geer and became a member of the law firm of Geer, Williams, Martin & Butler in 1905 which company later became Geer, Martin & Neudorfer. He will now devote his time exclusively to the Grand Trunk's legal work, having jurisdiction over the Grand Trunk lines West of Detroit and the St. Clair River, including Michigan, Indiana, Illinois and Wisconsin.

H. L. Lehmkuhle has been appointed general accountant of the New York, Chicago & St. Louis and the Lake Erie & Western, with headquarters at Cleveland, O. **C. L. Peckham** and **A. W. Latham**, assistant auditors of the New York, Chicago & St. Louis, with headquarters at Cleveland, have been appointed assistant controllers of the combined roads, with the same headquarters. **W. H. Elmendorf**, auditor of the Lake Erie & Western, with headquarters at Indianapolis, Ind., has been appointed auditor of disbursements, and **W. W. Cumberworth**, auditor of freight accounts of the Lake Erie & Western, with headquarters at Indianapolis, Ind., has been appointed assistant auditor of freight accounts of the two roads, both with headquarters at Cleveland. The above appointments are the result of the consolidation of the accounting departments of the New York, Chicago & St. Louis and the Lake Erie & Western.

Operating

D. H. Miller, general yardmaster of the Illinois Central at Herrin, Ill., has been promoted to trainmaster, with the same headquarters.

F. M. Allison, superintendent of the East Tennessee & Western North Carolina, has been promoted to general superintendent.

W. W. Shoemaker, road foreman of engines of the Seaboard Air Line, with headquarters at Jacksonville, Fla., has been promoted to trainmaster, with headquarters at Hamlet, N. C., with jurisdiction over Andrews, S. C., and territory north thereof.

E. J. Devans, superintendent of the Buffalo, Rochester & Pittsburgh, with jurisdiction over the entire line, has been reappointed general superintendent. This position, along with several others, was abolished on September 1, 1921, and is now re-established, effective October 1. Other appointments occasioned by the re-establishment of the positions are **A. B. White**, superintendent, with headquarters at Punxsutawney, Pa.; **M. G. McInerney**, superintendent, with headquarters at Rochester, N. Y.; **F. H. Post**, superintendent, with headquarters at DuBois, Pa.; **T. C. McCarthy**, assistant superintendent, East Salamanca, N. Y.; **J. J. Garin**, chief dispatcher, East Salamanca; **P. N. Boylan**, chief dispatcher, Rochester; headquarters of **H. E. Patterson**, assistant superintendent, East Salamanca, transferred to Rochester.

N. A. Williams, whose promotion to general superintendent of the Los Angeles & Salt Lake, with headquarters at Los Angeles, Cal., was reported in the *Railway Age* of September 16 (page 544), has been promoted to acting general manager, succeeding W. H. Comstock, temporarily assigned to other duties. Mr. Williams was born May 29, 1778, at Laclede, Mo., and entered railway service July 22, 1898 as a brakeman on the Chicago, Burlington & Quincy at Brookfield, Mo. On January 28, 1902, he left to become a brakeman on the Denver & Rio Grande and on April 3, 1903, was promoted to conductor. On August 10, 1909, he was promoted to assistant superintendent, which position he held until July 1, 1910, when he was promoted to superintendent. He resigned on May 1, 1914, to engage in private business and re-entered railway service September 1, 1916, as a trainmaster on the Union Pacific at Grand Island, Neb., which position he held until June 1, 1917, when he was promoted to assistant superintendent. On February 22, 1918, he was promoted to superintendent and on December 10, 1921, to acting general superintendent. He was promoted to general superintendent of the Los Angeles & Salt Lake, with headquarters at Los Angeles, Cal., on August 6, 1922, and on October 1 was appointed acting general manager.

Traffic

C. L. Brown has been appointed general agent of the Pere Marquette, with headquarters at San Francisco, Cal., succeeding E. S. Andrews, deceased.

L. L. Lapp, chief clerk to the vice-president and general manager of the Gulf, Mobile & Northern, with headquarters at Mobile, Ala., has been promoted to division freight agent, with headquarters at Meridian, Miss.

B. J. Lawless has been appointed commercial freight agent of the Buffalo, Rochester & Pittsburgh, with headquarters at Newark, N. J. **J. C. Gross** has been appointed to a similar position, with headquarters at Pittsburgh, Pa.

J. O. Gill, district freight agent of the Gulf, Mobile & Northern, with headquarters at Mobile, Ala., has been promoted to general freight and passenger agent, with the same headquarters, succeeding **E. W. Ritchie**, resigned to enter the executive department of the Louisville & Nashville, with headquarters at Louisville, Ky.

W. F. Lincoln, whose promotion to general freight agent of the Union Pacific, with headquarters at Los Angeles, Cal., was reported in the *Railway Age* of September 9 (page 491), was born on November 12, 1870, at Baltimore, Md. He entered railway service in May, 1887, in the general freight office of the Southern Pacific at San Francisco, and remained with this company until January 1, 1905. On this date he entered the employment of the San Pedro, Los Angeles & Salt Lake, as a rate clerk, which position he held until No-

vember 15, 1911, when he was promoted to assistant general freight agent. He was holding this latter position at the time of his recent promotion.

Mechanical

B. F. Kuhn, district superintendent of motive power of the New York Central, Lines West, with headquarters at Collinwood, O., has been promoted to assistant superintendent of motive power, Lines West, with headquarters at Cleveland, Ohio.

W. W. Payne has been appointed road foreman of engines of the Seaboard Air Line, with headquarters at Jacksonville, Fla., succeeding W. W. Shoemaker, appointed trainmaster of the East Carolina division. **H. M. Agin** has been appointed assistant road foreman of engines, with headquarters at Waldo, Fla.

Engineering, Maintenance of Way and Signaling

A. J. Hammond, assistant chief engineer of the Chicago Union Station Company, with headquarters at Chicago, resigned September 30 to become associated with James O. Heyworth, engineer and contractor, Chicago, Ill.

Special

J. G. Hughes, whose promotion to assistant commissioner of taxes of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., was reported in the *Railway Age* of September 9 (page 492), was born in 1878, at Oakland, Cal. He entered railway service in 1917 in the valuation department of the Gulf, Colorado & Santa Fe and remained with this company until the latter part of 1918, when he entered the employ of the St. Louis-San Francisco as land appraiser and served in this capacity until the fall of 1919 when he was placed in charge of joint land appraisals, with headquarters at St. Louis, Mo., which position he held until July, 1921. He became land assistant in the valuation department of the Atchison, Topeka & Santa Fe on the latter date and held this position until his promotion to assistant commissioner of taxes.

Donald D. Conn, of Minneapolis, Minn., has been appointed manager of the public relations section of the Car Service Division of the American Railway Association, at Washington, effective on October 1. He takes the place made vacant by the resignation of **A. G. Gutheim,** who left to practice law. Among Mr. Conn's duties will be those of making special studies, from time to time, of such subjects as may require special attention on the part of the Car Service Division, such as the movement of coal, grain, or other important and seasonal commodities. Mr. Conn was formerly head of the traffic department of the Shevlin, Carpenter & Clarke Company of Minneapolis, and later was head of the Transportation Division of the Joint Congressional Commission of Agricultural Inquiry. More recently, Mr. Conn was appointed assistant to Conrad E. Spens, federal fuel distributor. Mr. Conn was born at Boston, Mass., but most of his life has been spent in the Middle West. He was educated at the University of Michigan and at Cornell University and after some early training in the railroad business he became general traffic manager of the Shevlin, Carpenter & Clarke Company at Minneapolis in 1916. He has also been chairman of the transportation committees of the Western Pine Manufacturers Association, the Northern Pine Manufacturing Association and a member of the transportation committee of the National Lumber Manufacturers Association. In May, 1921, he was appointed chief of the transportation division of the Joint Congressional Commission of Agricultural Inquiry.

Donald Conn

Obituary

H. G. Sparks, vice-president and general manager of the Gulf, Mobile & Northern, with headquarters at Mobile, Ala., whose death from gangrene of the throat occurred on August 17, was born December 23, 1880, at Muncie, Ind. He graduated from Washington and Jefferson University in 1903, and entered railway service in May, 1905, as a rodman of the Chicago & Eastern Illinois with which company he was consecutively assistant engineer, office engineer, division engineer, assistant superintendent and superintendent until March, 1920. On October 1, 1920, he entered the employ of the Gulf, Mobile & Northern as operating assistant to the president, with headquarters at Mobile, Ala., and on November 1 of the same year he was promoted to general manager, with the same headquarters. Early in 1922 he was elected vice-president and general manager, with the same headquarters, which position he was holding at the time of his death.

H. Visscher, treasurer and paymaster of the Kansas City Southern, with headquarters at Kansas City, Mo., and consul for the Netherlands, died on September 21 after a lingering illness due to a complication of diseases. Mr. Visscher was born on April 18, 1871, in Deventer, Holland, and came to the United States in 1893 as a representative of the Dutch interests that financed the Missouri, Kansas & Texas Trust Company and the Kansas City, Pittsburgh & Gulf, which was reorganized after the receivership under the name of the Kansas City Southern on April 2, 1900. He was assistant treasurer of this company from its reorganization until May 9, 1906, on which date he was promoted to treasurer, the position he was holding at the time of his death. Mr. Visscher was appointed consul for the Netherlands in Kansas City in 1915, and was the first consul for that country to be located permanently in Kansas City.

H. Visscher

C. T. Ames, superintendent of the Des Moines Valley division of the Chicago, Rock Island & Pacific, with headquarters at Des Moines, Iowa, whose death from the collision of a track motor car, on which he was riding, and an automobile truck, was reported in the *Railway Age* of September 30 (page 634), was born November 5, 1875, at Boston, Mass. Mr. Ames entered railway service in October, 1892, as secretary to the general freight agent of the Fitchburg (Boston & Maine) at Boston. On January 13, 1903, he entered the service of the Chicago, Rock Island & Pacific as secretary to the superintendent of the Illinois division at Rock Island, Ill., since which he has been chief clerk to the superintendent of the Illinois division, service inspector in the general manager's office, with headquarters at Chicago, assigned to special work in the general superintendent's office, with headquarters at Des Moines, Iowa, transportation clerk in the general manager's office at Chicago, chief clerk to the vice-president in charge of operation, superintendent of the Chicago Terminal division, with headquarters at Chicago, trainmaster of the Des Moines Valley division, with headquarters at Des Moines, due to the consolidation of the division, and superintendent of the Des Moines Valley division, with the same headquarters.

EDITORIAL

Railway Age

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Brighter Prospects for the C. N. R.

The outlook for the future of the Canadian National Railways has brightened with the consolidation of all the properties under one management and the appointment of Sir Henry Thornton to the chairmanship of the board of directors. Only two of the new directors have had railway experience; the rest of them represent various interests, economic and political, including that of organized labor. Presumably, then, the task of operating the properties will devolve almost entirely upon Sir Henry Thornton. Sir Henry has had experience at several widely different types of railroading in this country and abroad and he has succeeded at all of them. He has the confidence and respect of all with whom he has had dealings. His relations with labor have been particularly pleasant during his period with the Great Eastern in England. Concerning the widely different interests represented on the new board of directors, particularly that of organized labor, he has no fears. To use his own words, "A man is either straight and competent or crooked and incompetent. If he is crooked and incompetent we can easily rid ourselves of him. If, on the other hand, he is straight and competent, we have no need for fear simply because he is a labor man or the representative of any other economic interest." On another page in this issue is an article giving the details of the reorganization of the Canadian National. We feel that our readers will join with President Rea of the Pennsylvania in welcoming the appointment of Sir Henry because "he brings to his great task that full knowledge and experience of the transportation situation" which will be advantageous both to Canada and the United States.

Take Advantage of the Natural Tendencies

Analyses of railway operating statistics, unless made with extreme caution, may easily lead to erroneous conclusions. Unless all the prime factors exerting an influence on a given set of figures are taken into consideration, one may easily be led astray. As a case in point, an increase in the net tons per loaded car during succeeding months is no criterion of the amount of effort being exerted by the railroad to increase the average car loading, because the load per car increases automatically during periods of industrial expansion. The character of traffic also has an important influence. For example, variations in the amount of ore and coal movement will always be reflected in changes in the load per car. Thus, in the case of one western railroad handling considerable coal traffic, the net tons per loaded car decreased from 28.9 in March to 20.7 in April, as a consequence of the coal strike. Probably, the most vital factor influencing the car loading is the change in the attitude of the shipper which takes place during a period of improving business. Naturally, during times when the volume of his sales depends almost wholly on his success in effecting shipments, he will take full advantage of every car placed at his disposal. Therefore, even though a railroad makes no organized effort whatever to secure heavier loadings per car, an increase in the average loading is almost certain to take place. But this automatic improvement will by no means equal that which may be obtained if the management directs its efforts to this end. The greatest improvement in the car loading may perhaps be effected by showing full appreciation of the efforts made by shippers who show the greatest willingness to co-operate.

Training Railway Employees

This country is far behind Great Britain in its facilities for educating railway employees. It is true, of course, that certain roads provide courses of training for apprentices and that instruction in the operation of air brakes and other mechanical devices is given to other employees from time to time. Moreover, a number of universities offer courses in transportation subjects for regularly enrolled students, but practically no provision at all has been made for the education of men in active railroad service in such fundamental subjects as railway economics, principles of train operation and the like. As a contrast to what has *not* been done in this country, we have the statement from our British contemporary, Modern Transport, that a total of 557 railway employees attended the classes on transportation offered during the academic year 1921-1922 by the London School of Economics. Such a large attendance, of course, could not have been secured without the whole-hearted co-operation of the railways entering London. These courses were given for the most part in the evening and at other times so arranged as not to conflict with the hours of duty of the employees. In all eleven courses of lectures were offered, including such subjects as Organization of Transport, Economics of Transport, Commercial Railway Economics, Operating Railway Economics, Railway Statistics, Factors in Train Operation and Control, the Railway in Relation to the State, the Law of Carriage by Railway, etc. Such educational advantages serve the dual purpose of interesting employees in their daily activities and in providing well trained men for promotion to positions of higher responsibility. In practically every large American city there is a university or similar institution which conducts evening classes in various lines of study for the benefit of persons employed during the day. If the railways would interest themselves in the matter, these institutions would doubtless be glad of the opportunity to increase their curricula to include railway subjects.

The Smaller Mechanical Associations

The last two years have been unusually difficult ones for all of the railway mechanical associations and this has been particularly true of the smaller associations which are composed of foremen of the various departments, such as the general foremen; master blacksmiths; master boilermakers; tool foremen; chief interchange and car foremen; master tinners, coppersmiths and pipefitters; air brake men; and traveling engineers. The need for strict economy has either made necessary the abondonment of conventions, or has materially restricted the attendance. Several of these associations, which regularly meet in the fall, have been forced recently to cancel convention plans or to postpone them until later in the year because of the shopmen's strike, which made it impossible for

foremen who had to do with the maintenance of equipment to leave their posts for even a few days. These associations have accomplished much in the past and are responsible for the introduction of many improved practices and methods of doing work which have saved the railroads many times over the small expense involved in maintaining the associations and in holding their annual conventions. Printed committee reports are valuable and helpful to a member who is obliged to stay at home, but the only way in which he can obtain the greatest help is by talking over his problems with others who are working in the same field. Much of the benefit of a convention which is taken home, never gets into the printed proceedings, but is developed through informal conversation. The present time is a critical one for some, if not all, of these associations. The demands upon the supervisory mechanical officers are bound to be heavy in the next few years and many new men will be needed. Everyone will require all the assistance and helpful inspiration that can be obtained from the work of the various associations. There never was a time when such work was of greater importance or more lasting good could be accomplished. It is to be hoped that such associations will receive the needed and whole-hearted support of the higher executives of the railways.

Water Supply and Traffic Movement

In the every day work of a railroad, occasions seldom arise where it becomes necessary to the functioning of their departments that officers charged respectively, with the responsibility of supplying water and with the moving of cars should "lose any sleep" over each other's trials and tribulations. So well established is the understanding that to supply water is one thing and to handle tonnage another that it is rare for either branch to manifest more than a casual interest in the affairs of the other. In keeping with this, those entrusted with the water supply ordinarily concern themselves little with what transpires on the locomotive side of the water tank other than to prevent a reckless waste of water where it is none too plentiful. But the situation, for a time, is now changed. The business of moving traffic is the immediate concern of all; a circumstance which means several things in water service. In general, it means, first, that present practices in water service must for the time be justified unequivocally by their contribution to the moving of business or be suspended until the emergency is passed. Specifically, it means that the department, above all else, should so study the trend of consumption and adapt its equipment to the consumption as effectively to guard against shortage. This may lead to a new pumping schedule, or to the repairing of a pump which might otherwise be left untouched until a breakdown occurs. Or, as in the case of one railroad, it may lead to the temporary installation of emergency pumping units. Next to preventing shortage, it means that efforts shall be directed to the elimination of all causes of delay to trains, however slight, that may result in one way or another from a shortcoming in water service. An investigation to this end may disclose the advisability of again cleaning all roadside tanks as well as the more frequent sludging of settling tanks to protect locomotives from delays resulting from roily water. Again, it may disclose the advisability of making a radical alteration in the prevailing method of treating the water in order to eliminate road troubles, even if at the expense of a little more shop work. It may warrant slight changes around the standpipes that will enable engines to take water more quickly, or even such a modification in the method of receiving chemicals or other supplies as will release cars more quickly for revenue service.

Employee Representation on the Pennsylvania

The shopmen's strike and the way in which the Pennsylvania Railroad came through it has served to focus attention on the scheme of employee representation which has been developed on that system during the past year and a half. Less than 30 per cent of the Pennsylvania shopmen left the service when the strike was called, and two months after the strike started the shop force had been restored to more than 95 per cent of the normal working force. The first comprehensive and authoritative account of the development of the employee representation plan and its workings has just been given out—an article in this issue covers it fully. The plan marks a distinct step forward in drawing the men and the management closer together and making a larger degree of real team work possible—a thing which is quite necessary if American railroads are to serve the public acceptably. Briefly the plan provides for the employees having a voice in matters affecting their welfare. The machinery which has been set up makes possible a prompt consideration of all grievances, criticisms and suggestions; these are freely and openly discussed around the table by representatives of the men and the management. The plan itself seems to be mechanically correct. The real factor, however, is the spirit which must vitalize it—a spirit of co-operation and fairness. That this is not lacking is indicated by the results that have been obtained thus far. It is important to understand, in installing and developing a scheme of this sort, that it must be dominated by the right sort of spirit and this must extend from the very top—the board of directors—all the way down to the least important foreman. Even one man in the chain who may be out of harmony will do much to endanger its success. The operation of the plan should incidentally locate inefficient foremen or officers, at least from the standpoint of understanding men and controlling them, and thus make it possible to develop them by proper coaching and training, or to eliminate them if they fail to improve. Handling grievances promptly at the point where they develop prevents their spreading and becoming aggravated; it adds dignity to the local supervision and makes for closer and more cordial relation between the men and the local officers.

Do Railroads Suffer From Inbreeding?

"NINETY PER CENT of the success of a railroad depends upon the human element." This is one man's estimate of the value of personnel in railroading. The same idea has often been expressed by others and is, beyond question, the dominant thought underlying all management. Transportation means movement, consequently dynamic energy is the important quality in those who direct it. But it is not alone in the transportation department that the human element is a vital factor. The effectiveness of the various special branches of the railway organization is even more dependent on good leadership. If a division superintendent, a general superintendent, or a master mechanic, proves unworthy, the results of his shortcomings become apparent to his superiors almost immediately and he is quickly brought to account or dismissed. But there is no such check on the bridge engineer, the engineer of tests, the signal engineer, the superintendent of timber preservation, the general safety agent, the superintendent of water treatment and the director of fuel conservation. So long as the work assigned to them moves smoothly and they keep out of trouble they are comparatively safe in their positions. The real success of the special department, as measured by the extent to which it becomes a vital factor in the efficient operation of the property, depends on the extent to which the man in charge is able to convince the management of the merits of the various measures which he wishes to initiate.

The success of a specialist not only implies a profound knowledge of his subject, but demands also personality and force that can drive home the ideas which his special knowledge gives him. Obviously, this calls for the exceptional individual. The man must be willing to devote his time to the minute technology of his own specialty and this as a rule unfits him for promotion to other branches of the service. The direct result is that his tenure of service in a given position is usually much longer than in the case of the operating officer, who, if he is successful, is frequently transferred from one point to another and rapidly advanced to positions of greater responsibility.

Because of the limited opportunities for promotion and because of the predominating characteristic of the department head, it is usually found that these special departments are of the one-man type. His individuality dominates the work. He alone is held responsible for the results. The situation is one not specially conducive to the development of competent assistants or understudies.

While the one-man organization places a subordinate in an unfortunate position and tends to drive out the more ambitious members of the staff, it does no particular harm to the property as a whole, so long as the head of the department retains his position. The difficulty arises when he resigns or dies. Usually no strong man is available to take his place, but notwithstanding this fact someone from his organization, or, someone from another department of the road, is selected to take his place. The result in either case is much the same. The new incumbent must be educated either in the technology of his position or in the art of management and several years will elapse before the department can recover from the period of ineffective leadership.

Much better results would be obtained if the railroads pursued the policy of canvassing the entire special field for a fitting successor, something which could be done through the channels of the various national associations. A man secured in this way would often be more familiar with the work of his predecessor than anyone actually having previous service on the railroad, but the greatest gain would accrue from the healthy turn-over in the field as a whole. Promotions would be more frequent and the special knowledge would be more thoroughly disseminated among the various roads. It would overcome the effects of the inbreeding from which the special departments on some of the roads of the country are suffering.

Settlements with Train Service Employees

MANY OF THE RAILWAYS recently have made agreements with the conductors' and trainmen's organizations under which the present wages and working conditions of these employees will be maintained for a year. Some railways have made similar agreements with the engineers' and firemen's organizations. These developments mean that existing controversies between the railways and organizations signing the agreements will be withdrawn from the Railroad Labor Board for the period mentioned. Indications are that in a comparatively short time practically all the railways will make similar settlements with the engine and train service employees.

The reasons why these settlements are being made are fairly obvious to those familiar with the pertinent facts. The engineers and conductors are the highest paid railway employees. The firemen and trainmen are among the highest paid. When the railways about a year ago applied the second time within a year to the Railroad Labor Board for general reductions in wages, they asked that the wages of train service employees should be reduced ten per cent, and that time and one-half for overtime in freight service should be abolished.

It was evident even then, however, that serious difficulties would be encountered in trying to secure reductions of the wages of these employees. The RAILWAY AGE mentioned these at that time. The work done by employees in train service is different from that done by any class of workers in any other industry, and therefore it was impracticable to base petitions for reductions in their wages upon the ground that they were being paid more than men doing similar work in other industries. Furthermore, measured by the increase in the cost of living since before the war, the pay of engineers and conductors generally did not show increases in purchasing power. Measured by the same standard, the wages of firemen and trainmen had increased, but not anywhere near as much as those of most other classes of employees. Since then there have been no substantial changes in the cost of living. It was, therefore, plain that the railways would find it difficult to make a case before the Labor Board under the provisions of the Transportation Act for reductions of the basic wages of train service employees.

The situation was different with respect to time and one-half for overtime in freight service. It is based upon an unsound principle and by giving employees a positive incentive to delay the movement of trains it tends to interfere with efficiency of operation. We have not heard the last of it yet. But the railways have just gone through a strike of shop employees which has more or less crippled many of them. They are confronted with a demand for the movement of the largest traffic in history. For them to have got into a serious controversy with the train service employees under present conditions would have been most undesirable from their standpoint, and especially from the standpoint of the public.

There was another reason why the railways were disposed to deal even generously with employees in train service. With a few exceptions they have stayed at work and faithfully performed their duties during the shop employees' strike when such performance of their duties was almost vital to the interests of the railways and the welfare of the country. This undoubtedly influenced many railway managers to be disposed to postpone any attack upon their wages. If a serious effort was not to be made in the near future to secure reductions of their wages it was expedient to take action that would show this was the case. The railways under present conditions need the most efficient service that the train service employees can render, and they would have found it impossible to get such service from them if the employees had been in constant fear that proceedings speedily would be pushed for reductions in their pay.

The railway industry needs a truce to labor controversies in present circumstances above almost everything else. The shop employees' strike is now on most railways a matter of history, although the effects of it are still felt and long will be felt. Peace between the railways and the train service employees now seems certain for at least a year. No other class of employees can by strikes or other means seriously interfere with the movement of traffic. So far as the labor situation is concerned, it would seem that the railways are now going to be given an opportunity to operate their properties for a time with maximum efficiency.

While the wages of train service employees were reduced by a small percentage in 1921, the agreements made leave them among very highest paid of any class of working men in American industry. The average monthly earnings of railways general officers, including all the so-called "fancy" salaries, are $532, and of division officers, $320, the average for all general and division officers being $418. The

average monthly earnings of passenger engineers in July were $254, or an annual rate of $3,048, and the average earnings of passenger conductors were $233, or at an annual rate of $2,796. The average earnings of engineers in freight service were $237, and of conductors in similar service, $212. The average earnings of passenger firemen and helpers were $187, and of passenger brakemen and flagman, $155, the average earnings of firemen in freight service were $165, and of freight brakemen, $154. The highest wage of all, that of freight engineers in local and way freight service—$275 a month, or at an annual rate of $3,300—is not much below the average earnings of division officers, and is more than half as large as the average earnings of general officers. The lowest, that of brakemen, exceeds $1,800.

Certainly none of these classes of employees can justly complain about their compensation in comparison with that received by their officers, or that received by men in any other industry. Once having agreed to continue to pay them these relatively high wages, the railways will have the right to ask in return the most loyal and efficient service that they are capable of rendering.

Keep the Individual Car Moving

WITH A SHORTAGE of more than 100,000 cars at the last report (September 23) it is evident that the limited car supply is now an important factor in the ability of the railways to meet the transportation demands of the country. Every effort that is made, therefore, to use more intensively the cars that are available tends to increase their capacity. Heavier loading of cars is one alternative with vast possibilities; the reduction of delays to cars is another. Both now require increased supervision, particularly the latter

To keep *all* cars moving, attention must be given to *each* car. The big problem now is to bring to light the individual car, loaded or empty, which is being delayed, for when discovered the remedy is obvious in most cases. Nothing will contribute more to this than the personal checking of "on hand" reports by local operating officers at short intervals. The detection by each operating officer of at least one car every day that would otherwise have remained idle will do much to stimulate activity in this direction.

The problem of keeping cars moving has many ramifications. It involves the constant checking of yards to detect cars delayed by "no bill" or other causes, the supervision of company material shipments, the regular inspection of outlying sidings and spur tracks, the prompt and frequent switching of repair tracks, etc. It also involves enlisting the co-operation of shippers in releasing cars as quickly as possible, even when this involves overtime and extra expense for them. At a time such as the present when the co-operation of each shipper will contribute to the common good of all by increasing the number of cars available for their traffic, it is possible to induce many of them to employ extra forces or to work forces longer hours to load and to unload cars more quickly. Many car days can also be saved by the co-operation of the shipper in keeping the railway advised regarding the unloading of cars so that it can move them promptly when released and also in unloading them quickly when placed.

The greatest improvement in the use of cars will not be secured by new or novel means, but by the universal application of those measures with which every railway operating officer and shipper is familiar, but the importance of which they may fail to realize as an aid in the present period of heavy traffic. If those measures are adopted which will keep each individual car moving, as far as practical, the question of car mileage will be answered and a long step will be taken toward meeting the present unusually heavy transportation demands.

Getting the Most Out of Locomotives

NEVER IN HISTORY did conditions so imperatively demand that the railways should get the most possible service out of their locomotives as they do now. The RAILWAY AGE showed in an editorial published two weeks ago how greatly the increase in the number of locomotives in service has declined within the last twenty years.

It is sometimes said by persons who do not study the facts that this decline of the increase in the number of locomotives in service has been largely or wholly offset by the increase in their average tractive power. Unfortunately, this is far from true. The Interstate Commerce Commission has published statistics regarding the tractive power of locomotives since 1902. In the five years ending with 1907 the average increase per year in the total tractive power of locomotives in service was 128,000,000 pounds. In the seven years ending with 1914 the average increase per year was less than 75,000,000 pounds. In the seven years ending with 1921 it was only 63,500,000 pounds. In the year 1921 it was less than 39,000,000 pounds.

Indications are that the increase in the demands of traffic will be as great in the present period of business revival as it has been in past periods of business revival. These figures demonstrate that the total increase in the tractive power of the locomotives in service has been nowhere near in proportion to the probable increase in the demands of traffic. It is probable that the amount of traffic handled cannot possibly be increased as much as it has been in past periods of active business.

The effects of the great decline in the amount of new locomotive power provided can be largely offset only by greatly increasing the number of tons carried one mile per locomotive and per pound of tractive power. The first thing needed to increase the amount of traffic handled with each unit of power is to secure the maximum practicable loading per freight car. Every unnecessary ton of the dead weight of cars which is pulled is a waste of power. The second most essential thing to do in order to secure the maximum utilization of available power is to increase the number of cars per train as much as is consistent with getting the trains over the road in reasonable time. Every time an engine is pulling less cars than it can reasonably pull there is a waste of power.

But the maximum utilization of power cannot be obtained unless every possible expedient is adopted to secure not only the heaviest practicable train loads, but to get the trains over the road with the least possible delay, and to keep locomotives out of shops and out on the line pulling trains as much of the time as practicable. The places where the worst congestions develop and delays occur on railroads are in yards and terminals and in roundhouses and shops. Usually the main tracks are not congested. Therefore, the more trains there are which are so made up and operated as to move long distances without breaking up and making up in intermediate yards, the greater will be the service obtained from power.

Likewise, the longer distances locomotives are run without being taken off trains and turned the greater will be the service obtained from the power. Of course, however, if locomotives are to be run longer distances without attention they must be sent out in the best practicable condition. Furthermore, if trains are to be moved with the maximum average speed practicable in proportion to the size of train loads, they must be despatched in such a manner as to permit the fewest and the shortest possible delays to them. Despatchers can do much to increase the service obtained from locomotives by using their utmost resources to prevent trains from accumulating at points where congestions of trains tend to develop, such as at coaling stations.

All such suggestions as the foregoing point to one sugges-

tion which, under such conditions as now exist, is of the most vital importance. That is, that the most intensive supervision should be exercised by yardmasters, roundhouse foremen, despatchers, trainmasters, road foremen of engines and other supervisory officers over the handling of locomotives and trains. The vital problem which must be solved if the railways are to move the maximum possible traffic with existing facilities is that of keeping not merely every car moving, but also every locomotive moving as much as possible with the maximum practicable load. Statistics upon the subject show not only that there has been a decline over a period of years of the increase in the total tractive power available, but that there has not been, even in times of heavy traffic, an increase in the number of ton-miles per locomotive proportionate to the increase in the average tractive power of locomotives. In other words, even the relatively small increase in tractive power has not been fully utilized. Further analysis of the statistics has shown that this has been due to the fact that the number of miles run per locomotive per month or per day has not been increased or even maintained.

The railways should be making every effort to increase the number of ton-miles per day of cars, but they should be making even greater efforts to increase the number of ton-miles per locomotive per day. Unless the statistics upon the subject are very misleading, there is a great opportunity to increase the amount of business handled with existing facilities by more intensive supervision to increase the mileage of service obtained from locomotives.

Organized Labor's Sense of Responsibility

THE REPORTS of the annual meeting of the National Union of Railwaymen, Great Britain, as published in the union's official magazine, would make surprising reading for anyone who knows labor unionism only from observing conditions in America. Most of the time of the convention, as could be expected, was taken up in the discussion of matters of union policy directly affecting the economic status of its members, but the duty of unionized employees to their employers and the public was not neglected. Witness the opinion of J. H. Thomas, parliamentary general secretary of the union, on the subject of railway employees who are found guilty of pilfering:

> They will get no sympathy or support from our organization in this matter, and I warn them that we will be as anxious as the railway companies to stop this kind of thing. We shall show no mercy to them. The union has respect throughout the length and breadth of the land, and has established the confidence of the railway management, which finds its reflex in many ways. We believe we can contribute to the efficiency of railway service, and we can do much to help the undertaking. We must let the traveling public know and feel in sending goods on the railway they are entrusting them to men who are jealous and proud to maintain their trust.

Local committees of employees and officers are the foundations upon which rest the peaceful adjudication of disputes on Great Britain's railways. Above the local committees are the district councils, above them the railway councils and above the railway councils the two national bodies, the Central Wages Board and the National Wages Board. This method of organization is important because it does away with the professional grievance man and distributes his functions over a larger number of men. The larger the number of employees who come together with their local officers, the larger the group which is going to be informed of the viewpoint of the officers; also, conversely, the officers will get the point of view of larger numbers of employees.

Because of the closer contact between officers and men, there is a considerable improvement in the interest of the union in the successful operation of the railways. C. T. Cramp, industrial general secretary of the union, at the annual convention outlined, as some of the accomplishments which the local committees should strive for, the prevention of claims for loss and damage, heavier and better car loading and improved efficiency generally. Mr. Cramp said further that, while he believed capitalism to be an evil thing, nevertheless that there were among those in high positions within the capitalist class men who were as fair and as honorable as anyone in his own class.

These favorable conditions obtain in Great Britain in spite of the fact that organized railway employees are committed to a policy of government ownership and operation with union participation the same as in America. The British unionists are evidently proceeding on the hypothesis that if the railroads are to be turned over to the government with union participation in management it will be better if they are turned over as going concerns rather than as bankrupts. They also appear to be working with the idea that if they are ever going to be allowed to participate in management under a policy of nationalization that it is up to them to prove themselves capable of performing such a trust.

If there is any lesson to be learned from the railway labor situation in Great Britain—and there should be many—it is that organized labor will find it to its advantage to develop a sense of responsibility in the performance of its duty to its employers and the public. As a corollary to this it might be added that employers should foster and encourage the development of this sense of responsibility by every means in their power—the outspoken recognition of the disciplinary action taken by the trainmen against leaders of certain outlaw strikers, for instance. Another method is the appointment of union leaders on technical commissions and calling for their advice and assistance in outlining the broader phases of railway policy. J. H. Thomas of the National Union of Railwaymen was one of the members of the commission which prepared the able report on automatic train control, a resumé of which was published in the *Railway Age* of July 22, page 149.

It is a question, of course, whether union leaders in this country would co-operate in any such arrangement or whether they would permit their members to meet with the managements in committees formed not only to adjudicate disputes but to promote efficiency of operation. That, however, is for the unions themselves to decide. They, more than anyone else, stand to benefit from the development of a sense of responsibility to their employers and the public. The railways and the public should, however, foster this development as much as they can—especially on the part of unions which by their age and the high ratio of their members to total eligible employees have given proof of their strength and permanence.

New Books

Railroads and Business Prosperity, a Series of Addresses and Papers Presented at the Annual Meeting of the Academy of Political Science in the City of New York, April 28, 1922 Edited by T. W. Van Metre and Parker Thomas Moon. 130 pages. 6 in. by 8½ in. Bound in Paper or Cloth. Published by the Academy of Political Science, Columbia University, New York. Price $1.50 Bound in Paper.

This book contains thirteen addresses on the subject of railway transportation which were delivered before the meeting of the Academy of Political Science on April 28. The speakers were well chosen and this report of their addresses gives in compact, readable form the best survey obtainable of expert opinion on current problems in railway economics.

As such it merits the attention of every railroad man who is concerned with the questions of railroad policy. No railway publicity man should be without it, as indeed should no one who is in any way interested in solving the problems confronting the railroads today.

The addresses reproduced in this book were on three general subjects, viz: the Labor Provisions of the Transportation Act; Railway Policies and the General Welfare; and Freight Rates and Business Revival. Some of the speakers were: Professor Henry R. Seager of Columbia University; Professor Frank H. Dixon of Princeton University; C. B. Heiserman, general counsel of the Pennsylvania; W. N. Doak, vice-president of the Brotherhood of Railroad Trainmen; Henry T. Hunt, formerly of the Labor Board; Henry C. Wallace, Secretary of Agriculture; Daniel Willard, president of the Baltimore & Ohio; Walker D. Hines, formerly director general of railroads; Professor W. J. Cunningham of Harvard University and R. H. Aishton, president of the American Railway Association.

The Academy of Political Science has shown its appreciation of the importance of the railroad problem by having scheduled it for discussion at two of its meetings during the past few years. The value of open forums such as these in bringing railroad problems to the attention of the intelligent public needs no extended elucidation. Railroad men can show their appreciation of the Academy's work in no better way than by following these meetings, if not in person, at least by a study of the proceedings.

The Eastern Railroad. By F. B. C. Bradlee. 118 *pages, 6 in. by 9¼ in. Cloth. Published by The Essex Institute, Salem, Mass.*

This is a book of a single chapter—of 118 pages; a "Historical account of early railroading in Eastern New England, second edition." The lack of chapter headings and of an index will detract from its usefulness, and the reader unacquainted with eastern Massachusetts and southern Maine needs a map if he is to read intelligently; but the book is very interesting in spite of these deficiencies.

The work is about the same as a journal, the only classification of material being chronological, but the author has selected his matter with excellent judgment, and there are no dull pages. He has given us, evidently, a faithful abstract of the railroad news (of that region) to be found in the files of the newspapers of Salem and Boston for the 60 years covered by his story. Yet it is not a mere abstract, as the author must have had a considerable personal acquaintance with the men and things with which he deals. He is a lover of accuracy.

The substance of the book is essentially "popular." The business and financial affairs of the railroad are not neglected, but the personalities of the officers, conductors and station agents, the time-tables, the pictures of locomotives and old station buildings and other features with "local color" constitute the most salient features. The consolidation of the Eastern and the Boston & Maine in 1884 is well covered.

New England was a field of anti-slavery discussion as far back as 1841 and it appears that the term "Jim Crow car" was in use at that time. Controversies about negro passengers led the Eastern Railroad to abolish second-class passenger cars, in which the fare had been about a third less than the first-class rates. The difference of view as to the use of the words "depot" and "station" seems also to have arisen back in those early days. "Depot" is used in officers' orders and quite generally, yet the pictures of early buildings show them lettered with the word "station." George Peabody, afterward eminent as a philanthropist, was president of the Eastern from 1836 to 1842.

The Eastern began using coal in its locomotives in 1858, but it neglected the use of the telegraph (except possibly in very unusual circumstances) until 1871, after the Revere collision, which killed 29 passengers. In 1872 Charles F. Hatch was brought from the Lake Shore & Michigan Southern and made general manager, and Hall automatic block signals (wire-circuit) were installed on 16 miles of the road. Although the Eastern was the main railroad from Boston to Maine and New Brunswick it had at that date only 20 miles of double track.

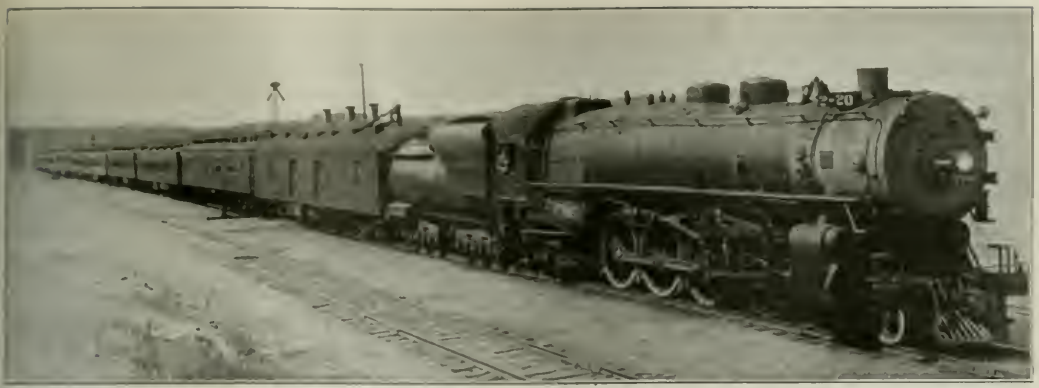
Proceedings of the American Wood Preservers' Association, 1922. *534 pages of text, 6 in. by 9 in. Illustrated. Bound in cloth or paper. Published by the American Wood Preservers' Association, S. D. Cooper, secretary, c/o Atchison, Topeka & Santa Fe, Topeka, Kan. Price, cloth* $6, *paper* $5.

As indicated by the title this is a report of the eighteenth annual convention of an association organized in 1905 for the development and improvement of the science of timber preservation, and the conservation of forests through the increased use of treated timber. One of the most valuable features of the volume is an annual report of statistical data on the use and consumption of treated timber, the volume of preservatives used, and other related data prepared by the United States Forest Service in co-operation with the American Wood Preservers' Association. The list of members in the back of the book, amplified by a classification of the membership according to railroads, industries, educational institutions, etc., also comprises a valuable "Who's Who" in the timber preserving industry. From the standpoint of the railway reader the volume this year is of greatest value because of the amount of space devoted to the economics of timber preservation as applied to railway crossties. Committee reports and individual papers presented and discussed at the convention in Chicago on January 24, 25 and 26, as reported in the proceedings include such topics as the Economics of Crosstie Renewal; Factors Affecting the Cost of Treated Crossties; the Feasibility of Introducing Tropical Ties in the United States; the Experience with Treated Wood on the Santa Fe; Should the Cost of Treating Ties Be Charged to Maintenance or Capital Account?, etc. Mention should also be made of the voluminous progress report made by the San Francisco Bay Marine Piling committee, which has developed valuable information concerning the marine borer problem. Other papers presented relate to the more technical problems of timber preservation and to efforts being made to promote the wider use of treated timber in the United States.

Universal Directory of Railway Officials, 1922. 5½ in. by 8½ in. 644 Pages. Bound in Cloth. Compiled by the Editor of the Railway Engineer (London) and Published by the Directory Publishing Company, Ltd., 33, Tothill Street, Westminster, London, S. W. 1, England.

This is the twenty-eighth annual edition of this work, which gives the names and addresses of principal officers of all the railways of the world. As such it is a valuable reference book for manufacturers of railway equipment and supplies and others who wish to keep in touch with railway officers in various parts of the world. Classification is by countries and under each country the names of the railways with a list of their officers are given in alphabetical order, together with a few details about each railway such as length of line, gage and number of locomotives and cars. Names of foreign railways are given in the language of the country together with their English equivalent. Reference is further facilitated by an alphabetical index of all railway officers. The book is as up-to-date as is possible under the circumstances.

The "Pullman News," October issue, contains an announcement of the establishment of free industrial insurance by the Pullman Company in connection with its system of employee representation.



Locomotive 7000 Hauls 11 Steel Cars Over a Heavy Grade Division

Service Records of U.P. Mountain Type Locomotives

Performance Indicates that No. 7000 Exceeds Both Theoretical Starting and Horsepower Capacity

THE LIGHTEST Mountain type locomotive in proportion to maximum horsepower capacity which has yet been built, was delivered to the Union Pacific by the American Locomotive Company late in May, 1922. From the date of breaking in during the last week in May to July 3, this locomotive made 10,000 miles, at the rate of 500 miles a day, and up to the end of August had made a total of 28,000 miles. Much of the service during this time has been made on runs of approximately 500 miles in length, some of which have been made without cleaning either the fire or the ash pan.

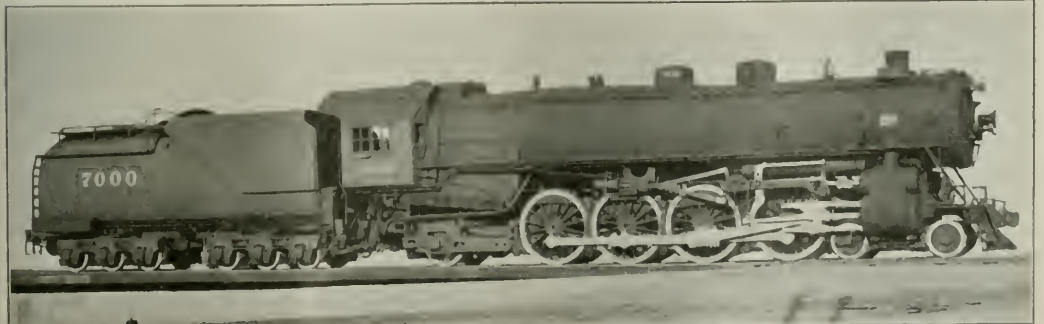
This locomotive, a description of which has already appeared in these columns,* has a total weight of 345,000 lb., of which 230,000 lb. is on the drivers, and a rated tractive effort of 54,800 lb. It has 73-in. driving wheels, 29-in. by 28-in. cylinders and a boiler pressure of 200 lb. per sq. in.

Engine No. 7000 and the 54 additional locomotives of the same type which have since been ordered, were built for use in passenger service between Cheyenne, Wyo., and Ogden, Utah, a distance of 484 miles in which are encountered numerous long grades. The character of the line, which is shown in the accompanying profile, is such that passenger trains have been handled by Mikado type locomotives. With these engines it has been necessary to maintain high running speeds on the down grades in order to maintain the passenger train schedules with the comparatively low speeds which can be made on the up grades. The high sustained capacity of the Mountain type locomotive was expected to maintain the schedules with less extreme variations from the average speed.

Locomotive 7000 made its first trip in passenger service on June 1. Following a trip from North Platte, Nebr., to Omaha, a distance of 281 miles, with a train of refrigerator cars weighing 2,460 tons, which took seven hours and fifty minutes, earlier in the day, the engine left Omaha at 4:30 P. M. with train No. 3 which it took through to Cheyenne, Wyo., a distance of 507 miles, arriving at 10:30 A. M. on June 2. On the same afternoon the locomotive left Cheyenne for Ogden, Utah, a run of 484 miles, with a train of 10 sleepers and two diners, a run requiring 15 hrs. 15 min. of continuous service from the locomotive, which was made with no trouble whatever from journals or bearings running hot.

One of the best runs indicative of the high sustained

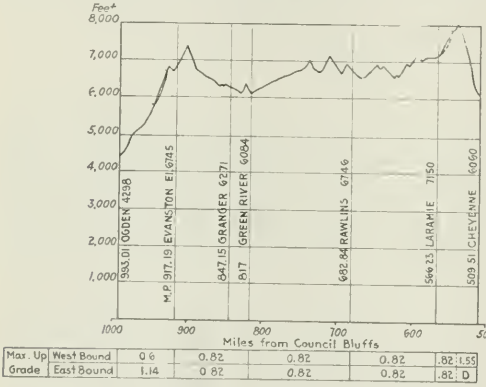
* See the June 10 issue of the *Railway Age*, page 1325.



This Locomotive Established New Records by Developing 3,500 Indicated Horsepower

capacity of the locomotive was made on June 9, when it took second No. 19 from Cheyenne to Rawlins, Wyo. The train, made up of 11 cars, left Cheyenne one hour late. Over the 57-mile district from Cheyenne to Laramie the train made a little better than running time. For the first 31 miles out of Cheyenne is encountered a steady up grade with a total change of elevation of slightly less than 2,000 ft. and about 10 miles of 1.55 per cent ruling grade. The schedule calls for an average speed of 28.4 miles an hour with no stops over this district. From Laramie to Rawlins the grade is broken, with the difference in elevation slightly favorable to westbound movement. Several grades, however, one of considerable length, are encountered. Over this district, 116 miles in length, the running time is three hours and twenty minutes, including four stops. Engine 7000 made this run in two hours and twenty-six minutes. Deducting the time for the stops, this required an average running speed of 60 miles an hour. The highest speed attained was 75 miles an hour, at which the locomotive operated with remarkable smoothness.

On June 15, Engine 7000 took eastbound train second No. 20, consisting of 13 cars, from Ogden to Cheyenne. This train left Ogden 40 min. late, 25 min. of which was made up on the long heavy climb between Ogden and Evanston,



Profile of Union Pacific Between Ogden and Cheyenne

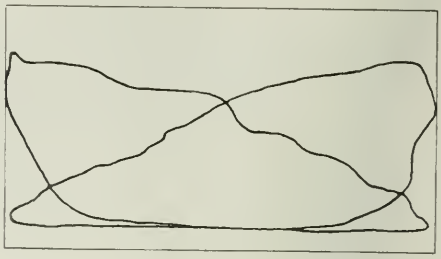
Wyo. In the first 65 miles of this 76-mile district there is a change of elevation against eastbound movement of 2,500 ft. with a 16-mile ruling grade of 1.14 per cent. The schedule of No. 20 calls for an average speed of 27.6 miles an hour with no stops. On this run engine No. 7000 maintained an average of 32.7 miles an hour over the district.

This 484-mile run was made without cleaning either the fire or the ash pan.

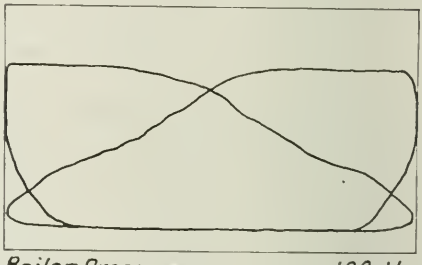
The locomotive has made a number of runs both on the Oregon Short line and the Oregon, Washington Railroad & Navigation Company. On a number of these runs its performance over 2.2 per cent grades has been observed. Although the locomotive is not primarily designed for service on long mountain grades of this character, but rather for its ability to maintain comparatively high speeds on grades requiring considerably less than the maximum starting tractive effort, it is interesting to note that the locomotive maintained 28 miles an hour with a train of 12 cars over a 2.2 per cent grade, and with 10 cars was able to start and rapidly accelerate to a speed of 10 miles an hour, at which it was working at less than half cutoff.

On another occasion this locomotive took a passenger train from Pocatello, Idaho, to Portland, Ore., a distance of 729 miles, including four engine divisions, without cleaning the fire

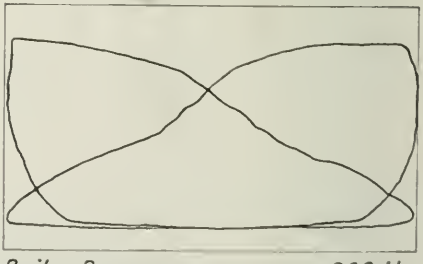
In recent tests this locomotive established a new record of power output for simple locomotives and also set a figure for weight per horsepower which is believed to be substantially lower than has ever been attained previously in road service in this country. On October 1 locomotive 7,000



Boiler Pressure 198 Lb.
Mean Effective Pressure 81.42 Lb.
Miles Per Hour 50
Indicated Horsepower 3500



Boiler Pressure 198 Lb.
Mean Effective Pressure 91.57 Lb.
Miles Per Hour 44
Indicated Horsepower 3464



Boiler Pressure 200 Lb.
Mean Effective Pressure 99 Lb.
Miles Per Hour 40
Indicated Horsepower 3404

Typical Indicator Cards Taken on Road Tests

hauling train No. 4, consisting of 11 cars weighing 816 tons, at a speed of 50 miles an hour on an ascending grade of 0.82 per cent developed 3,500 indicated horsepower. This is at the rate of one horsepower for each 98.6 lb. weight of the locomotive; moreover the power developed is 15.5 per cent greater than the rated cylinder horsepower and 17.2 per

cent greater than the rated boiler horsepower according to Cole's method.

This performance has been nearly equalled on other occasions. On September 26, hauling 11 cars weighing 823 tons, 3,404 indicated horsepower was developed at 40 miles an hour, and 3,464 indicated horsepower at 44 miles an hour. The indicator cards taken at these three speeds are reproduced in one of the illustrations.

Although accurate test data are not available, it is evident from the operating results obtained that the locomotive is rendering a highly satisfactory performance both from the standpoint of fuel economy and starting as well as speed capacity.

On 19 regular trips on the Wyoming, Western and Colorado divisions this locomotive made 62,592 passenger car miles on a fuel consumption of 338 tons, or at the rate of 10.8 lb. of coal per passenger-car mile. Comparing this with the April average for the main line division of the Union Pacific, this shows a decrease of 26 per cent.

Based on train resistance calculations the performance of the locomotive on the 2.2 per cent grade of the Oregon Short Line between Pocatello, Idaho and Butte, Mont., indicates that the locomotive developed a starting tractive effort of 58,000 lb. as compared with the theoretical rating of 54,800 lb. on the usual basis of calculation. A steam gage on the throttle pipe indicates that when working full stroke at low speed the pressure drop between the boiler and the steam chest does not exceed five to ten pounds. This, together with the 90 per cent cut off of the Young valve gear is responsible for the high starting tractive effort.

Although open to some question as to accuracy, calculations based on theoretical train resistance on the 1.55 per cent ruling grade west of Cheyenne indicates that the locomotive developed something over 2,000 hp. at 25 miles an hour, or approximately 12 per cent more than called for by the American Locomotive Company's tractive effort curve.

The engine has made a splendid impression among the crews who have operated it. This is undoubtedly partially due to its smooth riding qualities, particularly around curves, as well as its steaming qualities and ability easily to maintain schedules. The well balanced proportions of the machinery is attested to by the ability of the locomotive to operate continuously on runs varying from 500 to 700 miles in length.

Some of the Physical Properties of Paints*

New Method Used to Obtain Reproducible Films—Effects of Composition—Causes of Spotting

By P. H. Walker and J. G. Thompson
United States Bureau of Standards

THE LIFE of any paint may be divided into three periods: (1), the period of storage between manufacture and application; (2), the period of application when the paint is spread out in a thin, wet film, and (3), the period of exposure covering the life of the dry paint film. Each period is characterized by certain physical properties which indicate the value of the paint. During the first period little information of value is obtainable, but certain defects in manufacture or material may be indicated by such phenomena as flocculation, caking, or excessive settling. It is during the second period that the really valuable physical properties, such as the wetting power or adherence to the surface, ease of application, hiding power, color, uniformity, gloss, spreading rate, and rate of drying appear.

In the final stage of the life of the paint the only factors considered are those which affect the permanence or stability of the film established as a result of the properties which appear and function during the second period. All of these properties are important, but few if any can be measured with any degree of accuracy, and most of the properties are tested by methods in which the personal equation is so large that reproducible results can not be obtained. Any study of the physical properties of paints necessarily must begin with a standardization of tests.

Preparation of Paint Films

In view of the number and importance of the properties which first become evident at the time of application, it is obvious that this forms the logical starting point for any investigation. The physical properties which combine to determine the consistency or behavior of a paint at the time of application are of fundamental importance, but before any comparative study could be undertaken it was necessary to devise some reproducible method of preparing paint films. Flowing produces satisfactory results but unfortunately is limited to a few of the thinnest paints. The ordinary methods of brushing and spraying are unsatisfactory since the resulting films are never uniform and can be duplicated only by accident. Some mechanical means therefore must be employed and as a result of some promising preliminary experiments centrifugal force was adopted.

A number of circular glass plates furnished the standard surfaces to be covered with paint. These plates were each 25 cm. in diameter and approximately 1 cm. thick. The surfaces were ground flat and finished by fine grinding but were left unpolished, to furnish a surface to which the paints would adhere readily. In the earlier work steel plates were used but were later discarded, as the glass proved to be much easier to handle and to keep clean.

The apparatus employed consists of a vertical spindle rotated by a belt connected with a variable speed motor. To the upper end of the spindle is fastened a circular wooden block to support the glass plate. The plate is brought up to constant speed and an excess of paint, previously screened through a 200-mesh sieve to insure uniformity and freedom from skins, is poured on at the center of the plate. The paint flows out, covers the surface, and the excess is thrown off. The motor is then stopped and the plate removed and allowed to dry. After the paint is dry the film thickness is determined by means of an Ames dial gage, reading direct to 0.01 mm. and estimating to 0.001 mm.

At any given speed, the centrifugal force increases directly with the distance from the center of rotation. One would expect, therefore, that the resulting film would be thinnest at the circumference of the plate and would reach a maximum at the center. This is what usually occurs and the resulting film is generally pyramidal, although the pyramid does

*Abstract of a paper presented before the American Society for Testing Materials, Atlantic City, N. J., June 29, 1922.

not extend uniformly over the entire surface. The film usually presents the appearance of a large, flat plane with a small, sharply defined pyramid at the center. The pyramidal film which is characteristic of most paint is not produced by varnishes nor by liquids such as linseed oil. These give flat films of uniform thickness across the entire surface, in spite of the fact that the centrifugal force varies widely at different points on the plate. A table accompanying the paper gave the film thickness measured at varying distances from the center. Raw linseed oil gave a film about 0.016 mm. thick, varnishes 0.024 mm. to 0.040 mm., enamels and oil paints 0.030 mm. to 0.085 mm.

Numerous experiments with varying amounts of paint led to the conclusion that the film thickness is independent of the amount of paint applied. An insufficient amount will cover only a portion of the surface, while an excess will cover the entire surface and the excess be thrown off. The resulting films in both cases are of equal thickness at corresponding points, but for the sake of convenience it is advisable to use a slight excess to insure covering the entire surface.

At speeds of 200 r.p.m. or less many paints produce films too thick to dry properly. Too high speeds cause segregation of the pigment particles and in some extreme cases a tendency to disrupt this film has appeared. A speed of 300 r.p.m. seems to be the most generally satisfactory.

The film thickness is practically independent of the time of whirling after the first short interval of time has elapsed. Working with ordinary paints at a speed of 300 r.p.m., it was found that three minutes' whirling invariably provided a comfortable margin of safety beyond the time necessary to reach equilibrium.

The most satisfactory features of this method are the uniformity of the films produced and the ease and certainty with which they can be duplicated.

Effect of Composition on Paint Films

The next investigation was a study of the effect produced upon the life and behavior of a paint film by varying the proportions of pigment and oil in the film. For comparative purposes the films should be of equal thickness and the use of centrifugal force as previously described furnishes a convenient means for determining the film thickness which will result when any paint is spread under certain selected conditions. If several paints produce films of equal thickness when whirled at the same speed, it may be assumed that those paints will produce comparable films when brushed out on test panels. The object sought was to produce a series of paints of varying oil-pigment ratios thinned with turpentine until they would spread or brush out to produce dry films of equal thickness.

Four pigments were selected for study:

(a) Basic carbonate white lead.

(b) Zinc oxide.

(c) Sixty per cent basic carbonate white lead, 40 per cent zinc oxide.

(d) Sixty per cent basic carbonate white lead, 30 per cent zinc oxide, 10 per cent asbestine.

Each pigment was ground to a paste with a normal amount of raw linseed oil. Each paste was divided into several weighed portions and varying amounts of oil were added to the different portions until the resulting series of semi-pastes or semi-paints represented a range of pigment content varying from 15 to 50 per cent by volume. The corresponding limits for the oil being 85 and 50 per cent by volume. Liquid drier was added to each semi-paint in the proportion of 5 cc. of drier to 95 cc. of oil.

Some one mixture had to be chosen as an arbitrary standard and that consisting of 25 per cent basic white lead and 75 per cent oil was adopted, since this mixture behaved well under the brush and produced a film of satisfactory appearance and properties. The other mixtures were thinned with turpentine until they produced the same film thickness when whirled at the same speed. The turpentine being volatile serves merely to increase temporarily the mobility of the paints and later evaporates.

The preparation of the paints resulted in some interesting observations. As expected, it was found that the thinning power of turpentine varies with the different pigments, but it was rather surprising to find a variable thinning power for any one pigment depending upon the composition of the vehicle already present, as appeared in the cases of the zinc oxide and mixed pigments. It is difficult to draw conclusions regarding the consistency of the paints from the data, since the thickness of the wet films will vary widely although the dry films are all of equal thickness. Nevertheless, there is unmistakable evidence that the thinning power of turpentine not only varies with different pigments, but also varies for any one pigment with the composition of the mixture being thinned.

Causes of Spotting in White Lead Paints

It is generally believed that a paint resulting from the thinning or breaking up of a basic carbonate white lead paste should be allowed to stand for a day or two before being used. The probable reason for the origin of this belief was found when a white lead-oil-turpentine paint was used immediately after mixing, flowing the paint on a clean glass plate to form a smooth wet film. In the course of a few minutes small pits appeared on the surface of the film and gradually increased in depth and diameter. The phenomenon appeared over and over and could not be ascribed to any fault in the preparation of the surfaces painted. The same result was obtained no matter whether the paint was applied to glass, steel, or to a previously dried coat of paint.

Summarizing the results of many experiments, it appears that the spotting tendency:

(a) Is common to all mixtures of basic carbonate white lead and raw linseed oil.

(b) Does not appear when other pigments are substituted for the basic carbonate white lead.

(c) Does not appear when other oils are substituted for raw linseed oil.

(d) Is not due to too much stirring or to lack of stirring; presence or absence of liquid driers and volatile thinners; order of mixing; presence of free fatty acids, mineral acids, or water, although any or all of the foregoing factors may at times exert a modifying influence.

(e) May be explained upon the assumption of a reaction between the basic carbonate white lead and some unidentified portion of the oil.

(f) May be eliminated by boiling the oil in the presence of driers which may convert the troublesome component to an inactive form; by treating the raw oil with basic carbonate white lead during storage prior to its use; or by aging the paint to allow the reaction to reach completion before the paint is applied.

Two and a Half Billions is the total number of passengers carried by rail in local New York City traffic, in the year ending with last June, as reported by the State Transit Commission, an increase of 98½ millions over the preceding year; or from 2,491,909,178 to 2,590,313,728. These totals represent the business of the surface, subway and elevated lines. About 60 per cent was handled by the rapid transit routes—subway and elevated lines—while 40 per cent was carried by the surface lines. More than three-fourths of the increase appears in the reports of the surface lines, which handled 75,316,859 more paying passengers than in 1921. On the Manhattan elevated lines of the Interborough system, the loss was 25,776,235 as compared with 1921. The Sixth avenue elevated has suffered from the opening of the new Broadway subway, operated by the Brooklyn Rapid Transit Company.

Employee Representation on the Pennsylvania

Employees Have a Voice in the Management in Matters in Which They Are Directly Concerned

THE SHOPMEN'S STRIKE has tended to focus attention upon the efforts which have been made by the Pennsylvania System to bring about "a spirit of mutual understanding and cordial co-operation between management and employees." The road, because of the widespread interest in its methods and the many requests for information about them, has issued a statement telling of the origin, development and achievements of the plan.

The introduction to the statement contains these words:

"No illusions are entertained by the management that is has found a panacea for all the ills that afflict present day relationships between employers and employees. It is believed, however, that the employees and officers of the Pennsylvania System have adopted a policy and practice in their own dealings with each other, which, if lived up to by both in a spirit of sympathetic understanding, mutual co-operation and fair play, will materially benefit all who are connected with the railroad, and will be reflected in a higher standard and a larger measure of service to the public. The performance of the Pennsylvania System during the period of the shopmen's strike and the demonstration of loyalty on the part of its employees under most trying circumstances offer a practical and substantial foundation for that belief."

The article which follows is made up of liberal extracts from the statement. We have omitted, however, material concerning certain details relating to the extensions of the plan to other classes of employees than those engaged in train service; also the reproduction of notices informing the employees of the elections, typical ballots, and graphic charts showing the structure of the committees and the steps to be taken in handling controversial questions with the management. The appendix of the booklet contains also a typical set of by-laws jointly formulated by employees and management governing procedure under the plan of employee representation; it also contains the constitution of the Altoona Works Employes' Association.

Purpose and Origin

The policy and practice of the Pennsylvania System in its relations with employees may be summarized in one sentence: To give all employees an opportunity to have a voice in the management in all matters affecting their wages, working conditions and welfare, and in other matters of mutual concern affecting the welfare of the company and of the public which the company serves.

"What we want," said General Atterbury, early in the negotiations with the employees, "is committees of employees, whose orders come from the bottom, from the men at work on this railroad, and are not handed down from the top by some people we know nothing about. We shall be better off by far if we have our agreements and negotiations between ourselves—then we understand them." This policy is based on the belief that the interests of the employees, the company and the public can best be served by bringing about mutual confidence, sympathetic understanding and real co-operation between employees and management. It is essential to these conditions that the relationship between employees and management be direct, frank and friendly, without interference on the part of persons or organizations having interests to serve other than those of the railroad, its employees and the public.

It is recognized, of course, that an employee has a right

Shop Craft Representatives at White House Where They Appealed to President Harding in Behalf of Loyal Pennsylvania Employees

First row—left to right: P. M. Hughes, General Chairman, Electrical Workers; Wm. Donahue, General Chairman, Blacksmiths; T. H. Davis, General Chairman, Eastern Region; J. J. McBride, General Chairman, Machinists. Second row—left to right: E. C. Arnold, General Chairman, Sheet Metal Workers; H. H. Emberger, General Chairman, Boiler Makers; E. R. Snyder, General Chairman, Carmen.

to join or not to join any organization as he sees fit, but membership or non-membership in any organization does not concern the management in the practice of the policy on which the officers and the employees have mutually agreed. The primary requisite is that the employees and the management deal directly with each other; that spokesmen for the employees be employees themselves, chosen by the employees, speaking and acting for the employees, and not taking orders from or acting for persons or organizations outside the Pennsylvania System.

Such a basis is fundamentally sound. It is of paramount importance in the interest of the public, which requires adequate, efficient, economical and uninterrupted transportation service, by reason of the fact that the sympathetic strike, the closed shop and restriction of output are countenanced and practiced by certain organizations which during the period of federal control very largely extended their membership among railroad employees.

Prior to federal control the Pennsylvania had an enviable reputation of always treating its men fairly, and the esprit de corps among Pennsylvania men was one of the distinguishing characteristics of the railroad's service. For a period of many years prior to the Railroad Administration there was no serious strike or disagreement between the officers and the men. Every employee understood that he had the right to appeal to the general manager. Substantial justice was done to all, and the employees as a body were satisfied, and worked in close co-operation with the officers of the company.

The management had, many years ago, satisfied itself that the committees with which it dealt on behalf of engine and train service employees did actually represent Pennsylvania Railroad employees in this service. Furthermore, at the termination of federal control, their same committees continued practically intact, and nothing has since transpired to affect the relationship already established between them and the management.

On the other hand, although it had been understood that the status quo, as far as labor organizations were concerned prior to federal control, would be maintained during federal control, the fact is that organization of railroad employees into national and international unions was promoted under the Railroad Administration, and railroad officers were ordered to keep their hands off. The result was inevitable. At the end of federal control, the management found national and international organizations of the character already referred to, superimposed on our employees, regardless of their desires, and representatives of these organizations presuming to speak and act for our employees.

During the so-called "guarantee period" lasting six months after federal control, it was impossible to alter this situation. The Transportation Act, however, required employees and management to get together and adopt every reasonable means of settling amicably all controversial matters liable to interrupt transportation. It was the belief of the management that this was impossible under existing conditions, which constantly jeopardized amicable relations with its employees. The best interest of the public, as well as the company and its employees, themselves, it was felt, demanded closer relationship between employees and officers, and every endeavor should therefore be made to bring about co-operative effort in serving passengers and shippers.

In order to re-establish the harmonious relationships existing between employees and officers prior to federal control, the Pennsylvania System adopted a policy of giving employees a voice in the management and announced a plan of employee representation. Steps toward the development of the plan were taken soon after the return of the railroad to its owners. Informal discussions were held with representatives of various groups of employees looking to a more representative and more satisfactory means of disposing of controversial matters than had been in effect up to that time.

First Steps in Developing Plan

The first definite step was taken at a joint meeting of officers from all parts of the system and representatives of the employees in engine and train service—the engineers, firemen, conductors and brakemen. All the local divisional chairman representing these employees attended. The meeting was held in Philadelphia on December 21, 1920. This meeting was the forerunner of many similar meetings with these and other groups of employees, and it laid the foundations of the present plan. General Atterbury, who addressed the officers and employee representatives in joint session, sounded the keynote of the company's policy when he said: "The successful solution of the problems that are before you, if carried to a logical conclusion, means that not only will there never be a strike, but that it will never be necessary to take a strike vote on the Pennsylvania System. It should mean the setting up of proper machinery for the prompt consideration of changed working conditions and of grievances, and, finally, that failing to agree between yourselves on a settlement of any of these questions, there shall have been provided beforehand the machinery of a tribunal to which the question can be submitted for final decision."

Outline of Policy

Outlining the purposes of the plan that he proposed, General Atterbury said: "This occasion is unique. Never before, so far as I know, have the officers ever invited the representatives of the employees to a conference. Heretofore request has come from the employees, and then only when they had something to ask in the way of increased wages, or improved working conditions, or adjustment of grievances. As representatives of the employees, you are vitally interested in a pleased patronage and an aggressive, business-getting organization. To you it means *greater earnings, more regular employment,* and *earlier promotion.*

"We have heard a great deal the last few years of collective bargaining. One hardly knows what the theorist means by collective bargaining. But if by collective bargaining you mean the employees and the management sitting down to seriously discuss working conditions, and a schedule results which is mutually satisfactory, then we have had collective bargaining in force for at least 17 years.

"This meeting today is in continuance of that policy. Some 310 men are here representing approximately 51,000 men, or nearly 30 per cent of all of our employees. You are the men in the train service—the most responsible; the most highly organized; and, generally, the most highly paid. In all these 17 years years, although occasionally strikes have been threatened, never once has a strike been called. We have always been able to compose our difficulties. You represent the conservative in labor organizations. You neither practice nor advocate the closed shop, nor the sympathetic strike; nor can a strike of your organizations be called without its being properly submitted to your membership by ballot. You do not intentionally through your schedule limit production, as the combination of 'Day' and 'Mileage' is piece work, pure and simple.

"The railroad officers who are present represent the management of a property in which about two billion dollars is represented, approximately half of which is in bonds, and the other half in stocks. The bonds are largely owned by life insurance companies, savings banks, and other financial institutions, and in the stability of these bonds a very large majority of the people of the country are directly or indirectly interested, through their life insurance policies, or their deposits in the savings banks.

"The other half of this great investment—that is the stock

—is owned by some 140,000 stockholders, of whom about one-half are women. Bear in mind that the policy of the Pennsylvania management has never been to pay large returns to its stockholders. The aim has been to assure to stockholders a reasonable return, upon which they could depend. Furthermore, the Pennsylvania Railroad has no watered stock, and the records will show that over a period of nearly 75 years it has paid regular dividends to its stockholders averaging approximately six per cent.

Three-fold Duty of Management

"The duty of the management is three-fold. They have a direct duty to see that the capital already invested shall be given a fair return. Surely that duty is owed to those who have entrusted their money to our care. Further, if a fair return is not paid, new capital for improvements, extensions and betterments cannot be obtained. The management also have a duty to the public. If the railroad is granted reasonable and fair rates, the public, in return, is entitled to efficient and satisfactory service. Last, but not least, is the duty of the management to the employees—that is, good wages, good working conditions, and discipline fairly and impartially maintained. Kindness, courtesy and consideration are not incompatible with good discipline. Lax discipline is not kindness, for in your occupation lax discipline spells death, and disaster.

"The employees equally with the management have their responsibilities. Given fair wages and fair working conditions, the management has the right to expect and exact from the employees an honest day's work; prompt, willing and cheerful observance of orders; and economical use and care of the property entrusted to them. The management has the right to ask the same kindness, courtesy and consideration to the officers and to the public on the part of the employees which the employees have the right to expect from their officers.

"I have tried to lay down a simple platform of principles on which you, as officers and employees, can meet. I have given you jointly certain questions to solve. The spirit in which you approach these questions will determine the success with which they are settled. I have no doubt that there are many petty grievances on both sides. Forget them for the time being. Each put himself in the place of the other, and see if he cannot understand the other fellow's side."

The result of this meeting was the joint formulation of a plan and procedure whereby all questions of a controversial character arising between the employees in engine and train service and officers of the company would be handled in an amicable way, and settled if possible without intervention by outside parties. A "memorandum of understanding" was formulated and signed covering the method to be followed in the adjustment of all disputed matters. Because this memorandum, in its purpose and effect as well as in the spirit in which it was negotiated, became the basis of similar negotiations and understandings affecting employees in other branches of the service, its provisions are given somewhat in detail. The preamble reads: "The outline of the method in which controversial matters are to be handled as given below is for the purpose of expeditious adjustment of matters presented, to the end that there may be a satisfied spirit among the officers and employees and it is important, therefore, that so far as is possible, decisions will be reached at the time of meeting, such decisions to be confirmed in writing as promptly thereafter as is possible. This plan for handling schedule and other matters can be successful only by full and conscientious co-operation on the part of both the management and employees, and it is expected that when questions are presented for disposition that the spirit of absolute fairness will be the factor in adjusting these matters."

The memorandum is a complete exposition of the procedure to be taken in every step of the way from the division superintendent and the local chairman representing the employees in his territory on up to the Joint Reviewing Committee which is the final arbiter in the disposition of any matter referred to it.

Shop Crafts' Southwestern Regional Reviewing Committee

Back row—left to right: Arthur Fischman, Secretary; L. S. Osmer; W. C. Higginbottom; W. C. A. Henry; F. S. Owen; J. L. Deem, G. B. Fravel; Taber Hamilton; J. F. McEvoy; C. R. Perin; J. E. Mechling. Front row seated—left to right: R. K. Rochester; J. E. Cavey, Vice Chairman; E. B. Dithridge, Chairman; H. W. Daringer.

Essential Features of Method Adopted

In general, the essential features of the method adopted are these:

First Step.—Monthly meetings between each division superintendent and the local chairmen representing the engine and train service employees, at which all controversial matters arising on the division may be taken up with five days' advance notice by either party of the subject to be discussed.

In questions relating to schedule matters, when there is agreement between the superintendent and local chairmen, it is put into effect at once and the interpretation agreed upon is referred to the Joint Reviewing Committee for review. When there is a disagreement on the division, and no interpretation of the question has been made by the Joint Reviewing Committee, the matter is referred to the Joint Reviewing Committee for decision.

In each case, however, copy of the interpretation agreed

upon or the joint statement of facts, where there is disagreement, is forwarded to the general superintendent and general manager for their information.

In discipline and other matters when appeal is taken from the decision of the division superintendent, the question goes next to the general superintendent in charge of a general division (which includes several divisions).

Second Step.—Monthly meetings between each general superintendent and the general chairmen representing the engine and train service employees, at which controversial matters on which the local chairmen and division superintendent have been unable to agree are discussed with five days' advance notice by either party of the subject to be discussed. In questions relating to schedule matters, the same procedure is followed as with the division superintendent. In other than schedule matters, in case of disagreement, the question is referred next to the general manager in charge of the region.

Third Step.—Monthly meetings between each general manager and the general chairmen representing the engine and train service employees, at which controversial matters on which there has been a disagreement with the general superintendents are discussed with five days' advance notice by either party. In questions relating to schedule matters the same procedure is followed as with the division and general superintendents. In other than schedule matters, where there is disagreement, the question is referred to the Joint Reviewing Committee for decision.

Fourth Step.—Monthly meetings of the Joint Reviewing Committee, at which all matters in which there has been a disagreement and an appeal taken from the division or general superintendent or general manager, are discussed. The whole schedule of monthly meetings is so arranged that the general chairmen are enabled to cover the meetings with general superintendents and general managers throughout the system and carry matters through to the Joint Reviewing Committee without delay.

Keystone of Plan Is Joint Committee

The Joint Reviewing Committee for the engine and train service employees and similar bodies for employees in other classes of the service, constitute the keystone of the arch of satisfactory industrial relations on the Pennsylvania System. It is the highest authority on the railroad in the settlement of matters in dispute between employees and management. Its decisions are final and it is the final arbiter in the determination as to how any matters on which it is unable to reach a decision shall be decided. Executive officers of the company cannot interfere with its prerogatives.

The text of the "Memorandum of Understanding" in this particular is therefore quoted verbatim:

MAKE-UP OF JOINT REVIEWING COMMITTEE

20. The Joint Reviewing Committee shall consist, for the management, of two representatives from each region of the system; for the employees, the general chairmen of the engine and train service employees, which, as at present constituted, consists of nine members.

METHOD TO BE FOLLOWED BY JOINT REVIEWING COMMITTEE

21. In all matters other than discipline the entire committee will sit.
22. In cases of discipline the representatives of the management in the region where the case arises, together with the representatives of the employee involved in that region where the case arises will not sit on the committee but will present the case to the remaining members of the committee, who will hear and determine the matter at issue.
23. The management and the employees will have equal voting power and not less than a two-thirds vote will be necessary to reach a decision.
24. In case a decision is not reached by the Joint Reviewing Committee not later than subsequent monthly meeting at which the case was first brought up, further procedure will be had as determined upon at the time of such disagreement.
25. Meeting place of the Joint Reviewing Committee will be fixed from time to time by the committee.

The chairmanship of the Joint Reviewing Committee alternates every six months between the management representatives and the employes.

New Schedule of Rules Negotiated

One of the first tasks undertaken by the representatives of these employees and the representatives of the management was the formulation of a new schedule of working conditions. Prior to the formation of the Joint Reviewing Committee the men in engine and train service had been working under six different schedules, one for the former Lines East and one for the former Lines West, and one each for the Vandalia, Grand Rapids and Indiana Railroads, C. L. & N., and N. Y. P. & N. Due to the fact that prior to the end of federal control the Pennsylvania System had not been operated as a unit, there were many points of difference between the schedules and many disputed questions involved in each of the schedules themselves.

When the Pennsylvania Railroad resumed the management of its property on March 1, 1920, however, the system was reorganized as a unit with four operating regions and Altoona Works. When employees in engine and train service requested that a system schedule be established which would harmonize the difference between the existing schedules and settle points of controversy within the schedules themselves, the members of the Joint Reviewing Committee assumed the task and constituted themselves a schedule committee to work out the new arrangement.

In addition to this work, which was under negotiation for several months, the members of the Joint Reviewing Committee held their regular monthly meetings at which all other questions arising between the management and the employees in this service were taken up and decided to the satisfaction of all concerned. The Joint Reviewing Committee has since acted upon any questions arising in the application of the new schedule.

Extension of Plan to Other Classes of Employees

Obviously the working out of the plan already adopted by the employees in engine and train service for local self-government had been watched with considerable interest by other groups of employees and its practical workability was beginning to be demonstrated. To an appreciable degree, therefore, the proposal to extend this policy to other classes of employees met with at least an interested response.

Owing to conditions largely brought about under the Railroad Administration there was a great deal of skepticism as to the sincerity of the management, but it was felt by the more constructive leaders of the employees that the experiment might be worth trying. On the part of the officers the utmost frankness was observed and the employees' spokesmen were invited to participate and assist in working out the details of the proposed election.

When the Labor Board issued its Decision No. 119, respecting the negotiation of new schedules of regulations, and the company announced its policy of instituting a plan of employee representation, the employees generally were in a receptive mood to consider the actual details and to participate in making it effective. The then spokesmen of the signalmen and maintenance of way men actually participated in the preparation of the election machinery.

Accordingly arrangements were made to call into conference with the officers the general chairman and committee of the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers and later on the general chairman and committee of the Brotherhood of Railway Signalmen of American.

It was pointed out to these men and their committees some of the undoubted good that would result both to the employees and the management if jointly a plan could be devised for them which would provide home rule, popular elections of employee representatives, participated in by all employees coming within their respective groups, a voice in the management in determining their wages and working condi-

tions, and as part of the necessary machinery, a tribunal consisting of an equal number of representatives of the employees and the management, who would sit as a high court and decide all controversial questions properly brought before them.

A complete election procedure was worked out and fully explained to the employees in notices posted on the bulletin boards. The ballots themselves also contained a complete and definite explanation of the machinery provided for them to exercise their right of franchise in the choice of representatives to deal with the management on behalf of the employees in the various classes.

Steps were also taken to meet spokesmen for the other classes of employees with a view to explaining the plan to them in detail. These groups included: shop crafts; telegraphers; clerks; miscellaneous forces (office, station, warehouse, storehouse and elevator forces, and engine and train crew callers, excluding the strictly clerical and supervisory forces); stationery engineers (steam), and firemen and oilers; marine department employees; dining car and restaurant service employees and the employees in the various administrative departments of the general offices.

Essential Features of Election Plan

The essential features of the election procedure were these: All employees were given an opportunity to elect employee representatives by secret ballot; all employees in the respective classes were eligible to vote; no candidates were named or suggested by the management or printed on the ballots; any employee, whether union or non-union member, was eligible for election; employees wrote on the ballot the names of their choice; the ballots, in sealed envelopes, were opened and counted in the presence of representatives of the employees and the management; employees receiving the largest number of votes were recognized by the management as empowered to speak and act for the employees participating or entitled to participate in the election.

How Secrecy of Ballot Was Insured

The ballot itself, contained in a sealed envelope, was enclosed in another sealed envelope by the voter. On the outside of the latter envelope appeared the voter's name, occupation, location and division for the sole purpose of checking the names of the voters against the payrolls to see that only employees had voted. These outer envelopes, however, were destroyed in the presence of representatives of the employees and the management before the sealed envelopes containing the ballots themselves were opened. This procedure insured absolute secrecy of a man's vote.

The ballots themselves were opened and counted in the presence of and by representatives of the men and the management. There was absolutely no way in which the name of a man voting could be identified with his ballot.

No better evidence of fairness and impartiality upon the part of the company could be offered than the fact that some classes of employees elected all union men to represent them, and the management is now dealing with these elected representatives.

In the case of the signalmen, maintenance of way employees and telegraphers, solid union committees were elected. The employees who were members of the union received the highest number of votes and the management recognized them and immediately entered into negotiation with them with a view to formulating rules covering working conditions which would be mutually satisfactory. In the case of some of the other classes, some union and some non-union men were elected and the same procedure was adopted.

The first business before these elected representatives was of course the question of new schedules of working conditions and the employee representatives and representatives of the management immediately took this matter in hand. When it had been satisfactorily concluded, however, request was made by the employees that permanent machinery, similar to the Joint Reviewing Committee for engine and train service employees be jointly established for other groups. In general, therefore, the plan of employee representation ultimately worked out for all classes of employees was based largely upon the memorandum of understanding already entered into by the management and the general chairmen of the engineers, firemen, hostlers, conductors, trainmen and switchtenders.

Regional Joint Committee of Clerical Employees, Eastern Region

Left to right—H. M. Carson, General Superintendent, Central Pennsylvania Division; J. R. Rudolph, General Chairman, Philadelphia Terminal Division; H. E. Enochs, Superintendent, Wage Bureau; R. V. Massey, Assistant General Manager; M. T. Miller, Regional Chairman; J. A. McLaughlin, General Chairman, Southern Division; F. W. Smith, Jr., Special Agent, Eastern Pennsylvania Division; E. S. Werntz, Secretary; Oscar Howe, General Chairman, Eastern Pennsylvania Division; A. B. Clark, Superintendent, Trenton Division; F. J. Garren, General Chairman, New Jersey Division; F. W. B. Humes, Superintendent, Stations and Transfers; E. A. Kidney, General Chairman, General Superintendents' Departments.

Plan of Procedure for Handling Disputes

That is, the plan included:

1. Local committees for the division and general divisions. Regional and system committees for the handling of matters appealed from the divisions and general divisions.

2. Joint committees, similar to the Joint Reviewing Committee already described, composed of equal representation of management and employees, all members having equal voting power with two-thirds vote necessary to decide any issue.

3. By-laws governing procedure of these committees, schedules of meetings with division, general division superin-

tendents and general managers and future election machinery for the election of successive employee representatives at regular periods.

Naturally there are variations from this general plan to meet special conditions such as exist at Altoona Works, but the policy and practice throughout are the same in principle.

Controversy With Labor Board

Of all the groups of employees, System Federation No. 90, Railway Employees Department, American Federation of Labor, and a minority of the clerks, members of the clerks' union, objected to any plan of voting by the employees which did not place the name of their organizations on the ballot as a candidate. System Federation No. 90 was largely imposed upon the employees in the shop crafts during the period of federal control and the management was not satisfied that it actually represented the wishes of the majority of the shop employees on this railroad.

The officers of this organization insisted that they had the right to represent Pennsylvania employees and in a conference similar to the meetings with other groups when the details of the plan were being worked out, they declined to participate in the election machinery which had been agreed upon with the spokesmen for the other groups unless the name of their organization was placed on the ballot. They maintained that they as an organization be recognized as representing all the shop craft employees.

Nevertheless the elections were held. Officers of System Federation No. 90, however, persuaded employees not to vote in the elections and many of the shopmen refused or failed to exercise this right. As a matter of fact, if they had so desired, and as was clearly explained to them, the union officers who were employees could have nominated themselves as candidates, just as the union officers in the signal, maintenance of way and telegraph departments did, and if elected would have been so recognized by the management. Furthermore there was no objection to a voter's placing organization initials or symbols after the name of the candidate for whom he voted. In the case of every one of the signal committeemen elected, the initials B. R. S. of A. appeared after the candidate's name on the ballots voted by signal department employees.

In the case of the shop crafts, employee representatives were elected by those employees who did vote and the management recognized them and negotiated new schedules of working conditions with them. These schedules have been in effect since and have worked with mutual satisfaction to the great majority of the shop employees and of the management.

The United States Railroad Labor Board, without, as it is believed, any authority under the Transportation Act, declared said elections illegal and the contracts entered into between the management and the elected employees representatives null and void and ordered a new election in the shop crafts. (Decision No. 218.)

Not only that but the board declared that the organization itself must have a place on the ballot and must be recognized as entitled, if selected by the majority of the employees, to represent them, that other than employees could represent Pennsylvania employees and that men who had ceased to be employees were eligible to vote.

The management stood by the elections already held and when the Labor Board was about to publish an opinion that the company had violated its decision, the company adopted the only method open to it to test the power of the Labor Board to make the order which it had made and instituted a proceeding in the United States Courts to restrain the board from publishing such an opinion. The United States District Court upheld the Pennsylvania System and granted an injunction. The Labor Board appealed and the Circuit Court of Appeals reversed the District Court and the Pennsylvania has taken the case to the United States Supreme Court.

The Pennsylvania Railroad Company raised two main points:

1. That the order of the Labor Board in this case was beyond its authority under the Transportation Act; that the company therefore had not violated any lawful decision of the board and that the board should be restrained from publishing an opinion to that effect.

2. That if the Labor Board did have authority for its order, then the sections of the Transportation Act giving it such power were unconstitutional.

Summary of Company's Position in Controversy With Labor Board

The railroad position throughout the course of the argument before the Labor Board and before the court may be summarized as follows:

1. The company has not denied and does not now deny the jurisdiction of the Labor Board to hear and decide such disputes as fall within the purview of Title II of the Transportation Act.

2. The company does deny the right of the Labor Board to invade the domain of management and insists that in declaring said election illegal and said contracts null and void, and in ordering that a new election be held as it did in its Decision No. 218, the board exceeded its powers and without warrant of law exercised the functions of an administrative or regulatory body, and asserted jurisdiction over matters solely referable to the functions of railway management.

3. In its relations with its employees, the company seeks one object and one alone namely, the right to deal directly with its own employees without interference by those having interests to serve other than the interest of the employees, the railroad and the public. To that end it has offered classes of employees a voice in matters affecting their welfare through employee representatives of their own selection, whether union or non-union men.

4. Sixty-six and one-half per cent of the employees who are interested in and affected by rules covering working conditions have by vote or otherwise expressed a desire to negotiate rules and working conditions through employee representatives, and contracts have been entered into between the management and representatives of approximately 150,000 employees.

5. Representatives of the various classes of employees with whom contracts have been made have expressed their satisfaction not only with the manner in which representatives were elected, but also with the rules and working conditions agreed upon.

6. If the company complied with the Labor Board's decision No. 218, it would be obliged to repudiate these contracts to the great and irreparable injury of the company and its employees.

How the Plan Has Worked Thus Far

It would seem that there could scarcely be a more severe test of the Pennsylvania plan of employee representation than that afforded by the national strike of railroad shopmen which began on July 1, 1922. Not only has it afforded a successful demonstration of the co-operative policy adopted by the company and its employees in general, but also it has furnished practical proof that System Federation No. 90 does not actually represent the majority of the shop craft employees on the Pennsylvania System.

The strike vote on which the shop craft employees on the Pennsylvania System were called upon to strike was taken when the company refused to hold a new election as ordered

by the Labor Board in 1921. The company was not a party to the issues which precipitated the general strike. The issues on which the strike was called did not apply to this railroad. Wages had been fixed by mutual agreement, rules had likewise been determined and had been in effect for almost a year; and no outside contract work of the kind complained of by the strike leaders had been let by this railroad.

Bearing in mind that System Federation No. 90 had claimed the right to represent the shop crafts and had been sustained by the Labor Board to the extent that a new election was ordered, the strike call on the Pennsylvania really amounted to a protest against the Pennsylvania plan of employee representation.

Employees Repudiate Fancied Grievances

Certainly if the majority of the shop crafts were dissatisfied either with their wages and working conditions or with the methods of election followed by the company, or the procedure adopted for the settlement of matters in dispute, no more propitious occasion for indicating such dissatisfaction could be presented than a strike by shopmen all over the country.

But what happened was this: Less than 30 per cent of the Pennsylvania shopman left the service when the strike was called. Within two months after the strike started the shop forces of the system had been restored to more than 95 per cent of the normal working force. The great majority of the employees who remained loyal were working under regulations that had been agreed upon between the management and the employee representatives elected the year before—the election which the Labor Board had declared illegal. They were working under wages agreed upon between the management and the same employee representatives.

Practical Demonstration of Success of Plan

It would be difficult to imagine stronger proof of the fact that the great majority of even the shop craft employees are satisfied with the Pennsylvania plan.

Ever since the plan has been in effect, however, it has furnished practical demonstrations of its workability and the confidence of the employees. A study of the disposition of grievances and controversial questions arising between employees and the management in the first six months of this year affords interesting evidence as to how the Pennsylvania System plan of employee representation is actually working.

This is the second year in which it has been in effect.

Disposition of Grievances and Controversial Questions
(First Six Months of 1922)

MONTH	No. of Cases Taken Up	Adjusted or Compromised in Favor of Employes	Percent	Withdrawn No Merit, etc.	Percent	Decision Appealed	Percent	Received By Reviewing Committees	Decision in Favor of Management	Percent	Decision in Favor of Employes	Percent	Withdrawn No Merit, etc.	Percent
January	896	415	46.3	256	28.6	225	22.9	18	11	61.1	6	33.3	1	5.6
February	987	441	47.1	279	29.8	217	23.1	10	8	80.	1	10.	1	10.
March	808	412	47.5	221	25.8	232	26.7	6	5	83.3	1	16.7	—	—
April	734	341	46.5	209	28.5	184	25.0	—	—	—	—	—	—	—
May	996	545	53.7	247	23.8	221	22.5	5	1	20.0	3	60.0	1	20.0
June	771	389	50.4	244	26.5	178	23.1	59	24	40.7	9	15.3	26	44.0
Total	5,201	2,553	49.1	1,456	27.1	1,239	23.8	98	49	50.0	20	20.4	29	29.6

Note: This statement is designed to show the disposition made of grievance cases and controversial questions by the various officers with whom such cases were taken up, and represents the procedure followed in handling these matters from origin to final disposition.

It does not, however, show the final disposition of all cases originating or taken up with higher officers, for the reason that in cases where the decision of an officer below the superintendent or of a superintendent is appealed successively to the general superintendent, the general manager and the reviewing committees, such cases would not ordinarily be finally disposed of during the period of one month.

The number of cases shown as having been taken up with and disposed of by higher officers and the reviewing committees may or may not be included in the number of cases reported as having been taken up with and disposed of by the officer next lower in rank, depending upon whether the case was handled during the month by the officer next lower in rank.

Voting Booths at Planing Mill for Shop Employees' Election at Indianapolis, Ind.

The analysis of the records of the first half of this year covers not only engineers, firemen, conductors and trainmen, but also shop craft employees, signal department, maintenance of way, clerical employees, telegraphers, marine employees and miscellaneous forces. It includes such questions as seniority, discipline, time allowances and other matters that arise in dispute in the ordinary operation of the railroad and in its relations with employees.

The accompanying table gives the disposition of these matters and shows the number of cases taken up with officers below superintendents, with superintendents, general superintendents and general managers; the number of cases adjusted or compromised in favor of the employees with these various officers; the number of cases withdrawn as having no merit, etc.; the number of cases in which decisions were appealed to the next higher officers; and the number of cases received and disposed of by the reviewing committees.

The reviewing committees in the case of each class of employees concerned are composed of an equal number of representatives of the employees and the management. All members of these committees have equal voting power, the employee members being selected by the employees themselves. Two-thirds vote of the committee is necessary to decide any question submitted to the committee and the chairmanship alternates between an employee member and a management member.

Summary of Cases Handled Under Plan of Employee Representation

The total number of cases taken up with individual officers, from those below the grade of superintendent on up through the general managers, was 5,201.

Of this number, 2,553, or a little more than 49 per cent of the total number of cases, were adjusted or compromised in favor of the employees in conference between the employee representatives and the respective officers, without appeal and therefore without the necessity of being referred to the reviewing committees.

Appeals from the decisions reached in conference between the officers and employee representatives were taken in 1,239 cases, or about 24 per cent of the cases handled. In 1,409 cases, or about 27 per cent of the total, the matter was withdrawn as having no merit or for other reasons. In less than two per cent of the cases taken up on behalf of the employees was it necessary to take an appeal to the reviewing committees, a mutually satisfactory settlement having been reached with the local officials or next higher authorities in all other cases.

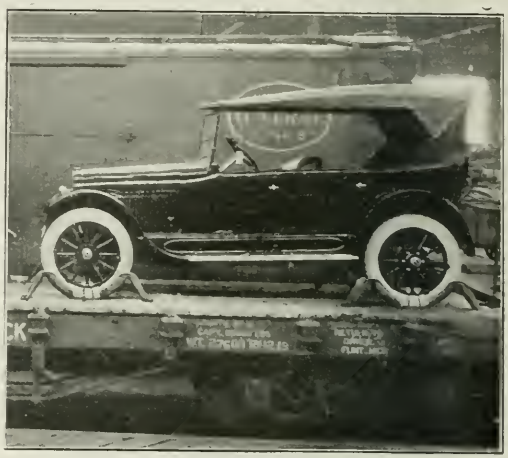
The actual number of cases received by the reviewing committees in the first six months of the year and disposed of, according to records covering this period, was 98. Of this number, 49 were decided in favor of the management, 20 in favor of the employees, and 29 were withdrawn after reaching the committees.

The record of cases handled to conclusion in conferences between the various officers and the employee representatives down the line, is regarded by the management as a tribute to both the employees and the officers. It shows conclusively a manifest spirit of fair play and a willingness on the part of employees and officers to co-operate in reaching an amicable settlement of matters in dispute.

THE NEW JERSEY ASSOCIATION, said to represent 4,000 New Jersey students attending New York University, has petitioned the Interstate Commerce Commission for a lower railroad fare for New Jersey students attending school in New York. The petition says that there are 10,000 such students—men and women, and that the preferential rate would save them $500,000 a year.

Gier's Blocks for Fastening Automobiles on Cars

A NUMBER OF manufacturers of automobiles have reduced loading and unloading costs, and at the same time have made their cars even more secure from possible damage while in transit by using Gier blocks, which are returned by the consignee and used over again. In a severe test made in the Buick Company's yards, the draft timber and the whole end of one box car were broken by the terrific impact, but the Gier blocks held the automobiles securely. These blocks are 10½ in. high and stamped to fit the tread



Gier's Automobile Loading Blocks

of the wheel, from No. 10 steel. They weigh 10 lb. each and can be nested and returned to the factory in bundles.

One shipper reports that the blocks average three trips in two months at a return cost of 40 cents a set of eight. Each is stamped with the owner's name. It is estimated that the blocks earn their cost in five trips. They cause the minimum damage to freight car floors, as an easily removable double-head nail is used.

P & A Photo

C. & N. W. Carmen Again at Work

Sir Henry Thornton to Head Canadian National

American Trained General Manager of English Road Chosen for Important and Difficult Post

By J. L. Payne

All suspense with respect to the appointment of a new board to take charge of the Canadian National Railways has been ended by positive action on the part of the government. No one may say that impulsiveness had been shown. It was in 1918 that the system was erected, following the collapse of the Canadian Northern and Grand Trunk Pacific, and early in the following year legislation was passed providing for a board of directors. Nothing was done in 1919, however, nor in 1920 and 1921.

Matters were about at their worst when the King government came into power in December last. Popular alarm was then acute. There was a general and urgent demand, on the part of press and people, that steps should be taken to put in a strong, capable and courageous board. The taking over of the Grand Trunk in 1921, adding nearly 5,000 miles to the 17,000 odd which had composed the national group, made immediate action imperative. But it was not until 10 months later that this highly necessary step was taken. In this, depending on the angle of view, some will see the looseness and irresponsibility which usually attach to public ownership, while others will identify proper prudence and deliberation in the discharge of an important duty. It is sufficient to say that, in the meantime, growing impatience had been shown on the part of the press of the country, voicing public sentiment.

(*Photo from Co-operative Press*)

Sir Henry W. Thornton

Let no one, however, from whatever point of view the matter may be scanned, fancy that the government was confronted by a light task. Without the slightest prejudice, let it be said that the results of public ownership had positively appalled the Canadian people. As has been said, the operating deficits jumped by many millions annually. Worse still, advances from the public treasury, to cover losses and put the new system into proper working shape, went up by hundreds of millions. Reference to that aspect will be made further along. There was genuine and universal fear that if these losses were not stopped the country would find its credit impaired—would, indeed, be confronted by staggering conditions.

There was unquestionably one cause in particular for this long delay. A man of outstanding capacity was required to head the new board—a man whose record and qualifications would command public confidence—and it was found that such a man was hard to get. The United States was combed to find him. The question of compensation was not an impediment; for the government could fix the salary of the man who measured up to the specifications at any amount. There was no limit. One after another men who had earned a name in the American railway world were called to Ottawa in this grand quest. Those who would have been acceptable backed away when they looked at the task before them and took cognizance of the conditions under which they would be expected to work. Some wanted a freer hand than could be assured. Others who would have accepted the post were found lacking in qualifications regarded as vital. Thus the months went by. The right man could not be found, or when found, shrank from the great responsibilities involved.

At last a choice has been made, and a name hitherto unmentioned in the canvass has been introduced to the Canadian people—the name of Sir Henry Worth Thornton. He is an American by way of England. The new general manager and chairman of the board was born at Logansport, Ind., in November, 1871. He is therefore 51 years of age. He was graduated from the University of Pennsylvania in 1894 as a civil engineer, with the degree of bachelor of science. His first job was as draftsman in the offices of the Pennsylvania Railroad, where he seems to have gained recognition; for, after rising from one position to another in the engineering department, he was in 1911 made general superintendent of the Long Island Railroad, a subsidiary of the road with which he had been engaged for 17 years. Here he found scope for executive judgment, chiefly in connection with the terminal problems of the Pennsylvania in New York City and the organization of the electrical train service of the Long Island Railroad. At one time he was chosen by L. F. Loree, then general manager of the Pennsylvania, to develop a students' course in transportation, because of his experience in nearly all departments of the Pennsylvania System, and he appears to have made good.

While it does not appropriately form any part of this hasty sketch of facts and events, it may be worth while, in passing, to observe what happened in the rise and progress of this distinguished railroader, and why. He had a sound grounding. He started at the bottom of the ladder. He no doubt had great natural gifts; for in this rugged and practical world a pint measure can never be made to hold a quart. He had the capacity for big things; but that would not have carried him to high place if he had not got into his proper orbit. He found the orbit in the Pennsylvania system and quite obviously made the best of it That gives us a clue to the character of the man. His was not a pyrotechnic advancement. He came to his full stature by successive steps, appropriating knowledge as his experience

widened. The point which needs to be emphasized is that he was qualified for a large orbit and he found it.

Achievements in England

In April, 1914, he was offered and accepted the post of general manager of the Great Eastern Railway in England. He got it on his merits. A few months later the world war broke out, and strenuous times came to the heads of the large British railways. The Great Eastern, one of the most important of the English roads, with strong steamship connections, became one of the leading lines of military communication. Mr. Thornton was made a member of the executive committee of general managers which, under the control of government, administered all the railways of the United Kingdom. In 1916 he was appointed director of inland water communication, with functions extending to France, Egypt and Mesopotamia. Early in 1917 he was sent to Paris as assistant director general of railways, and became further identified with military operations. From the rank of colonel he passed up to be brigadier general. Finally, he had charge of army transportation on the continent with the rank of major general.

While all this was happening, Henry Thornton remained an American citizen. Having regard to the more or less rigid rules of English life in such matters, this would seem anomalous. It was. But great events were transpiring and big men were needed to cope with them. His nationality was subordinate to the service he was prepared to give. That alone counted. It was not until March, 1919, that he was naturalized as a British subject. In May of that year he was, for high services to the state, gazetted Knight Commander of the Order of the British Empire, and became Sir Henry Thorton. He is also Commander of the Legion of Honor of France, an officer of the Order of Leopold of the Belgians, and holder of the Distinguished Service Medal conferred by the American government.

New Task One of Greatest in Railway World

These brilliant titles and honors grow rather dim when brought into contrast with the glaring fact that Sir Henry Thornton has now been chosen for one of the most gigantic tasks ever assigned to a man in the history of transportation by rail. Canada's venture into public ownership has created a problem graver than that which has confronted any country. It is no mere figure of speech, or play on words, to say that if he solves it he will save a nation. It is a solemn truth, although it is only clearly recognized by those who have studied the facts and grasped their real significance. He has to turn an annual loss of more than $100,000,000 into at least a balancing of accounts. His pathway is at this moment beset by obstacles. One of them is fundamental and relates to the act under which he must operate. Let us look at its main features—for Americans will be deeply interested in what may happen with respect to Canada's national railways as Sir Henry proceeds with his administration.

The governor in council may nominate such persons as may be deemed expedient, not less than five, nor more than fifteen, to be directors of the company hereby incorporated, and upon such nomination being made the persons so nominated, and their successors, and such other persons as may from time to time be nominated by the governor in council as directors, shall be and are hereby incorporated as a Company, under the name of "Canadian National Railway Company," hereinafter called "the Company." No stock ownership shall be necessary to qualify a director.

The directors shall hold office from one annual meeting to another or until their successors are appointed, unless removed by the governor in council for cause. Upon any vacancy occurring the governor in council may fill the vacancy by the appointment of a successor. The continuance of a vacancy or vacancies shall not impair the powers of the board of directors. The annual meeting shall be held upon the second Thursday in April in each year, or on such other date as the directors may from time to time determine

It will be seen that these clauses place absolute power as respects the board in the hands of the government, and government control of course means political control. "Unless removed by the governor in council for cause" has enormous significance. It is clear that at any time the official life of a director may be brought to an end. It is not for a moment suggested that this power of life or death over every member of the board would be used arbitrarily or contrary to public interests. Popular judgment, always active and articulate in Canada, would not permit the assertion of reckless political control; but we must all see that the power is there, and, while it is there, partisan expediency may compel—as it has so often done in the past—action which could not be defended on higher grounds.

Government Earnestly Striving to Solve Railway Problem

The King government inherited this railway problem, and, the writer believes, is sincerely trying to solve it. The announcement of the personnel of the new board, with such a commanding personality as Sir Henry Thornton at its head, has been received by the Canadian people with unqualified approval. The general judgment is that a strong board has been chosen. There is a universal disposition to give the management every possible latitude in the tremendous task which it has assumed; but no one who is familiar with the main features of that task would feel like minimizing it. One of these features is the great length of parallel mileage, both in the East and the West, but particularly in the West. This grew out of two political roads being built through the same territory at the same time, which must always be regarded as a folly that could not have been carried out under other conditions.

Everything would now seem to depend on whether or not Sir Henry Thornton and his associates are given a free hand. While the power to control is still vested in the government under the Act of 1919, there is nothing whatever to prevent the substitution of another measure giving as complete independence to the new board as the Railway Commission of Australia and the Railway Commission of Canada enjoy. Political considerations alone would interpose an obstacle. Public sentiment would probably approve; but it happens that the Progressives, chiefly from the Western provinces, hold the balance of power in Parliament, and they are strongly in favor of public ownership. It is in their territory, moreover, that the parallel mileage, to which allusion has just been made, is situated. The question of vested rights comes in on the part of small communities located along this double right of way, and to that sort of feeling politicians are invariably sensitive. These people would resist being changed from their present main line status to branch line rank. They like to see the express trains go by, notwithstanding the fact that they contribute very little traffic to them, which is another way of saying that the human factor here holds a large place.

Various Interests—Including Organized Labor—Represented on Board

Sir Henry Thornton will have around him a group of admittedly strong men. They have apparently been chosen on their merits, and for that reason are acceptable to the Canadian people—or appear to be at this moment. They are:

John H. Sinclair, of New Glasgow, Nova Scotia. Mr. Sinclair was for many years a member of Parliament, and is the only man on the new board who could be suspected of holding place for political reasons; but he is really a good choice. He is conservative, cautious and competent. He brings no railway experience to his task; but his strong and slow-moving judgment will be valuable. His integrity is unimpeachable.

Richard P. Gough, of Montreal. Mr. Gough is a man

of large business experience, and in that regard is neither stronger nor weaker than scores of others who might have been chosen. He is what the country will regard as a fair representative of Canada's men of commerce.

James Stewart, of Winnipeg. He is probably the choice of the Progressives. He was for some time the head of the Canada Wheat Board, and is at the present time general manager of a large milling company. He is held in universal esteem as a man of capacity.

Ernest R. Decary, of Montreal. He was for some time head of the Montreal Civic Commission, and made good. In a large sense he might be regarded as the representative of French Canadian interests on the board.

Frederick G. Dawson, of Prince Rupert, British Columbia. Mr. Dawson is spoken of very highly by those who know him; but he starts as a stranger to the people of central and eastern Canada. He is a wholesale merchant.

Tom Moore, nominally of Ottawa. Mr. Moore is head of the labor unions in Canada, an Englishman by birth, who has made a very favorable impression for his moderation and breadth of view. He will not be a cipher at the meetings of the board; but he must be clearly identified as the special representative of labor.

Graham A. Bell, C. M. G., of Ottawa. From a clerkship Mr. Bell has risen in the Department of Railways and Canals to be deputy minister. Of all the members of the board, Mr. Bell is the only man, save the general manager and Mr. Ruel, who has had any railway experience whatever. He was never connected with any of the operating departments, but he is a master of all the financial details relating to the Canadian National system. He was very closely associated with the old Canadian Northern management, and he bears an untarnished name. For the present he will continue also to serve as deputy minister, although it is generally believed that it would be in the public interest if he gave his whole time to the railway proposition.

Gerard G. Ruel, of Toronto. Mr. Ruel, as a lawyer, has had long experience in the capacity of railway solicitor, chiefly for the old Canadian Northern; but his work heretofore has been somewhat in the background. For that reason his being given a place on the new board has occasioned some surprise. He will, however, be a useful member in matters of detail and law.

That then, is the composition of the board, for which the country has waited so long with rising impatience and discouragement. Before it lies a task of stupendous proportions. At the bottom of the broad problem, as has been said, lies the fact of a very large surplus mileage, consisting of trackage running almost side by side over thousands of miles of territory. Can political interests stand the strain of dealing with that situation in a businesslike spirit? That is the supreme question which the course of events alone will answer.

Road's Financial Condition Has Improved, But Is Still Grave

It would be quite impossible for any uninformed reader to gage the real magnitude of the problem awaiting solution in Canada. During the current year drooping hopes have been revived by the monthly announcements of operating results on the government lines. If all continues to go well until the end of the current year, the deficit on operating account may be cut down to about $10,000,000; but, while some of that betterment is on a bookkeeping basis, the fixed charges have grown at such a rate as to practically absorb all the gain on operating account. These fixed charges present one of the most difficult problems with which Sir Henry will have to deal. They were large when the Canadian Northern and Grand Trunk Pacific were taken over. They were increased when the Grand Trunk was absorbed into the public railway system. The swelling has come chiefly, however, from the fact that since public ownership was set up hundreds of millions have been taken out of the Dominion treasury to meet the needs of the system. The actual deficit as revealed by standard railway accounting amounts now to about $100,000,000 per annum, quite apart from operating loss.

The advances made from the public treasury totaled $112,632,154 for the fiscal year ended March 31 last, without taking any account whatever of interest and other charges attaching to five thousand miles of line being operated at a loss, but which are taken care of under the head of the public debt and are therefore not identifiable.

Advances from Public Treasury

The facts in that regard are so enlightening that it is distinctly worth while to give them in detail. They are as follows:

Canadian Northern	$45,688,142
Grand Trunk	56,442,020
Grand Trunk Pacific	10,501,992
Total	$112,632,154

That was the amount of the direct call on the public treasury for these three roads. A very large amount, certainly not less than $30,000,000, would have to be added for the National Transcontinental, the Intercolonial, the Prince Edward Island and 500 miles of branch lines. The facts are not available at the moment. But that is not all. During the year, securities were issued on account of the Grand Trunk for $25,000,000 and an equal amount for the Canadian Northern, both bearing government guarantees; so that the final total would be close up to $200,000,000, if not well beyond that figure. One of the difficulties in the way of getting precise and accurate information is an archaic system of accounting, which covers up an enormous amount of capital charges under the rather indefinite head of the public debt.

Capital outlay, without reference to the $100,000,000 required annually to cover the ordinary deficit, will unavoidably be large as time proceeds. The government, for example, must provide for a high proportion of the transportation needs of the West as the area of settlement is extended. Equipment requirements will be heavy and constant. In short, the money for all purposes must come out of the public treasury, with a corresponding addition to fixed charges. Yet there is the chance that earnings may exceed operating cost, and that as traffic develops a growing credit balance may help to meet the burden arising out of capital liability. That chance will be improved if efficiency and sound administration succeed to the inefficiency and waste which have protruded from every angle of public ownership in Canada. As the retiring general manager said recently, "the Canadian National can be made an asset if politics are excluded."

Notwithstanding the grave burden which rests on the people of Canada as the result of railway nationalization, there is a general feeling that public ownership should be given a fair chance. Let it be clearly understood, however, that this disposition to adopt a passive attitude does not rest on definite popular approval of the underlying principle. It rests solely on the conviction that the situation is so bad nothing else whatever can be done. The people of Canada, neither directly nor indirectly, ever approved of the principle of public ownership. The position of matters in Canada will be quite misunderstood unless that fact is clearly recognized. The people were not consulted, and no one may say how they feel about the abstract proposition. What they realize is that these costly properties are on their hands, and that all they can do is to make the best of them. They are therefore disposed to give the new board their loyal support and on their own part spend much time in fasting and prayer. Their taxes will not permit them to forget their obligations.

Suggestions for Greater Efficiency and Economy

By Franklin Snow

The Limited, running 45 minutes late, was nearing New York. On the next track, a short distance back, was the local suburban train. Ten minutes further delay for the express would mean a refund of extra fare amounting to $1.20 each to over 100 passengers. The trains approached the point where one or the other must take the only remaining inbound track. The recognized principles of dispatching, that a delayed train shall be given every opportunity to make up lost time, and that a through train shall ordinarily be given precedence over a local, even though they may both be of the same actual class, would indicate that the Limited should be given the track. Nevertheless, on No. 2 track appeared a home signal, while on No. 4 track the local received a proceed signal to take the cross-over and precede the Limited into the terminal, thus jeopardizing the chances of the express to arrive less than 55 minutes late (after which the refund for one hour's extra fare must be paid).

That this inefficient dispatching occurred with frequency can be attested to by the writer, who observed this trick as often as once a week over a period of several months. It is obvious that the dispatcher, and indirectly the officers who later reviewed his train-sheet, made a direct error in judgment, or else were inexcusably ignorant of the fact that a chance was being taken in holding a train running so closely on the time when a refund of extra fare would be necessary. The $150 or so, in this case, is a trivial sum, when considered as a portion of a trunk line's monthly revenue, but the indifference with which its loss is evidently regarded indicates a certain laxity in supervision which may be considered a fair criterion of much greater extravagances elsewhere.

In direct contrast to this incident may be cited another similar case which happened several years ago, when railroad operating ratios were below 70 per cent and when there was less absolute necessity of watching every penny. The Knickerbocker Limited, from Boston to New York, left New Haven 40 minutes behind schedule. Considerable "joshing" ensued in the observation smoker between passengers and conductor, the former inquiring as to whether or not refund receipts were ready for distribution. The conductor, with some pride, assured the passengers that they would not need them *that* trip, and such proved to be the case, a particularly fast run being made which enabled the train to pull into the Grand Central just 29 minutes late, or a minute under the time after which refunds of extra fare were necessitated.

Innumerable instances coming to the attention of observant passengers or shippers make it apparent that, despite the much greater necessity for economy in every direction, there is much room for increase in efficiency. Reliable statistics point out the fact that little lasting improvement has been made over 1919 operating standards, despite the temporary spurt in 1920.

The following table, showing comparative statistics of the most interesting and valuable features for the month of July, indicate a discouraging gain in efficiency effected by private management. In 1919 the Railroad Administration was operating the roads under normal conditions, the war traffic having ceased, but being replaced by heavy commercial traffic. In 1920 the railroads were endeavoring to reach the highest possible point of efficiency, with a 30-30 record on car-loading and car-mileage (which was never attained), against the time when the government guarantee would expire, while in 1921 the figures reflect, to an extent, the cessation of activities in shops, to which is attributable the increase in percentage of bad-order cars.

	1919	1920	1921
Per cent of cars loaded	67.9	71.1	63.6
Average number tons per car mile	27.9	28.2	27.8
Average car-miles per car-day	24.1	24.4	21.3
Net ton-miles per car-day	455	490	375
Average speed per freight-train-mile	10.8	10.8	11.9
Gross train miles per freight-train-mile	1,571	1,470	1,472
Net ton-miles per freight-train-mile	757	725	674
Per cent of net to gross-ton-miles	48	49	46
Cost per freight-train-mile	$1.54	$1 87	$1.88
Average per cent locomotives unserviceable	27.2	24.2	23.3
Average per cent freight cars unserviceable	8.7	6.6	15.9

The above statistics, picked at random, represent those given greatest consideration by operating officials, out of the mass of reports which the railroads compile (either voluntarily or by order of the I. C. C.). No extended analysis is offered, nor is one necessary. The 1921 figures show no appreciable improvement over those in 1919, while in some instances they show a decided falling off in efficiency. The spurt of 1920 was short-lived. Car miles are now averaging 21 miles per day, while loading remains fixed at approximately 28 tons per car. Despite the present great surplusage of freight cars, it is indeed a poor policy to permit car-mileage to fall off as it has. When traffic again revives it will take months to get an organization keyed up to the point where it was when the high pinnacle of 28 miles was touched.

This record, once attained, should have been used as a spur to even greater accomplishment in this direction. When there is an ample supply of cars for all requirements, there is, of course, no great incentive to expedite movement of cars on line in order to make them available for another load. Nevertheless, while it is impossible to prepare figures to verify the contention, it is obvious that a car moving only 20 miles per day is costing more to handle than one which is sliding along at a 30-mile per day average, even if only in additional per diem charges. However, some justification of decreased car-mileage may be found in the increased average train speed.

Gross tonnage per train decreased 100 tons to 1,472, but this is really an economy, as too high a tonnage record has frequently meant enormously increased transportation expenses in overtime wages, etc. As the per cent of net gross decreased from 48 to 46, we must, however, consider this as a failure to maintain the highest efficiency of transportation.

Increased cost per train-mile is, of course, directly attributable to wages, while high percentage of unserviceable cars, is, as previously pointed out, due to the fact that the roads have permitted repair work to wait until it could be performed under the lowered wage-scale.

Many concrete examples of extravagance and needless expense are at hand. The sight of a business car, trailing an already over-loaded passenger train is a familiar one to travelers. Transportation experts tell us that it costs 30 cents a mile to haul a heavy steel car. Therefore, let us assume that an official going from New York to Chicago, something under 1,000 miles, taking his car with him, is costing his company approximately $600 for the round trip. As a large part of the run is made at night, "inspection" is a poor excuse for the necessity of a business car. While many officials take such opportunities to get rid of accumulated correspondence, we might remark that even a railroad president could dictate for one evening in a Pullman drawing-room, in view of the economy thus effected. However, the height of the ridiculous is reached when, as happened recently on a great western line, two cars were added to a heavy transcontinental train (necessitating an extra locomotive) to carry certain economically-inclined officials to a fuel-conservation meeting.

In justice to railroad officials though, be it said that the use of official cars has been greatly curtailed recently, and the sight of such a car on a foreign line today is unusual, a tacit understanding having been reached, doubtless, that cars shall not be used off the home roads except in necessity.

Another matter, which is frequently censured editorially by certain periodicals as costing the railroads many thousands of dollars annually is that of free transportation, to which officials, employees, and their families are entitled. Too much has already been said and written on this subject to warrant any further comment on the right or wrong of the question, although the writer is inclined to the belief that passes, judiciously granted, are a direct benefit to the railroads, insofar as the employees take pleasure and pride in obtaining such passes. The system of granting free transportation differs on every road, although the basic principle is length of service, or meritorious service with the company.

Thus, to obtain an annual pass represents something of an achievement and increases the prestige of the recipient among his fellows, thereby increasing his loyalty to the company which rewards his faithful service. Further, an official can obtain a pretty good line on the interest his men take in their road by the pass requests they make; *i.e.*, an employee whose idea of free transportation is that it gives him an opportunity to see what his road looks like and with this knowledge become of greater value to the company, is the man worth developing, while the man who constantly requests passes to a nearby pleasure resort or city thereby indicates his indifference to the opportunity of making his holiday trips of benefit either to the company, or himself.

However, looking at the entire question of free transportation in a broad spirit, there is no reason why railroad men should not receive gratis, or at half-rate (as is the case of some foreign employees' passes), the product of their business, namely transportation, just as freely as those in other industries benefit by gifts, discounts, and wholesale prices in their own line. For instance, it is the custom for hotel men to decline payment of bills incurred by other hotel managers who happen to stop at their hostelry.

Unfortunately, though, an extravagance has crept into the distribution of annual passes by the use of the "complimentary list." This burdensome practice has become so fastened on the railroads, that toward the close of each year all departments of the larger roads prepare, and submit to their pass bureaus, a list of officials and their families, who, in the opinion of the pass-requesting officer, should receive annual transportation over his line. The original idea was to include primarily those officials of foreign roads who might be in a position to divert considerable traffic to a road presenting them with passes. The lists have now assumed such proportions, however, that personal friends of officials, past and present, comprise a large part of the list, together with widows of former officers of various roads, some living, some dead; children of officials, many of whom have long-since become self-supporting, or married, and other similar incongruities.

When the amount of money spent both in stationery and clerical labor in this annual procedure is considered in its entirety, no imagination is necessary to point out one huge and useless extravagance. How much better it would be if an agreement could be made whereby passes would only be issued upon request of an official of a foreign road, who, presumably, would only request such transportation for himself and family as he might reasonably expect to use during the ensuing year. This would also, to some extent, preclude the possibility of passes falling into improper hands.

With the present great number of outstanding annual passes, many conductors glance at them only in a cursory manner, especially on the suburban trains, which many employees use for commuting to and from their places of employment. So lax have conductors become that recently it was discovered that a former employee of a railroad was travelling to work on a Railroad Y. M. C. A. card, which bore a distant resemblance to the annual pass of the company. The conductor on whose train the man rode had doubtless become so familiar with this person's face as being a pass-holder, that he ceased to even glance at the pass-case which was shown daily, the man covering a certain part of it with his hand, and in this way the company was hood-winked for several months, before the fraud was discovered.

However, these occasional instances of mis-use of passes should not be considered as being arguments against the privilege itself, which is a thoroughly and properly appreciated one by the great mass of railroad men. The only condemnation of it is in the extravagances which have crept into the system of distribution.

When Headlight Meets Headlight

READERS INTERESTED in the train accident record will recall the account of a collision of passenger trains at Plains, Kansas, on April 19, 1922, about 2 a. m. (reported in the *Railway Age* of June 10) in which each of the two enginemen, running at full speed toward each other on single track, remained oblivious to his danger until within a very short distance of the other train; though both trains carried bright electric headlights and the line of road was straight and level and the weather clear. Both enginemen were killed.

Since the publication of that report there has been a considerable amount of discussion of the question how such a disastrous error could be made; and we have made inquiry of a number of operating officers and locomotive runners with a view to comparing representative opinions. The government's investigation has afforded no light on the two enginemen's probable mental processes; and, the enginemen themselves being silent in death, all that can now be said is in a measure speculative; nevertheless an examination of the general headlight question may be instructive. Can the engineman of a moving passenger train be so dazzled, as he faces an electric headlight a half-mile away, that he will think it is several miles away? And is there no remedy for such a risky condition? A collision similar to that at Plains occurred at Seneca, Mich., on November 27, 1901, causing the death of 20 or more passengers.

Were the Enginemen Asleep?

A decided majority of careful men who have examined the record of this case hold that with competent and experienced enginemen, awake, the collision would not have occurred. Two superintendents and one engineman conclude, from the record, that unquestionably both of these men must have been asleep.

A trainmaster (formerly an engineman) and two superintendents feel sure that each engineman, having assumed, when he started out on that seven-mile run, that the opposing train was on the siding at the remote station, and having been assured that he himself had the undoubted right of road to that station, continued to rest in that assumption, giving little or no thought to the headlight. This line of thought implies either that (1) the near approach of the opposing headlight was not perceptible or (2) that its presence on the main track (instead of, as assumed, on the station side track) did not present so different an aspect as to remind the observer that it was not on the siding, or (3) that the engineman was not keeping a good lookout.

In all this both enginemen are to be considered, each by himself, each having encountered conditions which presumably were exactly like those encountered by the other.

This view, that both enginemen had full confidence that their right to the road was absolute, is strongly emphasized by a committee which was convened by Road Foreman of Engines E. W. Elleman, of the Hocking Valley, to consider this case. It enforces the grave truth that a mistake of dispatcher or operator in giving right to road, which was

the primary cause of this collision, must always be considered as irreparable.

Explicit Rules Needed

Considering the single question, what to do about the headlight, the first thought of most officers is that the rules ought to cover the point very explicitly. A rule which has been approved by the A. R. A. committee on operation (on January 9, 1922), requires electric lights to be dimmed "when standing." An officer of the Baltimore & Ohio states that substantially this requirement is included in the rule of his road; and a rule of this general character is in effect practically everywhere; but to what degree uniformity of wording and of practice have been agreed upon, in any territory, is a point on which further light is needed.

A traveling engineer of the Illinois Central suggests that the proper rule should read:

(a) When trains are standing on siding, clear of main track, to meet an opposing train, the headlight is to be concealed.

(b) When trains are standing on main track, clear of siding to be entered by opposing train, the headlight is to be dimmed.

(c) When trains are standing on main line, or on siding not clear of opposing train, or when running, the headlight is to be kept burning brightly.

An officer of the Southern Railway sends the substance of a letter, concerning this collision, which was received by him from an engineman of 30 years' experience (on a line with tangents many miles long). The following paragraphs from this letter are intended, evidently, by the writer, as a summary of his views as to both cause and remedy:

1. Brain fag. Loss of memory. A man sees with his brain, his eyes are only a medium for transmitting.

2. Did not err as to distance; they had no knowledge of their surroundings; caused by temporary mental aberration.

3. The difference between a strong electric headlight a half mile away and one three to six miles away is so marked, in clear weather, that no man in possession of his mental faculties could fail to note the difference.

4. To decide distances in a case like this is not difficult, assuming the engineman knows the road.

5. See that enginemen are thoroughly familiar with the physical characteristics of the road.

6. Try to see that the morals of enginemen are of the highest type and that they have ample rest before reporting for duty.

7. A lack of concentration, failure to keep one's mind on the job, is responsible for most accidents.

8. Preach Precaution, Prudence and Morality; this results in safety of operation.

Lights Should Be Focused Downward

Those correspondents who emphasize the difficulty of estimating the distance of an approaching electric headlight —some of them declaring that no one can trust himself to do it with certainty—make prominent the importance of correct focusing of every light. The light should be focused downward, so as to illuminate the rails several hundred yards ahead, but not farther. A lamp improperly focused may light up the rails for many miles ahead. On an undulating grade this difficulty is, of course, inescapable; but runners well acquainted with the road can, of course, make due allowance in such situations. It is suggested that roundhouse foremen should be very particular in requiring proper focusing, and that individual enginemen should be forbidden to make any change in the adjustment. An officer of the Great Northern advises that some of the enginemen on his road propose the dimming of headlights about two-thirds, when opposing trains are nearing each other. This would aid both trains in locating themselves, and each other, while yet affording a light strong enough to drive with safety.

The two following interesting paragraphs are from an officer of the Florida East Coast:

"Shut off your own headlight and when the rails show a glint of light the approaching train is approximately one mile away. We have observed headlights on our road, over the Keys, one-half hour before the train would reach you. It was customary to drive motor cars until the rails showed a glint of light, and then, without hurrying, the motor car could be removed with safety. However, this required a certain knowledge of conditions, and strict attention to the business in hand.

"All enginemen are not alike in this respect. It may or may not be a matter of record, but collisions have in fact been averted a number of times by the headlights burning, when lap-orders were given or orders overlooked. We have had one case of two trains colliding on straight track with headlights burning. The negro fireman, who was experienced, called the engineman's attention to the opposing headlight, and then turned his own headlight out to determine the distance; but the engineer paid no attention to the warning. One train had a meet order, the other had nothing The fact that the headlight showed up called for action."

A Succinct Summary

An operating officer in Louisiana interviewed some of his older enginemen and gives the following comprehensive comment and review:

"Without exception all of the locomotive engineers that I have talked with on the subject insist that this collision should not and would not have occurred under the conditions as stated, had the engineers of both of the trains been awake and alert and fully masters of themselves at the time.

"Almost without exception our engineers called attention to similar experiences of their own. They say that when an electric headlight gets within a range of something like a mile it is very easy to locate it, one of the ways being that the line of rails will show up very plainly; while at a distance of two miles or more, about all that can be seen is a light similar to a ball of fire. After the light gets closer, and particularly when within about a mile, there is a heavy glare which increases and is so strong that it shows up the line of rails brightly. In short, the verdict which I obtained from interviewing these men, at least a dozen in number, is that under the conditions named the engineers, one or both of them, must be held finally responsible.

"I have ridden engines at night a good deal during my years as a transportation officer and the replies given me by these engineers as above are in line with my experience.

"It would hardly seem that both of these engineers could have been asleep at the same time; yet that could be possible. It could be possible also that one of them was asleep and the other carelessly allowed himself to take his eye off the rail for a minute or two at the very time he should have been keeping the sharpest lookout; and, as we all know, enginemen will sometimes do that very thing.

"What can be done to educate or regulate enginemen in connection with such a situation? The solution of the problem lies in selecting for the position of engineman only those who have been proved to be safe and sane men. Enginemen are not all alike. It has been my experience on the three different roads that I have served that we have enginemen who are known by the rank and file to be essentially safe men, while there are others who are generally recognized to be, if not unsafe, not as safe as they should be. And there is what we may call the middle class.

"I think we may safely conclude that this collision could not have occurred under the circumstances, had the enginemen in charge of both trains been what railroad men term essentially safe men."

The Gilmore Arch—An Overhead Highway Bridge

Development of Concrete in Railway Construction*

A Review of the Steps in the Adoption of This Material on the Delaware, Lackawanna & Western

By M. Hirschthal
Concrete Engineer, Delaware, Lackawanna & Western

SOMEWHAT MORE than twenty years ago, the Delaware, Lackawanna & Western embarked on a departure from the then current railroad construction practice in the east, by adopting concrete as the material for bridge abutments, retaining walls, etc., for the Newark, N. J., grade

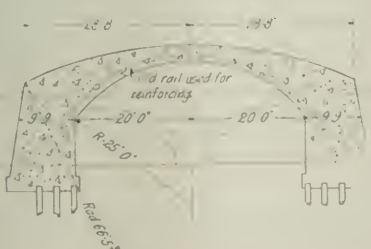


Fig. 1—Forty-foot Arch Over Beaver Brook, Bridgeville

crossing elimination work. Railroad engineers then, as now, enjoyed the reputation of being the most conservative of any in the practice of engineering and this adoption of concrete was considered a bold step forward. Contrary to the normal direction of the progress of civilization, which has been from the east toward the west, the progress in the use of concrete was from the west toward the east as concrete appeared in the construction work of the western railroads several years before it was employed by the eastern lines.

Prior to the advent of W. K. McFarlin as chief engineer of the Lackawanna just before 1900, concrete was not used along the line of the railroad for any purpose other than back-filling or other equally unimportant work not subject to stresses. The remarkable growth of the use of this "new" construction material, both plain and reinforced, in the 20 succeeding years, is evidenced by the monumental structures of concrete all along the line from the lowly drain pipe to the majestic Tunkhannock viaduct. The evolution of the design and construction of concrete structures from the humble beginning became a very interesting process,—at first slow and laborious,—increasing in its momentum and finally becoming almost all-embracing in its scope.

Evolution is defined by Herbert Spencer as a development from the simple to the complex, and the evolution of the use of concrete as a structural material is no exception,—it is the development from the simple gravity sections with pressure lines limited to the middle third of the plane of section, resulting in simple compression throughout, to the highly complex four-way type of reinforcement, and rigid frame structures designed to take stresses of all types and in all directions, complicated by all manner of combinations and conditions of loading pertaining to any particular case.

The following description is an attempt to outline this growth and illustrates the wide usage that concrete enjoys in the construction work of the Lackawanna. The description necessarily partakes somewhat of the nature of a historical sketch due to the fact that each new structure has represented a step forward in the development of the use of concrete for purposes requiring more complicated design.

The Early Uses of Concrete

As already mentioned above, the first use of concrete along the line, and the only use of it for some years, was in the

* This is the first of three articles. The other two will appear in early issues.

construction of retaining walls and bridge abutments of the mass type with the standard section then obtaining in general practice in the design of masonry retaining walls particularly for retaining railroad embankments, keeping the pressure within the middle third to avoid tension at any part of the section. The cry in railroad practice has always been "make them heavy enough," it being assumed that under this condition the soil pressure would take care of itself.

The next use of concrete was in the construction of "rail-

of stone masonry. The new arch is segmental, of 40-ft. span length, with 10 ft. rise and a 3-ft. crown thickness to carry a fill of over 40 ft., necessitating a length of barrel of 123½ ft., supported on pile foundations. The section is what might be termed a "Trautwine" section, having very heavy haunches and but slightly battering abutments. The ring was reinforced by rails to conform to the intrados of the arch, (Fig. 1).

It was also in 1903 that the Keyser Valley and Kingsland

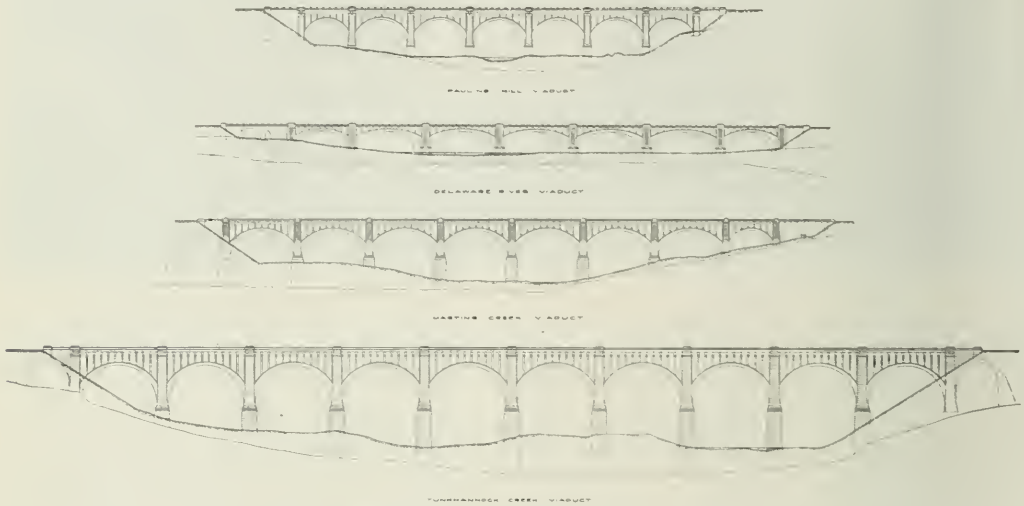


Fig. 2—Four Large Arch Viaducts

Paulins Kill Viaduct, length 1,100 ft., height above water 117 ft.
Delaware River Viaduct, length 1,450 ft., height above water 64 ft.
Martin's Creek Viaduct, length 1,600 ft., height above water 150 ft.
Tunkhannock Viaduct, length 2,375 ft., height above water 240 ft.

top" and "I-beam top" culverts. These were the earliest structures of concrete but were so designed that the rails or I-beams carried the railroad loading while the concrete filled in to form a solid floor as a protection for the steel. There were also a few concrete arch culverts of smaller spans.

The first structure of any size or importance to be built of concrete on the line, was the arch at Bridgeville, N. J., erected in 1903 to replace a double-barreled arch culvert

shops were built and concrete used in the construction of all of the foundations and floors and subways, and in some instances for the roofs of the various buildings.

Isolated structures of the minor type continued to be constructed of concrete, but the first *reinforced* concrete structure was a coal trestle built at Hoboken, N. J., in 1906-1907. Here, the track stringers were designed as reinforced concrete beams, supplanting the use of steel rails or I-beams.

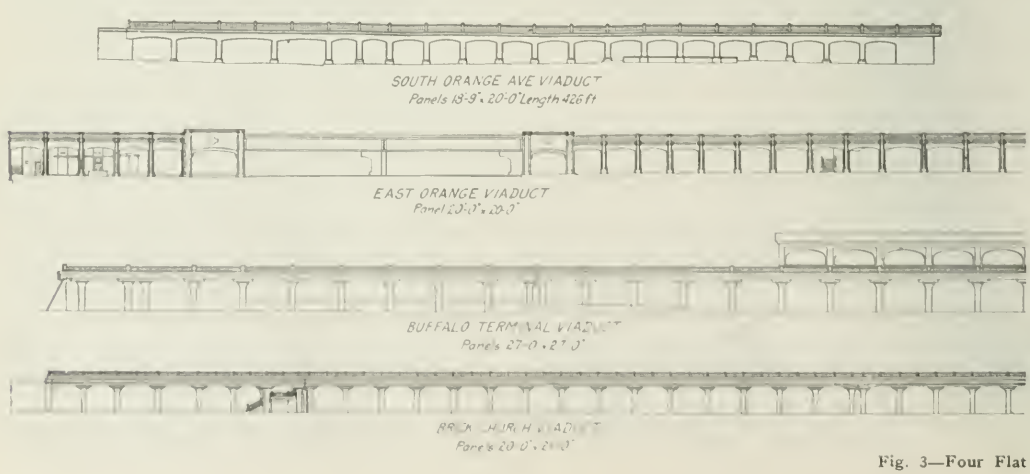


Fig. 3—Four Flat

This trestle of 112 ft. of mass wall aproaches, 226 ft. of reinforced concrete stringers on piers, with temperature reinforcement in each face, and 150 ft. of coal storage bins, entailing the use of reinforced concrete stringers supported on reinforced concrete girders, which in turn are supported by reinforced concrete walls, retaining the coal carried on a reinforced concrete floor, which spans between concrete retaining walls.

At each pier along the open trestle a rail is imbedded transversely, overhanging both sides sufficiently to support a concrete walk. This is evidently a substitute for a reinforced concrete bracket or cantilever, confidence in reinforced concrete not having advanced sufficiently at that time to permit of reinforced concrete cantilevers.

Somewhat later a skew arch bridge was designed and built

Fig. 4—Showing Flat Slab Construction at Buffalo

over Washington Avenue, Washington, N. J. The right span of this bridge is 44 ft. clear, and as the central angle is 42½ deg. there is a skew angle of 47½ deg. This excessive skew was modified by forming the faces of the bridge to a skew of 25 deg. with the center line of the avenue. This arch is segmental in form with a 10-ft. rise and a 3-ft. crown thickness without any reinforcement, while the elevation of the top of parapet is that of the top of rails. The abutments are supported on pile foundation. One-half of the roadway is carried by the roof of a two-span box culvert, reinforced with rails forming a then typical double rail-top culvert.

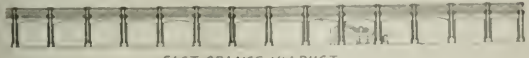
At about this time the design and construction of the various shops at Scranton, Pa., was begun and it was decided to use reinforced concrete as the material of construction. This project included a vast program of buildings for many purposes and various conditions of loadings from light office loads to locomotive loading and entailed several years of continuous construction.

Late in 1907, the preparation of plans was begun for the Hopatcong to Slateford cut-off, now known as the Lackawanna Railroad of New Jersey. The character and object of this improvement have been described so often and thoroughly that no detailed repetition is needed here. However, it was on this improvement that concrete and reinforced concrete were employed by the Lackawanna for the first time on so large a scale and for so many types of construction. There were the two important viaducts, the Delaware River structure of elliptical arches, and Paulin's Kill with semi-circular arches, and while the majority of the bridges, both over and undercrossings were of the arch type, there were a number of flat construction, both of the "T" beam and simple slab type.

Altogether there were 73 concrete bridges and culverts of which about 50 were major structures, concrete construction having attained to sufficient magnitude to justify the organization of a special concrete department to handle the design of all concrete structures. The successful completion of this cut-off, entailing the placing of 260,000 cu. yd. of concrete and 5,000,000 lb. of reinforcing steel, marked an epoch in railroad construction and put concrete in the foreground as the material for consideration in subsequent important construction work. Therefore in the planning of the Pennsylvania cut-off from Clark's Summit to Hallstead and in connection therewith, the projection of the Tunkhannock viaduct, concrete construction occupied a strategic position and had a strong line of defence against the proposed steel structure, despite the advantage of first cost and of established usage which the latter type enjoyed. It is interesting to note that an effective argument for concrete in consideration of the type of structure to be used for the Tunkhannock viaduct, was the striking effect produced by a wooden model of the proposed viaduct so perfect as to all its architectural details, and color as to simulate the completed structure. This model made so favorable an impression that it was shipped to the Leipzig Exposition.

The Pennsylvania cut-off was by far the largest improvement, both in mileage and cost, undertaken by the railroad, and is described in an interesting article by G. J. Ray, chief engineer, appearing on page 1243 of the *Railway Age* of December 24, 1921. With few exceptions all the structures are of concrete, of which; of course, the Tunkhannock and Martin's Creek viaducts are the outstanding features. The total number of structures on this improvement, exclusive of these two viaducts, is 86, of which seven are of structural steel, and 79 are of concrete, 42 of them being major structures. Like the New Jersey cut-off, there have been many articles descriptive of the general scope and details of construction and of the two viaducts, that it is only necessary to summarize by stating that 345,000 cu. yd. of concrete and 6,250,000 lb. of reinforcing steel were placed in the bridges and culverts of this cut-off.

Between the projection of the two "cut-offs" there was begun an ambitious program for the elimination of all



EAST ORANGE VIADUCT
Length 842 ft

BUFFALO TERMINAL VIADUCT
Length 1100 ft

BRICK CHURCH VIADUCT
Length 1085 ft.

Slab Viaducts

grade crossings in the thickly populated districts along the main line and also on the Montclair branch. The part of this program first to be carried into execution was the elimination of the crossings on the branch from the East Orange city line to the terminal at Montclair and incident thereto the construction of new passenger stations. Embraced in this work are arch construction both overhead and undercrossings, flat construction and, for the larger spans, structural steel encased in concrete. In connection with this improvement, reinforced concrete coal pockets were constructed at Montclair.

After the completion of this first portion of the program of elimination, there were executed at various times the improvements along the main line to Morristown, eliminating successively the grade crossings at Chatham, Madison, South Orange, Morris Plains and Orange, culminating in the East Orange improvements now in progress with the completion of which all grade crossings from Mount Taber, N. J. and Montclair to Hoboken will have been eliminated. In all of these improvements, concrete, both plain and reinforced, is the principal medium of construction, particularly in the East Orange improvement where the only structural steel work occurs at the Main street crossing where the excessive skew of the angle of crossing precluded the use of reinforced concrete as an undercrossing. This street crossing is part of a viaduct, the remainder of which is of concrete.

There were important improvements at other points on the line, notably at the west end at Buffalo where a new terminal was designed and constructed. The tracks there are carried on an elevated structure and the portion under the train shed is utilized as a warehouse and provided with tracks for drilling purposes. There again because of the magnitude and importance of the structure, the question of the type and material of construction had to be considered seriously before a final decision was made. Concrete was selected because of the uniformity afforded by the flat slab construction and the reduction in maintenance costs over those for structural steel.

During all this time and since, isolated grade crossing eliminations and bridge renewals have been executed in concrete at many points along the line, except where clearance requirements and excessive spans made its use prohibitive. Among other structures to be designed and built of reinforced concrete are buildings, cinder pits, sand storage bins, transmission poles, etc.

In all of the concrete work along the Lackawanna the distinctive feature is the attention paid to architectural details to produce artistic effects in harmony with the use and environment of the structure under consideration. It is the writer's opinion that this railroad is one of the few, if not the only one in the country that does not submerge all architectural and individual effects by the use of standards throughout, with the result that the structures on this line stand out as individual bridges, stations, etc.

The structures herein described have been selected for the purpose of illustrating certain types and to point out particularly interesting examples as indicating divergence from the ordinary.

Several Large Arch Viaducts Have Been Built

Of all the structures, perhaps the best known are the four arch viaducts, because of the interest attaching to their magnitude and because they perhaps best illustrate the individuality of treatment above mentioned. While the Paulin's Kill and Tunkhannock viaducts are similar to each other in so far as they both have sufficient head-room to permit of the use of semi-circular arch spans and spandrel arches, their treatment both architecturally and structurally is absolutely dissimilar.

The difference architecturally is apparent to the eye in the difference of the piers, pilasters and railings. The structural difference is chiefly in the use of the buried abutment arch spans of the Tunkhannock (employed as well in connection with the Martin's Creek), eliminating the otherwise high walls used at the abutments of the Paulin's Kill viaduct, the selection of the rib instead of the barrel type and the provision of a ledge to support centering later ornamentally treated, to obviate the necessity of erecting falsework for arches from the ground.

A comparison of the Delaware River and Martin's Creek viaducts, in both of which the rise is considerably less than

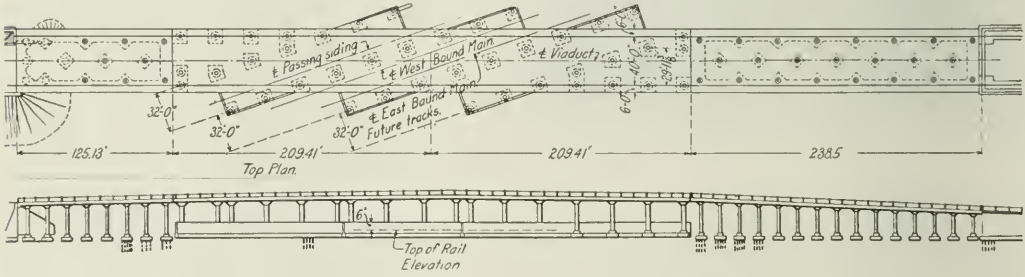


Fig. 5—Flat Slab Viaduct Over the Track at Sanford's Crossing

half the span, discloses the use of a segmental form of arch in the design of the Martin's Creek as contrasted with the elliptical form in the earlier Delaware river viaduct which is of the barrel type with "U" abutments while the later structure is of the rib type with centering ledges, and submerged arch abutments. Architecturally there is a marked difference in the treatment of the pilasters and railing. Figure 2 shows these four viaducts and the data concerning them.

Flat Slab Viaducts

There are also four long viaducts of flat-slab type, viz: The Buffalo terminal, the South Orange avenue viaduct, and the Brick Church and East Orange viaducts now in the course of construction in connection with the East Orange improvements. Here, as in the case of the arched viaducts, it may be noted that each is treated, so far as architectural details are concerned, absolutely independently of the others, and while two of the structures have cantilever fascias and the other two columns and pilaster fascias, they also differ from each other in architectural details. The structures of the cantilever fascia type are the Buffalo terminal and the Brick Church viaduct, while the South Orange avenue and the East Orange viaducts are of the fascia column type.

The viaduct at the Buffalo terminal is by far the largest, both as regards area and cost, having an extreme width of 154 ft. to accommodate seven tracks at its wide end and

narrowing down to a 46 ft width for three tracks with a total length of somewhat over 1,100 ft.

The columns supporting the structure are cylindrical, reinforced by both longitudinal bars and spirals and are spaced 27 ft. center to center in both directions, the transverse section being completed by 9 ft. 6 in. cantilever spans at each side. The slab, two feet thick, is increased in thickness at the supports to form drop panels and is reinforced with four bands of steel reinforcement, running respectively longitudinally, transversely and in each of the diagonal lines, with bars from each band bent up at the supports to take shearing stresses and those due to negative moment. This slab, beside carrying the tracks and platforms, supports the column concentrations of the train shed roof for the major portion of its length. The train shed columns surmounting this slab are spaced 27 ft. on centers longitudinally to correspond to the spacing of the columns below; transversely, however, the spans are increased sufficiently to permit of spanning over two tracks and center to center of 20-ft. platforms so that some of these columns transfer concentrated loads to the slab which distributes them to the lower columns. The foundations throughout this improvement are on piles surmounted by heavy concrete footings, all connected by reinforced concrete struts in both directions.

The three other viaducts provide facilities for three tracks throughout with station platforms between two of the tracks and on one side of the third, having a width of about 80 ft. in the vicinity of the stations and narrowing down to 46 ft. at the ends.

The East Orange viaduct is complicated by the fact that the crossing at Main street is on a considerable skew and requires long spans, precluding the use of this type of construction and necessitating the use of I-beams encased in concrete with fascia girders supporting the skew ends. This problem was solved architecturally by the use of concrete portals over the sidewalk spans adjacent to the two road spans. This treatment is very effective.

The shortest of the viaducts is the South Orange avenue viaduct, which is 426 ft. long and was built without expansion joints. The others are of very nearly equal length, but while the Buffalo viaduct has but one expansion joint which occurs at the change of section, the Brick Church and East Orange viaducts have joints at intervals of 250 to 300 ft. The columns are spaced 20 ft. center to center longitudinally for the three viaducts, except at the street crossings, of which that at South Orange avenue has the longest spans, these being 33 ft. center to center. The transverse column spacing varies in the three viaducts. At Brick Church the transverse spacing is 21 ft. with two cantilevers of approximately 7½ ft. each while at East Orange and South Orange, where fascia columns are used, the column centers transversely are 20 ft. and 18 ft. 9 in., respectively. Figure 3 shows the four viaducts for comparison with the information concerning each of them.

Overhead Highway Flat Slab Viaduct

While the above mentioned are the only viaducts of this flat slab type to carry railroad loadings, there is also a viaduct over the railroad tracks carrying the highway loads of Newark Turnpike, at Kearney, N. J., known as Sanford's Crossing (Fig. 5). This was an unusually difficult grade crossing elimination, due to the character of the soil, the proximity of the trolley line and the Pennsylvania railroad shops crowding the work. It was further complicated by the extreme skew of the angle of crossing (70 deg. 48 min.) as well as by the inordinately large spans made necessary by the requirement of spanning two tracks with the necessary side clearances, resulting in spans of 32 ft. center to center in both directions. The columns for these spans are supported on four rows of continuous piers acting as guard walls, carried to a height of 6 ft. above the top of rail as a protection against derailment. The approaches are smaller spans of 22 ft. 6 in. center to center with diagonal spacing of columns and sidewalks overhanging on either side. Expansion joints are placed at both ends of the main spans. All the foundations on this viaduct, the length of which is 782 ft. exclusive of retaining walls, are supported on piles, the columns of the approach spans being supported on clusters with individual footings, while those of the main spans are continuous. A peculiarity of the columns on this structure is their octagonal shape which, though attractive in appearance, was found to be excessive in cost of forming and their use was not repeated.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING during the week ended September 30 was the largest for any week since October, 1920. The total showed another increase of 15,000 cars as compared with the week before, to 988,381, which was within 3,902 of the loading during the corresponding week of 1920, when the total was 992,283, and was 83,550 in excess of the loading for the corresponding week of last year. As compared with the week before coal loading increased from 187,896 to 189,349, and there were also increases in the loading of all classes of commodities except grain and grain products and forest products, but the principal increase was in miscellaneous freight which increased nearly 10,000 cars. Increases as compared with 1920 were shown in grain and grain products, livestock, merchandise and miscellaneous. In the Alleghany, Southern, Central Western and Southwestern districts also increases were shown as compared with 1920. While grain loading was less than that for last year the total loading to date in 1922 is in excess, not only of 1921, but also every other year. The summary as compiled by the Car Service Division of the American Railway Association is shown in the accompanying table.

The freight car shortage showed another increase during the last week of September to 130,325, which included 66,529 box cars and 38,954 coal cars, while the surpluses amounted only to 6,593.

The railroads have been furnishing a steadily decreasing percentage of the cars required for coal loading, according to the weekly reports of the Car Service Division of the American Railway Association. For the week of September 23 the percentage of cars placed to cars required was 58, as compared with 63, 73, 78 and 82 in the four preceding weeks, respectively. For the week of September 23 the cars required were 367,616, as compared with only 193,660 in the corresponding week of last year; the cars placed were 212,685 and the cars loaded 181,346, an increase of 21,580 or 13.5 per cent over last year.

The number of locomotives out of service for repairs showed an increase during the first half of September as compared with the last half of August. On September 15 the number requiring over 24 hours for repairs was 16,572 or 25.8 per cent, as compared with 25.3 per cent on September 1, and the number out of service for repairs requiring less than 24 hours was 3,585 or 5.6 per cent, as compared with 3,573 on September 1. The number of serviceable locomotives stored was also reduced from 2,842 to 1,982.

In a circular addressed to the shipping public, asking co-operation to bring about the most economical use of cars, M. J. Gormley, chairman of the Car Service Division, says:

"Prior to the strike of the shop crafts on July 1 the Car Service Division prepared an estimate of car loading for the remainder of 1922 together with probable transportation conditions coincident with the peak of railroad traffic generally reached in October.

"The chart then prepared is attached. It outlines load-

ing for 1920 and 1921, and for 1922 up to July 1 of, (1) Coal, (2) All commodities except coal, (3) Total all commodities. The estimated figures subsequent to July 1, 1922, are shown by the light dotted line. The actual loading July 1 to date is shown in heavy line marked 1922. This estimate was prepared without knowledge of the shopmen's strike and was withheld account conditions incident to the strike.

It was estimated—

1. That coal mining, suspended in union fields since April 1, would generally be resumed not later than August 1, 1922.

2. That the loading subsequent to July 1 would reasonably be expected to increase at a ratio corresponding to the average of years 1919, 1920 and 1921.

3. That while there would be a decided increase in coal loading subsequent to August 1 the production would not reach the record of 1920 for the reason that it was generally conceded there was a production considerably beyond the actual demand in the fall months of that year.

"Records indicate that the railroads handled at one period it would be and which estimate was made prior to the strike of the shop crafts.

"It is extremely important from the standpoint of shippers as well as the railroads that extraordinary methods of co-operation be adopted along the following lines in order to measurably meet the transportation needs, particularly of the next few months.

1. Load cars to their full carrying capacity.

Figures show that 2,250,000 less cars would have been used during the year 1921 to handle the same amount of tonnage provided the cars had been as heavily loaded during the entire year of 1921 as they were during the last quarter of 1920. The light loading of equipment constitutes a very great waste in transportation, including the addition of empty mileage for the return of excess cars in service for handling the same tonnage.

2. Unload cars promptly.

Save car delays. At least 150,000 cars are unloaded every week day. If 24 hours can be saved in more promptly unloading one out of every ten cars placed for unloading there will be 15,000 additional cars available for shippers. The railroads do not want demurrage.

3. Order cars in advance, and on a basis of what will

REVENUE FREIGHT LOADED

SUMMARY ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, SEPTEMBER 30, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	7,527	3,736	55,492	1,644	5,886	3,828	64,242	94,674	237,029	.....	.....
	1921	8,912	3,123	46,550	1,571	4,577	1,713	63,684	81,945	.....	212,075	242,719
Allegheny	1922	3,110	3,717	56,345	4,613	3,159	9,361	50,409	78,630	209,344	.....	.....
	1921	2,757	3,321	49,017	2,586	2,846	5,391	48,204	59,818	.....	173,940	203,100
Pocahontas	1922	254	540	16,690	228	1,448	34	5,111	3,490	27,795	.....	.....
	1921	283	312	22,831	184	1,193	97	5,692	4,170	.....	34,762	37,896
Southern	1922	3,842	2,827	22,124	902	18,363	1,203	37,515	43,718	130,494	.....	.....
	1921	4,103	2,150	24,414	405	15,950	302	40,761	43,847	.....	131,932	129,677
Northwestern	1922	18,952	9,702	10,048	1,408	15,533	32,597	28,934	41,891	159,065	.....	.....
	1921	19,340	8,406	9,934	502	11,989	17,363	29,006	41,930	.....	138,470	167,648
Central Western	1922	13,399	15,344	21,254	504	7,313	2,192	32,926	58,700	151,632	.....	.....
	1921	17,030	12,657	22,162	211	6,860	723	32,593	52,122	.....	144,358	143,446
Southwestern	1922	5,045	3,964	7,396	157	7,040	562	15,380	33,478	73,022	.....	.....
	1921	4,797	3,010	5,446	129	6,438	883	16,165	32,426	.....	69,294	67,797
Total Western districts	1922	37,396	29,010	38,698	2,069	29,886	35,351	77,240	134,069	383,719	.....	.....
	1921	41,167	24,073	37,542	842	25,287	18,969	77,764	126,478	.....	352,122	378,891
Total, all roads	1922	52,129	39,830	189,349	9,456	58,742	49,777	234,517	354,581	988,381	.....	.....
	1921	57,222	32,979	180,354	5,588	49,853	26,472	236,105	316,258	.....	904,831	.....
	1920	43,632	33,383	209,898	14,790	62,085	78,458	203,506	346,531	.....	.....	992,283
Increase compared	1921	.....	6,851	8,995	3,868	8,889	23,305	.....	38,323	83,550	.....	.....
Decrease compared	1921	5,093	.....	.....	.....	.....	.....	1,588	.....	.....	.....	.....
Increase compared	1920	8,497	6,447	.....	.....	.....	.....	31,011	8,050	.....	.....	.....
Decrease compared	1920	.....	.....	20,549	5,334	3,343	28,681	.....	.....	3,902	.....	.....
September 30	1922	52,129	39,830	189,349	9,456	58,742	49,777	234,517	354,581	988,381	904,831	992,283
September 23	1922	52,379	36,896	187,896	8,671	58,853	49,587	234,371	344,638	973,291	873,641	1,008,109
September 16	1922	52,096	34,929	172,241	8,188	57,371	53,293	234,513	333,294	945,919	852,552	991,166
September 9	1922	47,732	29,512	139,570	8,418	51,906	53,833	203,666	298,107	832,744	749,552	883,415
September 2	1922	54,619	31,847	149,487	8,389	58,706	62,354	233,550	333,246	931,598	831,288	961,633

in 1921 within 5 per cent of the previous peak car loading of the country, which occurred in 1920, and this was done without car shortage and without transportation difficulties, but during that period there was pronounced efficiency in the handling of cars on the part of shippers and the railroads. It was the conclusion prior to July 1, 1922, that with the continuation of this efficiency in transportation a peak loading of 1,100,000 cars would be reached in October, 1922, which figure is 10 per cent in excess of anything of record heretofore and that this would be accomplished without appreciable car shortage or transportation difficulty.

"It, of course, is impossible to forecast the cumulative effect of the transportation difficulties of the past three months, but the actual loading of traffic, other than coal, since July 1 as shown by the chart, closely approximates the estimates made. The coal loading since the resumption of general mining is only slightly less than it was estimated be loaded within a 24 hour period. Do not hold cars for prospective loading.

This will be helpful in having requirements met, and will conserve equipment available for general distribution. It helps no one to pyramid orders and disrupts efforts of car distributors to meet demands uniformly.

4. Place orders requesting reconsignment with promptness.

It is easily possible to avoid at least two days' delay in car movement by this means.

5. Issue bills of lading promptly.

"Freight cars are built to haul goods, not to store them. They should be loaded to the limit of their capacity. They should be loaded and released with the utmost promptness.

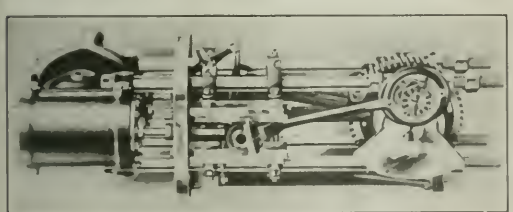
"By co-operating in carrying out these suggestions all will be contributing in large measure to the meeting of current transportation requirements."

Unit Steam Motor Car Built for the Canadian National Railways

Steam-Propelled Unit Railway Motor Car

Improved Power Plant with Water-Tube Boiler and Oil Burner Characterize Canadian National Car

MANY RAILROADS within the past year have turned to the self-propelled passenger car as a device which would aid materially in reducing operating costs on branch lines, or in sections where the traffic is light. Much of such equipment tried has followed closely the lines of development of the gasoline-engine motor bus used on highways



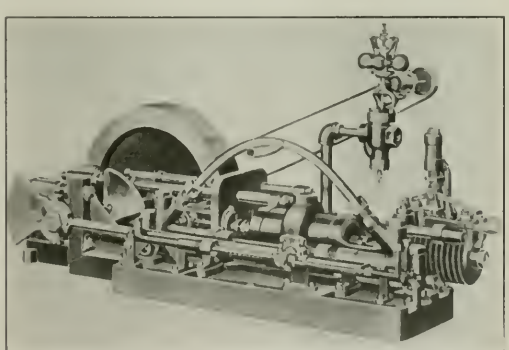
The Main Engine is of the Two-Cylinder Simple Type

with more or less modifications to adapt it for use on railroad tracks.

A distinctly different car of the self-propelled type is the oil-burning, steam-driven car built by the Unit Railway Car Company, Boston, Mass. One of the early cars of this style was shown at the Atlantic City convention in 1919, a description of it being given in the *Railway Age*, June 18, 1919. From experience gained through observation of the cars which have been in service since that time, the builders have been able to make a number of improvements in details of design. These have been incorporated in the cars recently delivered to the Canadian National, the Boston & Maine and the Uruguayan Government.

The power plant in the Unit railway steam cars embodies the principles used in the Stanley steam automobiles and is built under the same patents. Ease and flexibility of control with large reserve capacity for quick acceleration, or for use on grades is a characteristic of these cars. They are usually operated as a single car unit, but have sufficient power for pulling a trailer, or can be used for switching purposes when necessary. Maintenance can be attended to easily by ordinary railroad mechanics and the costs should be low.

The delivery of the car to the Canadian National was hurried in order that it might be shown at the annual exposition in Toronto. Without waiting for a preliminary trial, it was started from Boston under its own power and ran to Toronto, a distance of 660 miles, without interruption, except for delays incidental to orders from the operating



Auxiliary Steam Engine with Air Compressor, Feed Water and Oil Pumps

departments. The running speed for much of the distance was between 45 and 55 miles per hour.

Car Body and Truck

In appearance, as will be noted from the photograph, the car bears a closer resemblance to the usual steam railroad passenger, or to an interurban electric car than is the case with many of the gasoline engine cars. The body is of steel construction and the car is equipped with standard

couplers. The Canadian National car is 50 ft. 7 in. long over end sills and is divided into four compartments. Next to the driver's compartment, in which is located the boiler and auxiliaries, is a baggage compartment. There is also a smoking compartment separated by a partition from the main part of the car. There are seats for 38 passengers and, in addition, two folding seats are provided in the baggage compartment, which furnish room for eight additional passengers if desired. The rear platform is enclosed and provided with doors. A small toilet room occupies one of the rear corners of the passenger compartment. Current for electric lights is supplied by a small generator driven by the auxiliary engine.

The trucks are of a modified arch bar pedestal type of light construction. The wheels are 34 in. in diameter and ball bearings are used in the journal boxes. The distance between truck center pins is 28 ft. The forward truck has a wheel base of 6 ft. 1 in. and is so arranged that the distance from the center bearing to the front axle is 2 ft. 1 in., and from the center bearing to the trailing axle the distance is 4 ft., this being done in order to increase the percentage of weight on the front pair of wheels, which are the drivers. The rear truck has a wheel base of 5 ft. 6 in.

The car is designed for single-end operation, but may be driven at equal speed in either direction. The weight disposition is as follows:

Light weight of car complete	59,000 lb.
Weight on front driving axle	25,500 lb.
Weight on front trailing axle	12,400 lb.
Weight on rear truck	21,100 lb.

As the weight of the power plant complete with all auxiliaries is 13,000 lb., the weight of the body and trucks is but 46,000 lb.

The Water-Tube Boiler

The boiler is of the water-tube type and is made in 12 sections, being constructed throughout of Shelby seamless boiler tubes. Each section consists of a front and back vertical header, the two being joined by 22 water tubes inclined at about 11 deg. to the front header and a single connecting steam tube at the top inclined at about 1 deg. to the back header. All tubes are straight, in which respect they differ from the earlier design. The tubes are electrically welded to the headers and opposite each end of every tube an opening is provided in the headers through which the tube can be inspected, cleaned or in case of a rupture, can be temporarily plugged until a new tube can be welded in place.

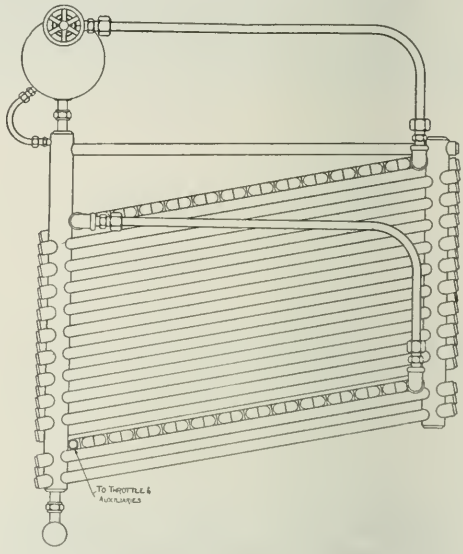
Each boiler section when ready for assembly is subjected to a hydrostatic test of 3,500 lb. per sq. in., and while under this pressure is given a babbitt hammer test for leakage or defective tubing.

The front headers are connected by parabolic shaped tubing to a steam drum. The construction of the drum and connections is such that they act as a desaturator, and any moisture separated from the steam is returned automatically to the boiler. The lower ends of the front headers are connected to a mud drum.

From the steam drum the dry steam passes through the superheater in series, an arrangement which has been found materially to increase the life of the superheater units. As will be noted from the drawing, the superheater pipes are in two banks, one near the top and the other near the bottom. Unions are provided which permit of their easy removal. All unions and connections are of special construction and made of monel metal to resist the high temperatures. All the steam is superheated, no saturated steam being used for auxiliaries or for other purposes. By using superheated steam for all purposes, there is always some flow through the superheater for operating the auxiliary engine, atomizer, blower and ejector.

The steam pressure ordinarily carried is about 800 lb. per sq. in., while the ultimate temperature after passing through the superheater is from 650 to 800 deg. F. The steam from the engine is condensed as explained later, and fed back to the boiler. A gravity-feed oil separator is used together with a boiler compound to eliminate the effect of oil in the feedwater as oil tends to decrease the efficiency of the boiler and endangers the heating surfaces when exposed to high temperatures.

The boiler proper is placed on top of a fire-brick lined combustion chamber, shown in the photograph taken when partly assembled. Any crude or refined oil that can be pumped may be used for fuel, but the grades most generally used are kerosene or distillate. The oil is atomized by high pressure superheated steam. The supply of fuel oil is carried in a tank underneath the car, from which it is pumped as explained later.



Water-Tube Boiler with Superheater

Main Engine and Condenser

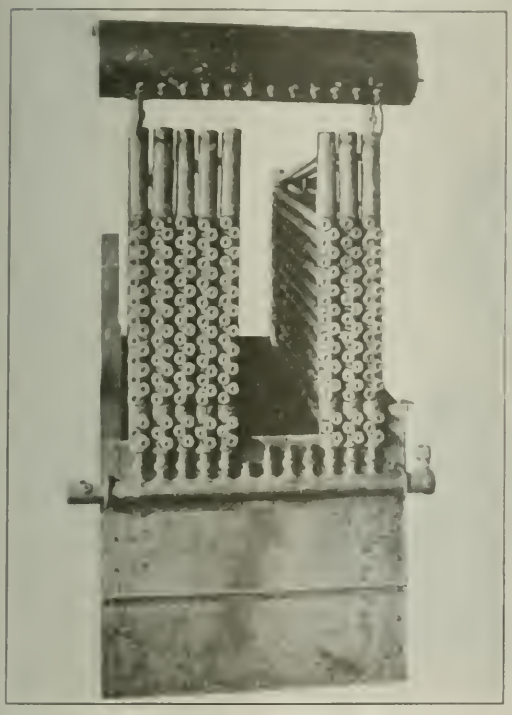
The car is propelled by a simple two-cylinder engine mounted on the front side of the forward truck, power being transmitted to the axle by a single spur gear pressed onto the center of the axle. The gear ratio ordinarily employed is approximately 1½ to 1. When the car is traveling at a speed of 30 m.p.h. the engine, which has an 8-in. stroke makes about 433 r.p.m., and has a piston speed of 577.5 ft. per min. The engine is entirely enclosed and thoroughly insulated. The gears run in a bath of oil.

The high pressure superheated steam is carried from the throttle to the engine by a flexible pipe having four special steam packed joints. The exhaust steam from the main engine and also from the auxiliary engine is conducted to an air cooled condenser located on the roof of the car at the forward end. The condensed water flows back to the tank underneath the car. There are two water tanks, one holding 175 gal. and the other 90 gal. In winter the exhaust steam may be passed through heating coils in the car. The supply is sufficient to keep the car comfortable in the most severe weather.

The auxiliary steam engine, which is located in the driver's compartment, needs little explanation. It drives the two feedwater pumps, the fuel-oil pump, the duplex cylinder

lubricating oil pump, the air compressor and the 2 kw. D.C. generator. The engine is run at a constant speed and governed by a ball type governor.

Boiler feed is accomplished as follows: The two pumps running at constant speed deliver the hot feedwater through the automatic by-pass to the condensate tank. When the water level in the boiler falls below the automatic by-pass tube, expansion of the tube closes the valve and the water is pumped into the boiler until the tube is submerged, or enough of it to establish and maintain a nearly constant water level irrespective of the load on the boiler. When the throttle is open under heavy load, there will be a slight drop of water level as indicated on the water column. This is absolutely reliable for when the throttle is again closed



Partly Assembled Boiler on Combustion Chamber

the water level will rise to the normal or light load level. Due to the high pressure, a water gage is not used, but an indicator mounted on top of the water column and operated by the expansion of that portion of the water column above the water level has been substituted. The water column is equipped with trycocks which permit the water level to be checked for accuracy.

The fuel oil is pumped from the 175-gal. storage tank underneath the car, located in front of the rear truck, to a 20-gal. auxiliary atomizer tank bolted to the partition near the roof in the baggage compartment, which gives a constant head to the atomizer. From the tank the oil flows by gravity to the dual automatic control mechanism, which is actuated hydrostatically by the throttle operation, in that the slightest throttle opening causes a fluid pressure drop in the superheaters, thereby releasing the hydrostatic head on the dual automatic diaphragm permitting a simultaneous opening of the fuel oil and high pressure superheated steam passages to the atomizer. The atomized fuel is ignited by the pilot burner. The fire control is such that a light fire will be maintained for light loads and correspondingly increased for heavy loads. When operated at full loads, the temperature in the chamber is from 2,800 to 3,100 deg. F. and every brick and joint of fire clay is glowing with incandescense and radiates heat to assist in the combustion which is complete before the gases come in contact with the boiler-heating surfaces.

The air compressor, as will be noted from the illustration, is in tandem with the auxiliary steam engine cylinder, the air piston being mounted on an extension of the steam piston rod. The compressor is lubricated by an adjustable oiler in the air intake. A governor is located over the inlet valves, and when the desired pressure has been attained both inlet valves are held open, permitting cold air to circulate in the cylinder until the next pressure drop occurs. The compressor cylinder is air cooled. The capacity of the air compressor is 11½ cu. ft. of free air per minute, which is more than sufficient for the operation of the air brakes with which the car is equipped.

Lubrication of both main and auxiliary engines is by splash, thereby lubricating the housing or the driving axle as well as every portion of the engine with a flood of oil. The cylinders are lubricated through blinkers on the instrument board, thence to the steam lines to either engine.

The low water automatic control is a device by which the flow of fuel oil to the atomizer is shut off before the water in the boiler gets dangerously low. The water connection to the low water automatic control is in series with the automatic by-pass in order to utilize the same temperature that operates the automatic by-pass. Therefore, should the automatic by-pass fail for any reason, or if the pumps should not supply the boiler with water to meet boiler evaporation requirements, the expansion tube of the low water automatic control is filled with steam at a high temperature, closing the valve in the head which at once cuts off the fuel oil supply to the atomizer. The value remains closed until the water level is restored, after which the atomizing burner will again function to restore and maintain the steam pressure.

Tests and Efficiency

Records taken from cars in service show an average consumption of approximately 0.7 gal. of distillate, or 0.65 gal. of kerosene per car mile. At the low price at which distillates can be obtained in many places, this represents a fuel cost of about four cents per car mile. For lubricating purposes two gallons of a special cylinder oil has been found to be sufficient for a 400-mile run and one gallon of engine oil for the same mileage.

The mechanical efficiency in the main engine and drive is high. The boiler efficiency when using superheated steam at 700 to 800 deg. F. at the atomizer is said to be about 77 per cent. The time required to generate steam with storage air for the atomizer is from 20 to 25 min. and with steam at 200 lb. pressure, approximately 18 min. An evaporation of about 14 lb. of water from and at 212 deg. F. may be obtained per square foot of wetted heating surface. The main engine uses from 14 lb. to 19 lb. of water, depending upon load and grade conditions, to develop one horsepower hour.

The Eastern Railway of France now has more than one-quarter of its locomotives fitted with audible cab signals. The total number of locomotives in service at the present time is, for passenger trains, 1220; for freight trains, 798; total 2,018. Of these, 428 passenger engines and 144 freight engines are fitted with the signal apparatus. Ramps have been installed at 390 distant signals and at 130 home signals. The company plans to fit up 1,278 more locomotives before the end of 1923, and to install 1,560 additional ramps.

Daniel Upthegrove

DANIEL UPTHEGROVE, general solicitor of the St. Louis Southwestern, who has been acting president of that company since the death of James M. Herbert on August 5 of this year, was elected president at the annual meeting of the board of directors in St. Louis, Mo., on October 3. He also succeeds Mr. Herbert as president of the St. Louis Southwestern of Texas; as president of the Dallas Terminal Railway & Union Depot Company, and as vice-president of the Arkansas & Memphis Railway, Bridge & Terminal Company.

In the choice of Mr. Upthegrove, the directors of the "Cotton Belt" have named a man who has been connected with the property for 25 years. Although he has always been in the law department he has become well known among the employees and his popularity extends from the lowest rank to the highest officers.

His greatest asset is his unusually clear grasp of the essentials of every problem with which he is confronted. He attributes his steady rise from a local "Cotton Belt" attorney at Greenville, Tex., to the highest position that company can offer, to his "early determination to make himself so useful in his job that it would be a necessary part of the road. My theory of handling any matter," he states, "is to pick out the essential things and to do them to the best of my ability." There will be no change in the present policy of operating the 1,776 miles of line, the new president has declared, and his chief occupation, he states, will be to give effect to a sentiment expressed by the late President Herbert, in the words, "The biggest man on this road is 'Old Man Service,' and service comes first."

Daniel Upthegrove

Mr. Upthegrove was born at Greenville, Tex., on May 26, 1871, in which city his father was a prominent attorney. He was sent to the Battleground Academy, Franklin, Tenn., to take his pre-legal studies. He later continued his education at Vanderbilt University, Nashville, Tenn., and at the University of Texas 1895-96. Early in 1897 he passed the bar examinations and began the practice of law at Greenville under direction of E. B. Perkins, then regarded as one of the ablest lawyers of that state. He obtained his first legal position in 1897, and at the same time first entered railroad service, when he began to represent the St. Louis Southwestern of Texas in the local justice courts in his home town. Soon thereafter his friend and counselor, Judge Perkins, moved to Dallas, Tex., to become general attorney of the Cotton Belt of Texas, and in November, 1901, he summoned Mr. Upthegrove to become his assistant.

In December, 1916, President Herbert, recognizing the marked ability of the assistant general attorney at Dallas, offered him the position of general solicitor of the St. Louis Southwestern, with headquarters at St. Louis, Mo., which he accepted. This advancement was unexpected and made a radical change in his life plans for he had intended to develop a law practice at Dallas that would give him a remunerative income in the event that he later determined to forsake his work as a railroad counsel for general practice. While he has not come up from the ranks of "practical" railroad men, the new executive is said to have an extensive knowledge of railroad operation, gained through study and association with Mr. Herbert, whom he usually accompanied on his inspection trips over the system.

President's View on Strike Settlements

WASHINGTON, D. C.

PRESIDENT HARDING is represented as feeling that at least one of his policies for settling the railroad strike has been vindicated by the adoption on many roads of the so-called Willard-Jewell plan of settlement. Newspaper correspondents were told at the White House on Friday that it was worth their notice that the settlement of the railroad strike is continuing and that it is being made "on the basis of the original proposal of the President to the railroad executives." This proposal was the one in which he suggested that the strikers be returned to work with seniority rights unimpaired, by way of restoring the status quo as of June 30, before he made his later proposal that the question be referred to the Labor Board which had already decided it the other way. The plan of settlement which has been signed upon some 82 roads does not promise the restoration of former seniority rights but the President has been told that the practical effect amounts to about the same thing. He was told by a railroad manager, it was said at the White House, that when his road settled with the shop crafts it had 2,400 new employees to whom it had promised permanent jobs and whose services it needed to make up for the work lost during the strike. It had offered them a chance to stay but in 24 hours 2,200 of them had quit. The President considers this an illustration going to show that the seniority problem was not such a serious one as many of the railroad officers attempted to make it appear, and that 95 per cent of the serious transportation embarrassment now being experienced in many lines is due to the impaired condition of equipment due to the strike and which was represented by the railroads as less serious than it was. Apparently the President regards the illustration afforded by one railroad manager as of more importance than that of the larger proportion of roads on which the seniority question was of such import that they went ahead and beat the strike without settling. It has also been suggested that the President may have overlooked the possibility that if a large number of roads had not stood pat, the strikers on the other roads would not have flocked as new recruits to the "die-hard" roads in sufficient numbers to have aroused the interest of Mr. Jewell in seeking and making settlements with the roads which chose to deal with him.

Railroad Executives Plan to Expedite Coal

WASHINGTON, D. C.

A PROGRAM of recommendations for accelerating the transportation and distribution of coal throughout the country was unanimously decided upon by the advisory committee on transportation, recently appointed by Federal Fuel Distributor C. E. Spens, at a conference held with Mr Spens in Washington on October 5. The details of the committee's recommendations are given in the following letter addressed to the executive heads of all the railroads by Chairman Daniel Willard:

"At a meeting held in Washington this date between C. E. Spens, federal fuel distributor, and an advisory committee on transportation, appointed by him, the situation as to fuel supply throughout the country was fully explained by the fuel distributor and the necessity for increased efforts by the carriers was emphasized. After full consideration the following recommendations were unanimously adopted as definite requirements necessary to meet the situation:

1. Unload promptly all railroad material including railroad fuel.
2. Discontinue as far as possible all maintenance and construction work requiring use of power and cars so as to turn this equipment into commercial service.
3. Use all available forces to check yards and stations for delayed cars with a view to securing not only prompt unloading but prompt movement.
4. Continue a vigorous campaign to reduce to the minimum locomotives and cars awaiting repairs.
5. Return foreign coal cars to owners or connections in home route with the greatest possible dispatch.
6. Loading of foreign coal cars in the direction of the mines, as permitted under I. C. C. Service Order No. 25, should be confined so far as possible to through movement to points on the owner's rails.
7. Conduct an active campaign to have all cars loaded to their safe carrying capacity.
8. Point out to coal operators that available coal equipment can be increased by the avoidance of sales that require abnormally long distance movement.

"All railway executives are urged to make every practicable effort to accomplish these results."

The members of the advisory committee also constitute the conference committee appointed by the American Railway Association on September 29.

An appeal to coal producers to assist in expediting the movement of coal by loading cars to carrying capacity and by refraining from the loading of coal into cars for which they have no billing, was made on October 9 by Federal Fuel Distributor C. E. Spens. Receivers of coal are asked to unload cars immediately upon arrival. Coal shippers are requested to confine their operations as far as practicable to their normal spheres of distribution, in order to reduce the amount of transportation service required. Consumers are asked, if the coal is available, to confine their purchases to the grades of fuel to which they have been accustomed.

"We have already received responses from a number of the railroads to the effect that they will co-operate to the limit along the lines recommended by this advisory committee," Mr. Spens said. "The public, however, should appreciate that there are unusually heavy offerings of traffic of all character to the railroads, and aside from the general priority orders of the Interstate Commerce Commission that now obtain, we are hoping it may not become necessary to recommend any action that might interrupt the transportation of other commodities. The priority orders now governing the handling of coal equipment are, of course, already interfering to some extent with the movement of commodities that are usually loaded in this class of equipment, but it is our great desire that there should be no greater interference with general transportation than appears to be absolutely necessary to care for the coal emergency.

"An analysis of the present coal transportation, production and present reserves clearly indicates that for some weeks the commodities covered by priority orders, particularly coal, must be given extraordinary attention. We are confident the matter has been placed before the carriers in such a way that they are fully alive to the situation, and, in spite of the existing handicaps, will do their utmost to accomplish their proportion of the burden.

"Coal producers and coal receivers can assist to a very large extent. Producers should load cars to carrying capacity, and should not load coal except to fill orders on hand; in other words, they should not have unbilled cars on hand at mines, which practice is common under normal conditions, nor should coal be billed excepting to bona fide consignees. Existing conditions will not permit of making coal warehouses out of coal equipment. Receivers of coal should arrange to unload cars immediately upon arrival."

Fuel Distributor Spens on October 4 issued a modification of his order of September 27 waiving the requirement that coal operators furnish a detailed report of the names and addresses of all consignees with car numbers and initials as to all producers who shall themselves keep and preserve full and detailed records showing such facts in such form as to enable them promptly to furnish such information as to any shipment, if and when required in any particular case. The request for the detailed report of shipments resulted in such a flood of papers being forwarded to Mr. Spens' office that it was difficult to find a force to handle them, and the order says the modification is "to facilitate reporting and assure the earliest possible receipt of the more essential information immediately required."

A slight decrease marked production of soft coal during the first week of October, according to the weekly bulletin of the Geological Survey. For three weeks in succession the output had been slowly increasing, reaching 9,776,000 net tons in the week of September 30. During the week of October 2-7 the returns so far received indicate a total of about 9,600,000 tons. The current rate of output exceeds 1921, but is far below that of other recent years. Production of bituminous coal in the first week of October of the past six years has been as follows:

	Tons		Tons
1917	10,962,000	1920	11,350,000
1918	12,398,000	1921	9,134,000
1919	11,518,000	1922	about 9,600,000

Production of anthracite continues at around 1,900,000 net tons a week. The total of all coal raised is therefore about 11,500,000 tons, considerably below the amount needed to meet current consumption and the heavy movement up the lakes, and at the same time to rebuild consumers' stocks.

Production of anthracite continues to increase and the total output in the third week after the strike was estimated at 1,947,000 net tons. Preliminary returns for last week indicate that production will again be in the neighborhood of 1,900,000 tons. The table below summarizes the preliminary returns on anthracite loadings day by day since the strike was called off.

DAILY CAR LOADINGS ON ANTHRACITE CARRYING ROADS.

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
First week after strike	928	1,783	3,272	4,046	4,704	5,088
Second week after strike	5,449	5,725	5,857	5,900	5,730	5,506
Third week after strike	5,952	5,959	5,862	5,953	6,012	6,144
Fourth week after strike	5,838	6,056	5,839	6,046	.....	.....

The all-rail movement of coal to New England through the six principal Hudson gateways increased to 3,541 cars of bituminous coal and 2,206 cars of anthracite in the week ended September 30. In addition there were also forwarded through Rouses Point in that week 75 cars of bituminous coal and two cars of anthracite. Bituminous coal is now moving into New England by rail in larger volume than at the same season last year, but the anthracite shipments have not yet attained last year's rate.

Shipments of bituminous coal through Hampton Roads decreased during the week ended September 30. Dumpings for the week totaled 283,987 net tons as against 312,003 tons in the week before.

General News Department

The Interstate Commerce Commission has announced that oral arguments will be held at Washington on November 1 in valuation cases involving about a dozen roads, including the Texas Midland, Winston-Salem Southbound, Elgin, Joliet & Eastern, Norfolk Southern, Central of Georgia and Ann Arbor.

The American Association of Railroad Ticket Agents will hold its annual convention at Savannah, Ga., on November 13, 14 and 15. Following the meeting the ticket agents will leave for a trip through Florida, stopping at the larger cities in that state, and reaching Key West on November 20, when they will embark for Havana, at which place they will remain two days.

The Railway & Locomotive Historical Society has issued Bulletin No. 3, a pamphlet of 54 pages, filled with reminiscences of old locomotives mostly those of New England roads, though space is given to the full story of the "General" of the Western & Atlantic, and the tragedy of the Andrews raiders of 1862. The illustrations include the "Uncle Tom," a 4-2-2 locomotive (with tender on the same frame) of about 18 or 20 tons, which flourished on the Fitchburg & Worcester Railroad about 1850-1860, and a number of others equally interesting. It is said that about 1843 Hinkley & Drury built a good many of this type. Charles E. Fisher, president of the society, 152 Harvard street, Brookline, Mass., desires information for a history of the early locomotives of the New York, New Haven & Hartford and of its predecessor companies in Connecticut.

Metropolitan Track Supervisors' Club

R. S. Parsons, vice-president, Erie Railroad, and Earl Stimson chief engineer maintenance of way, Baltimore & Ohio, will each give a short talk on railroad maintenance problems before the Metropolitan Track Supervisors' Club at its next meeting at the Martinique Hotel, New York City, on Saturday afternoon, October 14. Other subjects before the meeting are discussions of previous papers on laying rail and highway crossings and the presentation of a paper on rail creeping by R. L. Haring, supervisor, Long Island.

New York Railroad Club Meeting

"Speeding Up Operation" will be the subject of the meeting of the New York Railroad Club which will be held in the Engineering Societies Building, New York, on Friday evening, October 20, at 8:00 p. m. A symposium has been arranged which will cover the consideration of better operating methods and practices and ways in which the present plant and facilities may be utilized to greater advantage. This will include the use of signals to facilitate operation, how to get more work out of locomotives and better service from the cars.

Labor Board Deadlocked on M. of W. Wage Increase

Disagreement among the three groups on the Railroad Labor Board has delayed a decision on the requests of maintenance of way employees for a wage increase. On October 4 it became known that the three public members on the board favored an advance of two cents an hour in the pay of common laborers, whereas the labor group and the railway group declined to vote favorably on this increase the former because the increase was deemed inadequate and the latter because they did not believe that such an increase was justified on the testimony presented to the board. This deadlock has continued up to the present time and the present indications are that the board's decision in the maintenance of way case will not be handed down until after the convention of the United Brotherhood of Maintenance of Way Employes and Railroad Shop Laborers at Detroit closes on October 15.

N. Y. C. Meets with Enginemen and Switchmen

Representatives of the Brotherhood of Locomotive Engineers the Brotherhood of Locomotive Firemen and Enginemen and the Switchmen's Union of North America met with officers of the New York Central on October 9 for the purpose of negotiating a new agreement covering wages and working conditions. At the time of going to press these conferences were still on and it was reported that certain new working rules sought by the enginemen were delaying the settlement. The proposal for bonus payments to train and engine crews in freight service is one of the points scheduled for discussion at this meeting.

Strike Settlements in the West

The Chicago Great Western has settled with its employees with the provision that employees who took the places of strikers will head the seniority list. The shopmen's strike on the Gulf Coast Lines and the Houston Belt & Terminal has been ended by an agreement which gives the men seniority and other rights as of June 3. The seniority rights of present workmen not being disturbed. The Louisville & Nashville and delegates from all of the shops of the road have perfected a new organization of shopmen.

The Chicago, Rock Island & Pacific has renewed for one year its agreement with the Brotherhood of Locomotive Engineers covering working rules and conditions.

Conductors and Brakemen Agree with Southeastern Road

An agreement covering wages and working regulations until October 31, 1923, was signed at Washington on October 5 by representatives of the Southeastern railroads and the Order of Railway Conductors and the Brotherhood of Railroad Trainmen. In addition to maintaining the present rates of pay and rules, the agreement provides that all disputes over wages and working conditions now pending before the Railroad Labor Board shall be withdrawn. Committees of representatives of the labor organizations and the managements were given authority to take up and consider elimination or modification of local rules during the tenure of the general agreement.

Would Abandon C. P. & St. L.

A plea for the abandonment of the Chicago, Peoria & St. Louis was made to Judge E. S. Smith in the Circuit court at Springfield, Ill., last week by Attorney A. P. Cook of New York, who represents a majority of the bondholders of that road. Mr. Cook pointed out that the road could neither pay operating expenses nor interest on its obligations. Judge Smith, who named receivers for the road in 1914, directed the attorney to file petition with the State and Interstate Commerce commissions. The road includes 245 miles of line, extending from Peoria, Ill., to St. Louis, Mo., 200 miles; with branch lines from Havana, Ill., to Jacksonville, 42 miles and Alton to Grafton 15 miles. There are shops at Springfield and Jacksonville. It has been in the hands of receivers since 1914, and there is a constantly growing deficit.

Railway Fire Protection Association

This association will meet at Willard Hotel, Washington, D. C. on Tuesday, Wednesday and Thursday, October 17, 18 and 19. The principal committee reports to be presented are the following: On statistics—Geo. R. Hurd, chairman; on handbook—E. H. Berry, chairman; on fire prevention in shop plants—J. R. Peters, chairman; on locomotive fire hazards—Earl N. Floyd, chairman; on forms—W. C. Neely, chairman; on storage and handling of gasoline and electric motor trucks in freight depots and ter-

minals—E. J. Reilly, chairman, [illegible] handling of oxy acetylene apparatus in shops—Gilbert A. Hays, chairman, on docks, piers and wharves and fuel oil on water—W. J. Stevens, chairman; on development and use of national standard couplings—F. H. Elmore, chairman; on coaling plants—W. E. Cathcart, chairman; and on protection of tie and timber treating plants—L. F. Shedd, chairman.

Papers will be read by James L. Madden, manager of the insurance department of the United States Chamber of Commerce, L. P. Kimball (B. & O.), W. T. Krausch (C. B. & Q.) and A. R. Small. There will be a general discussion on Tuesday afternoon on the I. C. C. rules for transportation of explosives, etc., and on gasoline dangers at wrecks and in loading and unloading.

The chairman of the committee on arrangements is E. B. Berry, Southern Railway, Washington.

Speakers for R. B. A. Dinner Announced

The speakers for the fourteenth annual dinner of the Railway Business Association to be held at the Hotel Commodore, New York, on November 9, have been announced as follows: Charles H. Markham, president of the Illinois Central; James A. Emery, counsel of the National Association of Manufacturers, and George Wharton Pepper, senator from Pennsylvania.

The official statement of the Railway Business Association describes the speakers as follows:

President Markham of the Illinois Central has risen from the foot of the ladder on the operating side, was for many years a railroad traffic officer, long an executive in commercial industry, during federal control of railways a regional director, identified with company autonomy in railway labor relations, embodies in his leadership the experience of the railway employee, the railway manager as an employer and in contact with the public, the industrial shipper, the government officer and the public spirited citizen.

James A. Emery, counsel of the National Association of Manufacturers, profound student of the social aspects of government regulation, courageous critic of employers and employees in their policies affecting the public, gifted speaker, voices the needs and views of a very large body of business men whom transportation affects on the one hand as shippers and on the other as employers competing with the railways for labor.

George Wharton Pepper, United States senator from Pennsylvania, appointment of whom to that office brought Pennsylvania national congratulations and who in the subsequent primaries against opposition of organized labor and advocates of the veterans' bonus was nominated by more than 200,000 majority, many years a leader in civic, philosophic and athletic activities, eminent orator, brings to our rostrum the impressions of a trained student of government free from the atmosphere which involves senators who participated in the railway legislation of 1920.

"Big Four" No Longer Exists, Says Lee

According to W. G. Lee, of the Brotherhood of Railroad Trainmen, methods of settling wage and working agreements between the "Big Four" transportation brotherhoods and the railroads have entered a new era, and if the present course of negotiations is continued the country for several years at least will not be threatened with a complete tie-up of railroad transportation through a concerted strike of these brotherhoods on all lines of the nation. Decentralization of all wage and working rules negotiations and a return to the system prevailing for twenty years prior to the time when the four train service brotherhoods pooled their strength into what has since become known as the "Big Four" railroad brotherhoods, has already set in, in the view of Mr. Lee, speaking at Cleveland.

The new alinement of the transportation brotherhoods probably will find the Brotherhood of Railroad Trainmen and Order of Railway Conductors in one group, and the Brotherhoods of Locomotive Engineers, Brotherhood of Locomotive Firemen and Enginemen and the Switchmen's Union of North America in another.

"I feel that I am able to handle my organization to better advantage, to get more for my men and to work more effectively all around if the trainmen and conductors go it alone, so far as wages and working rules are concerned," Mr. Lee said.

"This whole business, with all railroad unions on one side and all railroads on the other, with the Railroad Labor Board in between, got too big for any one man or a few men to handle. It was loaded with dynamite for the country as well as for ourselves and the executives. No sane government would permit any fraction or class to paralyze the transportation business of the country and thereby punish the innocent, who are always in the majority. The only way out was to separate." So far as strikes, wages and working rules negotiations are concerned, the "Big Four" no longer exists. The brotherhoods will continue to work together on legislative, non partisan, political and purely organization matters.

Wage Statistics for July

According to the monthly bulletin of wage statistics issued by the Interstate Commerce Commission, for the month of July, the shopmen's strike was badly broken on July 15, two weeks after it was called. At that date it was only 52 per cent effective from the standpoint both of the number of men employed and the straight time actually worked. Whereas statements by the shopcraft leaders usually referred to the number of men on strike as 400,000, the commission's report says: "Based on the count at middle of month, the number of employees in the maintenance of equipment and stores group as a result of the strike conditions decreased 255,266, or 52 per cent from the number in June, while the total number of hours was 45.4 per cent less. On the other hand, the overtime paid for in this group was more than three times as great in July as in June. The straight time actually worked was 52 per cent less in July than in June."

The report shows a total of 234,837 employees in this group in service at the middle of the month, including 14,088 employed on a daily basis and 220,749 on an hourly basis. The average earnings per employee for the month ranged from $80 for common laborers to $207 for boiler makers. Blacksmiths averaged $155, car men from $141 to $172, electrical workers from $144 to $203, machinists $197, molders $131, sheet metal workers $196. Regular apprentices averaged, however, only $69 and foremen and inspectors in general averaged higher than the classes of employees named. Another change due to the strike is shown in the statement that the police forces were 37,929 greater in July than in June, 1922.

The total number of employees reported by Class I railroads for the month of July shows a net decrease from the previous month of 217,590, or 13 per cent. The increase or decrease (D), by groups, was as follows:

Executives, officials, and staff assistants	372
Professional, clerical, and general	39,526
Maintenance of way and structures	D5,583
Maintenance of equipment and stores	D255,266
Transportation (other than train, engine, and yard)	5,157
Transportation (yardmasters, switch tenders, and hostlers)	1,315
Transportation (train and engine service)	D3,111
Net decrease	D217,590

A comparison of the number of employees and their compensation for the month of July, 1922, with the same month last year follows:

	Number of employees	Total compensation
July, 1921	1,634,872	$214,339,385
July, 1922	1,467,824	193,571,244

The Rock Island Celebration

The celebration of the 70th anniversary of the founding of the Chicago, Rock Island & Pacific Railway was carried out at Chicago, Joliet and other places on Tuesday, October 10, in accordance with the previous announcements. A large number of officers of the road, old-timers and friends of the Rock Island gathered at the LaSalle Station, Chicago, in the morning and an hour was spent in greetings, posing for pictures and other holiday activities. The train shed was jammed with the crowd. A holiday spirit permeated the entire Rock Island System. Among the other features at Chicago was a group of girls dressed in gowns similar to those worn by the women who were passengers on the first train which was run on the opening of the first section of the line from Chicago to Joliet, 40 miles.

At ten o'clock, a special train in charge of Charles Hayden,

chairman of the board of directors, was started for Joliet. It was stopped for two minutes at the shops at 47th street, where the shopmen turned out in full force. This train was in charge of five employees whose aggregate service on the road equals 200 years. Among the passengers was a woman who rode on the first train 70 years ago.

At Joliet, the party proceeded to the Court House lawn, where a monument has been erected to Samuel Benedict Reed, the civil engineer who surveyed the route between Chicago and Joilet. The monument was unveiled by Anne Reed Bates, great granddaughter of the surveyor. A dedication speech was delivered by J. E. Gorman, president of the road. Mr. Gorman took occasion to call attention to the danger of super-regulation of the railroads. The anniversary day was brought to a close with the broadcasting of the story by radio from station KYW. This story was again spread throughout the western country, from other stations farther west, and employees and others at various points all over the system were able to listen to the music of the orchestra and parts of the addresses.

Shop Craft Leaders Continue Fight on "Daugherty Injunction"

Two motions, made before Judge James H. Wilkerson of the Federal District Court at Chicago by Donald R. Richberg, attorney for the railroad shopmen in the "Daugherty injunction case," were defeated on October 6, when the court denied Mr. Richberg's motion that the government file a bill of particulars giving details of the charge made against the strikers in affidavits presented to the court, and also refused to issue an order granting Mr. Richberg's request that the case be pronounced one of "extraordinary public interest" so that three judges of the Circuit Court might be assigned to hear it immediately. At the same time Blackburn Esterline, assistant solicitor general, stated on behalf of the government that the court would be asked to refer the hearings in support of the government's plea for a permanent injunction to a master in chancery. Attorney Richberg also filed, on behalf of the defendants in the case, formal denials of the charges made against them in the government's bill. He again declared that the actions of railroad executives were responsible for the strike and that the men had merely walked out to defend their rights.

When Attorney Richberg appeared before the court on October 5 he declared that he had been unable to see Attorney General Daugherty in Washington to present his plea for an early final hearing or a review of the interlocutory injunction handed down by Judge Wilkerson on September 25. In connection with his statement to the court, Mr. Richberg delivered a copy of a letter to Solicitor-General Beck severely criticizing the position of the government attorneys.

After stating delays and disappointments over an appointment with the government attorneys, Mr. Richberg said he had received a letter from the solicitor general asserting the position of the Department of Justice to be as follows:

"1. If it were practicable to have three circuit judges hear the case, that proceeding would not expedite, but delay it.

"2 That the department invites counsel for the defendants to consider agreeing on a statement of facts and asks counsel for the defendants to submit such a statement of facts.

"3. If an agreed statement of facts is not practicable, then two courses are open:

"(a) A stipulation to submit the case on the affidavits with leave to either party to offer additional testimony.

"(b) A trial of the case largely on depositions taken 'throughout the United States' except where a stipulation of facts may dispense with formal proof."

In the letter in reply to Solicitor-General Beck, Mr. Richberg said:

"There are two matters which the defendants desire to have expedited. First, a review of the interlocutory injunction, and, second, a final hearing of the case. Your suggestions affect only the second matter and practically ignore the matter of probably greater importance to the defendants."

The shop crafts' attorney said he would "seek to obtain protection of the rights of the defendants through orders which the court may enter and through procedure which the court may adopt, despite the manifest opposition of the attorney-general to the entry of any order or the adoption of any procedure which will protect the defendants from the abuse of official power."

"The use of the summary equity procedure to obtain a tentative conviction of 400,000 men of criminal conspiracy upon evidence found solely in an undigested mass of ex parte affidavits reeking with hearsay and perjury has been made the means of depriving these men of liberty and property so long as the interlocutory injunction remains in force," his letter said.

"The department threatens to take depositions throughout the United States' and make the burden of defending as oppressive and expensive as possible to the already deeply wronged defendants. As an alternative the department offers that counsel for the defendants may stipulate that the unknown and unexplored 'Mount Everest of evidence' in the form of affidavits, be submitted as though formally taken, or in other words, that we allow the defendants to be found guilty of a criminal conspiracy without opportunity to cross-examine hundreds of witnesses."

Solicitor-General James M. Beck, on behalf of the attorney-general, in a letter to the counsel for the shop unions, suggested that the best method of expediting the case is to follow the course which would permit of a direct appeal to the Supreme Court. This method, he said, would be "to agree upon a statement of facts for submission to the district court, which would eliminate the necessity of proof as to many matters which as matters of fact are indisputable. If you would care to submit to the department, without prejudice, a statement of such facts as you would agree were the facts of the case, the department could then indicate to what extent it was prepared to accept such statement of facts, as the full evidence in the case, or as part thereof. This course might eliminate thousands of pages of testimony which would be for the convenience, not merely of the court, but also of counsel for both parties."

Labor Board Again Rules Against Contracting

On October 7 the Labor Board handed down twelve decisions, all of which involved principles of contracting. Nine of the decisions condemned this practice, while one favored it. In all of the cases decided unfavorably to the railroad contentions, the Board referred to its decision in a similar case involving the Indiana Harbor Belt and published in the *Railway Age* of May 13, page 1111. The disputes so decided in this latest group of decisions involved the following carriers, contracting companies and facilities:

The Erie and the Meadville Machinery Company for the operation of shops at Dayton, Sharon, Meadville, Hammond, Huntington, Marion, Rochester, Avon, Elmira, Cleveland, Binghamton, Galion, Dunmore, Avoca and Stroudsburg.

The Cincinnati, Indianapolis & Western and the Kellogg-Grego Railway Service Company.

The Cincinnati, Indianapolis & Western for the contracting of certain clerical and station work.

The Pere Marquette and the Fort Street Union Depot for the contracting of the power plant and facilities at Baldwin, Mich.

The Cleveland, Cincinnati, Chicago & St. Louis and the Railway Service & Supply Corporation for the contracting of freight car repair shops at Brightwood and Beach Grove, Ind., and the locomotive repair shops at the latter point.

The Bangor & Aroostook for the contracting of its shops at Houlton, Maine.

The Chicago, Rock Island & Pacific for contracting of coal chutes at Cortland, Kan., Fairbury, Neb., and Lincoln, and a pumping station at South Bend, Neb.

The Michigan Central and the Illinois Car & Manufacturing Company for the contracting of the car shops at West Detroit, Mich.

The Chicago & Alton and Joseph Colianni & Bros. for the handling of coal, sand and cinders and for the pumping of water along its lines.

A dispute involving the New York Central and the Railways Employees Department of the American Federation of Labor, the hearings in which were described in the *Railway Age* of September 17, 1921, page 541, was decided by the board in favor of the New York Central. Contracts entered into by that carrier with the Western Union for the purpose of constructing and maintaining telegraph lines along the New York Central right of way were declared legal by the board inasmuch as they were made in the public interest and the practice had been in effect prior to the passage of the Transportation Act.

Several alleged disputes over the practice of contracting were

at the same time dismissed by the Board. Among the cases of this character being two involving the Ann Arbor and one involving the Southern Pacific, Texas & Louisiana lines.

Railway Returns for August Show Effect of Strikes and Rate Reduction

The net operating income of the Class I railroads totaled $2,579,789 in August, according to reports filed with the Interstate Commerce Commission. This represented a return on an annual basis of only 2.65 per cent of their tentative valuation, the lowest since May, 1921. In August last year the net operating income totaled $90,160,200, which was at the annual rate of return of 4.54 per cent, while in July this year it was $69,239,000, or 4.04 per cent.

The railroads fell short $61,689,500 of a return of 5½ per cent.

Operating revenues were $473,877,000, a decrease of 6.3 per cent compared with the same month last year, while the operating expenses amounted to $387,150,000, an increase of 1.3 per cent. Factors affecting this decrease in revenues and the increase in expenses were the coal miners' and railroad shopmen's strikes and the decrease of approximately 10 per cent in freight rates made effective on July 1.

During the first eight months this year the net operating income was $471,183,600, compared with $300,003,000 during the corresponding period last year. This is at the annual rate of return of 4.07 per cent on the tentative valuation, compared with 2.64 per cent during the first eight months in 1921. Operating revenues for the eight months totaled $3,528,502,000, a decrease of 3.2 per cent, while the operating expenses totaled $2,800,501,000, a decrease of 9.7 per cent.

The carriers in the Eastern district had a net operating income in August of $14,929,990, compared with $35,402,300 during the same month last year. The operating revenues were $227,016,000, a decrease of 4.9 per cent, while the operating expenses amounted to $196,821,900, or an increase of 4.3 per cent.

The railroads in the Southern district had a net operating income in August of $4,618,000, compared with $4,422,000 during the same month last year. The operating revenues totaled $54,321,300, or a decrease of 2.4 per cent, while the operating expenses totaled $46,083,000, or 4.6 per cent under those of August last year.

Carriers in the Western district had a net operating income in August of $33,031,700 compared with $50,335,500 in August last year. The operating revenues for those roads totaled $192,539,300, a reduction of 8.9 per cent, while their operating expenses amounted to $144,245,000, a reduction of ½ of 1 per cent under August one year ago.

Forty-nine roads in August had operating deficits. Of this number 28 were in the Eastern district, 8 in the Southern and 13 in the Western district. In July, 47 had operating deficits.

P. & A. Photo

Anthracite Miners at Nanticoke, Pa., Returning to Work

Traffic News

The Interstate Commerce Commission has assigned the interchangeable mileage book case for oral argument before the full commission at Washington on November 15.

A total of 98,223 travelers visited Yellowstone National Park this year as compared with 81,656 in 1921. Of this number 33,588 persons traveled by railroad to the park's entrance.

F. H. Baer, traffic commissioner of the Cleveland, Ohio, Chamber of Commerce, has been temporarily appointed director of transportation of the Ohio State Fuel Administration, with headquarters at Columbus, Ohio.

The steel mills in Pittsburgh and vicinity report serious congestion because of lack of cars, and at the end of last week, according to newspaper reports, the Carnegie Steel Company had 100,000 tons of finished and semi-finished steel piled up.

The Boston Chamber of Commerce is complaining to the Interstate Commerce Commission alleging lack of cars for the movement of flour and grain eastward, and the Commission is requested to see that export trade in these products is not favored to the detriment of domestic consignees.

The coal situation at New York City has been complicated by the presence in the yards on the New Jersey side of the River of large quantities of anthracite, of small sizes, which cannot be disposed of. At the end of last week, it was said that the total number of these cars loaded in all of the yards was 3,500. It appears that the owners expected to sell this coal largely to owners of apartment houses and to manufacturers; but some of these parties have bought bituminous coal from England and others are apparently waiting for a fall in the price.

The Illinois Central's "Hotel On Wheels," which was so popular at the Knights Templar Conclave held in New Orleans, last April, will be re-established for the American Legion convention to be held in the same city on October 16-20, inclusive. At the time of the Knights Templar Conclave, 2,500 persons were housed in parked Pullman cars, 3,211 meals were served in the Illinois Central dining cars, 1,185 shower baths were provided for and a club house, laundry facilities, barber shop and other comforts were placed at the disposal of the patrons. Present indications are that there will be a demand for a great many more cars for the American Legion than the 125 sleeping cars used in April.

Coal Supplies in Hands of Consumers

As a part of its campaign to stabilize the fuel situation through co-operative effort between the government and business, the Chamber of Commerce of the United States has made a survey of coal supplies in the states east of the Mississippi and north of the Ohio rivers. This part of the country has been regarded as the critical territory in the event of a coal shortage this winter. The information gathered by the Chamber which was obtained through local chambers of commerce, was summarized as follows:

"There are practically no supplies in the hands of local dealers.

"Public utilities, about 45 days.

"By-product coke plants fairly well supplied.

"Steel works fairly well supplied.

"General industries about 45 days.

"The bituminous situation is becoming easier.

"There seems to be no general complaint as to price.

"The critical situation is that of securing sufficient domestic supply in advance of cold weather, especially for the Great Lake states and the populous areas of New York State, New England and the central Atlantic states.

"There is much interest being taken in the use of oil.

"There is a general increase in the use of coke for domestic fuel.

"Certain cities have very effective systems of gathering information and distributing their coal, while others have nothing."

Commission and Court News

Interstate Commerce Commission

The commission has suspended from October 10 until February 7, 1923, the operation of schedules published in supplements to B. T. Jones' tariffs, which propose to either cancel or increase proportional rates on petroleum and petroleum products between Chicago, Ill., and Mississippi and Ohio river crossings on the one hand and points in Central Freight Association, Trunk Line and New England Freight Association territories on the other.

The commission has suspended until February 5, the operation of certain schedules published in supplements to Agent F. A. Leland's tariff which propose to establish reduced proportional rates from Beaumont-Port Arthur-Houston groups, applicable on petroleum and its products (except crude and fuel oil) of 14 cents per 100 lb., and on crude and fuel oil 12½ cents to New Orleans, when final destination is in states other than Alabama, Florida, Georgia, Mississippi, North Carolina and South Carolina, also to establish joint rates from the same groups to points in Western Trunk Line and Central Freight Association Territories.

Court News

Damages to Live Stock Attributed to Inherent Nature

Where it is shown that no injury could have occurred to live stock, received by the carrier in good condition, and properly loaded, from negligence in transportation, but some of the stock are dead on arrival at destination, the West Virginia Supreme Court holds that such result will be attributed to the inherent nature or propensities of the animals, and not to the negligence of the carrier.—Talbott v. Payne (W. Va.) 111 S. E. 328.

Right to Require Change in Railroad Bridges

The Circuit Court of Appeals, Seventh Circuit, holds that the fact that land owners constructed an artificial channel under a bridge built by a railroad company and maintained the channel for more than 20 years gave them no right to require the bridge to be altered and nothing more than a prescriptive right to the use of the channel in its existing condition.—Hines v. Woodson, 280 Fed. 966.

Right to Use Other Railroad's Right of Way Held to Include Right to Install Siding

Where a railroad had the right under its charter to maintain an independent track over another railroad's right of way under proper regulations of such other railroad, the Vermont Supreme Court holds that it could install a siding provided that would not give it an unreasonable advantage over the other railroad and was necessary for the proper use of its own rights.—D. & H. v. Rutland (Vt.) 116 Atl. 211.

Injury to Passenger's Fingers in Door Jamb

The Kansas Supreme Court holds that a railroad is not liable for injuries to a passenger of mature years who in the act of leaving the car places her fingers in the door jamb and the door is blown shut by a gust of wind, when she knew that the door was not fastened, and knew it had been swinging freely "all the time" during her journey of 65 miles.—Brehm v. Atchison, T. & S. F. (Kan.), 206 Pac. 868.

Discontinuance of Branch Line Justified

The Mississippi Supreme Court holds that where it is clear from the evidence that there is no public need to be served by the reconstruction of an abandoned branch line, and no reasonable expectation of present or prospective traffic which would justify the expenditure for its construction, equipment and operation, denial of mandamus to keep the track in operation is proper.—State ex rel. Collins v. Leland Southwestern (Miss.) 91 So. 7.

Not Liable for Delay in Delivery Caused by Strikes

The Maine Supreme Court holds that a carrier is not liable for delay in delivery due to strikes where it has exercised reasonable diligence to prevent them and minimize their consequences. While a master is responsible for the acts of its employee within the scope of his employment, an employee ceases to be such when he strikes. The court points out that some authorities distinguish between peaceable strikes and strikes accompanied by violence.—Warren v. Portland Terminal Co. (Me.) 116 Atl. 411.

"Interstate Shipment" Within Federal Larceny Statute

The Circuit Court of Appeals, Second Circuit, holds that a shipment originating in one state and consigned to a point in the same state, but moving in its course through another state is interstate commerce within the meaning of Act of Congress, Feb. 13, 1913, providing for punishment for larceny of goods in interstate commerce. Such a shipment has become subject to different jurisdictions in the course of transportation, and this makes federal control practically necessary, as well as legally possible.—Yohn v. U. S., 280 Fed. 511.

Not Liable if Passenger Negligently Misuses Step Box

The Louisiana Supreme Court holds that where a carrier of passengers furnishes a step box, it is bound to see that it is safe as to strength, so constructed as not to be easily overturned, is kept in proper condition, and when set out for use by passengers is placed on a level and stable surface; but the carrier is not the insurer of the passenger against the consequences of his own negligence, and where the passenger is injured in attempting to use such appliance without looking at it, and stumbles over or against it when he should have stepped on it, his injuries are attributable to his misuse of the appliance and not to its inadequacy, and the carrier is not liable for the injuries.—Scott v. V. S. & P. (La.) 90 So. 840.

Time Limit on Complaints of Overcharge

The Supreme Court of the State of Washington holds that the provision of the Federal Transportation Act that the period of Federal control shall not be computed as part of the periods of limitation in actions against a carrier or claims for reparation to the commission for causes of action arising prior to Federal control, applies only to the Federal rate regulating statutes, and has no effect on a state statute requiring complaints of overcharges to be filed with the state Public Service Commission within two years from the accrual of the cause of action, and failure to file within that time will bar recovery.—Northern Pacific v. Department of Public Works (Wash.), 207 Pac. 686.

Decisions Under Federal Employers' Liability Act

The New Hampshire Supreme Court holds that an employee engaged in repairing the track of an interstate railroad was within the act.—McLean v. Boston & Maine (N. H.) 116 Atl. 435.

The Mississippi Supreme Court holds that an employee injured while repairing an interstate locomotive dismantled and undergoing general repairs, and out of service several weeks before and after the injury, was not within the act.—New Orleans & Northeastern v. Beard (Miss.) 90 So. 727.

The Minnesota Supreme Court holds that persons engaged in emptying a cinder pit used for cinders from engines engaged both in interstate and intrastate commerce should be held to be employed in interstate commerce.—Stavros v. Chicago, M. & St. P. (Minn.) 186 N. W. 942.

The New York Appellate Division holds that a laborer in a repair and construction gang, about to commence work on an uncompleted facility which would not engage in interstate commerce until completed, i. e., a crossover track, was not engaged in interstate commerce.—Otterstedt v. Lehigh & Hudson, 193 N. Y. Supp. 104.

Foreign Railway News

Mexican National Railways to be Returned to Owners

The Mexican National Railways will be returned to their owners not later than November 15 according to a Mexico City dispatch to the Wall Street Journal. The announcement is reported to have been made by the Mexican treasury department.

New Station at Tampico, Mexico

It has been announced at Tampico that government approval has been given the plans and specifications for the proposed new passenger station of the National Railways of Mexico at Tampico, which plans were drawn by J. Montanez, terminal engineer. The building will cost approximately $500,000 United States currency. It is stated, however, that on account of the financial stringency it is probable that the erection of the station will not be started until the early part of next year.

Prospective Large Equipment Inquiry from Argentina

The La Plata Meridiano Railway, owned and operated by the Province of Buenos Aires, Argentina, has been authorized to construct and equip 650 kilometers of new lines provided proper financial arrangements can be made, according to a cablegram received by the Bureau of Foreign and Domestic Commerce. Originally bids were to be opened October 31, but the date has been put off to December 31. Some of the equipment includes 44,300 tons of 31 kg. rails; 470, 30-ton covered-goods wagons; 30, 30-ton open-goods wagons; 50, 30-ton flat cars; 130, 30-ton cattle cars; 27 Pacific type locomotives; 10 first class, American type passenger cars; 10 second class, American type passenger cars; 39 baggage cars; machinery to equip the shops and numerous miscellaneous items.

Southern Pacific Improves Line in Mexico

Permanent bridges are being built on the line of the Southern Pacific Railroad of Mexico to replace the temporary structures that were erected to meet emergencies during the destructive revolutionary period. It is stated that the Southern Pacific has made a formal offer to the Mexican Government to accept bonds to cover the $12,000,000, United States currency, claim which it holds against the government for losses and damages to its property at the hands of revolutionists. The line all the way from Nogales, Ariz., to Tepic is being placed in first class condition and a gratifying increase of traffic has taken place during the last few months. It is authoritatively announced that the Southern Pacific has not abandoned its original plans for the construction of an extension of its line from Tepic to a connection with the National Railways of Mexico at Orendain, near Guadalajara. It is not known, however, just how soon work will be resumed on this project. It involves the construction of several tunnels and much other heavy work.

South Manchuria Railway Plans Improvement

For the fiscal year ending March 31, 1923, the South Manchuria Railway has appropriated $4,061,910 to be devoted to railway improvements and construction, according to recent information from the company, according to Consul J. W. Ballantine at Dairen.

The double-tracking of the line with 100-pound rails between Tiehsing and Chungku, between Chuantu and Shwangmiaotze, and between Wuchiatun and Suchiatun will be continued, and the type of rails used in the Dairen wharf inclosure will be changed.

At Mukden station a roofed-in passenger platform will be constructed and additional sheeting will be purchased to protect against moisture in connection with the equipment for mixed storage of beans. On the line between Mukden and Suchiatun, an automatic signal system will be installed. The building of additional freight locomotives, reconstruction of rolling stock of all types, and the finishing of 9 freight locomotives and 20 freight cars begun during the previous fiscal year complete the program.

To Electrify Portion of Mexican Railway

Information has been received that at the recent annual meeting of the shareholders of the Mexican (Vera Cruz) Railway Company, held in London, England, provision was made for electrifying the thirty miles of mountain division of the road between Orizaba and Esperanza. The announcement of the proposed improvement came from Vincent W. Yorke, of London, chairman of the board of directors. The electric power for operating trains on this portion of the line will be obtained either from the hydroelectric plant of Lord Cowdray and associates situated near Orizaba or an entirely separate plant will be built by the railroad, it is stated. Mr. Yorke further said that at the shareholders meeting the action of the Mexican (Vera Cruz) Railway Company is obtaining a concession for a proposed railroad to run from a point on its Mexico City-Vera Cruz main line to Tampico was ratified and that financial provision for the early construction of this new line has been made. He announced that the cost of its construction would be approximately $8,000,000 United States currency.

New Philadelphia & Reading Consolidation Type Locomotive

These locomotives have driving wheels 55½ in. in diameter, carry 210 lb. steam pressure and exert a maximum tractive force of 64,300 lb. The total weight of engine and tender is 467,000 lb. Twenty-five locomotives of this design are being built by the Baldwin Locomotives Works.

Equipment and Supplies

Locomotives

THE PERE MARQUETTE is inquiring for 22, 8-wheel switching locomotives.

THE PENNSYLVANIA will build 3 electric locomotives in its Altoona shops.

THE SOUTHERN PACIFIC, TEXAS LINES, is inquiring for 9 Pacific type locomotives.

THE CENTRAL OF NEW JERSEY is inquiring for from 5 to 10 Mikado type locomotives and expects to order additional motive power later.

THE UNITED FRUIT COMPANY has ordered one Mikado type and one 6-wheel switching locomotive from the Baldwin Locomotive Works.

THE TIMISKAMING & NORTHERN ONTARIO has placed an order with the Canadian Locomotive Company for rebuilding and repairing 6 locomotives.

THE LEHIGH VALLEY, reported in the *Railway Age* of September 23 as inquiring for 25 Mikado type locomotives, has ordered 15 Mikado type from the American Locomotive Company and 15 Mikado type from the Baldwin Locomotive Works

Freight Cars

THE PENNSYLVANIA will build 100 steel caboose cars in its Altoona shops.

THE CENTRAL OF GEORGIA is inquiring for 10 steel underframes for caboose cars.

THE PERE MARQUETTE expects to come in the market soon for 2,000 cars, including 1,500 box cars.

THE CHICAGO GREAT WESTERN has awarded a contract to the Pullman Company for 500 box cars.

THE NORFOLK SOUTHERN has ordered 240 steel underframes from the Virginia Bridge & Iron Company.

THE UNITED FRUIT COMPANY has ordered from the Magor Car Corporation 25 cane cars for the Tela Railroad.

THE INTERSTATE RAILROAD has ordered 1,000 box cars of 55 tons' capacity from the Pressed Steel Car Company.

F. M. PEASE, Chicago, Ill., has ordered 100 tank cars of 8,000 gal. capacity from the Pennsylvania Tank Car Company.

THE CHICAGO & NORTH WESTERN will receive sealed proposals until October 20 for 800 steel ore cars of 50 tons' capacity.

THE GRAND TRUNK is having repairs made to 1,000 box cars at the shops of the National Steel Car Corporation, Hamilton, Ont.

JOHN A. ROEBLING'S SONS, Trenton, N. J., have ordered 2 hopper cars of 55 tons' capacity from the Pressed Steel Car Company.

THE OLD TIME MOLASSES COMPANY, INC., has placed an order with the American Car & Foundry Company for 72 tank cars of 10,000 gal. capacity.

THE EAST JERSEY RAILROAD & TERMINAL COMPANY has placed an order with the American Car & Foundry Company for 25 tank cars of 10,000 gal. capacity.

THE UNION PACIFIC was erroneously reported in the *Railway Age* of September 30 as having placed an order with the Mount Vernon Car Manufacturing Company for 50 caboose cars. The inquiry for this equipment has been postponed indefinitely.

THE SINCLAIR REFINING COMPANY, Chicago, has ordered 5 tank cars of 6,000 gal. capacity and 5 of 8,000 gal. capacity from the American Car & Foundry Company.

THE TRANSCONTINENTAL OIL COMPANY has placed an order with the American Car & Foundry Company for 75 tank cars of 8,000 gal. capacity and 75 of 10,000 gal. capacity.

THE FRUIT GROWERS' EXPRESS, reported in the *Railway Age* of August 5 as inquiring for 1,000 refrigerator cars, will build these cars in its own shows at Indiana Harbor, Ind.

THE FRUIT GROWERS EXPRESS, reported in the *Railway Age* of September 23 as inquiring for 1,000 steel underframes, has ordered this equipment from the American Car & Foundry Company.

THE NEW YORK, CHICAGO & ST. LOUIS, reported in the *Railway Age* of September 23 as inquiring for steel underframes has ordered 300 steel underframes for stock cars from the Illinois Car Manufacturing Company.

THE BETHLEHEM-CHILE IRON MINES COMPANY, reported in the *Railway Age* of September 16 as inquiring for 20 ore cars has ordered 25 hopper bottom ore cars of 50 tons' capacity from the Magor Car Corporation.

THE CHICAGO, ROCK ISLAND & PACIFIC, reported in the *Railway Age* of September 23 as contemplating the purchase of 500 box cars, 500 coal cars, 500 automobile cars, 250 flat cars, 250 ballast cars, 250 refrigerator cars and 250 stock cars, has now issued inquiries for these cars.

THE DETROIT TOLEDO & IRONTON reported in the *Railway Age* of September 30 as inquiring for 500 to 1,000 coal cars has ordered this equipment from some company who will lease it a number of such cars until the new cars are constructed. It is reported that the Cambria Steel Company received this contract.

THE ATCHISON, TOPEKA & SANTA FE, reported in the *Railway Age* of October 7 as about to place orders for 2,000 refrigerator cars of 40 tons' capacity, 1,000 automobile cars of 40 tons' capacity, 500 double deck stock cars of 40 tons' capacity, 1,000 box cars of 40 tons' capacity and 500 cars of 50 tons' capacity, has ordered this equipment as follows: 1,000 refrigerator cars, 1,000 automobile cars, and 500 stock cars to the Pullman Company; 1,000 refrigerator cars, 500 gondola cars and 500 box cars to the American Car & Foundry Company and 500 box cars to the Standard Steel Car Company. This company reported in the same issue as having placed an order for 50 caboose cars to the American Car & Foundry Company has increased this order to 150 caboose cars from the same company.

Passenger Cars

THE CHICAGO & NORTH WESTERN is inquiring for 36 coaches, 10 baggage cars, 2 dining cars and 2 cafe parlor cars.

THE BALTIMORE & OHIO, reported in the *Railway Age* of October 7 as inquiring for 30 baggage cars, has ordered this equipment from the American Car & Foundry Company.

THE CENTRAL OF NEW JERSEY will buy new passenger equipment, to include 50 coaches, 5 steel combination passenger and baggage cars and 10 steel combination baggage and express cars.

THE CHICAGO, ROCK ISLAND & PACIFIC, reported in the *Railway Age* of September 23 as contemplating issuing inquiries soon for 50 all steel suburban passenger cars, is now inquiring for 50, 70 ft. steel suburban cars.

Iron and Steel

THE WABASH has ordered 15 000 tons of rail.

THE MISSOURI PACIFIC has ordered 15,000 tons of rail.

THE ANN ARBOR RAILROAD has ordered 3,000 tons of rail from the Midvale Steel & Ordnance Company.

THE TOLEDO ST. LOUIS & WESTERN has placed an order for 8,000 tons of rail with the Carnegie Steel Company.

The Chicago, Rock Island & Pacific has ordered 35,000 tons of rail from the Illinois Steel Company and 5,000 tons from the Inland Steel Company.

The Philadelphia & Reading has placed orders for 25,000 tons of 100 and 130-lb. rail with the Bethlehem Steel Company, Carnegie Steel Company and the Cambria Steel Company.

The Missouri, Kansas & Texas, reported in the *Railway Age* of September 30 as inquiring for 10,000 tons of steel rail, has ordered this tonnage from the Illinois Steel Company.

The Chicago, Milwaukee & St. Paul is reported to have purchased 40,000 tons of steel rail from the Illinois Steel Company and 10,000 tons from the Inland Steel Company.

The New York, Chicago & St. Louis has placed an order for 19,000 tons of rail, divided between Carnegie Steel Company, the Lackawanna Steel Company and the Inland Steel Company.

The Chicago, Burlington & Quincy, reported in the *Railway Age* of October 7 to have ordered 15,000 tons of steel from the Illinois Steel Company, is reported also to have ordered 15,000 tons from the Colorado Fuel and Iron Company and 4,000 tons from Inland Steel Company.

Track Specialties

The Missouri Pacific is inquiring for 3,000 tons of tie plates.

The Norfolk & Western is inquiring for 17,000 kegs of track spikes and 12,000 kegs of track bolts.

The Union Pacific is inquiring for 7,000 tons of tie plates, 10,000 kegs of track spikes and 8,000 kegs of track bolts.

The Missouri, Kansas & Texas is inquiring for 3,000 tons of tie plates, 2,000 kegs of track bolts and 4,500 kegs of spikes.

The Cleveland, Cincinnati, Chicago & St. Louis is expected to place an order this week for 2,500 tons of tie plates and 5,000 kegs of track spikes. The company is also inquiring for 1,250,000 bolts.

Machinery and Tools

The Virginian Railway is inquiring for some shop tools including a gap lathe and an engine lathe.

Miscellaneous

The Imperial Japanese Government Railways have ordered 33,000 car couplers from the American Steel Foundries.

The Erie has awarded a contract to the Truscon Steel Company, Youngstown, Ohio, for the sash required in the construction of its new machine shop at Hornell, New York.

The Chicago, Burlington & Quincy, reported in the *Railway Age* of September 16 as inquiring for 7 overhead electric cranes for its new shops at Denver, Colo., and for 2 gantry cranes for its scrap yard near Aurora, Ill., has ordered this equipment from the Pawling & Harnischfeger Company, Milwaukee, Wis.

Signaling

The New York Central has ordered from the Hall Switch & Signal Company 88 semaphore signals, style L; 542 relays; 401 switch boxes and other signal apparatus.

The Illinois Central has ordered from the Hall Switch & Signal Company 15 color-light signals. These with a previous order, will make a total of 69 light signals furnished by the Hall Company to the Illinois Central.

The Government of Japan has ordered for the Imperial Government Railways from the Union Switch & Signal Company, 275 automatic block signals, of which about half are semaphore and half color-light. The order includes 860 relays, 450 track transformers and other apparatus.

Supply Trade News

The Par-Kar Coach Company, St. Louis, Mich., has been incorporated recently to manufacture motor parlor equipment.

E. S. Berry, until recently with the New York Central and formerly with the **Hall Switch & Signal Company**, Garwood, N. J., has re-entered the service of the latter company as sales engineer.

W. S. Murrian & Co., Knoxville, Tenn., is the southern district representative of the **Flannery Bolt Company**, Pittsburg, Pa. In the *Railway Age* of September 9 it was incorrectly reported that W. S. Murrian & Co. was the representative of the American Flexible Bolt Company.

The Federal Trade Commission has announced the dismissal of its complaint against the Midvale Steel & Ordnance Company, Republic Iron & Steel Company, and Inland Steel Company, in which it was alleged that the proposed merger of the companies was an unfair method of competition. The complaint was dismissed upon the filing with the commission of a formal statement by attorneys of record for the three companies, that the merger had been abandoned.

Charles E. Fisher, assistant engineer, test department, New York, New Haven & Hartford R. R., has been appointed service engineer of the **Franklin Railway Supply Company**, New York, in charge of New England territory, with headquarters at Boston, Mass. After graduation from the University of Michigan, Mr. Fisher served the Pennsylvania Railroad in various capacities for three and one-half years. He then joined the Midvale Steel & Ordnance Company in its material department. While in that position, he was called to Rochester by the Signal Corps and later assigned to the Bureau of Aircraft of the U. S. Government, in which branch of the service he had charge of inspection of all material supplied to the government in that district. Upon completion of the government work, Mr. Fisher entered the service of the New York, New Haven & Hartford in its department of tests and from there went to the Franklin Railway Supply Company.

E. deH. Caldwell on September 1, joined the staff of the **Franklin Railway Supply Company**, New York, as special engineer in its service department. Mr. Caldwell began his railroad service with the Aurora, Elgin & Chicago Electric Railway Company, and from there entered the service of the White Company as superintendent of repairs, in which position he had an active part in the design of steam operated automobiles. After five years in that work, he devoted the next five years as chief engineer of the Webb Jay Motor Company in the design of steam automobile engines. For the next seven years he was vice-president and chief engineer of the Empire Axle Company, following which he served for one year as chief engineer of the Hammond Steel Company, with which organization he was connected at the time of entering the service of the Franklin Railway Supply Company.

E. G. Grace, president of the **Bethlehem Steel Corporation**, stated that the meeting of the board of directors held September 10 was for the purpose of taking final action on formal matters with respect to the Lackawanna purchase. The transaction was completed by delivery on the part of the Lackawanna Company of all instruments for passing title to all its properties and the delivery on the part of Bethlehem to the Lackawanna Company of the Bethlehem stock and cash agreed to be paid therefor. The Lackawanna Company is arranging for the delivery to its stockholders of their pro rata part of the Bethlehem stock and cash upon surrender of the stock of Lackawanna Steel Company held by such stockholders. The exchange is to be made at the office of Kean, Taylor & Company, 5 Nassau street, New York City, and it is expected that it will begin about October 27. All corporate proceedings for the dissolution of the Lackawanna Company have been taken and the dissolution papers are being filed.

President Grace emphatically denies recent rumors to the effect that the Bethlehem Company is considering the purchase of the Midvale Steel Company.

The Atlas Steel Corporation, Dunkirk, N. Y., was organized on October 2, as the result of a merger between the Youngstown Electric Alloy Steel Company, Youngstown, Ohio, and the Atlas Crucible Steel Company, Dunkirk, N. Y. Louis J. Campbell, a former vice-president of the Youngstown Sheet & Tube Company, was elected chairman of the board of directors and will be the active directing head of the corporation. On the board of trustees will be James A. Campbell and H. G. Dalton of Cleveland, Ohio, a vice-president of the Youngstown Sheet & Tube Company; John L. O'Brien of Buffalo, N. Y., and H. F. Van Der Voort of Dunkirk. Of the 20 directors of the new corporation, 12 are well-known Youngstown industrial and financial men, or men connected with the steel industry of the Mahoning Valley, who were members of the board of directors of the Electric Alloy Steel Company. They are: J. A. Campbell, L. J. Campbell, T. J. Bray, W. A. Thomas, Charles S. Thomas, Jonathan Warner, L. A. Manchester, Maurice Joseph, S. Livingston Mather, A. E. Adams, S. P. Ker and W. D. Myers. The other directors include Arthur H. Hunter, R. L. O'Brien, and J. F. Carter of Buffalo; H. F. Van Der Voort, R. J. Gross and H. G. Nichols of Dunkirk, and G. A. Colton and E. B. Green of Cleveland. These men were members of the directorate of the Atlas Crucible Steel Company. The officers of the corporation are: Arthur H. Hunter, president; J. H. Roberts, vice-president; W. D. Myers, secretary and assistant treasurer, and H. G. Nichols, treasurer and assistant secretary. Mr. Roberts was assistant to Mr. Campbell in the Electric Alloy Steel organization, while Mr. Myers was secretary and treasurer of the same company. Both these officers moved with Mr. Campbell to Dunkirk. Reorganization of the entire operating and sales force of the two concerns is now in process.

Pullman Company Issues Annual Statement

The net surplus of the Pullman Company for the fiscal year ending July 31, 1922, was $1,171,294. There was a deficit from the year's operations of $6,228,073, but the balance of the amount received from the government in settlement of claims for the period of federal control ($7,399,367) resulted in a net surplus for the year. President E. F. Carry, in his remarks to the stockholders, states:

> Travel, due to various causes, was at a minimum and it was not until the last few months of our fiscal year that it showed signs of improvement in response to seasonal reductions in railroad passenger rates. This improvement, however, has been halted by the discouragement of travel incident to the shopmen's strike commencing July 1. Acting under authority granted by stockholders at a meeting held on December 20, 1921, your company took over the assets and business of the Haskell & Barker Car Company, Incorporated, as of January 16, 1922, and the position of your company has been strengthened by the acquisition of the malleable foundry, wheel foundry, brass foundry and other manufacturing facilities of the Haskell & Barker plant. To complete this purchase, the capital stock of The Pullman Company was increased by $15,000,000, bringing the present capitalization of the company up to $135,000,000. At the close of the year, July 31, 1922, your company owned 7,674 cars, 202 old cars having been scrapped or sold and 126 new cars having been added to the equipment during the year.
>
> While the purchase of equipment by the railroads during the year far exceeded buying during the last few years, it did not approach normal. Scarcity of labor and materials made manufacturing conditions very unsatisfactory. The coal strike seriously interfered with procurement of materials, and on the whole the year from a manufacturing point of view has been a most aggravating one. Your company has orders for freight and passenger cars sufficient to keep it busy until the development of the new buying movement which is expected to follow the removal of uncertainties produced by the coal strike and railroad strike. There is still a great deficit in railroad equipment which must be supplied before the normal business requirements of the country can be met.
>
> Notwithstanding your company had a definite agreement with its employees in repair shops and cleaning yards, providing for arbitration of all disputes on working conditions, on July 1, a considerable number of employees in these departments, without warning and in violation of their agreement with the company, quit their positions in accordance with the general strike call of the shop craft unions. This walkout occurred in spite of the fact that your company did not cut wages, nor did the company in any way change the conditions under which these employees were working. Your company quickly recruited its forces and has been able to operate efficiently and without interruption.
>
> It is believed that with a settlement of the present labor disturbances and a return to more normal conditions in this country, there will be a large increase in passenger travel and a revival of car-building, which will result in a satisfactory improvement in the business of your company.

The income account for the fiscal year ending July 31, 1922, follows:

Revenue		
Earnings from cars	$62,548,406	
Returns from manufacturing, interest, etc.	3,944,631	
		$66,493,037
Expenses		
Operating expenses, repairs of cars, taxes, insurance, etc.	$55,182,022	
Depreciation on cars, etc.	7,039,248	
		$62,221,270
Net income		$4,271,767
Dividends declared		10,499,840
Deficit from this year's operations after payment of dividends		$6,228,073
Balance of amount received from the United States Railroad Administration in settlement of claim for period of Federal control		7,399,367
Net surplus for the year		$1,171,294

Obituary

Allen Sheldon, one of the Chicago representatives of the Gold Car Heating & Lighting Company, Brooklyn, N. Y., died at his home in Chicago on September 27.

E. B. Tyler, vice-president of the Mississippi Valley Structural Steel Company, and one of the founders of the Decatur Bridge Company, died suddenly of heart trouble in St. Louis on September 27.

Marcellus Lester Bailey, treasurer of the Union Manufacturing Company, New Britain, Conn., died on September 26. He had been connected with the company for more than 45 years, and a director and treasurer for 35 years.

John Francis Harrigan, vice-president of the Magnus Company, Inc., New York, died on October 1 at his home in Detroit, Mich. Mr. Harrigan was 54 years old and had been connected with the Magnus Company in Detroit continuously since 1885.

Trade Publications

Lighting System Maintenance.—A 12-page pamphlet under the title of "Lamp Maintenance Equipment" has been issued by the Thompson Electric Company, Cleveland, Ohio. The booklet illustrates and describes the safety disconnecting hangers manufactured by this company, including methods of wiring and the application of various types of reflectors. The reasons for cleaning reflectors and the risks which may be involved in doing so are described and particular stress is laid to the suitability of the hanger where the lighting units are placed close to moving belts or above traveling cranes.

Control, Signaling and Alarm Instruments.—The Brown Instrument Company, Philadelphia, Pa., has issued a 24-page booklet describing and illustrating the automatic control, signaling and alarm instruments manufactured by that company. The catalogue covers a control pyrometer as applied to electric, gas and oil furnaces, indicating control thermometers, a recording control thermometer, a recording pyrometer, a signaling pyrometer which shows by means of lights when the temperature is within certain prescribed limits, an alarm thermometer, control relays and a motor operated control valve.

There's a Lot of Freight to Move—Let's Move It. This is the title of a leaflet which has been issued by W. D. Beck, superintendent of car service of the Chicago & North Western, for both shippers and employees. Attention is called to the fact that the railroads want cars, not demurrage. Superintendents are urged not to "leave it all to the train dispatcher, the agent, or the conductor; try to dig up at least one car every day that otherwise would have remained idle.

"They are also urged to check on hand reports personally, once a week; also to see that all cars are being loaded full. All employees are urged to watch the cross haul of empties. "Don't pass up these cases, when you see them; but consider that it is your business, and then direct the attention of the proper officer to the condition. * * *."

Railway Construction

CANADIAN PACIFIC.—This company is preparing plans for improvements of its ferry docks at Victoria, B. C., to cost about $150,000.

CANADIAN PACIFIC.—This company has awarded a contract to A. E. Hamilton, Moose Jaw, Saskatchewan for a 100-ton standard mechanical coaling plant at Secretan, Saskatchewan. The company has also awarded a contract to W. A. Dutton, Winnipeg, for grading the final section of the Weyburn-Lethbridge line from Bain, Alberta, to Manyberries.

CHICAGO, BURLINGTON & QUINCY.—This company, reported in the *Railway Age* of September 30 as accepting bids for a one-story reclamation plant, 50 by 301 ft., at Eola, Ill., has awarded the contract to the Great Lakes Construction Company, Chicago. This company, reported in the *Railway Age* of September 23 as closing bids on September 25 for the construction of a passenger station, 24 by 100 ft., at Clarence, Mo., has awarded the contract to G. A. Johnson & Sons, Chicago.

CHICAGO GREAT WESTERN.—This company has awarded a contract to T. S. Leake & Company, Chicago, for the construction of a 20,000-ton capacity car icing plant 82 by 254 ft., at Oelwein, Iowa.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has awarded a contract to the International Filter Company, Chicago, for the construction of a water treating plant at Peoria, Ill., to cost approximately $25,000. The company has also awarded a contract to T. S. Leake & Company for the construction of a passenger station at Graham, Tex.

CHICAGO UNION STATION.—This company closed bids October 12 for the granite and stone work of the main building of the Union Station and for the construction of a signal tower.

ILLINOIS CENTRAL.—This company will construct a passing track of 110 cars capacity at Ramsey, Ill., at a cost of approximately $19,000. This company will also construct an additional connection with the Wabash, Chester & Western at Tamaroa, Ill., at a cost of $15,000.

ILLINOIS CENTRAL.—This company will construct a passenger and freight station at Glenwild, Miss., to cost approximately $9,000. The company will also construct extensions to its passenger station at Webster City, Iowa.

MISSOURI PACIFIC.—This company has awarded a contract to the List & Gifford Construction Company for the construction of a 2½ mile detour line between Corning, Ark., and Knobel involving the construction of 228 panels of trestle and the placing of approximately 60,000 cu. yd. of earth embankment. This company has also awarded contracts to the National Boiler Washing Company for the erection of new water treating plants at Ford, Ill., Knobel, Ark., Jefferson City, Mo., Waverly and Nevada, and for the remodeling of existing plants at Kansas City, Mo., Herington, Kan., Marquette, Concordia and Eads, Col., and Haswell, Union, Neb.

NASHVILLE & ATLANTIC.—The Interstate Commerce Commission has issued a certificate authorizing the construction of a line from Campaign, Tenn., 12 miles, in a southeasterly direction to a point on Rocky River.

NASHVILLE & ATLANTIC.—This company, which was reported in the *Railway Age* of August 19 as applying to the Interstate Commerce Commission for permission to construct an extension from Campaign, Tenn., to Rocky River, a distance of about 12 miles, has completed about four-fifths of the construction which includes a trestle 336 ft. long and 54 ft. high. The Rocky River Coal & Lumber Company, Nashville, Tenn., is the contractor.

NEW YORK, NEW HAVEN & HARTFORD.—This company has awarded a contract to the Roberts & Schaefer Company, Chicago, for a 600-ton reinforced concrete, three-track, Rands shallow pit, automatic electric locomotive coaling plant for installation at Boston, Mass.

NEW YORK, NEW HAVEN & HARTFORD.—This company has awarded a contract to the Roberts & Schaefer Company, Chicago, for the installation of a 300-ton reinforced concrete automatic electric locomotive coaling plant at South Worcester, Mass.

NORTHERN PACIFIC.—This company has awarded a contract to the Winston-Grant Company for the construction of a 50-ft. by 153-ft. two-story brick storehouse with platforms; also the construction of a 45-ft. by 95-ft. concrete and brick boiler and engine room, including a coal trestle, at Glendive, Mont., to cost approximately $70,000.

PENNSYLVANIA.—This company is asking for bids on the work necessary to complete the east bound main track and siding, West Morrisville yard. The approximate quantities are as follows: 15,000 cu. yds. excavation; 0.6 mile unloading, piling, distributing and laying track material; 1,600 cu. yds. unloading and distributing cinder ballast, and 3 No. 8 turnouts unloaded and laid. The work will be in charge of D. P. Pugh, assistant engineer, Norristown, Pa.

STALEY SYSTEM.—W. L. Staley of Grants, N. M., as president of the Staley System of Electrical Railway, has filed an application with the Interstate Commerce Commission for a certificate authorizing the construction of a system of railway extending from a point on the boundary line between Arizona and New Mexico in Pima County, Ariz., to a point on the Colorado-Utah line in Dolores County, Colo., making a total of 950 miles with 222 miles of branches.

UNION PACIFIC.—This company, reported in the *Railway Age* of September 23 as receiving bids for the extension and repairing of its passenger station at Kearney, Neb., has awarded the contract to P. J. Sullivan, Denver, Col.

WENATCHEE SOUTHERN.—The Interstate Commerce Commission has made public a tentative report of an examiner recommending a denial of this company's application for a certificate authorizing the construction of three lines in Washington extending from Wenatchee to Beverly Junction, 53 miles; Hanford to a point near Kennewick, 29 miles, and from a point 13 miles south of Wenatchee to Orondo, 30 miles.

THE IMPERIAL JAPANESE GOVERNMENT RAILWAYS, reported in the *Railway Age* of September 16 as inquiring for 32,900 couplers for freight cars, has ordered these couplers from the National Malleable Castings Company.

THE CHILEAN STATE RAILWAYS, 141 Broadway, New York City, are asking for tenders on October 20 for spare parts for locomotives, cars and coaches to include: 22 sets of superheaters; 265 locomotive axles; 139 tender axles; 1,100 axles for freight cars and passenger coaches; 3,861 tires for locomotive, freight and passenger car wheels; 2,713 steel boiler plates of various sizes, some plain and some flanged for locomotives; 1,290 springs for freight and passenger cars; miscellaneous supplies including 782 superheater flues and accessories for locomotives, coaches and freight cars.

Photo by International

Derailment Along Delaware River, Hankins, N. Y.

Railway Financial News

BALLARD & THOMPSON.—*Application for Certificate Denied.*—The Interstate Commerce Commission has denied this company's application for a certificate for the operation in interstate commerce of a line from Thompson to Sego, Utah, 5.25 miles, heretofore operated as a plant facility.

BOSTON & MAINE.—*Asks Authority to Merge Subsidiaries.*—This company has applied to the Interstate Commerce Commission for authority to acquire by merger the property and franchises of the York Harbor & Beach, Sullivan County, Vermont Valley, Barre & Chelsea, Montpelier & Wells River, and the Portsmouth Bridge, which it has controlled for years through stock ownership. The application states that this will tend to reduce operating expenses by the elimination of accounting, fiscal and other expenses.

CANADIAN NATIONAL RAILWAYS.—*Reorganization.*—See article on another page of this issue entitled "Sir Henry Thornton to Head Canadian National."

CHESAPEAKE & OHIO.—*Authorized to Issue Stock.*—The Interstate Commerce Commission has authorized an issue of $12,558,500 of convertible preferred stock in temporary or definitive form to be sold at not less than par for cash, and the proceeds to be used for additions, betterments and improvements. Authority was also granted for the issue of $12,558,500 of common stock from time to time in conversion of preferred stock of the company.

CHICAGO RIVER & INDIANA.—*Equipment Notes Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $414,700 of equipment notes of the Chicago Junction. The New York Central was also authorized to guarantee the notes.

CHICAGO, ROCK ISLAND & PACIFIC.—*Authorized to Sell Bonds.*—The Interstate Commerce Commission has authorized this company to sell $2,000,000 of 4½ per cent first mortgage bonds of the St. Paul & Kansas City Short Line now held in its treasury, at not less than 83½, to reimburse its treasury for expenditures for additions and betterments to the property of the Short Line company.

CHICAGO, ROCK ISLAND & PACIFIC.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $5,000,000 of first and refunding mortgage 4 per cent gold bonds to be sold at not less than 85, the proceeds to be used for additions and betterments, instalments of equipment trust notes and to pay indebtedness of the applicant to the War Finance Corporation.

CRYSTAL RIVER & SAN JUAN.—*Authorized to Operate Railroad.*—The Interstate Commerce Commission has issued a certificate authorizing this company to operate its railroad extending from a connection with the Denver & Rio Grande Western at Carbondale, Colo., in a general southerly direction to Placita, Colo., 20.66 miles, and also the railroad of the Crystal River Railroad Company extending from Placita to Marble, 7.32 miles. The former railroad was built by an industrial company for the transportation of quarried marble and the latter is controlled by the Colorado Fuel & Iron Company.

DAYTON, TOLEDO & CHICAGO.—*Asks Authority to Abandon Line.*—The receiver has applied to the Interstate Commerce Commission for authority to abandon its line from Delphos to Stillwater Junction, Ohio, 90 miles.

DENVER & RIO GRANDE.—*Sutro Committee Re-opens Contest.*—A committee, of which Richard Sutro is chairman, and the other members are Lewis L. Clarke, president of the American Exchange National Bank, and William Loeb, Jr., has asked holders of the Denver & Rio Grande first and refunding mortgage five per cent bonds and the seven per cent cumulative adjustment mortgage bonds to deposit their securities with the American Exchange National Bank, the depository of the Sutro committee. In its statement to the security holders the Sutro committee says:

> An exigency has arisen affecting the security of your investment and requiring prompt and aggressive action for its protection. This has prompted the undersigned committee to urge you to deposit with it such of your refunding bonds as have not yet been deposited with any of the committees, and to withdraw from the Hammond committee (which is charged to be acting for or under the domination of the Western Pacific Corporation) and from the Perkins committee (which is charged with being a Missouri Pacific committee), as well as from the Equitable Trust Company, which is admittedly acting in the interest of the Western Pacific Corporation, by depositing with the undersigned committee all certificates of deposit in respect of such bonds as are held by you.

The Sutro committee has made public a long letter from its counsel, Samuel Untermyer, narrating his application to the Federal Court in Denver for an order to the receiver to default interest payment on Rio Grande Western consolidated 4 per cent bonds. Mr. Untermyer points out that such default is the only method by which holders of the Denver refunding and adjustment bonds may recover an equity to which they are entitled in the stock of the Utah Fuel Company, which is pledged under the Rio Grande Western consolidated 4s. He advises that the refunding mortgage bondholders should insist to the court that default be made in interest on the Rio Grande Western bonds as a means of forcing the trustee of that mortgage into court, that they appeal in event of an adverse ruling and that they apply to the Interstate Commerce Commission for an open investigation of the history of the Denver & Rio Grande and the Western Pacific and their relations with the Missouri Pacific.

DETROIT, BAY CITY & WESTERN.—*Receivership.*—H. L. Stanton, vice-president of the Detroit Trust Company, has been appointed receiver of this road by the United States District Court for the eastern district of Michigan. The Detroit, Bay City & Western operates between Bay City, Mich., and Marine City, 120 miles.

ILLINOIS CENTRAL.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $6,645,000 of equipment trust certificates to be issued by the Commercial Trust Company of Philadelphia and sold at not less than 95.

INTERNATIONAL & GREAT NORTHERN.—*Reorganization—New Officers.*—According to J. & W. Seligman & Co. and Speyer & Co., reorganization managers, J. W. Kendrick and T. A. Hamilton, now vice-president of the St. Louis-San Francisco, will be president and general manager of the newly reorganized International & Great Northern. The details in connection with the reorganization are progressing to the satisfaction of the reorganization managers and it is expected that the reorganization will be completed and the new securities ready for delivery before the end of the present year.

MISSISSIPPI & ALABAMA.—*Authorized to Operate Line.*—The Interstate Commerce Commission has issued a certificate authorizing this company to operate under lease 17 miles of railroad from Vinegar Bend, Ala., to Leakesville, Miss., a part of the line formerly operated by the Alabama & Mississippi which the commission had permitted that company to abandon.

MORGANTOWN & WHEELING RAILROAD.—*Asks Certificate for Acquisition and Operation.*—This company has applied to the Interstate Commerce Commission for a certificate authorizing the acquisition and operation of the property of the Morgantown & Wheeling Railway between Blacksville and Morgantown, W. Va., 25 miles, and that of the Monongahela & Ohio, 3¼ miles, in connection with its own line of 14 miles from Waynesburg, Pa., to Blacksville, which will make a through line from Morgantown to Waynesburg, Pa.

OREGON TRUNK.—*Authorized to Abandon Deschutes Canyon Line.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of this company's line from South Junction to Metolius, Ore., 28.92 miles, part of its main line up the Deschutes Canyon, which for the greater part of its distance is paralleled by the Central Oregon branch of the Oregon-Washington Railroad & Navigation Company. The two lines were built by the Hill and Harriman interests at a time of keen competition after which an agreement was made for partial joint construction and operation and but one line was built from

(Continued on Page 729)

Annual Report

Twenty-Eighth Annual Report of Southern Railway Company — Year Ended Dec. 31, 1921.

R[illegible] V[illegible], October 1[illegible], 19[illegible].

To the Stockholders of

SOUTHERN RAILWAY COMPANY

The Board of Directors submits the following report of the affairs of the Company.

The income account for the year ended December 31, [illegible], which was published in March last and showed a balance of $[illegible] over fixed charges is here reproduced as the first of the [illegible] tables of financial data and statistics. It should be stated, [illegible] a comparative study, that some of the non-operating income figures include items, made available through settlements between the Federal Government and affiliated companies, which are not [illegible] operations during that year.

This report will be devoted to a discussion of matters of current interest.

OPERATIONS

The financial results from operation for the first half of the current year present a gratifying comparison with the year 1921. During the six months from January first to June 30, 1922, the operating income remaining after the payment of expenses, taxes, hire of equipment and joint facility rents amounted to $8,877,425, an increase of $6,733,478 over the $2,143,947 of operating income for the first six months of the preceding year. The gross was approximately the same, being $421,331, or little more than one half of one per cent., less in 1922 than in 1921. The revenue from freight traffic was $[illegible],3[illegible] or 5.68%, larger in 1922, but there was a falling off of about the same amount in revenue from the operation of passenger trains. Notwithstanding the fact that approximately the same passenger train service had to be maintained for a substantially smaller volume of traffic, operating expenses in the first six months of 1922 were reduced $7,538,785, or 13.51%, below the level for the same period of 1921, and of this reduction more than five millions were saved in conducting transportation, less than one-half of that amount being cut from the maintenance appropriations. The operating and transportation ratios in the first six months of 1922 were 77.87 and 39.39, respectively, compared with 89.43 and 47.14 in the preceding year. A surplus of $2,003,737 of income remaining after the payment of fixed charges for the first six months of 1922, compared with a deficit of $4,757,515 for the same period of 1921, an improvement of no less than $6,761,252.

These results augured well for a prosperous year, but the realization has been deferred by the consequences of what must now be recognized to have been a futile, if well intentioned, effort by governmental regulating bodies to reduce the cost to the public of freight transportation. First the Interstate Commerce Commission directed that effective July 1, 1922, freight rates should be lowered ten per cent. below the level which obtained on August 26, 1920. Then the Railroad Labor Law decided that wages of certain employees should be reduced from the same date. A nation wide strike of members of the several organizations of railroad shop crafts followed the application of that decision. The strike was a failure and is now history, but it may well have had the economic effect of postponing indefinitely any further diminution of freight rates. Uncertainty will continue to obscure hope in these respects so long as one governmental agency fixes income and another fixes outgo without economic relation the one to the other. If governmental agencies are to continue to determine the destiny of the railroads in these vital respects, there must be such coordination between those agencies as will relate their policies and at the same time establish their power to carry the whole purpose into effect. The time seems to have come for a single responsible regulating commission.

Despite these handicaps for lower freight rates and disorganization of labor, the results for the full year 1922 should be satisfactory, given during the remainder of the year the volume of traffic which now appears reasonably assured.

INDUSTRIAL AND AGRICULTURAL DEVELOPMENT IN THE TERRITORY SERVED.

Business in the South is again on the upgrade.

The output of the mills and factories has been steadily increasing during the last few months.

An outstanding feature has been the operations of the cotton mills, a happy contrast with the strike-ridden cotton manufacturing centers of the East. In July, 1922, according to figures compiled by the United States Census Bureau, 96.97 per cent. of the spindles in mills in the cotton producing states were active, while in other states the percentage of active spindles was only 78.53. During that month the average active spindle hours in the South was 250 compared with 145 in other states. In the twelve months ended July 31, 1922, the mills in the cotton producing states consumed 3,733,147 bales, which compares with a consumption of 2,178,767 bales by mills in the other states. The more favorable conditions for the cotton manufacturing industry in the South are reflected not only in operating statistics, but also in the record of new mill construction. During the same twelve months, according to the Census Bureau reports, there was a net increase of 245,831 spindles in Southern mills, and a net increase of only 79,627 spindles in mills in states outside of the South. A survey of new mills under construction or in prospect, indicates a continuation of the tendency shown by these figures.

There has been unusual activity in the provision of new business and residential structures, as well as in the construction of improved highways.

The mineral exhibit by Southern Railway System at the National Exposition of Chemical Industries held annually in New York City, has been productive of good results. It has afforded a convenient opportunity for those looking for new supplies of raw materials actually to see specimens of the materials available in the South, and to learn the location, character and extent of the deposits. The latest exhibit in September, 1922, called forth a large number of interested inquiries which should result in the establishment of new enterprises, as well as the enlargement of existing operations, with resultant increases in the Company's traffic.

While the farmers of the South have not recovered from the fall in the prices of staple farm products which occurred in 1920, a large part of the indebtedness which they were compelled to incur in 1920 and 1921 has been discharged, thanks to the practice of economy and the diversification of farm operations.

The Southern farmer is making hopeful progress in his journey from dependence upon a single money crop, with its one pay-day per year at market time for cotton or tobacco, toward the independence to be obtained by the operation of his farm to yield cash returns throughout the year from the sale of truck crops, cattle, hogs, poultry and dairy products. One proof of this progress is found in a report by the United States Bureau of Markets that from January 1, 1922, to August 19, 1922, there were shipped from the states of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and Tennessee, 107,2[illegible]8 carloads of cabbage, canteloupes, lettuce, onions, strawberries, sweet potatoes, tomatoes, water

Table 1.—INCOME STATEMENT

	1921	1920
Operating Revenues		
Freight	$85,185,0[illegible]1.64	Operating Revenues and Expenses are not comparable, the property having been operated by the United States Railroad Administration during January and February, 1920.
Passenger	32,1[illegible]4,922.[illegible]	
Miscellaneous Passenger Train	977,457.21	
Mail	3,373,069.76	
Express	2,649,455.14	
Other Transportation	1,2[illegible]8,256.26	
Incidental	2,29[illegible],06[illegible].57	
Joint Facility	874,845.34	
Total Operating Revenues	$1[illegible]8,715,150.[illegible]	
Operating Expenses:		
Maintenance of Way and Structures	$19,287,487.46	
Maintenance of Equipment	23,396,099.60	
Traffic	2,556,857.51	
Transportation	55,443,873.12	
Miscellaneous Operations	1,055,[illegible]85.09	
General	4,096,996.90	
Transportation for Investment—Credit	7,392.72	
Total Operating Expenses	$105,829,006.96	
Net Revenue from Operations	$22,886,143.05	
Taxes	$4,582,292.92	
Uncollectible Revenues	85,042.89	
Hire of Equipment	3,407,707.62	
Joint Facility Rents	839,317.71	
Total Other Expenses	$8,914,361.14	
Operating Income	$13,971,781.91	$15,320,073.35
Non-Operating Income		
Income from Lease of Road	$207,279.84	$32,405.98
Miscellaneous Rent Income	263,558.35	248,308.57
Income from Rail Leased	99,902.36	82,629.78
Dividend Income	2,112,894.73	1,268,692.48
Income from Funded Securities	888,535.41	904,361.02
Income from Unfunded Securities and Accounts	652,568.93	286,597.66
Miscellaneous Income	14,453.80	27,542.79
Total Non-Operating Income	$4,239,193.42	$2,850,538.28
Total Gross Income	$18,210,975.33	$18,170,611.63
Deductions from Total Gross Income:		
Rent for Leased Roads	$2,585,420.94	$2,827,173.41
Miscellaneous Rents	11,322.03	45,058.29
Separately Operated Properties	574,687.34	548,734.18
Interest on Unfunded Debt	663,725.49	492,405.61
Miscellaneous Income Charges	145,638.70	123,387.99
Total Deductions of this Class	$3,981,794.50	$4,036,758.48
Total Available Income	$14,229,180.83	$14,133,853.15
Interest on Funded Debt	$11,061,795.31	$11,144,830.00
Interest on Equipment Obligations	914,754.75	1,046,866.26
Dividend on Southern Railway—Mobile and Ohio Stock Trust Certificates	226,008.00	226,008.00
Total Deductions of this Class	$12,202,558.06	$12,417,704.26
Balance of Income Over Charges	$2,026,622.77	$1,716,148.89
Dividend of 2½% on Preferred Stock Paid December 31, 1920		1,500,000.00
Additions and Betterments Charged to Income		88,094.20
Miscellaneous Appropriations of Income	7,252.37	14,340.81
Balance Carried to Credit of Profit and Loss	$2,019,370.40	$113,713.88

Table 2.—PROFIT AND LOSS.

Credit Balance December 31, 1920		$46,974,374.24
Add:		
Credit Balance of Income for the Year	$2,019,370.40	
Credit Resulting from Settlement of Claim Against United States Government	17,949,785.34	
		19,969,155.74
		$66,943,529.98
Deduct:		
Property Retired	$3,302,331.54	
Securities Written Down	4,577,196.00	
Accounts Written off	1,610,383.94	
Discounts on Securities	1,190,749.41	
Net Miscellaneous Debits	822,073.66	
		11,502,734.55
Credit Balance December 31, 1921		$55,440,795.43

carloads, Irish potatoes, peaches and mixed vegetables, compared with 83,629 carloads for the same period of last year, an increase of 23,669 carloads, or 28.30 per cent., and this showing was made in spite of the fact that there was a substantial decrease in production of watermelons and peaches because of unfavorable weather conditions. Other bits of evidence of the same character are the establishment of twenty-six new creameries in the territory served by Southern Railway System, a large increase in the production of butter, the raising in south Georgia of milk fed poultry along the lines for many years profitably practiced in east Tennessee, the placing on farms throughout the territory of more pure bred poultry than in any previous year, and the growing of high grade tobacco in South Carolina and Georgia.

The higher price for cotton accompanying last year's small crop, led to larger plantings this year throughout the entire cotton belt. Adverse weather conditions and boll weevil ravages have cut down the yield in some localities, but latest condition reports appear to indicate that this year's crop will be larger than last. Production costs have been relatively low, and the crop should be sold at profitable prices.

The movement of farm settlers into the South, comparatively light for several years past, shows signs of increasing. Sound and conservative colonization projects are being launched in several localities served by Southern Railway System. Lands will be prepared for farming and offered on terms which should attract a desirable class of farmers from parts of the United States where land prices, measured by productive value, relatively are much higher than in the South.

It is fair to say that the farmers of the South now are in a more cheerful state of mind than they have been at any time for the past two years.

IMPROVEMENTS AND BETTERMENTS IN THE CAPITAL ACCOUNT.

No additions of importance were made to the property during the year 1921, but in May last arrangements were made to acquire 6,445 box cars, 700 passenger-train cars and 250 caboose cars. The cost of this equipment is $11,736,000, and the money was provided partly from current treasury funds, and the remainder from the sale of $9,300,000 Series "W" 5½% equipment trust certificates dated May 15, 1922, payable in thirty equal semi-annual installments. The substantial addition to the freight car supply thus provided should go far toward remedying the hire of equipment balances against the Company which have been conspicuous in recent income statements.

A start has been made in relaying with 100-lb. rail the existing 85 lb. rail in the heavy traffic main lines.

FINANCING CAPITAL REQUIREMENTS.

Confronted with the necessity of enlarging its facilities to handle a growing traffic, and unable to obtain a satisfactory price for four per cent. bonds secured by the Development and General Mortgage, the Company has for many years past been forced to resort to short term note issues to provide money for essential additions and improvements. The latest issue of $25,000,000 of such notes, made in 1919, to refund a previous issue, matured on March 1, 1922, and presented again the constantly recurring financial problem. A solution was found in the sale of thirty million dollars of bonds issued under the Development and General Mortgage carrying coupons calling for the payment of interest at the rate of six and one-half per cent. per annum. While only four per cent. of this annual interest rate could be secured by the mortgage, because of an express limitation in that respect, the remaining two and one-half per cent. interest is represented by the Company's unconditional promise to pay and is further protected by a covenant to secure such payment in any new mortgage which hereafter may be placed upon the railways subject to the Development and General Mortgage. An immediate and wide distribution of these new bonds was convincing evidence of hearty approval of the issue by the investment community. From the proceeds of this financing the short term notes were paid off, as also was a loan owed to the War Finance Corporation.

RELATIONS WITH EMPLOYEES.

To all officers and employees who have faithfully and efficiently performed their duties, the thanks of the Board of Directors again are tendered. Especially does the Board desire to record its appreciation and admiration of the service rendered by those loyal and courageous officers and employees who operated the railroad during the strike.

The Directors, with deep regret, record the death on August 11, 19.., of their esteemed associate Bishop John Carlisle Kilgo.

Respectfully submitted, by order of the Board,

FAIRFAX HARRISON,
President

Table 3—GENERAL BALANCE SHEET.

ASSETS	December 31, 1921.	December 31, 1920.
Investments:		
Investment in Road	$349,621,233.47	$352,256,487.95
Investment in Equipment	90,183,524.90	89,344,507.44
Total Investment in Road and Equipment	$439,804,758.37	$441,600,995.39
Cash Deposited in Lieu of Mortgaged Property Sold	$6,800.00	$9,822.50
Miscellaneous Physical Property	989,206.59	918,982.98
Investments in Affiliated Companies:		
Stocks	$35,224,658.76	$35,329,105.90
Bonds	26,307,912.28	28,307,968.38
Notes	4,535,655.53	4,936,368.04
Advances	3,873,143.96	4,222,017.69
Total Investments in Affiliated Companies	$69,941,370.53	$72,795,460.01
Other Investments:		
Stocks	$94,008.00	$94,007.00
Bonds	2,658,913.45	5,158,913.45
Notes	421,460.24	418,680.17
Total Other Investments	$3,174,381.69	$5,671,600.62
Total Investments	$513,916,517.18	$520,996,861.50
Current Assets:		
Cash	$8,097,605.58	$7,969,141.67
Special Deposits	8,475,700.50	3,062,487.10
Loans and Bills Receivable	867,662.92	532,810.10
Traffic and Car Service Balances Receivable	2,720,022.19	2,522,554.16
Balances due from Agents and Conductors	312,615.45	1,250,792.01
Miscellaneous Accounts Receivable	7,006,758.98	11,023,190.39
Material and Supplies	13,473,154.76	17,635,896.18
Interest and Dividends Receivable	1,277,280.99	768,220.39
Other Current Assets	540,526.22	1,788,645.36
Total Current Assets	$42,771,327.59	$46,553,737.45
Deferred Assets:		
Working Fund Advances	$48,836.78	$40,547.06
Cash and Securities in Insurance Fund	1,246,037.33	1,252,975.32
Cash Deposited under North Carolina Railroad Lease	175,000.00	175,000.00
Other Deferred Assets	86,383.33	442,910.46
Total Deferred Assets	$1,556,257.44	$1,911,432.84
Unadjusted Debits		
Insurance Premiums and Rents paid in Advance	$18,228.58	$67,189.43
Additions and Betterments Expenditures		
Freight Claims, Foreign Mileage and Sundry Items in Suspense	(329,108.22)	4,755,661.91
Total Unadjusted Debits	$3,317,336.80	$4,822,851.14
		$15,112,487.60
Claim Against United States Government		
Securities of the Company held by it	1921	1920
Unpledged	$25,568,200.00	$7,453,200.00
Pledged	48,311,000.00	105,000.00
Totals	$73,879,200.00	$65,947,200.00
Grand Total	$561,591,439.01	$609,427,370.53

LIABILITIES	December 31, 1921	December 31, 1920
Capital Stock:		
Common	$120,000,000.00	$120,000,000.00
Preferred	60,000,000.00	60,000,000.00
Total Southern Railway Company Stock	$180,000,000.00	$180,000,000.00
Southern Ry. Mobile & Ohio Stock Trust Certificates	$5,650,200.00	$5,650,200.00
Long Term Debt (Table 4)	$237,318,500.00	$234,212,500.00
Equipment Trust Obligations (Table 5)	15,773,800.00	18,721,000.00
Total Long Term Debt	$253,092,300.00	$252,933,500.00
Total Capital Liabilities	$438,742,500.00	$438,583,700.00
Governmental Grants:		
Grants since July 1, 1914, in aid of Construction	$84,078.58	$84,078.58
Current Liabilities:		
Loans and Bills Payable	$5,954,270.00	$7,880,270.00
Traffic and Car Service Balances Payable	2,023,634.11	3,963,900.37
Audited Accounts and Wages Payable	14,592,011.25	21,126,810.15
Miscellaneous Accounts Payable	2,399,027.75	2,975,592.00
Interest Matured, including interest due January 1st	2,925,320.70	2,898,169.30
Dividends Matured Unpaid	820.00	2,200.00
Funded Debt Matured Unpaid	32,589.80	161,727.80
Unmatured Dividends Accrued	56,502.00	56,502.00
Unmatured Interest Accrued	1,824,735.32	1,931,730.60
Unmatured Rents Accrued	320,804.96	356,108.58
Expenses Accrued not vouchered	1,490,511.86	1,420,563.03
Other Current Liabilities	1,089,735.58	1,854,530.99
Total Current Liabilities	$32,709,963.33	$44,627,113.70
Deferred Liabilities:		
Sundry Deferred Liabilities	$1,291,545.53	$1,624,081.39
Unadjusted Credits:		
Taxes	$1,251,395.94	$675,180.43
Insurance Reserve	1,346,037.33	1,252,975.32
Operating Reserves	1,304,255.11	2,762,304.84
Depreciation accrued on:		
Rail Leased to Other Companies	131,268.41	139,899.47
Equipment Owned	24,674,114.84	22,508,413.47
Equipment Leased from Other Companies	650,662.48	563,132.71
Sundry Items	2,309,388.66	3,985,425.10
Total Unadjusted Credits	$31,546,722.77	$31,887,412.14
Corporate Surplus:		
Additions to Property, since June 30, 1907, through Income and Surplus	$1,754,740.19	$1,661,187.48
Miscellaneous	21,593.18	14,340.81
Total Appropriated Surplus	$1,776,333.37	$1,675,528.29
Profit and Loss—Balance	$55,440,795.43	$46,974,374.24
Unadjusted Items (Net) Subject to Settlement of Claim with United States Government		$43,971,082.20
Grand Totals	$561,591,439.01	$609,427,370.53

(*Continued from page 726*)

Metolius to Bend. The companies have now agreed upon the joint use of the line of the Oregon-Washington between South Junction and Metolius and the Oregon Trunk desires to remove its tracks.

PENNSYLVANIA.—*Authorized to Lease Subsidiaries.*—The Interstate Commerce Commission has issued a certificate authorizing the acquisition by lease for 999 years of the Wheeling Terminal; Englewood Connecting; South Chicago & Southern; Toledo, Columbus & Ohio River; Cleveland, Akron & Cincinnati; Cincinnati, Lebanon & Northern; Pittsburgh, Ohio Valley & Cincinnati; Ohio Connecting; Indianapolis & Frankfort, and the Louisville Bridge & Terminal.

SABINE & NECHES VALLEY.—*Acquisition of Line Authorized.*—The Interstate Commerce Commission has issued a certificate authorizing this company to acquire and operate 11½ miles of railroad from Deweyville to Gist, Texas, and to issue $100,000 of stock, $82,000 of which, together with $24,000 of promissory notes, are to be used in payment for the railroad.

SOUTHERN PACIFIC—*Petition for Rehearing of Dissolution Case Denied.*—The United States Supreme Court on October 9 denied this company's petition for a rehearing of the case in which the court ordered a separation of the Central Pacific from the Southern Pacific.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—The stockholders on October 9 voted to increase the capital stock from $50,000,000 to $100,000,000. President Henry Miller said:

> The Terminal Railroad Association of St. Louis has outgrown the original financial structure of $50,000,000 made in 1902. At that time it could not be foreseen that the rail tonnage of this region would treble in 20 years. In the light of this experience, the plan and scope must be broadened. It is of vital importance to this community and the railroads that transportation facilities be provided through which traffic may flow freely in increasing volume, and every impediment should be removed as early as possible. Hence, the stockholders and directors at today's meeting voted to increase the authorized capital stock and bonded indebtedness from $50,000,000 to $100,000,000, to provide the financial means for improvements and future growth of the properties and to meet maturing obligations.

VIRGINIAN.—*Ford Not Seeking Road.*—President Clarence W. Huntington denies reports that Henry Ford has attempted to buy the Virginian or that any change in control or management of the road may be expected.

According to dispatches from Norfolk, Ford has long sought a deep-water terminal for a steamship line which could handle his automobile export business.

WESTERN PACIFIC.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $5,500,000 of first mortgage 6 per cent bonds, the proceeds to be applied to the acquisition of 2,000 refrigerator cars and 100 automobile cars. It is proposed to sell the bonds at 94.

Dividends Declared

Morris & Essex Extension.—2 per cent, payable November 1 to holders of record October 24.

Passaic & Delaware Extension.—2 per cent, payable November 1 to holders of record October 24.

Pere Marquette.—Preferred, 1¼ per cent, quarterly; preferred (account accumulated dividends) 1 per cent; prior preferred, 1¼ per cent, quarterly; all payable November 1 to holders of record October 14.

Syracuse, Binghamton & New York.—3 per cent, quarterly, payable November 1 to holders of record October 24.

Utica, Chenango & Susquehanna.—3 per cent, payable November 1 to holders of record October 14.

Trend of Railway Stock and Bond Prices

	Oct. 10	Last Week	Last Year
Average price of 20 representative railway stocks	72.35	72.58	56.48
Average price of 20 representative railway bonds	88.65	88.70	76.99

THE CHICAGO UNION STATION, reported in the *Railway Age* of August 12 as inquiring for 8 tractors and 200 trailers for use in the mail building, has ordered 6 tractors and the 200 trailers from the Mercury Manufacturing Company, Chicago, and 2 tractors from the Elwell-Parker Electric Company, Cleveland, Ohio.

Railway Officers

Executive

W. R. McGraw, superintendent of the St. Louis Southwestern, with headquarters at Pine Bluff, Ark., has been elected vice-president of the St. Louis Southwestern of Texas, and appointed general superintendent of the St. Louis Southwestern lines, with headquarters at Tyler, Tex.

Financial, Legal and Accounting

Clarence R. Smith has been appointed auditor of the Cambria & Indiana with headquarters at Philadelphia, Pa., effective September 20.

Operating

H. H. Hooper has been appointed superintendent of the Cambria & Indiana with headquarters at Colver, Pa., effective September 20.

H. C. Brock has been appointed trainmaster of the Plains division of the Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Tex.

M. O. Willard, supervisor of wages of the Oregon Short Lines, has been appointed assistant to the general manager, with headquarters at Salt Lake City, Utah.

J. P. Johnson, assistant superintendent of the Canadian National, with headquarters at Prince Albert, Sask., has been promoted to superintendent of the Prince Albert division, with the same headquarters.

D. W. Bowker, assistant superintendent of the St. Louis Southwestern, with headquarters at Illmo, Mo., has been promoted to superintendent, with headquarters at Pine Bluff, Ark., succeeding W. R. McGraw, promoted, and will be succeeded by **H. A. Dickey**.

A. C. McDamnell, general superintendent, purchasing agent and traffic manager of the Detroit, Bay City & Western, with headquarters at Bay City, Mich., has been appointed general manager, acting for the Detroit Trust Company, which has been appointed receiver of this road.

J. W. Riley has been appointed district manager of the Car Service Division with headquarters at St. Louis, Mo. He will have the authority of the Car Service Division in the territory which includes terminals at St. Louis, Kansas City, St. Joseph, Omaha, Council Bluffs, and other outlying points as may be directed.

Traffic

M. R. Scanlon has been appointed general agent of the Green Bay & Western, the Kewaunee, Green Bay & Western and the Ahnapee & Western, with headquarters at Toledo, Ohio.

Mechanical

O. M. Foster has been appointed district superintendent of motive power of the New York Central with headquarters at Collinwood, Ohio. **W. R. Lye** has been appointed district superintendent of motive power with headquarters at Elkhart, Ind.

H. Jefferson has been appointed road foreman of engines of the Second and Third Districts of the Plains division of the Atchison, Topeka & Santa Fe, with headquarters at Amarillo, Texas. **W. C. Sherman** has been appointed road foreman of engines of the First, Shattuck and Buffalo districts, including the Canadian terminal of the Plains division, with headquarters at Canadian, Texas.

Engineering, Maintenance of Way and Signaling

J. H. Baker, whose promotion to assistant engineer of valuation of the Southern Pacific, with headquarters at Los Angeles, Cal., was reported in the *Railway Age* of August 26 (page 403), was born April 30, 1882, at New York. He entered railway service in April, 1905, as a chainman on the Los Angeles & Salt Lake and until November, 1905, was successively rodman and levelman. From November, 1905, to November, 1907, he was engaged in subdivision work at Los Angeles and levelman and transitman on location surveys. In February, 1907, he entered the service of the Western Pacific as a transitman and from February, 1908, to December, 1908, he was in charge of engineering work at Townsite Bay Point, Cal. In January, 1909, he entered the employ of the Southern Pacific of Mexico as an instrumentman and remained with this road until March, 1910, when he was made engineer in charge of an irrigation project, which position he held until November, 1910 when he entered the valuation department of the Southern Pacific in which work he has been engaged until his recent promotion.

H. A. Cassil, whose promotion to chief engineer of the Pere Marquette, with headquarters at Detroit, Mich., was reported in the *Railway Age* of September 30, was born at Mt. Vernon, O. He entered railway service on January 1, 1898, with the Cleveland, Akron & Columbia (Pennsylvania). He entered the employ of the Pere Marquette in 1901 where he held several positions including that of division engineer of the Detroit-Canadian division. He left this road in 1906 to become associated with the Canadian White Construction Company of Montreal, Que. Two years later he reentered railway service in the maintenance of way department of the Cincinnati, Hamilton & Dayton, where he remained until this company was absorbed by the Baltimore & Ohio. He was then in the service of the Baltimore & Ohio Southwestern and the Baltimore & Ohio in various capacities until the reorganization of the Pere Marquette in 1917, at which time he was appointed engineer maintenance of way, which position he has held until his recent promotion to chief engineer.

H. A. Cassil

A. J. Hammond, assistant chief engineer of the Chicago Union Station Company, whose resignation on September 30, to become associated with James O. Heyworth, engineer and contractor, Chicago, was reported in the *Railway Age* of October 7 (page 680), is a graduate of Rose Polytechnic Institute and a post graduate of Massachusetts Institute of Technology. He was engaged in municipal engineering work in Indiana up to 1898, on which date he entered railway service as an assistant engineer on the Vandalia (Pennsylvania), with headquarters at Terre Haute, Ind., in which capacity he remained until 1901, when he engaged in private practice, at the same time being city engineer of South Bend, Ind. From 1909 to 1910, he was consecutively chief engineer of the Southern Michigan and Northern Indiana Electric Railways; bridge engineer of St. Joseph county, Ind., and consulting engineer of hydro-electric plants at South Bend and Elkhart, Ind., and Paw Paw, Mich. In 1910, he was appointed consulting engineer of the city of Chicago for the intake water tunnel at Seventy-third street and in 1911, chief engineer of the Bureau of Public Efficiency of Chicago. From 1912 to 1913, he was engineer of bridges and harbors of the same city during which time he designed the Michigan Boulevard, the Lake street, the Chicago avenue, the Belmont avenue bridges, and a number of fixed bridges. In 1914, he became consulting engineer of the Chicago Union Station Company and in 1915 was promoted to assistant chief engineer in charge of the design and construction of the passenger terminal, which position he held until his resignation on September 30.

Obituary

H. Hall, president and general manager of the New Orleans & Lower Coast, with headquarters at New Orleans, La., died on September 28 from septicemia.

Frank Owen Waldo, retired auditor of the Michigan Central, died in Detroit on October 4. Mr. Waldo was born in Hammond, New York, on December 11, 1854. He entered the service of the Rome, Watertown & Ogdensburg (now New York Central) as a telegraph operator at DeKalb Junction, N. Y., in 1870. He continued in various capacities with that road until August 12, 1876, when he entered the service of the Michigan Central as a clerk in the Auditor's office. He served with that company successively as general bookkeeper and chief clerk and on April 1, 1887, was appointed ticket accountant. He was promoted to assistant auditor on November 1, 1892, and was appointed auditor on October 8, 1908. Mr. Waldo retired from active service on account of ill health on June 1, 1918.

F. O. Waldo

Cecil A. Preston, valuation engineer of the Pennsylvania, died at Philadelphia on October 9. Mr. Preston was born in Philadelphia 70 years ago and was graduated from the Polytechnic College of Philadelphia in 1872 as a civil engineer. He at once entered railroad construction work, but he did not enter the service of the Pennsylvania until 1879. His first service with this company was in connection with surveys for new lines. On March 1, 1880, he was appointed assistant supervisor of the Baltimore section of the Northern Central; but after a few months he resigned and went to Mexico where he was engaged as principal assistant engineer of the Mexican National Construction Company, but returned to the Pennsylvania (Northern Central) in 1882 as assistant supervisor at York, Pa. He then served in various engineering positions until July, 1900, when he was appointed superintendent of the Elmira and Canandaigua divisions of the Northern Central with headquarters at Elmira, New York. In 1902 he was transferred in a similar capacity to Williamsport, and in the following year was appointed superintendent of the Middle division of the Pennsylvania at Altoona. In 1913 he was appointed valuation engineer, in which capacity he was serving at the time of his death.

C. A. Preston

EDITORIAL
Railway Age

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Will Farmers Favor a Policy Ruinous to Them?

THE TRANSPORTATION situation which now confronts the country is, in most important respects, the most serious in its history. The railways in the week ended September 30 loaded 988,581 cars with freight. This was but three per cent less than the highest record ever made. In spite of this the net car shortage reported in the week ended September 30 was 123,732 cars. Only four weeks before that there was still a small car surplus. Never before was a car surplus turned into a large car shortage so quickly. Seldom has there been a larger car shortage, and judging by the present course of events there is now, or soon will be, a larger car shortage than ever was reported before. The shortage of box cars is relatively as large as the shortage of coal cars. Every class of shippers is complaining that the amount of commodities it can produce and ship is being limited by inadequacy of transportation.

The most striking fact about this situation is that it has developed at the beginning of a period of revival of general business. Never was this the case before. Past shortages of transportation always have been experienced either at the end of a period of expanding industry and commerce or after business revival had been in progress for some time.

It is worse than idle to attribute more than a relatively small part of this transportation situation to the coal strike and the shop employees' strike. It is due almost entirely to the decline in the expansion of the capacity of the railroads which has been going on for 15 years. The annual increase in the number of locomotives in service was almost 90 per cent less and the increase in their tractive power 50 per cent less in the period of seven years ending with 1921 than in the period ending with 1907. The annual increase in the number of freight cars in service was 90 per cent less and in their tonnage capacity 80 per cent less. There was no decline meantime of the increase in the productive capacity of the country's farms, mines and factories. This is the real explanation of the present transportation situation.

While every class of producers and shippers is suffering heavy losses and is threatened with much heavier losses owing to this situation, no class of producers is suffering heavier losses from it or is threatened with heavier losses from it in future than the farmers. The decline in the development of the railroads began with the beginning of the policy of restrictive railway regulation and has been due mainly to it. The business men and farmers of the country advocated this policy and are responsible for it. Most business men, however, have come to a realization of the effects it has had in the past and of the much worse effects that its continuance would have in future. They can be relied on to favor and support a fairer and more constructive policy.

But the business men will not have the controlling voice in determining our future policy of regulation. The farmers will have it, especially the western farmers. And there is the gravest danger that the influence of the farmers will be exerted in favor of making regulation worse instead of better, more destructive of their own and everybody else's interest instead of more constructive.

One of the clearest and most conclusive statements indicating the losses the farmers are suffering, and will in future suffer, from the present transportation situation that ever has been made was made by Julius H. Barnes, president of the Chamber of Commerce of the United States, in an address last week in New York before the National Conference of Business Paper Editors. We publish Mr. Barnes' statement elsewhere in this issue. He is a grain exporter of 30 years' experience, was president of the government's grain corporation during the war, and is, therefore, the highest authority upon the subject he discussed. Consider his statement in the light of the fact that up to the middle of September the railways had moved more grain from the farms than in any previous year. Mr. Barnes showed that owing to inability of the railways to move grain from the agricultural districts to the eastern seaboard in sufficient volume within recent weeks the price being offered for grain in foreign markets and the price being paid for grain on American farms has widened from 10 to 15 cents per bushel more than it otherwise would have. He added: "We have today four billion bushels of grain in the west, the value of which to the farmer in every market in the west is at least 10 cents per bushel below the proper relation with the European consumer markets. You take 10 cents per bushel, assuming this condition continues through the crop year—and it won't, thank goodness—and it would mean a loss in farm revenues of $400,000,000. That train of evil, that train of economic loss to a basic industry of this country follows, I believe, from an over-rigid system of government regulation over our railroads which has extended over 10 or 12 years."

Mr. Barnes may be, and probably is, too optimistic in expressing the belief that this general condition will not prevail throughout the crop year. At any rate, as an expert he has given a mathematical demonstration that the farmers stand to lose hundreds of millions of dollars on their grain within the next year because of inadequate transportation.

There is only one way to stop this and even larger losses to the farmers. This is by enlarging the capacity of the railways so that they can promptly move to market all the crops grown when the market is favorable. The development of the railways has almost stopped because, as Mr. Barnes indicated, many years of drastic regulation have reduced and

limited the net return earned by them and made it impossible for them to raise the new capital required to enlarge the capacity of their tracks and terminals and provide more locomotives and cars.

In the face of this past experience and of these present conditions consider what is going on among the western farmers. While their prices are being kept down, and there is prospect that a large part of their crops may even be left to rot upon their hands because of inadequate transportation, men who pretend to be their friends and leaders are going among them preaching the doctrine that the unquestionably bad plight in which they find themselves is due to high railway rates, and that another great drive must be made by them at once for reductions of freight rates. Conspicuous among those who are preaching this doctrine are Senator Capper of Kansas, the leader of the farm bloc in Congress; Senator LaFollette of Wisconsin and Smith W. Brookhart, Republican candidate for United States Senator in Iowa.

They are telling the farmers that the railways are making large profits, although the average return earned by them this year on their valuation has been only four per cent, and in August, partly as a result of recent reductions in rates, was only 2.65 per cent. They are telling the farmers that the valuation of the railways is grossly excessive, although it was made mainly by the Interstate Commerce Commission, a body which certainly never in the past has shown itself unduly favorable to the railways, under a valuation law of which Senator LaFollette was the author. They are advocating the restoration to state commissions of the rate-making power they had and recklessly abused before the Transportation Act was passed, and the repeal of the rate-making provisions of the Transportation Act whose so-called "guaranty" clause expired by limitation on March 1, 1922, and the only important remaining part of which is a provision directing the Interstate Commerce Commission in regulating rates to take into consideration the need of the country for adequate transportation.

The representatives of the western agricultural states in the National Senate and House of Representatives constitute a powerful group. It would be worse than foolish to ignore the fact that such men as those mentioned are arousing a formidable sentiment among the farmers. The adoption of legislation such as they advocate would tend to prevent any increases in the present wholly inadequate net operating income of the railways as a whole, and to almost stop the increases in the capacity of the railways which are now being made and to prevent indefinitely the much greater increases in their capacity which the welfare of the country absolutely requires. The total losses which would be suffered by the farmers as a result of such legislation would be greater than those suffered by any other industry, or perhaps all other industries. But the danger that, with the farmers in their present mood and such propaganda being spread among them, such legislation will be passed, is very real.

The whole business of the country would be most adversely affected. The present transportation conditions would continue and grow worse. The party in power would find that the drastic limitation of all production and commerce which would be imposed would make impossible the great and long increase of prosperity which it is seeking so earnestly to bring about. And yet men high in the national administration who ought to know better are helping to create the very sentiment and to promote the very movement which would do most to defeat what they are trying to accomplish.

It is high time that the facts about the transportation situation and the real reasons for it, and the effects that its continuance and aggravation would produce, were presented by railway men, business men and public men to the farmers. Never in the history of the United States did any men pretending to be their friends do anything better calculated to bring permanent depression and ruin upon the farmers than men like Capper, LaFollette and Brookhart are doing by their advocacy of the most unsound policy of government regulation of railways that ever was conceived. Men such as they are mainly responsible for the present transportation situation. They are not friends of the farmer, but among the worst enemies he ever had, because they are basely and grossly misrepresenting the facts to him, recklessly disregarding the effects upon him to promote their own selfish ambitions. When will something effective be done to combat their propaganda?

Saving Minutes for Freight Trains

The schedule of a passenger train should be made to suit the capacity of the locomotive. That goes without saying. But it should fit the capacity of the men also. If the train needs 15 minutes at a division terminal to change locomotives and to supply the cars with water and ice, 15 minutes should be allowed. To allow only 10 minutes, because every other train is allowed that length of time, puts the train five minutes off its schedule and very likely wastes five minutes, *or more*, of some freight train's time. Making a schedule under which the train can reach the end of its run on time is not sufficient; the engineman should be encouraged to keep on time at every station, not discouraged by requiring him habitually to make up time lost at a station where the loss ought to have been provided against. A dispatcher on a large road remarked recently that there seemed to be a general custom of allowing all passenger trains 10 minutes for changing locomotives, whether the train had 4 cars or 12, and whether it needed 6 minutes or 16. Ten minutes seems to be a popular period, whether a train has much switching or none; whether the station force is small or is large. That dispatcher could think of no better thing to be done to simplify his work than to correct such schedules so as to enable him to always give freights as much time as possible.

Equipment Orders in September

The leading factor in the equipment market just now seems to be the increasing volume of freight car orders. The orders for cars during August and September were not large; in number they trailed locomotive purchases rather badly. A figure of 11,793 cars for the first two weeks in October seems to indicate, however, that things are beginning to pick up in this respect and that conditions in the remainder of the fall of the year should be somewhat better than they were during the period of the shopmen's strike. The month of September proved to be something of a star performer from the standpoint of locomotive purchases. The total for the month

—617—was twice that of any preceding month this year with the single exception of July, the total for that month being 353. To the end of September the orders in 1922 totaled 1,672 locomotives, 111,160 freight cars and 1,437 passenger cars. These are not exactly record breaking figures but they are not at all bad considering the number of idle serviceable or bad-order cars earlier in the year. The details follow:

CAR AND LOCOMOTIVE ORDERS

	Locomotives	Freight cars	Passenger cars
January	8	7,400	235
February	8	14,731	100
March	76	5,580	25
April	272	30,507	540
May	99	18,317	235
June	22	11,097	37
July	353	15,675	120
August	220	576	22
September	617	6,737	63
Total nine months	1,672	111,160	1,437

October, first two weeks: Locomotives, 120, freight cars, 11,793; passenger cars, 30.

Cultivating a Family Spirit

It would be difficult to over-estimate the practical returns, if the employees on the railroads generally could get back into the attitude which was predominant on most American railroads a few generations ago, when they referred to their roads with a feeling of real pride as "our road." Because of the consolidation and enlargement of properties and more intensive operation, capped by certain developments under federal control, this spirit has been lost on most roads, at least to a large degree. It is significant, however, that railroad executives generally realize the necessity of taking steps to bring it back and to have all of their employees feel as if they were members of a great family, of which they could well afford to be proud. As one way in which to develop and cultivate this family spirit, a considerable number of roads have maintained employees' magazines, some of them for a long time. The Pennsylvania Railroad, however, has recently gone one step further and is publishing regional bi-weeklies, in which at least 90 per cent of the space is devoted to news about the employees and their families. Its purpose is to get the employees better acquainted with one another, with the officers and with the property, and to weld them into one great, contented family. An article elsewhere in this issue, by Logan B. Sisson, briefly touches upon the aims and advantages of these regional newspapers and tells how large numbers of the employees co-operate in gathering the news and preparing material for publication. The experiment is still in an early stage, but it would seem to contain great possibilities. It differs so greatly from the average employees' magazine, as now published, as to indicate the desirability of studying the new development closely and critically to determine whether the employees' magazines can be benefited by a change or modification in their present policies.

A Shipper's Tribute

Interested observers who have had the opportunity of seeing newspapers from different parts of the country may have noticed that railroad problems seem to be the subject of somewhat unusual attention at present in two widely separated sections—California and New England. The discussion in California concerns the Southern Pacific-Central Pacific segregation. In New England the matter of railroad consolidations has been given particular attention and in general there has become evident a feeling which has as its basic thought the welfare of the New England railroads. This results partly because the executives of the railroads serving New England have inspired confidence in the favorable and improved results which the rail lines have secured. Another reason is the realization on the part of shippers and others interested that the welfare of the railways is a most important factor in the welfare of industry generally. At any rate, shippers, bankers and others in New England are showing an unusual interest in the railways which serve that section and the sort of interest which cannot but be helpful. A practical incident of the new attitude appeared as an advertisement in Boston papers a few days ago. It was headed "The Boston & Maine's Constructive Policies" and said:

"We desire to call the attention of New England business men, particularly those in the cotton trade, to an illustration of the broad-visioned policy of the Boston & Maine Railroad in co-operating with New England industry. We refer to the granting by the railroad of the storage-in-transit privilege on cotton at Lowell, by which cotton may be shipped from southern points to Lowell, stored there pending sale, and later reshipped to other mill centers, on the payment of the through freight rate from the South to the ultimate destination.

"In suggesting to the Boston & Maine that they grant this privilege, we found that the officials were willing to consider it from only one standpoint—whether or not it would help New England industry. When we pointed out that it would be of great advantage to New England cotton merchants and manufacturers, effecting economies that would help mills to meet the constantly growing Southern competition, the railroad management quickly acceded to our request. We believe New England business men will join with us in our appreciation of this constructive co-operation on the part of the Boston & Maine Railroad in upbuilding New England industry.

"LOWELL PUBLIC WAREHOUSE COMPANY, INC.,
"Lowell, Mass."

For a shipper to advertise a railroad is new and of more than common interest. Looked upon as an expression of a somewhat new and more favorable attitude, it is one of the best indications we have seen concerning the manner in which railway conditions in New England are shaping themselves.

Three-Machine Option Criticized

One railroad purchasing policy which has come in for considerable criticism recently is the practice of requiring the mechanical department, or tool committee, to specify at least three makes of each type of machine tool desired. Objections to this practice cannot be more briefly or fairly stated than in the following quotation from a manufacturer's letter: "Many of the railroads have adopted the policy of insisting that the mechanical department specify at least three makes of tools, any one of which the purchasing department is free to buy, although preference may be expressed for one of the three. While at first blush this appears a perfectly fair plan, it works a decided hardship on the leader in the field as well as on the railroad itself for, naturally, if any one tool has outstanding features, or is superior in quality, the price is apt to be somewhat higher. Although the difference in performance may pay many times over for the comparatively slight difference in first cost, the purchasing department has no means of gaging the value of such differences and so places the order for the cheapest of the three tools pronounced as acceptable. The mechanical department should have the privilege of specifying a particular make of tool provided the difference in price is no more than a fair differential over the next best machine in the class. Unless some such policy is adopted, the railroads will rarely get the most efficient tools but will receive only the second or third best. Furthermore, they are apt to pay more than the inferior tools are really worth for the third grade manufacturer will keep his price just low enough to get under the two leaders in his field, knowing that by so doing he is practically certain of securing the business." The arguments presented above are sound and hold particularly in the case of machine equipment for large shops and enginehouses where high produc-

tion is possible and desirable. For this work, durability and productive capacity are of the utmost importance, first cost being entirely secondary. The high-duty machine is a paying investment at any price within reason. For relatively small shops and terminals at outlying points, however, it is not maintained that the requirements always call for modern machines of the most improved type. The solution of the problem is to leave the final selection of machines to be ordered in the hands of the mechanical department. Knowing the appropriations available and being responsible for maintenance of equipment costs, the mechanical department should not be debarred from specifying the best machine of a given type on the market if it feels that conditions warrant such action.

The Rock Island's Big Celebration

THE MANAGEMENT of the Chicago, Rock Island & Pacific recently has done one of the best pieces of public relations work that it has been possible to credit to the management of any railroad within recent years.

Its officers some months ago conceived the idea of having a celebration of the seventieth anniversary of the founding of the railroad. The principal part of the celebration took place at Joliet, Illinois, on October 10. A special train was run from Chicago to Joliet, 40 miles, over the first section of the line ever opened to operation. Among its passengers on the special was a venerable woman who rode on the Rock Island's first passenger train 70 years ago. Other passengers included the directors and officers, and the train was in charge of five employees whose aggregate service on the road totaled 200 years. A monument to the engineer who surveyed the route between Chicago and Joliet was unveiled at Joliet by his granddaughter, the dedication speech being made by President J. E. Gorman. An address also was delivered by Chairman Hayden.

The foregoing brief statements of fact give a very inadequate idea of the length, extent and enthusiasm of the Rock Island's celebration. It really began weeks ago and was only finished on October 10. Soon after the plan for it was announced facts and anecdotes about the history of the railroad began to be furnished to the press throughout its large territory. The history of every large railroad is in great part the history of the territory it serves. This is conspicuously true of the Rock Island's history, for years ago it was built far out into sections of the country which were almost unsettled and almost wholly undeveloped. Its construction more than anything else made it possible for them to become settled and developed, and in consequence its history has made it possible for these sections to have any real history.

The newspapers in the Rock Island's territory soon saw how the preparations for the Rock Island's celebration made it possible for them to print many stories about the history of the railroad, and about their own communities and the railroad's relation to them, which were made timely and especially interesting because of the preparations for the celebration. Consequently the Rock Island's celebration became the subject of newspaper stories and of talk by the people in every community where it runs. An account of the services at Joliet were sent out by radio and heard by many thousands of people.

The conception and carrying out of the Rock Island's celebration undoubtedly has done much to make a very large part of its employees and patrons think and speak of it as "our railroad" who had not shown the same interest in it or had the same feeling toward it for years before. Furthermore, it has resulted in many things being told and published about the railroad which have revived memories of the great part it has played in developing the middle west and the southwest, and in converting, from almost a desert into fruitful and happy farming communities and towns and cities, lands which but for the railroad would still be virtually a desert.

The *Railway Age* has said much within the last year about the necessity of the railroads doing more to "sell" themselves to their employees and the public. The Rock Island has hit upon and carried out one of the happiest and most effective methods of selling itself to its employees and the public that could have been adopted. The Rock Island having used it so well, the same means probably could not be used so successfully soon by any other railway in its territory. The same method could, however, be used with corresponding results by railways in other parts of the country. Furthermore, the method the Rock Island adopted is but one of many which could be used to arouse a sympathetic interest on the part of employees and the public in their railways, and to make them better understand and appreciate what the development of the railways in the past has meant to the country and what their adequate development in future will mean to it.

The officers of the Rock Island are to be congratulated not only upon the progress they have made within recent years in increasing the efficiency and the earning capacity of the property, but also upon the good stroke they have made in adopting a very ingenious, pleasing and effective way of causing their employees and the public to appreciate the railroad more.

Engineering and Electrification

THE REPORT of the electrification commission of the Illinois Central recommending 1,500-volts direct current with an overhead contact for the electrification of the Chicago terminals should not be construed as a solution for the problem of deciding the voltage for other projects. Many railroads and manufacturers have, no doubt, watched with interest the work of this electrification commission, composed of some of the best qualified men in the country, for a period of over two years, in hopes that its deliberations would bear fruit in the form of conclusions of wide application to steam railroad electrification.

However, it should be understood that this commission, in the study of various electrifications of America and Europe, and in the preparation of detailed estimates of at least four distinct systems, had no intention of solving electrification problems in general but was concerned solely with the design of a plan of electrification to meet the needs of a particular situation.

In contrast to many other electrification projects, that confronting the Illinois Central is *not* required to meet any special operating necessity but rather represents a concession to the civic development of the city of Chicago. Therefore, the desired benefits of the proposed electrification lie within the city limits. As the Illinois Central lines operate through a comparatively level country and traverse several coal mining districts, reason would indicate that under such conditions steam locomotives will handle the traffic for years to come. Therefore, no consideration was given to the possibility of the electrification being extended to adjacent divisions.

In conclusion it should be emphasized that the decision of the Illinois Central applies only to a short mileage of terminal area handling a heavy suburban business, freight transfers and yard switching. This combination controlled the final decision and any road confronted with circumstances that vary from this by a single factor must engineer its own investigations.

Letters to the Editor

[The RAILWAY AGE *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]*

A Question for the Signal Engineer

KANSAS CITY

TO THE EDITOR:

Will some studious signal engineer tell us the average number of trains per day which must pass over a given crossing of two railways at grade in order to make it profitable to install a simple mechanical interlocking plant, making "whistle stops" unnecessary?

On a double track section, about 70 miles in length, of one of the most prosperous railways in the Middle West enginemen are required to bring their trains to a full stop at four places for unprotected junctions and grade crossings. This section of road is equipped with automatic signals. We are told that these signals "keep trains moving." Yet does anyone know of an instance where the installation of automatic signals has reduced train stops in such proportion as four simple mechanical interlocking plants would reduce them on this road?

This 70-mile example is rather out of the ordinary for a double track road, it must be admitted, yet there are many—almost countless—unprotected crossings at grade of busy single track railways in this part of the country.

The funds available for capital expenditures are limited. The wise railway officer will spend these funds on those improvements which promise the highest net return. The saving which a simple interlocking plant—or perhaps even better, the automatic installation for railway crossing protection which was described in your issue of May 20, 1921—could bring about, should place investment in such facilities on the list of the wisest which railroads can make.

It is the signal engineer's business to tell his superiors what expenditures in signal facilities will pay the largest returns on the investment. Can any signal engineer, then, conscientiously advocate the installation of any of the plain or fancy types of automatic signals while there yet remain in his territory railway grade crossings and junctions unprotected by any type of signal whatever and where, consequently, all trains have to be brought to a full stop?

QUAESTOR

Cost of Selling Machines to Railroads

NEW YORK.

TO THE EDITOR:

Your editorial in the issue of July 15 with the above title is timely. We are heartily in accord with your findings.

The question—Is it profitable to sell railroads, maintaining the same list price as used for commercial firms—is a live one at this time. You suggest that railroads should be willing to pay more. We find railroads are close buyers and hard to sell.

Let us take a commodity or appliance that has *merit proved beyond question*, that is being largely sold to railroads and commercial firms as well and outline briefly the conditions of sale that maintain in practically every case. The salesman demonstrates his appliance to the official in the commercial house, proves that an economy can be effected and lands the order. The concern, having branches in Chicago, St. Louis, Kansas City, Omaha and Denver, and the same class of work to do in each branch, of its own volition equips these branches with the appliance to its own benefit. There is cream in this transaction.

How with the railroads? The salesman demonstrates his appliance to the station agent, satisfies him of the advantages of his product and starts a requisition on its way first to division superintendent, then to general superintendent and so on up until he and it land in the purchasing department and each has to be sold. It is a long, long trail. Yes, he secures the order for Chicago station, installs his appliance, proves that it effects an economy, *but there it stops.*

The salesman claimed, and truly, that the same economy could be effected in St. Louis, Kansas City, Omaha and Denver and he was told to *"go to it"* and he did and—this picture is painted on facts—eventually landed them all, but there was no cream in this transaction. The time, effort and expense necessary eliminated all profits.

A representative of a reliable appliance house goes to the railroad feeling that he has a product that the railroad *should* be interested in. If he has, then the story is not a one-sided one, but of mutual interest. The purchasing of this commodity is not an expenditure but an investment paying a substantial return, and its use throughout the system should be furthered. Mechanical helps are being sought after today by all commercial concerns. The railroads can well seek for them too.

SUBSCRIBER.

Speeding Up Train Movement

ST. LOUIS.

TO THE EDITOR:

After reading the editorial "Speeding Up Train Movement," appearing in the *Railway Age* of September 30, I was prompted to prepare the following memorandum of certain other features of freight train performance:

The relation between the average speed and the average train load is very pronounced and my opinion is that it is more practical than theoretical. It is held generally by some that the gross train load is the first essential, to which I agree. There should not, however, be an overloading of trains and locomotives. In many instances, operating officers in their zeal to show heavier train loading, have gone beyond the economical limits but this is not equivalent to saying that they should permit locomotives to run over their train districts with less than their full economic rating.

Perhaps the speed per hour should be as near as possible to 12½ miles, to avoid excess expenses resulting from penalty overtime. Nevertheless tonnage should not be sacrificed for speed, nor speed for tonnage; admitting there is a difference between the possibilities on a low-grade line and on a heavy grade line. The economical speed at which certain types of locomotives may be run varies. On some freight districts a tonnage loading that would permit an average of 12½ miles an hour would mean uncertain operation on the up-grade side of the hill and unsafe speed on the down-grade side.

The length of trains handled also is an important item in the matter of time consumption. The speed of a train, however, is more frequently the result of train dispatching, passing and terminal track facilities, than it is, perhaps, of the tractive effort of locomotives used, but the train load is an influencing factor and one cannot be properly considered without the use of the other.

Increase in speed with a proportionate train load will increase the ton-miles per train hour to a point where the operation is most satisfactory and economical. The ton-miles per hour unit is influenced favorably by an increased train load or an increased speed, or in both, or an increase in

one factor proportionately more than a decrease in the other. On the other hand, a small decrease in the running time of a train will in many instances result in the loss of a car day at destination for each car in the train and frequently an aggregate loss of several car days; it also increases the per diem charges at intermediate stations, terminals and junctions.

The general rule is that the amount of fuel consumed per ton-mile is reduced as the engine load is increased to a certain reasonable limit. Solely on a ton-mile per hour basis a gradual gain in locomotive efficiency can be shown as speed increases from 25 to 30 miles an hour, but when the speed of a train averages more than 15 miles an hour, many factors other than ton-miles per hour affect the net economy. It is held that the modern locomotive attains its maximum fuel and thermal efficiency at speeds of not less than 12 miles an hour while working at 25 or 30 per cent cut-off. At lower speeds, high degree superheated steam is not obtained. Superheated steam locomotives are capable of higher sustained speeds than saturated steam locomotives capable of dragging the same train load.

The unit of measure is the "cost per ton per mile." Expenses directly chargeable to train service, aside from fuel and wages, include lubricants and locomotive and train supplies. These latter items are of less importance and the charges per ton-mile decrease as the utilized tractive effort increases.

The expenses of yard operation are seldom considered as being influenced by the character of train and/or the average running time between terminals. In hump yards the cost of switching is probably independent of the length of the train but in "flat" switching, the hauling of long cuts of cars reduces the speed of terminal switching and increases the cost. Enginehouse expenses likewise are affected. A reduction in the number of units handled will cause a decrease in the transportation cost per ton-mile. The subject is one which undoubtedly receives the attention of the officers of the individual railroads and what may be good practice on one road is not necessarily good practice on another.

My own thought is continually to force tonnage to the potential rating of the class of power in service, particularly in the direction of heavy traffic, increasing the average speed per hour by improved handling. This is the manner in which the most economical results are obtained, since the function is to move a given quantity of freight within a given number of hours and to produce the best results the happy medium must be found.

C. D. Hicks.

Side Lights Upon the Shop Strike Situation

Chicago, Ill.

To the Editor:

Those railway supply manufacturers who maintain staffs of experts in specialized work on the trunk lines have had quite as interesting a time, during the shop crafts' strike, as have some of the railway executives themselves. These experts are usually recruited from the ranks of railway supervisory forces and frequently belong or have belonged to one of the striking craft unions. Normally they merely instruct in the work concerned but just now there frequently is nobody to instruct and the work is there to be done just the same. In most cases the work is done, and better than ever before, to the credit of these experts and their employing companies. Those systems which heretofore have discouraged the use of experts on their lines have had to contend with embarrassments without this type of efficient assistance.

* * * * *

It is interesting to note what surprising results a few loyal master mechanics have obtained in getting terminal work done on the power. Job after job has been tackled, with only the master mechanic and possibly a foreman to help, with satisfactory results in a half or a quarter of the time usually allowed in normal operation.

One illustration is in mind: In replacing certain spring hangers on a certain class of engines, it has been customary for the machinists' gang to have other craftsmen called upon to drop the ashpan before the job was started and then to replace it after the job was completed. It was found perfectly possible to do the job without these several hours of additional work.

Another illustration: The matter of hydrostatic tests required by the Interstate Commerce Boiler Inspection Law has always been considered quite a formal proceeding. When, after these jobs had been allowed to accumulate, owing to inevitable disorganization, due to the strike, in the press of work of greater emergency, attention was given this detail, it was amazing to note the rapidity with which numbers of such tests were run, without sacrificing thoroughness to any degree whatever.

* * * * *

Several railways called in ticket clerks and other traffic employees for engine house assistance. Some of these men have come from "off-line" offices, and some of them had never even seen those parts of their own lines to which they were sent. They are receiving an education in practical operation, the like of which they could have obtained in no other manner.

Incidentally, these traffic men, clerks, solicitors, etc., become the best kind of terminal labor in a surprisingly short time. Of course, they are instructed in one specialized job after another as occasion arises and rapidly become proficient in each. With uncomplaining willingness they turn their hands and brains to any job which arises as fast as they receive instruction, and this spirit results in large amounts of work being done with a minimum of forces.

Loyal foremen, at outlying shop and engine terminal points, have quite the most unenviable positions imaginable. While they are, by the rules of their own crafts, exempted from strike call, the fact that their loyalty calls for actual work in maintaining operation subjects them to all manner of personal embarrassment and insult. These men deserve any reward it is possible to accord them. They seek no reward, however.

The position of the honest shopmen of long service is pitiable. They may not have wished to strike but their circumstance compelled it. It was not in the cards that they should win anything and many of them realized it, yet they had to go with the majority, their actions being controlled by those of radical tendencies. Whether they know it, their greatest gain is in the loss of the strike. By losing in a sense they win. They will be removed from the influence of discredited and radical leaders.

Greatest prosperity for the shopmen, notwithstanding the slight wage reductions, comes with greatest prosperity for the railways. By elimination of disturbers, non-conformists, and radicals as a result of the strike, the efficiency of the shop forces will mount and the position of the efficient workers taken back will be correspondingly improved.

Lumping the work of the poorest with that of the best, as has been the practice for several years, tends to discourage all but the most inherently loyal. The weakening of such a yoke cannot but have beneficial effect upon the individual.

L. F. W.

J. W. Kroell of Chicago was appointed president of the International Order of Railway Yardmasters on October 10, to fill the vacancy caused by the recent death of President F. W. Whelan. The appointment was made by the board of directors of the above organization.

Employees Greeting Special Train at 47th Street, Chicago—Photo from Underwood & Underwood

Rock Island Celebrates Seventieth Anniversary

Display of Enthusiasm Shown as Featured Program is Presented at Both Chicago and Joliet

ON TUESDAY, October 10, the Chicago, Rock Island & Pacific celebrated the seventieth anniversary of its founding, the day being observed over the entire system. The most elaborate ceremonies, however, were held in Chicago and Joliet, Ill., the first terminals of that carrier between which the first Rock Island train's inauguration run occurred on that date in 1852. The LaSalle Street Station, Chicago, was decorated for the occasion with American flags and numerous posters were displayed describing various features of the slogan "Seventy Years of Service." The first sleeping car used by that road was placed on exhibition in the station next to a modern Pullman in order that the public might compare the new with the old type.

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Rock Island Special Enroute Chicago to Joliet

The opening incident of the day in Chicago was the presentation of a "half century of service" medal to Engineer J. R. McGann by Charles Hayden, chairman of the board of directors. Adding color to the occasion were a number of young women dressed in the costume of 1852. The presentation was made on the platform of the station near the rear of a special train which was to carry the officers and guests of the road to Joliet for the ensuing anniversary ceremonies. When Engineer McGann had received his medal, Chairman Hayden, clad in the blue overalls of an engineer, took the throttle and guided the special train toward Joliet reenacting

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The Unveiling of the Reed Monument by Miss Anna Reed Bates, Great-Granddaughter of Samuel Benedict Reed

the first run. The engine and observation platform were both decorated with small American flags and red, white and blue bunting, and the train crew was made up of a number of the oldest employees. The conductor, J. Arzener, had seen 40 years of service; the brakeman, J. J. Conlon, 34 years; E. Faust, engineer, 39 years; and E. Wirthmiller, fireman, 41 years. At Blue Island, 49th street, Englewood, Hamilton Park, 124th street, and other districts and towns the employees were on hand to greet the train with cheers and the waving of flags and hats.

On arrival at Joliet, city officials received the visitors, together with 5,000 school children. Escorted by a band between lines of the R. O. T. C. of the Joliet high school cadet corps, the officers, and guests of the railroad proceeded to the courthouse lawn, where the boulder monument to Samuel Benedict Reed, civil engineer, who surveyed the original "Rock Island Line" in 1850, stands. This monument was erected by the Union Pacific, of which Mr. Reed was later superintendent of construction. A bronze tablet was placed on the boulder by relatives of the engineer, and Anna Reed Bates, his great-grand-daughter, unveiled the monument.

Addresses were delivered by Mayor A. C. Jeffrey of Joliet, Col. Fred Bennett, son-in-law of Mr. Reed; Charles Hayden, chairman of the board of directors, and James E. Gorman, president of the Rock Island.

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President J. E. Gorman and Guest of Honor, Mrs. W. W. Stevens, Who Was Passenger on First Train in 1852

Following the ceremonies at the monument a tree was planted in the courthouse lawn, on the former right-of-way of the Rock Island road. The Joliet Association of Commerce then played host to part of the visitors and at a luncheon given by this body, an address was delivered by L. M. Allen, vice-president. The main portion of the party returned to Chicago for a luncheon at the Drake hotel, at which addresses were made by Mr. Gorman, Mr. Hayden, M. L. Bell, vice-president and general counsel; Carl Nyquist, vice-president, and Judge Jacob M. Dickinson. T. H. Beacom, vice-president, was the master of ceremonies. At the close of the speaking program, Chairman Hayden presented, in behalf of the board of directors, a bronze medal to each of the pensioned employees who had or have been with the road for 50 years or more. The response in behalf of the pensioned employees was made by T. Knight of Forth Worth, Tex., a pensioned locomotive engineer.

In the evening the celebration closed with a radio program, broadcasted from the Westinghouse K. Y. W. station, Chicago. Employees' clubs in other localities "listened in" on the program as did commercial clubs in many "Rock Island" cities. The radio program consisted of music by the Rock Island orchestra, a greeting by C. Nyquist, songs, an address by C. Hayden, more songs, and orchestrations. The guest of honor for the entire day was Mrs. W. W. Stevens of Hubbard Woods, Ill., a passenger of the "first train" in 1852.

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Rock Island Officers and Guests at Joliet Being Escorted to Court House

In addresses during the day of celebration both Mr. Hayden and Mr. Gorman made pleas for public co-operation. Mr. Hayden said in part:

"You can not expect to be served by the perfection of transportation, unless you are willing to co-operate. If the war has taught us anything with reference to the internal affairs of this country, it is that the railroads must be built up, aided and encouraged by legislation, rather than harassed and beaten down. I insist that you and I as citizens of this great country must take an active part in seeing that future lawmaking and future regulations of our railroads shall be constructive and not destructive."

While Mr. Gorman said:

"We realize and face our responsibilities, but they are not ours alone. We need each other's help and friendly consideration. Any other relationship is to our common detriment. It is our ambition to establish and maintain such a relationship. We seek a release from super-regulation which stifles initiative and hampers prompt adjustments necessary to business emergencies. We welcome supervision and constructive criticism. We want you to come to us with your problems and seriously consider ours and aid in their solution."

Railway Real Estate Association Meets in Chicago

Discusses I. C. C. Valuation, Taxation, Land Purchase, Leases and Other Important Related Subjects

THE FOURTH ANNUAL meeting of the Railway Real Estate Association was held in Chicago October 10-12, inclusive. The program consisted of a series of individual papers on subjects related to land, taxation and other matters naturally coming under the direction of the real estate offices. The sessions were presided over by President J. T. Maher, right-of-way, land and tax commissioner, Great Northern. Mr. Maher also took part in the program, with a paper describing the activities of his department on the Great Northern.

J. T. Maher was re-elected president for the coming year. He had served in that capacity during only a part of the past year, succeeding to the office due to the resignation of his predecesor. Other officers elected were: First vice-president, O. F. Scudder, land and industrial commissioner, Chicago, Burlington & Quincy; second vice-president, P. McPherson, right-of-way and tax agent, Canadian Pacific; and secretary and treasurer, R. H. Morrison, assistant engineer, Chesapeake & Ohio. The next meeting will also be held in Chicago, beginning the second Tuesday of October, 1923. Abstracts of the reports follow:

How to Buy Right-of-Way

By O. F. Scudder,
Land and Industrial Commissioner, Chicago, Burlington & Quincy.

In the case of any extensive purchase in the larger towns or cities, it is always an advantage to make these under cover as far as possible, and it very frequently happens that the broker can get his commission from the owner of the property, which works a considerable saving, also. Unless the property to be obtained is too great in extent, the project generally can be carried through to the end without the purpose for which it is being assembled becoming known outside. At any event, results can be secured in the way of establishing a price basis, which is a great advantage if it becomes necessary to condemn. In working through outside agencies, I have always found it a good plan, in the first instance, to get the broker committed to an estimated cost or value of any property you desire him to secure, and have it understood that he is to work practically to that basis and not exceed such estimate without first getting approval. This will tend to hold your man at a conservative figure and he will not, in his eagerness to earn commissions, close on too liberal figures.

It is always an advantage to the right-of-way agent, before approaching the land owners to negotiate purchase, to inform himself as fully as possible of the plans of construction and use to which the property is to be put, especially in the case of any extensive right-of-way purchase for strictly new development, covering particularly the provisions for drainage and crossings, both public and private. If you are informed that at a certain point a very expensive crossing or other facility has been planned for the use of the land owner, it very frequently happens that a great saving in construction cost can be obtained by judicious purchase of land, or in making a cash settlement for waiver of crossings, etc., at considerably less than the engineering estimates.

Our investigation in connection with compiling returns to the Interstate Commerce Commission under the several valuation orders pertaining to Lands Held and Used for the Purposes of a Common Carrier, and for Lands Held and Used for Other Purposes Than Those of a Common Carrier, has developed that numerous transactions in the past, containing elements of severance damages, and damages to property taken, have been erroneously handled in our accounting. In order to obviate this and make sure that the full cost of all land purchased for transportation purposes is written into our capital account, we are now requiring the right-of-way agent to itemize all elements of damage entering into the settlement for every parcel purchased.

Railroad Insurance and Fire Prevention

By C. N. Rambo,
Manager of the Railroad Insurance Association.

Railroads vary in their methods of procuring indemnity against various kinds of loss. Some few railroads carry their own risks in part. In the main, however, they place their risks and liabilities with insurance companies, in some cases not insuring as generally as in others. When we speak of railroad insurance we cannot necessarily confine it to fire insurance. The general indemnities secured are those against loss by fire, general marine perils and disasters, damage and liability due to boiler explosions, and bonding of employees.

The insurance has to be handled on a wholesale basis. A general schedule of properties is prepared, with each property listed and valued, with its contents. These items may be located in many states, but instead of each unit of risk being written under an individual policy, requiring thousands of policies, a policy is issued covering the property in each state, and issued under the insurance requirements of that state.

It must be observed that in insuring the contents of cars, stations, freight terminals, etc., the cover is on the common carriers' liability as prescribed by the standard or uniform bill of lading, for property of others being transported and in the custody of the railroad. It covers also any warehousemen's liability. Aside from the cars and locomotives owned by the railroad insured, insurance is issued on the liability of the railroad for cars of other railroads passing over its lines in the necessary interchange of traffic.

Individual values are insured under railroad property schedules, i.e., a specific amount of insurance is placed upon each building, as well as on its contents, and a specific amount of insurance is placed upon each unit of rolling stock and a specific limit of liability is placed on the contents of each car, under common carriers' liability, as well as a limit of liability thereon in any one fire. Depreciated values of rolling equipment are usually insured. The process of insuring structures varies—but a satisfactory rule and average has been to insure 70 per cent or 80 per cent of value.

We cannot consider the matter of fire insurance without bringing in the collateral feature of fire prevention. If any proof of the necessity for giving fire prevention the consideration it deserves is required, we need only look to the contribution made last year to the national ash heap—$485,000,000. This large annual loss has only been exceeded once, in 1906, the year of the San Francisco conflagration. The present burning rate of $923 a minute constitutes one of the heaviest drags on our economic progress. During the year, 1918, 419 roads reported 20,628 fires, with a property loss of $12,263,220. This represented about four per cent of the total estimated loss of the country on all

properties for that year and it meant to the railroads an average loss of approximately $594.50 for each fire, or about $50 per mile of railroad. Certain of these fires damaged property outside the right-of-way resulting in a source of large claims against the railroads, but one to a very small extent insured. Of the total number of fires mentioned, 9,923 or 62.7 per cent were assumed to have been caused by sparks from locomotives.

Methods of Assessing Railroad Property for Taxation

By N. P. Haugen,
Formerly Chairman of the Wisconsin Tax Commission.

With the constant increase in public expenditures—federal, state and local—taxation has become the subject of much discussion, contention and dispute. The popular demand has increased for better roads, more efficient schools and more of them, better sanitary conditions, police protection, pension funds, bonuses, etc., and taxes are likely to keep on increasing for a time at least. In this increased public burden, railroads have no doubt in most of the states borne at least their full share, nor have they been reluctant or unwilling to take their part, if properly apportioned and equalized. Railroad property is so obviously in sight that it cannot escape the attention of the assessing officials.

Two general methods have prevailed for the taxation of railroads: one the gross earnings or license tax; the other, the advalorem tax. The tendency during the last 20 years has been to replace the former with the latter. The gross earnings tax has the merit of being simple in administration but it does not readily respond to the varying rates of taxation on other property and is therefore likely to violate the rule of uniformity generally prescribed in state constitutions. It is also likely to become the shuttlecock of politics as a change in rate can as a rule be authorized only by the legislative body.

The basis of assessment of railway property within a state is its "value," and many cases dealing with the subject of taxation show how the courts have defined "value" and the methods for ascertaining it. The result may be summarized by saying that "value" depends upon the extent and profitableness of the use of the property; that is, upon its net earnings. The courts have also repeatedly held that cost of reproduction is not "value" for taxation purposes. It is properly used for rate-making purposes but does not necessarily represent "value" as that term is used by the courts.

In assessing railway property it is, of course, the operated property only which is considered, and this presents a difficulty in using the stocks and bonds as the basis of value. Where proper elimination of outside holdings can be made, the stock and bond values of railroads averaged over a period of five years seems to correspond most closely to that full and true value which the assessment laws generally prescribe. It is well, however, to consider other methods for comparison purposes as they serve the assessor in verifying his approach at true value, and in this respect net earnings undoubtedly afford the best test.

Having arrived at the value of the system, the next step is to allocate such value to the different states into which the property extends. No absolutely precise method can be prescribed. One of the most important and also the most difficult of the problems presented in the assessment of railroads is to reach a fair adjustment for taxation purposes between railroads and other property of the state. Assessments can never be absolutely perfect. Judgments will differ, and valuation is largely a matter of judgment, but the public does have a right to insist that the officials exercise their best judgment in arriving at true value for public purposes.

Government Valuation as a Factor in Condemnations

By W. R. Tarbet,
Real Estate Agent, Illinois Central.

Intelligent and honest officials advised as to how and when and for what purpose the government's appraisals were made would not, in my opinion, give them any weight. When the case is on trial before a jury the court should not permit the introduction of the government's figures as evidence, because the government has not promulgated any plan for keeping land valuation up to date, although the act requires it to do so and to report to each Congress figures revised to date. Only an "informal" report on land value has as yet been made to us. Sometime in the future we may get a "tentative" report and eventually perhaps a "final" report. By that time the figures will probably be so out of date as to be utterly worthless for any purpose whatever.

Railroad value cannot be found by trying to fix a "value" on the land, the right-of-way, shop, yard and station ground, and adding to that a "value" of ties, rails, fills, cuts, bridges, buildings and rolling stock. Nobody can determine separate values of the component parts of a railroad, and then add them to get at the value of the carrier. There is no such thing as a "physical valuation" of a railroad until it is defunct; then it is a junk value. The taxable value of that part of a railroad system lying within any state cannot generally be found by capitalizing the net earnings in that state, or the average net for a period of years, because it is impossible to determine the net in most states, due to the prevailing practice of not distributing gross revenue and operating expense consistently with each other. Especially is this true as to the heavy terminal expenses.

The best way to get at the taxable value of a railroad system that generally has a fair net income is to combine the current stock and bond market value (less the value of all non-operative assets) with the value found by capitalizing the average net income for any five years last past. This system value can best be apportioned to the several states on a composite basis found from factors reflecting relative railroad activities, revenue, and investment.

Rental on Leased Railroad Lands

By J. L. Watson,
Right-of-Way Commissioner, Northern Pacific.

The purpose for which railroad lands should be leased, and by railroad lands I mean right-of-way and station grounds available for leasing purposes and the land acquired and held for railroad and industrial purposes, is to furnish sites for the convenient transaction of business to industries requiring trackage, and to create and control traffic for the railway company. The granting of leases on the right-of-way and station grounds will, in many cases, permit the prompt loading and unloading of cars and avoid delay which might otherwise ensue. In the grain growing sections it is more economical to have the grain warehouses and elevators located on the right-of-way, where switching can be done more conveniently and more economically than would be the case if such industries were located some distance off the right-of-way and served by a spur track.

Long term leases should contain a provision for rental adjustment at stated intervals. A good plan is to make such adjustment at intervals of five years with a provision for arbitration if the railway company and the lessee cannot agree upon the rental. In purchasing right-of-way sometimes it is necessary to acquire surplus property which is not needed for railroad purposes and which cannot be served to advantage with trackage and is perhaps of little value for indus-

trial purposes. In such cases it is best to sell the property if possible, but if it cannot be sold, or if the carrier is not anxious to sell it and can lease it for any legitimate purpose, I think it is justified in doing so for whatever rental can be obtained

Discussion

The discussion on this paper was led by J. C. Williams, assistant real estate agent of the Chicago, Milwaukee & St. Paul, who stated: "Land, or railroad right-of-way and station grounds, represents approximately 20 per cent of the total investment. Approximately 80 per cent of this is in towns and cities, as rural right-of-way is negligible so far as leasing is concerned; 65 per cent of this 80 per cent is taken up by tracks, depots, etc., and approximately 25 per cent of the remainder is necessary for future expansion, but due to location cannot ordinarily be leased. Approximately ten per cent of the remainder is neither necessary for future use nor can be leased to advantage and should be sold. The rest can and should be leased, and the guide to follow is 'Lease to the industry which gives rental plus transportation revenue a maximum.' Considering the present value of money and the usual rates of interest, six per cent of the value of the property, basing the value on the use to be made of it by the industry, is not excessive."

Relation of Federal Valuation of Railroads to Taxation of Railroad Property

By A. J. Rooney,
Tax Commissioner, Chesapeake & Ohio.

Taxation for federal government purposes must be indirect, as Congress has not the authority to levy a tax directly on the property of anyone. The most efficient form of indirect taxation was and probably still is that provided by the tariff laws, but in more recent years Congress provided, primarily, for a levy of one per cent upon the income of business corporations, followed by the capital stock tax law and the general income tax law, which latter, in turn, was superseded and augmented by the "War Revenue Act of 1917," later modified. The ad valorem basis of taxation, as applied under authority of the general property tax law, requires a complete valuation of all property at stated intervals. Under the ad valorem system, the total valuation and the total amount of revenue needed determines the tax rate. The valuation of this property and the tax rate, determine the amount of taxes the taxpayer must pay. When all property is listed for taxation at full value, the tax rate, all other conditions remaining unchanged, will be as low as it can be made. The just ad valorem taxation of railroads requires the just ad valorem taxation of all property.

The valuation to be placed on the property of a railroad, or any other "going concern," for the purpose of taxation, depends upon the "profitableness of its use." Such a concern might be entitled to earn a reasonable return upon a valuation of five million dollars, but, if, by reason of the rates prescribed, or the stress of untoward circumstances, it actually earns a reasonable return on only half that amount, then its valuation for the purpose of taxation would be correspondingly reduced—the low earnings being at once reflected in the "price value" or "market value" of its securities. In many of the states, the statutes prescribe that, in assessing the railroads, the earnings shall be "considered" and even in those states which provide for the valuation of physical property separately from the franchise, the earning power of the lines is given more consideration, for without such consideration no intelligent assessment can be made.

Public opinion is a large factor in determining how the railways shall be treated. Developments of the last few years have done much towards causing the public to look upon the railways with a different perspective. They recognize the importance of the railways to their own very existence. The history of the railways is linked with the history of the nation.

The public is interested more in rapid and safe transportation—ample and good railway service—than in cheap transportation or high taxation. There are large areas of land in the United States yet awaiting the coming of the railways for their development, but if the railways already existing are stultified, the capital necessary for their extension will not be forthcoming.

Other Papers

A paper, "Can the Multiple Studies Made in Connection with Federal Valuation Be Used as a Basis of Determining Cost of Acquiring Lands for Railroad Purposes," was read by W. R. Van Campen, land attorney, Presidents Conference Committee. He was inclined to discount the multiple studies as being of service in estimating individual land purchases or a limited number of such purchases. He said that past experiences will be of assistance in estimating new extensive land purchases and would be somewhat of a guide to the less experienced right-of-way agents. The multiple studies can be used, however, he said, in estimating present cost of acquisition for valuation purposes.

E. D. Anthony, assistant real estate and tax agent, Delaware & Hudson, presented the paper, "Crossings and Use of Railroad Land by Telephone, Telegraph and Other Public Service Companies." He said that the prime factors of the case are: first, the protection of the right-of-way and interest of the carriers in their property; second, the safeguarding of the lives of their employees and third, a regard for the welfare of the general public. His discussion concerned each factor individually. Judge R. V. Fletcher, general solicitor of the Illinois Central, representing the Association of Railway Executives, addressed the convention on the general railway situation.

Labor Board Gives Maintenance Men an Increase of Two Cents an Hour

An increase of two cents an hour for approximately 452,000 members of the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers was ordered by the Railroad Labor Board in a decision handed down on October 14. Increases were given to four of the nine classes of maintenance-of-way employees enumerated in the board's last wage decision affecting these workers. Section, track and maintenance foremen and assistant foremen, track laborers, and other common laborers in the maintenance-of-way department and in and around shops and roundhouses, drawbridge tenders and assistants, pile driver, ditching and hoisting firemen, pumper engineers and pumpers, crossing watchmen or flagmen, and lamp lighters and tenders, received the two-cent an hour increase. At the same time the board decided that the present conditions did not justify an increase for the following classes of employees: Bridge, building, painter, construction, mason and concrete, water-supply and plumber foremen, and assistant foremen, coal wharf, coal chute and fence-gang foremen, pile driver, ditching and hoisting engineers, bridge inspectors, and mechanics in the maintenance-of-way and bridge-and-building departments, and their helpers.

According to the board the increase applies to 451,911 maintenance-of-way employees and will add approximately $22,125,000 to the railroads' annual payroll. The board's latest ruling will place the minimum rate of pay for maintenance-of-way workers at from 25 to 37 cents an hour, the board estimating that 45 per cent of the men will receive

37 cents an hour or more, that 40 per cent will receive more than 30 cents an hour and that only about 5 per cent will receive less than 30 cents an hour.

Ben W. Hooper, chairman of the board, declared that the decision was made because of the definite upward trend of wages in other lines of industry, particularly the wages of common labor. There was no pronounced increase in the cost of living, he said.

"The board does not feel that it is receding from its decision of last spring as at that time the wage increase ordered was just and reasonable," he said. "The reason and issues leading to the present increase will be fully set out when the official decision is handed down."

The board's decision has been held up for more than 10 days because of the failure of the board members to reach an agreement, as pointed out in last week's *Railway Age*. The labor members of the board were holding out for an increase of more than two cents; the public representatives were urging the two-cent an hour advance, and the railroad representatives were demanding that no increases be granted. The deadlock was finally broken when the proposition of an advance of two cents an hour was approved by the three public members, Samuel Higgins, a member of the railroad group, and W. L. McMenimen, a member of the labor group. A. O. Wharton, another member of the labor group, and one railroad representative voted against the increase and the third railroad representative was not present.

The board's ruling follows closely on the defeat of E. F. Grable, candidate for re-election as grand president of the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers, and the announcement by his successor, F. H. Fljozdal, that a new demand "for improved working conditions and a living wage" would be made upon the board. Mr. Grable was defeated by more than 3,000 votes out of a total of approximately 86,000. The election was held the day previous to the announcement of the board's decision.

Prior to his defeat, Mr. Grable telegraphed a protest to Mr. McMenimen against the proposed two cent an hour increase. Mr. Grable requested a quick decision on the requests of the maintenance men and stated that unless a larger increase than two cents an hour was granted "loyal members may adopt extreme tactics fostered by questionable leaders to remedy their grievance." Following the board's announcement Mr. Grable is quoted as stating that the increase undoubtedly would be accepted by the organization as "temporary relief."

Association of Passenger Traffic Officers Meets

The sixty-sixth annual convention of the American Association of Passenger Traffic Officers met in Louisville, Ky., on October 10-11. While a large part of the meeting was concerned with routine business and the presentation of reports of regular standing committees, considerable time was given to the discussion of subjects of timely interest. Among these may be mentioned the problems now confronting the railroads as a consequence of the motor truck competition, and the recent development of gasoline motor rail cars. The following is a resume of the principal subjects discussed at the meeting. (1) Summer tourist fares: Is a uniform basis throughout the United States desirable and practicable? (2) Motor buses: Effect on passenger traffic. Should motor bus companies and individuals operating motor buses be subject to the same regulations and taxes as railroads? (3) Economies in construction of joint passenger tariffs. (4) Inter-territorial clergy arrangements. (5) Anti-scalping bill. (6) Uniform rules and practices for refund on tickets at stations. (7) Gasoline motor cars. (8) Construction of new hard roads paralleling steam lines.

It was suggested during the course of the reports and discussions that tickets sold prior to date of use be endorsed with both date of sale and date good for passage; that an earnest effort should be made to devise some means by which the ticket agents may clearly indicate on the coupon of each interline ticket sold for advance use, the date on which such ticket was sold and the date on which it will be valid for passage, such information saving an extraordinary amount of correspondence between accounting departments; that transfer charges be published in the Official Guide for information of ticket agents and be shown in tariffs regularly published and filed with the Interstate Commerce Commission, and that there be earlier promulgation of bases for division of tourist and other special fares.

It was also contended that the multi-route ticket is simple and so practical that it can be correctly issued by agents and with a saving of time over the single route ticket, but that the multi-junction ticket is somewhat complicated and likely to cause trouble and annoyance to holders; that whereas the present digest includes only divisions, mileages and transfers, that until some different action is taken by this association, the digest continue to be so restricted that at the earliest convenient date it may be republished in standard tariff size of 8½ in. by 11 in; that a rate expert from each territory be directed to arrange for the preparation and publication in suitable form of a digest of passenger fares for such lines as indicate their desire to participate in such a publication. It was further suggested that it was desirable to publish schedules of mixed freight and passenger trains, especially in view of automobile competition; discussion developed that there is no objection to the publication of such service in the Official Guide; that earlier consideration should be given summer tourist fares than has been the practice heretofore, thus affording needed time in which to determine the construction bases and carefully to prepare and check tariffs and file them on statutory notice and also enable the issuance of advertising matter in the winter and early spring months when many people are planning their summer vacations.

There was some discussion of the desirability of economy in the compilation of passenger tariffs through the elimination of unimportant headline points and destinations, the elimination of inactive and circuitous routes, etc., and the desirability of uniformity and standardization in tariff regulations. While it was felt it would be desirable to have uniform regulations to govern redemption of tickets at stations, for example, as to the period of time within which a wholly unused ticket may be redeemed by the ticket agent, it was concluded that the establishment of uniform rules is impracticable owing to different laws effective in the various states. The influence of the gasoline propelled motor car on passenger traffic and its adaptability to certain traffic conditions were discussed at some length.

The officers elected for the ensuing year are as follows: President, A. B. Smith, passenger traffic manager, Northern Pacific; vice-president, C. B. Ryan, passenger traffic manager, Seaboard Air Line; secretary, W. C. Hope, passenger traffic manager, Central Railroad of New Jersey. The executive committee consists of W. B. Calloway, chairman; M. L. Harris, E. P. Cockrell, W. H. Black, the president, vice-president and secretary. The convention was followed by a short business session of the Fraternal Society.

For Attempting to Wreck Lackawanna and Delaware & Hudson trains three youths at Scranton, Pa., were recently sentenced to eight to ten years' solitary confinement. The motive for their action was said to be revenge against the Delaware & Hudson for alleged injuries sustained by one of them.

I. C. Adapts Electrification to Terminal Traffic

Extended Investigation Leads to Selection of 1,500-Volts Direct Current with Overhead Contact

THE PROPOSED electrification of the Chicago terminals of the Illinois Central, involving heavy suburban traffic, freight transfers and interchanges, yard switching, and later the operation of through passenger trains, wholly within a terminal area, is a combination that has not been met heretofore in electrification problems. Considering the wide variation in the fundamental features of various important electrifications the final decision of the Illinois Central to use 1,500-volts direct current with the overhead contact system, as announced in the *Railway Age* of October 7, after an extended investigation which has been characterized by its thoroughness, is highly important.

Territory Involved in Electrification

In addition to its own trains the Illinois Central handles with its locomotives all of the passenger and freight traffic of the Cleveland, Cincinnati, Chicago & St. Louis from Kankakee, Ill., to Chicago, a distance of 54 miles. The Michigan Central also has trackage rights over the Illinois Central from Kensington into the city by means of which it handles its trains into Chicago with its own power although its freight house is located on the Illinois Central tracks and other facilities including the main passenger terminal at Roosevelt Road are owned by the Illinois Central. In addition to these trains the Illinois Central also handles five northbound and six southbound passenger trains of the Chicago, Lake Shore & South Bend between Kensington and Randolph street terminal. The St. Charles Air Line, running west from a connection with the Illinois Central at Sixteenth street, over which the Illinois Central operates west to Omaha, is not included in the electrification program.

According to the city ordinance covering this project, all suburban trains on lines to the south are to be operated electrically by 1927, the freight service north of East Roosevelt Road must be electrified by 1930 and the entire freight service within the city limits by 1935. The through passenger service within the city limits may, with certain provisions, be operated electrically by 1940.

The electrification for suburban service will include all suburban tracks between the suburban terminal at Randolph street and Sixteenth street; six tracks from Sixteenth street to Forty-seventh street; four tracks from Forty-seventh street to Sixty-seventh; three tracks from Sixty-seventh street to Kensington; and two tracks from Kensington to Harvey; the branch from Kensington to Blue Island; two tracks from Harvey to Matteson, which may also be used for steam passenger service; and two tracks from Sixty-seventh street to South Chicago. The route mileage involved is: Chicago to Matteson, 28 miles; South Chicago branch, 4.5 miles, and the Blue Island branch 4.4 miles, with a total of approximately 125 track miles.

Traffic Study Foundation of Terminal Development

As early as 1881 the Illinois Central operated 44 trains daily in suburban service between the old Central Station, then located at Randolph street, and Grand Crossing, near Seventy-eighth street, a distance of 8.5 miles, while 15 of these trains were run on to Kensington, 6.5 miles farther, which was then the limit of the suburban zone. During the World's Fair in 1893, extensive suburban service was installed to handle the heavy traffic to and from the fair grounds, which were located adjacent to the Illinois Central tracks between Fifty-sixth and Sixty-seventh streets. With the rapid growth of population in the area served, the Illinois Central has continued to show a steady increase in business, the approximate number of revenue passengers handled each year since 1905 being given in the following table:

1905	13,100,000	1915	13,150,000
1906	13,800,000	1916	14,100,000
1907	13,600,000	1917	13,700,000
1908	11,950,000	1918	12,850,000
1909	12,150,000	1919	15,250,000
1910	13,750,000	1920	19,000,000
1911	13,338,000	1921	19,800,000
1912	13,750,000	1922	21,000,000 —or more.
1913	13,550,000		
1914	12,750,000		

It is important to note that these figures do not include the non-revenue employee traffic amounting to over 3,000,000 passengers for 1921, or an average of something like 8,900 a day.

Of the some 73,000 passengers carried on ordinary week days, about 42,000 are carried between 6 and 9 o'clock in the morning and between 3 p. m. and 5:30 p. m. A count on a certain day showed 10,714 passengers departing from Randolph street between 3 p. m. and 5:30 p. m., which together with 7,808 from Van Buren street made a total of 18,522 or 124 passengers a minute. During 15 min. of the peak rush from 4:30 p. m. to 4:45 p. m., there were 3,800 passengers or 253 a minute. During this evening rush trains are operated out of Van Buren street and through the yards

Map of the Chicago Terminal District of the Illinois Central, Showing Lines to Be Electrified

on less than two-minute headway, the average for the full period of service from 3:30 a. m. to 12:45 a. m., being a train every 7.5 min. The Illinois Central made a special effort to serve the public during the strike on the Chicago surface lines from September 1 to 6, 1922, during which period a record traffic of 157,517 passengers was handled in a single day. So many of these people have continued to use the Illinois Central that it has been necessary to add 10 trains to handle the business to the best advantage. The schedule at this time calls for 370 trains each week-day with six or seven coaches in a train during the rush hours, and shorter trains at other times throughout the day. The loading and unloading of passengers is expedited considerably by elevating the station platforms at all suburban tracks level with the car platforms.

One factor that has contributed to the success of the Illinois Central suburban service is the separation of the express and local runs between Van Buren street and Hyde Park (Fifty-third street). The express trains make this run of 5.5 miles in 11 minutes while the local trains, making more intermediate stops, require from 18 to 23 min. The express trains to South Chicago make eight stops, covering the run of 13 miles in a minimum of 35 min. The minimum running time to Matteson, a distance of 29 miles, including eight stops is 59 min.; and to Blue Island, 18.5 miles, including eight stops, the minimum running time is 45 min.

These schedules can be shortened by a higher acceleration rate, with the same running speed. A detailed study of the speeds of over 800 trains showed that 50 m.p.h. was the approximate maximum speed of the present steam equipment. While higher speeds were contemplated at first on the new work, estimates showed that added investment in equipment and the greater operating cost that would be required were out of proportion to the benefits derived. It was decided, therefore, to fix the balanced speed of the new electric equipment at 50 m.p.h. and provide an acceleration under load of 1.5 m.p.h. per sec. and a braking rate of 1.75 m.p.h. per sec. In other words, while the new equipment may not have a greater maximum speed than some of the present steam trains, it will start so much quicker that the trains will make the runs in considerably less time.

Switching Area Important Consideration

The electrification will include the extensive freight house and track layout just south of the Chicago river and extending south to East Roosevelt Road, which, including the additional electrified tracks just south of East Roosevelt Road, aggregates 40 miles of tracks, most of which are yard tracks. The switching service on all of the industry tracks in the terminal within the city limits will also be handled electrically.

Part of the Fordham yard at Burnside and part of the Wildwood yard south of Kensington are to be included in the electrification. At Markham yard (the general classification yard which is not yet completed) all of the southbound receiving yard as well as enough of the northbound departure yard will be electrified to permit the picking up of northbound trains. Inspection facilities for electric locomotives will be located at Markham yard and also at a point in the neighborhood of Twenty-sixth street.

Freight Yard North of Randolph Street

The ordinance concerning the project provides that nothing in the terms shall prevent other roads not electrically operated from entering the tracks of the Illinois Central south of East Roosevelt Road with steam locomotives for the purpose of interchange, or to prevent the Illinois Central from using steam locomotives for the similar interchange of business to and from other lines not electrified until such time as these roads are required to electrify.

The extensive track layout between Randolph street and the Chicago river is located close to the great loop district of Chicago. Freight houses of the Illinois Central, the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis are located in this area. Large coal yards and warehouses of private concerns are also served in this yard. The short haul of coal, fruit, and general merchandise from this yard to the main wholesale and retail districts offers a decided advantage. Ground in this territory is very valuable and as the present tracks and freight houses cover almost all of the Illinois Central property there is not much room for further development under steam operation. However, with the introduction of electric propulsion it will be possible to house over many of these tracks with vast freight houses, cold storage warehouses for fruit, etc.

Freight Train Movements

As soon as the Markham yard is completed the main line steam freight service will terminate at this point. Therefore, there will be many through transfer trains to be handled electrically between Markham yard and the Randolph street freight houses. Berry trains, banana specials, etc., will be handled through to Randolph street intact. As high as 500 cars for the Illinois Central and 200 cars for the Michigan Central have been handled into and out of Randolph street in one day.

Transfer trains will also be made up in Markham yard for delivery to other roads. In addition to the traffic of the Illinois Central that of the Michigan Central and the Big Four must be handled electrically over the terminal territory.

A large amount of track changes, depression and elevation are to be carried out before the actual construction of the electrification can be started. These consist principally of the depression of the tracks between Twenty-fifth street and Forty-fifth street and their elevation between Forty-fourth street and Fifty-first street. In the rearrangement of tracks some industry tracks will be located on the extreme west side of the right of way next to which all of the suburban tracks will be consolidated. The through passenger tracks will be just east of the suburban tracks and the freight tracks on the east side of the right of way. At certain places industry tracks will be served from the east side also.

Electrification to Meet Traffic Requirements

A commission was appointed in December, 1920, to make a thorough investigation of the different systems of electrification available. Practically all of the installations in the United States to date have been made to meet special operating problems in tunnels or on grades. The New York Central tracks in New York were electrified primarily to eliminate the smoke in the Park Avenue tunnel and the electrification covers through and suburban passenger service. This is a low-voltage direct current system with a third rail. The Norfolk & Western 11,000-volt single-phase alternating current electrification is principally for heavy freight service over mountain grades; it uses overhead contact wire. The New York, New Haven & Hartford uses an 11,000-volt single-phase alternating current system and is the only example of an electrification which handles through freight, switching, through passenger and heavy suburban passenger service. However, this installation extends to New Haven, a distance of 72 miles. An overhead contact wire is used in this installation. The Chicago, Milwaukee & St. Paul installation is a 3,000-volt direct current system with an overhead contact and handles through passenger and freight, but does not have a dense traffic or suburban services.

Three possible schemes were eliminated early in the study. On account of the extensive yards involved, a search was made for some sort of a self-contained power unit. The storage battery locomotive had to be eliminated on account of the seemingly prohibitive operating charges. A locomo-

tive embodying some form of the Diesel engine may be developed for freight and through passenger service but a unit of this sort has not yet been built to meet the requirements of the present project. The three-phase alternating current system, which requires a double overhead contact system, was eliminated from consideration on account of the complications in construction of the overhead system without any advantages over the single phase.

Complete estimates of first cost, maintenance and operation were then compiled for the four remaining systems (i.e.) (1) 750-volt direct current with third rail; (2) 1,500-volt direct current with overhead contact; (3) 3,000-volt direct current with overhead contact; and (4) 11,000-volt alternating direct current with overhead contact.

The 750-d.c. system was eliminated because of the extensive freight yard trackage involved where a third-rail was undesirable from a safety standpoint and also on account of the fact that this system would require a heavy and extensive overhead layout to provide continuous contact for switching locomotives on ladder tracks and in complicated yards. Considering the climatic conditions along the lake front it was also feared that snow would drift on the tracks in the depression to such an extent as to interfere with the operation of the third-rail. Moreover, the cost of the 750-volt system did not differ materially from that of some of the other systems considered.

The 3,000-volt d.c. system has not been thoroughly developed for multiple unit operation and its use on the multiple unit system required additional complications not met with in the other systems considered. In converting the high voltage alternating current from the generating station into direct current for a 3,000-volt d.c. system it would be necessary to use motor generators which are more expensive and less efficient than synchronous converters which may be used on a 1,500-volt system. Due also to other causes the first cost and annual cost estimates were higher on the 3,000-volt d.c. system.

The investigation, therefore, narrowed down to the 1,500-volt d.c. and the 11,000-volt single phase a.c. systems. Although satisfactory means of eliminating the inductive interference of an a.c. system with the telegraph and telephone circuits have been devised it was the opinion of the majority of the commission that the experimentation and the expense involved would be appreciable. At this point consideration was given to the fact that a growth of traffic in the terminal would require more rolling equipment rather than more track mileage and that there was no immediate prospect of the system being extended to adjacent main line divisions. With this idea in mind it was considered that 1,500-volt d.c. equipment, with its lower first cost, was better adapted to the future development of this particular project. In the final analysis between the 11,000-volt a.c. single phase and the 1,500-d.c. systems it was decided to adopt the latter.

Suburban Equipment

The electrified suburban trains are to be made up of new all-steel coaches equipped with motors and connections for multiple unit control. Controllers will be located at each end of every car, thus eliminating the switching or turning of any equipment at terminals. None of the old coaches now in service are to be used.

In October, 1921, the Illinois Central placed in service 20 new all-steel suburban coaches which are now operated with steam but in which provisions were made for the electrical equipment to be installed later. These new cars have a seating capacity of 84 persons. Therefore, better service can be given with fewer cars than are now used as the old coaches seat only 56 to 65 persons. These new cars were described in detail in the *Railway Age* for December 12, 1921. The 220 additional suburban coaches required for the new project will be designed along similar lines.

Eighty to 100-ton switching locomotives will be used in the various yards. On the through transfer between Randolph street and Markham yard it is the intention to use two locomotive units coupled. In this service under rated capacity the locomotives will operate at approximately 20 m.p.h.

The Illinois Central, as the owner of its own coal field and an advantageous power house site on the Calumet river near Riverdale, is peculiarly well fitted to build and operate its own power generation station. However, no decision has yet been reached on this point and the power may be purchased from a public utility company.

With the electrification the automatic signaling will be entirely rebuilt as a complete alternating current system. The existing direct current track circuits will be replaced with alternating current apparatus. Impedance bonds will be required at the ends of all circuits to isolate the track sections for the a.c. signaling current and to provide a continuation of the return propulsion circuit. The enclosed disc type of signals now used will be replaced with three-color type light signals. Although some of these signals have already been replaced, the new program calls for an entirely new relocation of the greater part of the signals.

Engineering Organization

In conducting the investigation the late A. S. Baldwin, vice-president of the company, was chairman of the commission. With him was associated D. J. Brumley, chief engineer of the Chicago terminal. In the course of their investigations Mr. Baldwin and Hugh Pattison, electrical engineer for the commission, toured Italy, Switzerland, France and England to investigate electrification. It was upon his return to this country that Mr. Baldwin died. Mr. Brumley succeeded him as chairman of the commission, which included Bion J. Arnold of Chicago, George Gibbs and Cary T. Hutchinson, New York, consulting engineers, and W. M. Vandersluis, engineer-secretary. Having rendered the report covering the decision on the fundamental features of the electrification the function of the commission is now terminated.

Railway Fire Protection Association

The Railway Fire Protection Association held its ninth annual meeting at the New Willard Hotel, Washington, D. C., this week, beginning on Tuesday, October 17, with an attendance of about 100. G. L. Ball (St. L.-S. F.), president of the association, occupied the chair.

President Ball in his opening address recited briefly the activities of the executive committee during the past 12 months and referred to the prosperous condition of the association. A periodical news-letter has been issued to members, keeping them advised of current developments. Regional meetings have been started in the east, and it is proposed to hold similar gatherings in the middle west and the west, perhaps once or twice a year. The United States Chamber of Commerce proposes to start a nation-wide fire prevention campaign and this association plans to co-operate in the movement.

The executive committee, E. A. Ryder (B. & M.) chairman, reported a total membership of 235 (157 active, 75 associate and three honorary), 36 members having joined during the year.

The Committee on Resolutions, B. S. Mace (B. & O.) chairman, reported a set of resolutions which were in the nature of a platform of principles for the guidance of members. In these the association appeals to all railroad executives not only to support their own fire prevention departments, particularly in the direction of educating all employees, high and low, but to proclaim with emphasis their own

purpose to support this association. Every road is urged to put all of its fire prevention activities under a single central authority and to see that there is effective co-operation between all other departments and the fire department. It was resolved to send a copy of these resolutions to the chief executive of every railroad in the country.

Fire Causes of 1921 in Detail

The Committee on Statistics, G. R. Hurd (I. C.) chairman, gave totals of fire losses for 1921, as reported by 75 railroads representing about 80 per cent of the Class I roads of the country. The total miles of road represented in these reports is 207,634. The number of fires reported is 7,963, only 12 less than in 1920, but the total of the losses, $7,589,611 is almost $3,000,000 less than in 1920. This difference is accounted for partly by the general fall in values of some classes of property, and partly by a lessened volume of freight business on the railroads. Losses due to fires on adjacent property increased, indicating the need of keeping in touch with neighbors. The committee suggested that a railroad should keep itself fully informed concerning fire hazards in all buildings within 150 feet of its right-of-way. Suggestions of the lessons of fires were given in connection with numerous classes: Exposure to forest fires, friction, hot journals, etc., incendiary and others. Smoking should be prohibited not only in shops, freight houses, etc., but in offices as well.

In the discussion on this report, E. N. Floyd (C. C. C. & St. L.), proposed that statistical averages by the month or day are not so valuable as those per train-mile—for some causes rise and fall with changes in volume of business. The importance of getting reports of all fires, no matter how trifling from a cost standpoint, was emphasized by several members. Some roads do not report all fires even where the loss is as much as $100. When responsible for a small fire, they often try to keep it out of the records.

The uselessness of reports which say "cause unknown" was pointed out by several members. The efficient superintendent does not accept such a report without full investigation. W. F. Steffens (N. Y. C.) said that on his road in 1921, by thorough investigation, a large number of fires were forced out of the "unexplained" column. "Spontaneous ignition" is another which oftentimes is suspicious.

E. W. Osborne (Nor. Pac.) believes he finds at least the probable cause in 99 per cent of his fires, and positive evidence in 75 per cent. Electricity is wrongfully blamed in many cases where the person reporting does not make thorough investigation or has a selfish purpose in concealing the true cause. "Electric fire" has taken the place of the former popular explanation, "caused by rats and matches."

This report was accepted and referred to the executive committee with recommendation to make the improvements in form and classification that had been suggested.

Locomotive fire hazards were reported on by a committee of which Earl N. Floyd (C.C.C. & St. L.) is chairman. The committee expects to have a conference with a committee of the International Railway Fuel Association, but beyond that had nothing to report.

What Progress Can Be Measured?

Tuesday afternoon was devoted largely to a "symposium" on "Are Fire Protection Efforts Producing Results?"

C. C. Rambo, manager of the Railroad Fire Insurance Association, the first speaker, reported his observations while visiting different roads in behalf of his association. Results were noted as "splendid" in 1918 and they are more certainly so now. Losses on fixed structures afford a good index of efficiency, as they are not affected much by fluctuations in volume of traffic and these show greatly reduced losses in 1921. Mr. Rambo emphasized the duty of concentration on preventable fires, which continue to occur year after year. Losses due to smoking and matches have increased seriously. In three years the total of railroad losses in these classes was $763,042, an increase, while the total losses, including all causes, decreased; and doubtless many "unexplained" cases ought to go in this class.

B. S. Mace (B. & O.) confirmed Mr. Rambo's views and statements. Mr. Mace is chairman of a committee appointed by the governor of Maryland, which has reformed much bad practice in that state and he recommends railroad fire protection officers to take part in state, municipal and community fire prevention activities. He has found speaking to pupils of public schools productive of excellent results. Teaching on this subject has been put into the curriculum in some Maryland schools. He hopes to get some advanced legislation in that state. Mr. Mace and E. B. Berry (So. Ry.) represent the Railway Fire Protection Association in the National Fire Waste Council. The Baltimore & Ohio offers to co-operate in fire prevention with all industries located on its lines.

W. S. Topping (Bureau of Explosives) gave interesting observations made in connection with the work of his bureau, confirming what had been said about progress during the past 15 years. The Bureau has induced manufacturers of explosives to make numerous improvements in packing which have lessened the number of fires in transportation. Among these are a rule not to ship in the same package two substances which, if mixed, will evolve heat, and not to ship oily waste or paper, and other such risky substances, in box cars. Gasoline fires have been reduced by encouraging the use of electric hand lanterns. All wrecking outfits should have portable electric lights. The number of train wrecks followed by fire has been markedly reduced.

Robert Scott (A.C.L.) and L. F. Shedd (C.R.I. & P.) reported interesting experiences lecturing to pupils in schools. The suggestion was made that gatherings of boy scouts and of girl scouts constitute a field which ought to be cultivated as much as the schools.

Committee on Forms

This committee, W. C. Neely (N. & W.) chairman, has begun its work but the roads have been slow in furnishing samples and information. The committee proposes to standardize the following: Preliminary notice of fire; full report of same with all needed detail; report of fires on non-railroad premises; form for collection of insurance; for proof of loss; placards; for an original fire survey; for re-inspection; regulations for fire drills, and others.

Transportation of Explosives

W. S. Topping, of the Bureau of Explosives, aided by the chief chemist of the Bureau, C. P. Beistle, and Inspectors Baldwin, O'Donnell, Cook and Campbell, answered a large number of questions presented by members about the proper interpretation and application of the I.C.C. rules covering the transportation of dangerous articles.

On January 1, next, revised rules are to be issued embodying additional features made possible by the increased power granted to the Interstate Commerce Commission in the last revision of the federal law. Shippers can be more effectively held to their responsibility. In this discussion W. F. Hickey (N.Y. N.H. & H.) called attention to the fire risk from stray electric current when cars of gasoline stand on side tracks not properly bonded and insulated to provide against that danger.

The difficulties incident to enforcing the rule that tanks to receive gasoline from cars shall not be placed within 30 feet of a passenger track were enlarged upon by a number of members. Oil men always object to the cost of a special track and if refused the use of a track near the main line, appeal to the traffic department with the threat to go to another road. To preserve this safety rule the railroads must act together.

Bridge and Building Meeting in Cincinnati

Thirty-Second Meeting Characterized by Good Reports, Active Discussion and Interest in the Exhibits

The American Railway Bridge and Building Association, in common with other railway organizations scheduled to hold meetings this fall, was confronted with the prospect of postponing its convention because of the serious difficulties with which the railroads contended during the past summer. The officers of this association were thoroughly determined to hold their convention, with the result that the meeting held in Cincinnati on Tuesday, Wednesday and Thursday of this week was one of the most successful which this association has ever held. That the officers of the association had the courage of their convictions and never laid aside their plans for holding the meeting is attested by the evidence of thorough preparations which characterized the sessions. The preparation of a bulletin containing the reports of all committees in advance of the meeting served to expedite the conduct of the sessions since it obviated the necessity for a detailed reading of the reports on the floor and thus afforded more time for thorough discussion.

The selection of a place of meeting as centrally located as Cincinnati was, no doubt, an important factor in encouraging a large attendance. The selection was also a happy one because it afforded the members of this association an opportunity to inspect the reconstructed Cincinnati Southern bridge over the Ohio river, which is in many ways one of the most interesting pieces of bridge engineering which has been completed in recent years. The session on Wednesday morning included a paper on the reconstruction of this bridge by F. W. Henrici, assistant engineer of construction, American Bridge Company, who was directly connected with the work, and this was supplemented on Tuesday afternoon by an excursion to the bridge site.

The convention was called to order at 10 o'clock Tuesday by C. R. Knowles (superintendent of water service, Illinois Central), president. After invocation by C. A. Lichty (inspector, purchasing department, Chicago and North Western) secretary, the association was welcomed to Cincinnati by Froome Morris, vice-mayor of the city and by Jas. A. Reilly, president of the Chamber of Commerce. A. O. Ridgway (assistant chief engineer, Denver & Rio Grande Western), vice-president, responded in behalf of the association. Following a review of the year's work by President Knowles, the report of the secretary-treasurer showed a membership of 830.

Over 250 members were present. R. N. Begien, general manager, Western Lines, Baltimore & Ohio, addressed the meeting on Wednesday morning, emphasizing the essentials of successful organization in the conduct of bridge and building work.

The papers and reports presented before the convention may be divided into two general classes, those dealing with the special problems arising through the advance in the science of structural engineering and those relating to the routine administration of railway bridge and building maintenance which comprises the principal responsibility of the bridge and building officer. As coming within the limits of the first class may be mentioned a report on labor-saving devices; a comparison of the relative merits of wood, steel and concrete tanks; the framing of bridge timbers before subjecting them to preservative treatment and a review of more recent studies of the bearing power of piles.

A large part of the active discussion at the various sessions related to the reports on the routine problems of bridge and building maintenance. Among these was a report on the painting of structural steel, reviewing common practice as to workmanship, and devoting considerable space to the material. This portion of the report included abstracts from papers presented before other technical societies from which a number of conclusions were drawn with regard to paints most suitable for various purposes.

The inspection of buildings was the subject of a report divided under two heads: Inspection of new buildings during construction and the periodic inspection of existing buildings. This took the form of detailed instructions to the inspector, together with some comments on the necessity for keeping an accurate record of such inspections.

The report of the Committee on the Construction and Maintenance of Sewers and Drains presented a concise summary of the properties and characteristics of the more common types of sewer pipe; namely, vitrified pipe, common drain tile, concrete sewers, brick sewers, cast iron sewers and wooden pipe. It also gave a summary of the hydraulics of conduits and a statement of principles of practice in construction.

Recognition was given to the growing use of the reinforced concrete trestles supported on bents of concrete piles in a committee report covering the handling and driving of concrete piles. This consisted primarily of a review of practices developed on roads that have had the greatest experience with the concrete pile trestle. An interesting feature of the report was the presentation of figures indicating the extent to which concrete piles have been used on some railroads. Thus, the Illinois Central has used 11,000 piles in a total of 22,072 lin. ft. of single-track concrete pile trestle, 3,747 lin. ft. of double-track trestle and 248 lin. ft. of three-track trestle. The Chicago, Milwaukee & St. Paul was reported as having driven a total of 18,088 concrete piles or 48,668 lin. ft. of piling.

Pile Driving and Pile Driving Records

The committee presented the definitions, specifications and recommended practice of the American Railway Engineering Association covering piles, pile driving and the construction and driving of pre-moulded concrete piles. The report also gave an extended review of current literature on the formulas for determining the bearing power of piles with the following comments on the consideration of foundation conditions and the recording of pile driving data.

The soil should be explored to a sufficient depth to determine if the ground alone will support the structure. If the investigation discloses that it will not sustain the structure alone it must then be determined what kind of piles should be used, their length and number. An exploration of the earth to determine the length of piles to be used may be made by driving test piles or by making borings. If test piles are used they should be driven to a greater depth than it is intended to drive the regular piles. The driving should be observed and the safe load at various depths computed by a suitable formula.

If the earth is homogeneous it is only necessary that the piles be driven to such depths that the frictional resistance of the ground is greater than any load which will be placed

upon the pile. It should be noted, however, that in most cases the ground to be penetrated is not homogeneous. In the case of a structure of great weight and extent the engineer should carefully consider the danger of stopping the piles in a hard stratum overlying a soft one for the simultaneous loading of the great number of piles may cause the soft stratum to squeeze out and the structure to settle.

A test load may determine if individual piles or even small groups of piles will sustain a given weight over a given area, but it does not necessarily determine that when the piles receive their permanent load the stratum in which they stopped will not settle or break through into a softer one and cause it to be forced out in a horizontal direction. It appears that an exploration of the earth by borings is safer and more satisfactory than the driving of test piles although a combination of the two methods is ideal and to be recommended. The advantage of borings over the driving of test piles is that they can be carried to much greater depths and the exact soils encountered known. It also obviates the danger of stopping the piles in a hard stratum overlying a softer one as mentioned previously.

Very careful notes should be made of all earth explorations and the driving of test piles. It is well to keep samples of the soils obtained at the various depths of borings. These should be kept at least until the structure has been in use for some time and any danger of its settling past. The engineer will be repaid many times for the trouble and cost of making explorations, one of which is ability to order an economical bill of piles or one calling for lengths that will not call for excessive cutoffs and waste.

The importance of making and filing complete and dependable notes of piles, piledriving, and soil explorations cannot be over-estimated. This has been brought home to the railroads in the work of preparing valuations of their properties for the Interstate Commerce Commission. These data will be found valuable in estimating and ordering material for emergency replacements as in the case of bridges destroyed by fire, washouts and wrecks. Other occasions for their use arise when structures are to be enlarged in extent or increased in height and when it must be determined whether additional piles will be needed and if so the number and lengths required. The results of soil explorations should be not only entered in the field books but also placed upon the piling plan for the information of the inspector and pile driver foreman.

There is considerable opportunity for standardizing the important items in pile driving records. The heading should contain reference to the location of the work on line or branch, date, contractor, pile driver number, and kind and weight of hammer. In case of the gravity drop steam hammer the make and number should be given, together with the number of strokes per minute, the height of fall and weight of entire hammer and striking part separately. If a double-acting steam hammer is used, it is necessary also to record the diameter of the piston.

In the body of the report some put in a date column so as to provide a continuous pile record and to give the opportunity to record the date each pile is driven. The best practice is to number the bents in the direction of the mile posts and the piles from left to right. For piers and other foundations a sketch or pile plan will indicate the system of numbering. The kind of timber or concrete in the pile should be noted. In the case of timber piles the diameter of tip and butt should be given, and in the case of concrete, the date of manufacture and the name of the manufacturer. Next should be recorded the length of pile in the leads, the length below cut-off, and the distance from base of rail, top of pier or other reference to the cut-off. The next group of data to be recorded is that regarding the penetration. It is well to record the total penetration and the amount of penetration in the soft and hard materials separately.

A column for remarks should be provided into which can be placed notes regarding the batter of piles, broken piles, whether rings or shoes were placed on piles and other information that may be desirable. Many roads record the total number of blows for driving the pile. It is also desirable to give the original length of the pile used, where a pile is cut off before being put in the leads, provided the part cut off is wasted and not driven as another pile.

For the record of test piles it is necessary to give the rate of penetration for each foot of the driving and as much information as is possible regarding the kind of soil, along with the data of ordinary driving as given above. It is especially important to get an accurate record on the driving of test piles. The record of soil exploration by borings should show the location of the test and the distance from base of rail or other definite reference point to each kind of soil. A note should be made of the compactness and moisture content of the soils encountered.

It is well within the province of this report to urge the making of clear and definite specifications for pile driving contracts and reasonable inspection during the progress of the work. Some engineers have subjected themselves to no little criticism in the past for loosely drawn pile driving specifications.

The common requirement that the piles be driven to "practical refusal" is deplored. The use of this term has been responsible for the partial or complete destroying of many piles by over-driving. When a pile has encountered sufficient resistance to support the load to be placed upon it, and the soil explorations indicate that it has reached or penetrated into a stratum capable of receiving the load, the driving should be stopped. This condition should be clearly defined in the specifications and the formula for determining the resistance of the pile given.

It is hoped that it will be possible for the railroads of the country to keep track of the results of driving piles under various conditions so that all may make use of the information obtained. The loads put on our bridges and other structures are steadily becoming heavier, and pile material, especially timber, is becoming scarcer and more costly. It is therefore essential that our materials be used with the greatest economy consistent with future safety.

[F. C. Baluss, engineer of bridges and buildings Duluth, Missabe & Northern, Duluth, Minn., chairman.]

Discussion

The discussion of this report hinged largely about the detail with which foremen and inspectors should be required to keep field records. Some advocated complete records of every pile driven to insure that data will be available in the event of a failure, while others deprecated this practice as favored the universal use of a short form, covering every pile unduly burdening a foreman. The consensus of opinion favored by the universal use of a short form, covering every pile.

Labor Saving Devices

The committee reporting on this subject presented detailed examples of a large number of types and classes of equipment which had been found of convenience and economy on various railroads, in many cases reporting on the actual saving obtained. The introduction to the report called attention to some of the difficulties involved in the application of labor saving equipment and suggested a number of principles which must apply.

The chief difficulty in the way of providing and using labor saving devices where considerable investment is involved, is that economies are not always secured unless the device is kept in constant use. It is also important to decide

whether theoretical or actual economies are realized, and whether such equipment should be supplied for each gang, or for alternate gangs or be kept at division headquarters. The distribution of equipment and labor saving devices should be under the direction of the division officers.

The motor car, as usual, came in for considerable commendation from the committee. There is no doubt, the committee stated, as to the advantage in the use of motor cars by bridge and building gangs. Until recently, the motor cars in use did not have sufficient power and capacity and had too much speed. At present the designs measure more accurately to what is required under actual working conditions. With the exercise of good judgment in the question of speed, the motor car is a valuable asset. The proper care and upkeep of a motor depends largely on the personal equation. The more complicated the construction of the car, the greater the cost of maintenance and upkeep and the less the value of the labor saved.

The following are a few brief references to comments appearing in the report concerning various pieces of equipment used in bridge and building work:

More attention should be given to the use of pneumatic and electric motors for boring holes incident to the construction of docks, cribs and protection piers at draw bridges. Electric drills are probably the most convenient and economical to operate where power is at hand. The Michigan Central recently constructed a crib at Mackinaw City where all the boring was done by compressed air furnished from a locomotive air pump. It was found by actual tests of hand and power boring that compressed air saved the equivalent of one man working 192 days in the drilling of 3,600 holes. The Northern Pacific uses electric motors to good advantage in boring for dowels in timber cribs. Holes 7/8 in. in diameter were drilled through 24-in. timbers in 40 sec.

Only limited data are available regarding the efficiency of tie dapping machines. A recent test on the Michigan Central showed that three men dapped 85 ties in eight hours, which is about 50 per cent more than the same number of men could have dapped by hand. The New York, New Haven & Hartford estimates that this class of machinery effects a saving of 50 per cent in labor costs.

To test scales at large freight houses where there are a great number to inspect, the New York, New Haven & Hartford uses a small four-wheel truck which will hold twenty 50-lb. weights. The loaded truck is used as the test weight and is moved to various points in the freight house instead of shifting individual weights.

Paint spraying machines were recently tested on the Pennsylvania at the East Altoona engine house. Inclined panels in the ventilators were painted by spraying at a cost of $0.029 per sq. yd. If this work had been done by hand it would have cost $0.059 per sq. yd. The grandstand and bleachers at Altoona were spray-painted at a cost of $0.036 per sq. yd.

A compressed air whitewashing machine is used by the Illinois Central for the whitewashing of fences and roundhouses, and disinfecting stock yards. The operation requires a crew of eight men. It is claimed that the machine will do the work 50 per cent cheaper than hand labor.

Bridge and building supervisors on the Missouri Pacific and the Union Pacific highly recommend a small stiff legged derrick mounted on a push car, equipped with hand winches and with the necessary clamps for clamping the push car to the track. This is an exceedingly valuable piece of equipment and one which should be placed with all gangs having to take care of pile trestle maintenance.

The self-propelled derrick car is strongly favored by all roads reporting on this machine. It saves a great deal of labor by eliminating train crews and work trains, which at best constitute a very large item in the cost of road work. This machine, being slow, is not recommended for main line work at a distance from sidings. For yard work it is ideal while for other work its usefulness depends on the number of trains to be avoided and the nearness of a siding. The average capacity should be 8 to 12 tons and the speed from 5 to 15 miles per hour. The greater speed is of advantage.

Locomotive cranes follow very closely the advantages claimed for the self-propelled derrick. Their scope is, however, broader and the average work which can be handled runs from 15 to 30 tons. The wrecking cranes are usually made use of where exceptionally heavy loads have to be handled. The value of the locomotive crane lies in its adaptability to many uses. For loading and unloading material out on the road locomotive cranes or self-propelled derricks are recommended by all for heavy work. For yard work, stiff legged derricks, carefully placed, are favored although special self-propelled derricks are frequently used.

Acetylene cutting and welding outfits for bridge gangs have been reported as almost indispensable for those roads having to remove or repair old structures. They may be used for cutting up or repairing girders in the field or dismantling old trusses which must be taken out of the way quickly. They may also be used for cutting I-beams, plates and angles in the field where a close fit is not required.

Portable telephones have proven very efficient for bridge jobs at a distance from a station and where it is necessary to get advice from the dispatcher as to time that track can best be out of service. They do not relieve the foreman of any precaution against accident but help to keep the work running smoothly.

For air tools the light portable compressors used for the tie tampers seem to meet with the approval of several roads. For heavier work the 9½-in. pump and cross-compound pump with three standard reservoirs was found to be a good combination. Air tools have been used for boring, grinding and drilling and for reaming, riveting and concrete drilling, all proving great labor savers.

Electrically-operated tools are of great value where power is available. They have about the same range of use as air tools with perhaps a greater advantage where large power is needed. Electric welders are very useful and particularly economical in welding broken castings on pile drivers, derricks, draw bridges, and bridge pedestals. This device not only saves time in getting damaged equipment back in service but also reclaims considerable material.

The most important field for improvement lies in an improvement of the esprit de corps whereby the men will be encouraged to think for themselves, to suggest methods of increased efficiency and to develop a feeling of loyalty to their employers. Without these, any mechanical device is doomed to failure.

The Michigan Central furnishes its bridge gangs with such technical magazines as the *Railway Age*, one copy to each gang, and other publications that can be picked up around the general offices. The men in most cases have shown considerable interest in these publications and spend their spare time in discussing different methods of handling the work instead of discussing topics which have a tendency to cause trouble and undermine the morale of the organization.

[J. S. Huntoon, assistant bridge engineer Michigan Central, Detroit, chairman.]

Discussion

The discussion of this report was largely in the form of statements pointing to other illustrations of devices developed to effect economies of various kinds. In connection with motor cars, attention was called to the wide variations in the cost of operation and the consumption of gasoline, one explanation offered being the possible diversion of the fuel to other uses, which has been overcome in some cases by mixing oil with the gasoline, thereby making it unsuitable for use in automobiles, stoves, etc. Considerable time was given to testimony on the many uses of pneumatic tools.

Relative Merits of Wooden, Steel and Concrete Tanks

The first railway water tanks were built of wood and, while other materials are now being used, it is safe to say that the wooden tank will never be discarded entirely. The advantages of the wooden tank are manifold. In the first place, it is the cheapest form of construction. A wooden tank is easily constructed and a carpenter crew assigned to this work soon becomes skilled in its erection. As wood is a poor conductor of heat and cold, it is a desirable material for tanks in cold climates as the water can be kept from freezing more easily. It is not considered practicable to build a wooden tank of larger capacity than 100,000 gal. The wooden tank carries a certain fire risk and is likely to be damaged or destroyed by fire in the frost-proofing or by the burning of adjacent buildings.

Creosoted Tanks

The increasing scarcity of durable timber for the construction of tanks, together with the increased cost, has resulted in a number of railroads constructing creosoted tanks, this type of tank now being standard on at least four railroads. Creosoted tanks are now being built in sizes up to 100,000 gal. capacity. The Illinois Central has 31 creosoted tanks in service and seven more now under construction. The advantage of the creosoted tank over the untreated wooden tank is that any timber that will take treatment can be used, thus making the cheaper timbers available for tank construction. Where the entire structure is creosoted there should be considerable reduction in maintenance as the life of the structure will undoubtedly be much greater and there is no necessity for painting other than the hoops.

The need of larger reservoirs than could be made safely with wooden staves led to the construction of the sheet iron and steel tanks, beginning about 30 years ago. The steel tank can be made of almost any desired capacity and has the advantage that it can be built quickly and is not excessively expensive. It is subject to corrosion and for that reason must be kept well painted both outside and inside. If there should be any neglect in this respect much harm may result. Reports indicate that steel tanks pass through severe freezing winter weather successfully and only the usual precautions for keeping the water from freezing need be taken.

Reinforced Concrete

The first reinforced concrete tank was built in this country in 1899, but only 53 had been built in this country and abroad by 1910. Since then many more have been constructed but not as many as the general use of concrete in other lines of construction would lead one to believe. Concrete tanks for railroad purposes are not being given general consideration for various reasons. Very few railroad water stations can be considered permanent because experience has shown that operating conditions are constantly changing, requiring frequent and unexpected changes in yards and tracks. A concrete tank cannot be moved and therefore if the permanency of the location is at all doubtful, it ought not to be built. It is also the most expensive type of tank and as the item of initial cost is often the governing factor in a decision, other types are used instead.

The Problem of the Concrete Tank

The great problem of the concrete tank is to secure a perfectly water tight reservoir. The first tanks built, as a rule, developed cracks after the tank had been filled with water. While the cracks gradually filled up, especially where the water contained limestone in solution, many of the early tanks had to be coated on the inside with some water-proofing composition. As far as is known, no tanks built recently have been waterproofed by coating the inside.

Much speculation has always existed as to the effect of severe winter weather on concrete tanks. Many such tanks are in service in northern climates and seem to give no more trouble than tanks of other types. In fact, some claim that the concrete tank stands up better than the wooden tank.

The construction of the concrete tank requires good workmanship. Most difficulties with concrete tanks can be traced almost directly to faults in the construction and it is therefore necessary that the work must be watched carefully.

Conclusions

A concrete tank will invariably represent a greater first cost than either a steel or wooden tank, yet this first cost is offset to a large extent by a far lower maintenance cost as it is a permanent structure with a life of perhaps 100 years as compared with other tanks having a maximum life not to exceed 50 years. One great disadvantage of the concrete tank is that it cannot be moved after erection.

While the concrete tank is admittedly more expensive than the steel and wooden tank and its greater life and lower maintenance cost are firmly established the relative cost and durability of steel and wooden tanks is still a matter of controversy. An average life of 30 years may be expected of tanks constructed of white pine, cypress and redwood while the other untreated timbers used in the construction of tanks will have a life not to exceed 15 years. Properly treated timber will have a life of at least 30 years and probably more. Steel tanks for railway water service have only been constructed during the past 30 years and as some of the first steel tanks constructed are still in service the minimum life of a steel tank properly painted can be based upon this figure with a minimum life of 40 to 50 years, always dependent on proper painting and maintenance. Many of the old style flat bottom steel tanks have failed through the bottom rusting away, and the figures on the life of the steel tank are based upon the modern type of conical bottom steel tank.

A feature of primary importance in the selection and construction of a water tank, and one that cannot be emphasized too strongly, is material and workmanship. As previously stated most of the difficulties experienced with concrete tanks can be traced directly to faulty construction. The manufacture of steel tanks has been developed to such an extent that one is reasonably sure of good material and workmanship as the material furnished by most manufacturers is uniformly up to standard specifications and the construction is usually done by workmen skilled in that particular line of work. The construction of concrete and wooden tanks is sometimes performed by workmen who are no doubt skilled in ordinary concrete work and general carpentry and building but perhaps do not fully understand the requirements of tank construction. Conditions encountered on the average railroad vary to such an extent that it would be unwise to establish any particular type or kind of tank as standard without regard to local conditions.

[F. A. Eskridge, assistant engineer Chicago & Eastern Illinois, Chicago, chairman.]

Discussion

The discussion following this report was not directed so much at the contents of the report as to the measures which must be taken to obtain good construction and satisfactory maintenance of the several classes of tanks. The greatest interest was manifested in the creosoted wood tanks, particularly as to methods of construction, framing before treatment and the kind of wood used. Favorable reports were given on a concrete tank in which the space underneath the tub is used as a pump house, this type having been found very successful in cold territory.

Framing Bridge Timbers Before Treatment

One of the developments that will come about with the general use of treated timber, is the framing of the timber before treatment. This is logical because it eliminates the cutting in the field that has caused many failures in the past. It is also desirable because it permits the use of machinery in place of hand work in framing the timber. It is an important development because it means that the bridge carpenter will no longer take an assortment of lumber to the job, remove decayed material and replace it by new material cut to fit, but that the lumber will be cut and framed at the mill and sent to the job ready to be placed. The field men will be erectors rather than carpenters. The structures will be built with more care and with an expected life of 30 to 40 years rather than 6 to 15 years. It will no longer be necessary for the railroads to carry large stocks of lumber for repairs due to decay, but only small stocks to take care of emergencies, such as burnouts, washouts and wrecks. It will no longer be necessary to adhere so rigidly to standard types, but structures can be designed more nearly to fit their individual location. In other words, our treated timber structures will soon be fabricated, like metal structures, at the mill ready for erection in the field.

Few railroads have so far adopted treated lumber for general use, but it is to be expected that before many years it will come into general use on all railroads: (1) because lumber is the most important material used in the bridge and building department, and will probably not be displaced to any great extent by other materials in the future; (2) on account of the rising cost of lumber the railroads cannot afford to use it untreated, and allow it to decay in the structure as at present; and (3) on account of the increasing scarcity of the better grades needed for use when untreated, it will be necessary to use the poorer grades which become suitable only after treatment.

Causes of Decay

We treat lumber to protect against decay. It is expensive and the results must warrant the expense. Experience teaches that we cannot get the results we want unless we observe certain precautions in preparing timber for treatment, in treating and in handling and working it afterwards. Treating processes have received a great deal of study and are fairly well standardized, but there is room for more study and care in the preparation of lumber for treatment. In handling lumber after treatment, experience has shown what to do, and we should now get this information to the inexperienced workmen, and make them appreciate that when working treated lumber they are no longer using plain lumber, but an entirely different material.

Decay starts from the outside. It is not necessary for the preservative to penetrate completely and to poison all of the wood; in fact it is not usually practicable to obtain complete penetration, but if there is an impervious armor of treated wood on the outside, surrounding the untreated wood, there will be no decay. If, however, there is a hole in this armor, caused by a crack, an injury, or by cutting or boring, that exposes the untreated wood, decay will take place if the other conditions are favorable, and they generally will be.

The ideal way to build with creosoted lumber would be to make complete detail drawings of each structure to fit the individual location. This would permit the framing of each member before treating. It would not be practicable to do this with pile structures since it is necessary to cut off piles to proper elevation after they are driven, and also because the piles cannot always be driven exactly in the desired location. For pile structures then, the ideal way is to drive the piles and cap them, and measure locations, then frame the balance of the structures to fit these locations and then treat the framed lumber. This idea is being carried out on some railroads in building small structures such as highway bridges, water tanks and coaling plants, but it has not been applied generally to bridges and trestles, where the bulk of the lumber is being consumed. In these structures it is the general practice to provide treated lumber in stock sizes and cut and bore in the field as may be necessary.

While most of the failures of treated lumber seem to be attributable to careless handling or cutting in the field, it is practicable to protect these exposed surfaces of pine lumber efficiently by coating them in the field. The replies to the questionnaire indicate a fairly uniform practice for protecting creosoted pine lumber in the field which consists in coating the surfaces with two or three coats of hot creosote oil and then with hot coal tar pitch. This is sometimes followed on ends of piles by a covering of tarred paper or galvanized iron. No instance is reported where treated pine timber cut in the field and protected in this manner has decayed afterwards. For Douglas fir this field treatment should be avoided wherever possible.

The chief objection to cutting treated lumber in the field is not that the cut surface cannot be protected, but the possibility that it will not be. Until workmen have been trained to work treated lumber, they fail to appreciate the necessity for, and have little patience with the extra care in handling and precaution in working that they are required to observe.

Conclusions

1. In the replies to the committee's questionnaire, all roads advocate the framing and boring before treatment as far as practicable.

2. It is practicable to frame and bore before treatment the timber in all classes of railroad structures, but it may be necessary in badly driven pile trestles, if cutting after treatment is to be avoided, to frame certain members in accordance with measurements taken after the piles have been driven.

3. All treated lumber should be handled carefully. Piles and other heavy sticks are likely to suffer more from rough handling than lighter sticks. They should be handled with chains and not with timber dogs or cant hooks. They should not be dropped from cars as they are likely to be bruised or cracked.

4. All holes for bolts bored before treatment should be 1/16 in. larger than the bolts. Those bored after treatment should be the same size as the bolt and should be protected thoroughly by pouring hot creosote oil into them. Oil can be poured into horizontal holes by using a bent funnel.

5. Ties are likely to suffer considerable wear, particularly if proper track fixtures are not used. Tie plates should be of adequate size and without claws to cut into the wood. Spike holes should be bored and filled with creosote oil before driving the spikes. All unfilled holes should be filled with creosoted plugs. Rails should be well anchored on approaches to prevent running as much as possible.

6. The committee recommends ballast deck trestles as against the general use of open deck trestles of treated timber. While the fire risk with open deck trestles of treated lumber is probably no greater than with untreated timber, when the structure is destroyed the loss is greater. With ballast deck timber trestles experience shows there is comparatively little risk from fire.

7. The committee recommends against the use of treated lumber with plain lumber in the same structure, in situations where it would be necessary to rehandle and refit the treated lumber when the untreated lumber is renewed.

This does not apply to the use of treated piles used in trestles along with untreated lumber.

[A. B. Ilsley, bridge engineer Southern Railway, Lines East, Charlotte, N. C., chairman.]

Election of Officers

At the annual election of officers on Thursday morning, the following were selected: President, Arthur Ridgway, assistant chief engineer, Denver & Rio Grande Western, Denver, Colo.; first vice-president, J. S. Robinson, division engineer, Chicago & North Western, Chicago; second vice-president, J. P. Woods, supervisor of bridges, Pere Marquette, Saginaw, Mich.; third vice-president, C. W. Wright, master carpenter, Long Island Railroad, Jamaica, N. Y.; fourth vice-president, E. T. Howson, western editor, *Railway Age*, Chicago; secretary-treasurer, C. A. Lichty, purchasing department, Chicago & North Western, Chicago; assistant secretary, F. E. Weise, engineering department, Chicago, Milwaukee & St. Paul, Chicago; directors, S. T. Corey, assistant bridge engineer, Chicago, Rock Island & Pacific, Chicago; W. B. Hotson, superintendent bridges and buildings, Elgin, Joliet & Eastern, Joliet, Ill., and P. N. Nelson, supervisor bridges and buildings, Southern Pacific, San Francisco, Cal. In addition to the inspection of the new bridge of the Southern Railway and the Motor Terminals Company's local freight handling facilities on Wednesday afternoon, the members made an inspection of the Chesapeake & Ohio terminal at Stevens, Ky., on Thursday afternoon. On Friday the flood control work of the Miami Conservancy District near Dayton, Ohio, was visited.

The Bridge and Building Supply Men's Association

An interesting and attractive exhibit relating to materials and devices applicable to bridge and building work was presented under the auspices of the Bridge and Building Supply Men's Association and attracted a great deal of interest and attention from those attending the convention.

The officers of the Supply Association for the past year were: President, M. J. Trees, Chicago Bridge & Iron Works, Chicago; vice-president, G. R. McVay, The Barrett Company, Chicago; treasurer, A. J. Filkins, Paul Dickinson Company, Chicago; secretary, D. J. Higgins, American Valve & Meter Company, Chicago; honorary director, C. E. Ward, U. S. Wind Engine & Pump Company, Batavia, Ill. The members of the executive committee were: F. M. Condit, Fairbanks Morse & Co., Chicago; W. H. Lawrence, Johns-Manville, Inc., New York; T. W. Snow, T. W. Snow Construction Company, Chicago; J. E. Nelson, Joseph E. Nelson & Sons, Chicago; William Volkhart, William Volkhart, Inc., New York, and B. J. Wilson, *Railway Age*, Chicago.

A list of the exhibitors, giving the nature of the displays and the names of representatives in attendance follows:

American Tar Products Company, Chicago; S. H. Fields and J. D. Treadway.

American Valve & Meter Co., Cincinnati, Ohio; model of drop spout; J. T. McGarry, D. J. Higgins, and C. F. Bastian.

American Hoist & Derrick Company, St. Paul, Minn.; literature; B. W. Maurer.

Asphalt Block Pavement Company, Toledo, Ohio; asphalt flooring blocks and literature; E. J. Snyder.

Barrett Company, The, New York; roofing, shingles, specifications, and literature; G. R. McVay and R. B. Gunter

Chain Belt Company, Milwaukee, Wis.; literature on concrete mixers; C. H. Marsh.

Chicago Bridge & Iron Works, Chicago; photographs and literature; Merle J. Trees and Ced B. Smith.

Chicago Pneumatic Tool Company, Chicago; H. G. Barbee and T. G. Smallwood.

A. D. Cook, Inc., Lawrenceburg, Ind.; deep well pumps, screens and literature; Charles Taylor.

Detroit Graphite Company, Detroit, Mich.; samples of paint and literature; A. B. Edge.

Duff Manufacturing Company, Pittsburgh, Pa.; jacks; E. A. Johnson.

De Vilbiss Manufacturing Company, Toledo, Ohio; paint sprayers; F. Craig.

Fairbanks, Morse & Company; literature; F. M. Condit, J. L. Jones, C. B. O'Neil and F. J. Lee.

Harker Manufacturing Company, Cincinnati, Ohio; fire prevention devices; C. E. Schultz.

Highgrade Manufacturing Company, Cleveland, Ohio; literature and samples of roofing cement; S. A. Baber.

Johns-Manville Company, Inc., New York; samples of roofing, pipe and boiler insulations, packing, waterproofing, industrial flooring and shingles; P. C. Jacobs, C. E. Murphy, Harry Newman and W. H. Lawrence.

Joseph Dixon Crucible Company, Jersey City, N. J.; literature; H. A. Neally.

Lehon Company, The Chicago; samples of roofing and shingles; Tom Lehon, John E. Eipper and F. T. Carpenter.

E. M. Long & Son, Cadiz, Ohio; model O. G. fire gutters; A. C. Long and H. D. Roby.

Minwax Company, The, New York; model of water proofing flashing for a bridge deck and literature; A. S. Harrison.

Mudge & Co., Chicago, literature; J. Mulholand and K. J. Eklund.

Murdock Manufacturing & Supply Company, The, Cincinnati, Ohio; hydrants, drinking fountains and railway water service boxes; J. C. Endebrock and Kelso Murdock.

Massey Concrete Products Corporation, Chicago; literature; C. H. Hunsaker and A. Hultgren.

National Lead Company, New York; literature; F. M. Hartley, Jr., T. Mangan and S. V. Van Riper.

Norton, A. O., Inc., Boston, Mass.; literature on jacks and jack covers; G. R. Law.

Nelson, Jos. E., & Sons, Chicago; literature; I. B. Tanner.

Nichols, Geo. P., & Bro., Chicago; literature; Geo. P. Nichols.

Patterson, W. W., & Co., Pittsburgh, Pa.; tackle blocks; W. W. Patterson, Jr.

Patterson & Sargent Company, Cleveland, Ohio; G. W. Anderson and W. H. McBride.

Paul Dickinson, Inc., Chicago; model of cast-iron camp car jack, chimney for small buildings and ventilators; A. J. Filkins.

Railway Review, Chicago; copies of paper; W. M. Camp and L. E. Kohler.

Rivet Cutting Gun Company, Cincinnati, Ohio; pneumatic rivet cutter and concrete digger; L. K. De Bus and Joseph Desalvo.

Robertson & Company, Wm., Chicago; model of culvert; R. F. Repasz.

Simmons-Boardman Publishing Company, New York; copies of paper; E. T. Howson, W. S. Lacher, F. C. Koch and B. J. Wilson.

Snow Construction Company, T. W., Chicago; literature; T. W. Snow.

Stover Manufacturing & Engine Company, Freeport, Ill.; literature on engines and samples of steel fence posts; W. V. Heckman.

U. S. Wind Engine & Pump Company, Batavia, Ill.; literature; C. E. Ward.

Volkhardt Company, Inc., The, New York; model of hydrants and parts; Wm. Volkhardt.

International

A Three-Cylinder Pacific on the Great Northern (England)

Engine No. 1471 Recently Hauled a 20-Car, 610 Long Ton Passenger Train Over a 105.5-Mile Division of Uneven Gradient in 2 Hours 2 Min. Locomotive Has Three 20 in. by 26 in. Cylinders, Working Pressure of 180 lb., Adhesion Weight of 60 Long Tons and a Tractive Effort of 29,835 lb. at 85 per cent Boiler Pressure

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING, after having reached during the week ending September 30 within 3 per cent of the peak loading of 1920 dropped back during the first week of October to 968,169 cars, an increase as compared with the corresponding week of last year of 68,488 cars, but a decrease as compared with 1920 of 43,487 cars. There were decreases as compared with the week before in all classes of commodities except coke, although the decrease in coal loading was only 37 cars, but the principal reductions were in merchandise and miscellaneous freight, which decreased about 15,000 cars. It is thought that this may be partly explained by heavier loading on account of the car shortage. In the Southern, Central Western and Southwestern districts, however, the loading was in excess of that for the corresponding week of 1920. In the Pocahontas district it was below that of last year. The summary as compiled by the Car Service Division of the American Railway Association follows:

Citrus fruit movement from Florida, and other perishable fruit, is increasing, and is much earlier than usual. Owing to limited refrigerator car supply, it is necessary to use ventilated box cars to the fullest extent where such cars are available.

The following new instructions are given:

(1) Ventilated box cars must not be used for loading except with perishable freight or with dead freight directly to home roads or from one local station to another on the home road.

(2) When no immediate loading should be moved empty to owners.

(3) Give special supervision to the handling of ventilated cars to see that instructions are fully understood and proper distinction made in the handling of these cars as distinguished from ordinary box cars.

Division 5 of the Interstate Commerce Commission has ruled that empty coal cars should not be used for the movement of coke but that special cases which might warrant an exception to that rule should be brought to its attention for appropriate action.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, OCTOBER 7, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	8,006	3,302	57,364	1,939	5,843	4,238	63,298	93,710	237,700	.....	.....
	1921	9,086	3,167	49,211	1,860	4,555	2,429	63,472	81,393	.....	215,173	248,303
Allegheny	1922	3,127	3,387	55,903	4,752	3,187	9,208	45,918	71,143	196,625	.....	.....
	1921	2,539	3,076	51,069	2,600	2,614	5,127	48,009	58,971	.....	174,005	212,538
Pocahontas	1922	177	383	16,981	286	1,340	29	5,055	3,635	27,886	.....	.....
	1921	264	328	21,361	178	1,237	93	5,707	4,061	.....	33,229	38,228
Southern	1922	3,912	2,425	22,311	903	18,523	1,168	38,424	44,770	132,436	.....	.....
	1921	3,901	2,144	23,971	472	15,993	435	39,956	41,573	.....	128,445	132,301
Northwestern	1922	17,904	9,622	10,483	1,451	15,679	30,091	28,678	41,415	155,323	.....	.....
	1921	18,639	9,030	10,001	619	11,636	16,199	28,640	43,262	.....	138,026	167,255
Central Western	1922	12,374	16,127	19,290	389	7,057	2,142	31,604	58,723	147,706	.....	.....
	1921	15,430	12,617	22,139	218	6,639	741	32,239	52,980	.....	143,003	142,580
Southwestern	1922	5,053	4,113	6,980	160	6,215	563	15,538	31,871	70,493	.....	.....
	1921	4,598	3,405	4,843	121	6,645	739	16,900	30,549	.....	67,800	70,461
Total Western districts	1922	35,331	29,862	36,753	2,000	28,951	32,796	75,820	132,009	373,522	.....	.....
	1921	38,667	25,052	36,983	958	24,920	17,679	77,779	126,791	.....	348,829	380,296
Total, all roads	1922	50,553	39,359	189,312	9,880	57,844	47,439	228,515	345,267	968,169	.....	.....
	1921	54,457	33,767	182,595	6,068	49,319	25,763	234,923	312,789	.....	899,681	.....
	1920	41,375	32,594	224,063	16,347	60,516	79,278	208,757	348,736	.....	.....	1,011,666
Increase compared	1921	.....	5,592	6,717	3,812	8,525	21,676	.....	32,478	68,488	.....	.....
Decrease compared	1921	3,904	.....	.....	.....	.....	.....	6,408	.....	.....	.....	.....
Increase compared	1920	9,178	6,765	.....	.....	.....	.....	19,758	.....	.....	.....	.....
Decrease compared	1920	.....	.....	34,751	6,467	2,672	31,839	.....	3,469	43,497	.....	.....
October 7	1922	50,553	39,359	189,312	9,880	57,844	47,439	228,515	345,267	968,169	899,681	1,011,666
September 30	1922	52,129	39,830	189,349	9,456	58,742	49,777	234,517	354,581	988,381	904,831	992,283
September 23	1922	52,379	36,896	187,896	8,671	58,853	49,587	234,371	344,638	973,291	873,641	1,008,109
September 16	1922	52,090	34,929	172,241	8,188	57,371	53,293	234,513	333,294	945,919	852,552	991,166
September 9	1922	47,732	29,512	139,570	8,418	51,906	53,833	203,666	298,107	832,744	749,552	883,415

Reports received by the Car Service Division show that 32,929 fewer freight cars were in need of repairs on October 1 than on July 1 last when the strike of railway shopmen began. The total was 291,654, or 12.8 per cent of the cars on line. This was a decrease of 12,894 cars as compared with the number on September 15, at which time the total was 304,548 or 13.4 per cent. On October 1 last year, 364,372 or 15.8 per cent were in need of repairs. Of the total 230,565 required heavy repairs, while 61,089 required only light repairs. This is a decrease compared with September 15 last of 11,114 in the number requiring heavy repairs, and a decrease of 1,750 in the number needing light repairs. Every district reported a decrease as compared with September 15.

The Car Service Division has cancelled instructions contained in CSD 111 for the diversion of ventilated box cars to Western territory.

Effective at once all roads were directed to give ventilated box cars expedited movement to their owners, except that cars on roads in territory west of Chicago and the Mississippi river en-route to Western roads on previous instructions will be moved through to destination.

Division 5 of the Interstate Commerce Commission has ruled that no objection will be interposed to the movement of mill cinder and mill scale for furnace use when moving in open top cars under the same conditions as fluxing stone for furnaces.

The percentage of cars placed to cars required for coal loading was reduced during the last week of September to 55 as compared with 58 the week before. There has been a steady decrease for several weeks. The number of cars required was 381,878, the number of cars placed was 211,061, while the number of cars loaded was 182,158. This, however, was an increase of 9½ per cent as compared with the corresponding week of 1921.

The summary of principal freight car accumulations compiled by the Car Service Division of the American Railway Association shows 68,663 cars held in greater numbers than can be handled or disposed of currently, as compared with 72,656 cars for the week of September 29 and 80,320 for the week of September 22. The latter figure represented the peak for the year. Of the total as of October 6, 52,812 cars were held on account of the disability of the reporting road to move them.

The Pennsylvania System Newspapers *

By Logan B. Sisson

THE PENNSYLVANIA NEWS was founded as an employees' newspaper and makes no claim to being an employees' magazine. It is rather an approximation of a country weekly in railroad overalls. It is printed on news print, comes out every two weeks, and at least 90 per cent of the space is devoted to news about the employees themselves and the activities of members of their families. The remaining space is used for new developments in the railroad property in which the employees are interested, humor, cartoons, poems and a short editorial. A considerable portion of the news is presented through pictures and drawings. Company or management propaganda has no place in the paper. It is a newspaper or as near a railroad family newspaper as the employees, with the guidance of the editorial staff, can make it. Its editorial masthead carries this sentence: "Published every two weeks by the Pennsylvania System for all employees in the ——— Region in the interest of getting us all better acquainted with one another and with the property."

Purposes of Regional Newspapers

What the Pennsylvania System hopes to accomplish with these newspapers is briefly summarized in the editorial announcing the first issue published in Pittsburgh last January:

"The Central Region celebrates the advent of 1922 with a newspaper for employees. It's coming around every two weeks—right into roundhouses, shops, yards, signal towers, freight and passenger stations and offices, and thence into the homes of 50,000 P. R. R. families—to repeat the friendly handshake which the first number extends. 'The Pennsylvania News' expects to get personal about the Central Region; to get all of us better acquainted with one another, with our officers, and with the property. Many who wear the Veteran Association button remember that several decades ago the boss knew all the men who worked with him, well enough to ask, occasionally, after the health of the Mrs. and youngsters. 'The Pennsylvania News' comes in, therefore, to supply some of the personal interest and understanding that is otherwise well nigh impossible in a region with 3,600 miles of track running from Altoona to Buffalo to Columbus to Wheeling, with Pittsburgh at the hub.

"It will endeavor to be just as human, just as informal, and just as interesting and helpful as you make it. A magazine interviewer recently asked Lord Northcliffe, the famous English publisher, what people are interested in. 'Themselves,' he replied without a moment's hesitation. That is just how 'Pennsylvania News' feels about its job in the Central Region. It places itself in your hands confident that you will co-operate in making it the influence you want it to be."

These newspapers are intended, therefore, to develop company spirit among the employees and pride in their work. They seek to interest the employee and entertain him. They make no attempt to "uplift" or preach.

The Central Region edition, which began with a circulation of 50,000, is now printing approximately 63,000 copies—one for each employee. The Northwestern Region edition, which began publication July 1, distributes 21,000 copies from the editorial office in Chicago. The third edition, soon to be inaugurated in Philadelphia for the Eastern Region, will require between 90,000 and 100,000 copies. With the fourth edition ultimately to be published in St. Louis for the Southwestern Region, the combined circulation of The Pennsylvania News will be 200,000. It will ultimately be possible to syndicate to the four editions general information of interest to all employees throughout the system.

Reporting News Events

In general the plan for gathering news is as follows: A chief correspondent is selected for each superintendent's division. He has reporters stationed at the shops, yards, roundhouses, freight stations and terminals. The number of reporters varies from six on a small division to 50 or more on a large division. The editor and his assistant at regional headquarters depend on the chief correspondents just as the city editor of a metropolitan newspaper depends on his reporters.

The chief correspondent, therefore, is a most important factor in the development of the newspapers. He is usually an employee who has been with Pennsylvania some time and one who enjoys a wide acquaintance among employees on his own division. He is the clearing house for all information concerning the employees in his territory. He gets out over the road with his camera on his back and develops news stories. He "covers" meetings, outings, athletic events, etc. He is in constant touch with the editor by telephone and telegraph as well as by mail. Once a month he attends a staff meeting at which the last issue of the paper is criticized and plans for the next issue are announced.

In the course of a few months employees who up to January 1 had given no thought to news gathering have developed into extremely capable reporters. They not only handle news when it comes in—they go out and get it. Keen rivalry between divisions for space in the paper keeps each correspondent on his toes. An example of how the division correspondents function was afforded at the annual Pennsylvania System outdoor championships at Altoona on September 23. The staffs of the two regional editions were present to cover the different events on the program. Each man reported to the press booth and wrote a brief account of the sport he had watched. In this way copy which later appeared in The Pennsylvania News was made available to the representative of outside newspapers. The correspondents also wrote news about employees from their divisions who were noticed at the games.

As many as 2,000 names of employees and their families have appeared in a single issue of the Central Region edition. It is safe to say that 25,000 names have appeared in the first 18 issues to date. Some of the most interesting news is obtained by following the employees away from their railroad jobs into their outside interests—their lodges, their hobbies, their pride in their children, the books they read, etc. A freight engineer on the Panhandle division proved to be one of the most talented amateur astronomers in the country. A crossing watchman in Indiana was found to be the author of a historical book which he had typed with the two fingers on his one remaining hand. Certain employees delight in hunting, in raising fancy chickens, in exhibiting prize bulldogs, in building their own homes, in serving as justices of the peace, etc. All this sort of information The Pennsylvania News endeavors to secure together with photographs to illustrate the stories. Last June it published 200 photographs of sons and daughters of Pennsylvania employees who were graduated from schools.

Advantages of Newspapers Over Magazines

In conclusion it might be of interest to enumerate the advantages which the regional newspaper seems to offer over the system magazine:

First—It comes out twice as often as the monthly magazine.

Second—Without any advertising revenue its approximate cost is only two cents a copy.

Third—Because the edition can be printed and distributed via railroad mail service in 24 hours, it has a timeliness which cannot be achieved in a magazine.

Fourth—It comes to its readers on plain news print stock, which suggests economy and democracy.

Fifth—By making over page plates it is possible to increase the volume of news published without increasing the actual size of the newspaper.

*From a paper presented at the meeting of the Railway Employes Magazines Association at Richmond, Va., October 6, 1922. Mr. Sisson is editor of the Central Region edition of the Pennsylvania News.

An Analysis of the Present Box Car Situation

Car Service Division Sends Roads Analysis of Box Car Situation in the Various Regions

WASHINGTON, D. C.

THE CAR SERVICE DIVISION of the American Railway Association, has sent to the various roads an analysis of the box car situation, as of October 1, which indicates:

(a) That combined, the Eastern and Allegheny regions, in other words, the territory east of the Mississippi and north of the Ohio rivers, had on July 1, 106.8 per cent of their box car ownership as compared with 119.9 per cent in 1920; August 1, 106.2 per cent compared with 119.4 per cent in 1920; September 1, 110.5 per cent 1920, compared with 108.4 per cent in 1922; October 1, 109.7 per cent, 1920, compared with 113.7 per cent in 1922, showing that up until the first day of October there were less box cars in this territory than in 1920.

(b) Combining the territory east of the Mississippi and south of the Ohio rivers, there was an increase in cars on line compared with 1920 and beginning with July 1 gradually increasing until October 1. The roads and the lines in this district were handling the heaviest coal production ever handled during their history during the months of April, May and June and beginning with the strike of the shop crafts on July 1 there was a gradual accumulation of traffic on all of these lines that made it impossible to secure prompt movement of the loaded or empty equipment. This is said to be without doubt responsible entirely for the increase in box cars on line as compared with 1920. The embargoes against receipts of traffic from connections and loading on a great many of the lines in this territory which were in effect for July and August have gradually been taken off and traffic that has been held out of those territories has been moving in there more freely since the first of September. There has been a very considerable reduction in the cars on line in the Southern District ever since September 15 due to improved transportation conditions.

(c) Combining the Northwestern, Central Western and Southwestern regions it shows that on July 1, 1920 there was 87.7 per cent box cars of ownership on line as compared with 94.2 per cent July, 1922; August 1, 1920, 90.1 per cent compared with 94.5 per cent 1922; September 1, 1920, 91.9 per cent compared with 94 per cent 1922; 94.3 per cent October 1, 1920 compared with 92.0 per cent 1922.

Divided by regions the situation is about as follows:

Eastern Region

2.6 per cent less box cars on line than ownership Oct. 1, 1922.

2.1 per cent less box cars on line than on Oct. 1, 1920.

0.1 per cent increase in ratio of loading to total loading in all regions as compared with 1920.

This shows that for the region as a total there were comparatively less cars on line than in 1920 at a time when the loading was on a parity with the present and that these roads loaded practically no greater proportion of the loading of the country as a whole than they did in 1920 or 1921.

Group "A" of the Eastern region is the only territory showing an excess over ownership and that is in New England. These roads have approximately 90 per cent in excess of the cars on line that they normally had during a period of car surplus. Under orders from the Car Service Division cars are now moving out of New England empty to make up a deficit of the United States roads to the Canadian roads. In addition to that they are moving out of New England to the anthracite loading roads for loading to the west. In view of the transportation conditions it is not practical to attempt the movement of empty box cars out of New England to the west and furthermore the demand for westbound loaded movement will absorb all cars available for movement in that direction.

Allegheny Region

30 per cent more box cars on line than ownership Oct. 1, 1922.

10.1 per cent more box cars on line than on October 1, 1920.

0.3 per cent increase in ratio of loading to total loading in all regions as compared with 1920.

This is a territory that normally has box cars on line in excess of ownership even during a period of car surplus due to the fact that inbound business in box cars is received in excess of outbound business. It is a heavy coal producing territory and since August 1 the necessities of coal production have absorbed facilities which have increased transportation demands in certain districts and made the equalization of box car traffic more difficult. However, box cars are being delivered to western connections in excess of the number of box cars received, thereby reversing the normal flow; also box cars are being delivered empty to western connections in volume and to some extent to southeastern lines who have a deficit compared to ownership.

Pocahontas Region

48.1 per cent more box cars on line than ownership Oct. 1, 1922.

26.5 per cent more box cars on line than on October 1, 1920.

1.0 per cent decrease in ratio of loading to total loading in all regions as compared with 1920.

The percentage of box cars on line in excess of ownership appears heavy, but in actual figures is only a comparatively small number due to the region constituting only three roads with an ownership of less than 15,000 box cars. These conditions are the after effects of the coal and shopmens' strikes and other labor difficulties which were somewhat more acute in this territory than elsewhere. Specific instructions are in effect on the lines in this district to expedite the return home of cars belonging to the roads in the three western regions which will have a material effect in restoring the proper car balance.

Southern Region

5.9 per cent more box cars on line than ownership Oct. 1, 1922.

9.2 per cent more box cars on line than on October 1, 1920.

0.4 per cent decrease in ratio of loading to total loading in all regions as compared with 1920.

Increase in box cars on line October 1 due almost entirely to result of conditions of operation already cited, due to the coal and shopmens' strikes. Decrease in their relative loading also due to this same cause. With operating conditions rapidly being restored to normal the number of box cars on line is also being brought down to a satisfactory figure. Furthermore definite arrangements applying to the return of cars belonging to western lines are in effect and are expediting the movement of equipment to the west.

Northwestern Region

9.1 per cent less box cars on line than ownership Oct. 1, 1922.

2.0 per cent more box cars on line than on October 1, 1920.

0.6 per cent decrease in ratio of loading to total loading in all regions as compared with 1920.

Roads in this territory had on August 1 a supply of cars practically equal to their ownership, thus putting them in good position for handling the seasonal movement of crops starting at that time. Decrease since that date has been due entirely to heavy off line traffic. It will be noted that with a considerably better car supply than in 1920 the ratio of loading in the region to the total was less than in that year. There are two or three roads in this district to which assistance is being given by arbitrary delivery of empty box cars due to the unusual volume of off line traffic and lack of compensating return loaded movement and to meet an emergency potato movement.

Central Western Region

16.5 per cent less box cars on line than ownership Oct. 1, 1922.

7.4 per cent less box cars on line than on October 1, 1920.

1.3 per cent increase in ratio of loading to total loading in all regions as compared with 1920.

In spite of a slightly less car supply than in 1920 the ratio of loading to the total in all regions increased perceptibly. During the three months July 1st to October 1st Central Western region has handled an extremely heavy volume of off line traffic, including lumber, grain and other agricultural products. It is believed that the increasing westbound movement of cars from the eastern territory will balance this movement and increase the cars on line.

Southwestern Region

9.9 per cent more box cars on line than ownership Oct. 1, 1922.

1.3 per cent less box cars on line than on October 1, 1920.

0.3 per cent increase in ratio of loading to total loading in all regions as compared with 1920.

This territory shows an excess of cars on line to ownership and a consistent increase in cars since July 1. This has been due to normal movement of grain and agricultural products from Central Western region to consuming territory and to ports for export; also due to operating conditions as result of the shopmens' strike which has interfered in some degree with free circulation of cars. However, the increase in cars on line during this period occurred in each of the three years for which figures are shown. Heavy demands for northbound loading, particularly forest products, will reduce the supply in this territory somewhat more rapidly, now that the cotton movement is practically over.

Underwood & Underwood

A Russian Section Gang

Yardmasters Get New Working Rules

NEW RULES governing the working conditions of yardmasters, members of the Railroad Yardmasters of America, were announced by the Railroad Labor Board on October 16, and are applicable to 12 roads which are parties to the dispute. The new rules include:

ARTICLE I—SCOPE

The term "yardmaster" as herein used shall be understood to include general yardmaster, assistant general yardmaster, yardmaster, assistant yardmaster, except general yardmasters referred to in Ex parte No. 72, Interstate Commerce Commission.

ARTICLE II—HOURS OF SERVICE AND OVERTIME

(a) Eight hours, exclusive of the agreed meal period, shall constitute a day's work.

(b) All time in excess of eight hours shall be paid for at prorata rate. Time consumed in making transfer shall not be counted as overtime.

(c) Where three shifts are worked covering the 24-hr. period, the starting time of the first shift shall not be earlier than 6 A. M., nor later than 8 A. M.

ARTICLE III—REST DAYS

(a) Yardmasters regularly assigned seven days per week will be granted two rest days per month without loss of pay.

ARTICLE IV—MISCELLANEOUS

(a) When a regularly assigned yardmaster is required to perform service other than regular duties, the rate of pay will be not less than the regular pay for days so used. When an assistant yardmaster is required to substitute for yardmaster, or when a yardmaster or assistant yardmaster is required to substitute for a general yardmaster or assistant general yardmaster, the yardmaster or assistant yardmaster will assume the rate of pay and the hours applicable to the position to which assigned.

(b) No change in the title of yardmasters of any grade shall be made for the purpose of reducing the rate of pay of position unless there is a change in their duties and responsibilities.

Referring to seniority, discipline and vacation rules, disputes over which were remanded to the parties involved by the board, the decision said:

The evidence indicates that a majority of the carriers before the Board in this case and their employees have agreed upon seniority and discipline rules, and these subjects are remanded in their entirety. The Labor Board believes that certain other subject matters may not be covered in all localities by rules of general application, and require further consideration by the parties directly concerned. All such rules which involve a dispute between a particular carrier and its employees are hereby remanded to said carrier and its employees for the purpose of adjustment under the provisions of section 301 of the Transportation Act, 1920.

In further negotiations attention is again directed to the principles announced in Exhibit "B" of Decision No. 119.

The action of the Labor Board in declining to adopt a rule requiring carriers to grant annual vacations with pay to this class of employees must not be construed to mean that the Board disapproves the granting of such vacations by the carriers. The Board is expressing neither approval nor disapproval, but is of the opinion that this question should be disposed of by mutual agreement of the interested parties.

The following roads are parties to the dispute ending in this decision:

Baltimore & Ohio Chicago Terminal, Central Vermont, Denver Union Terminal, Ft. Worth & Denver City, Gulf Coast Lines, Jacksonville Terminal Company, Michigan Central, New York Central (West of Buffalo), New York Central (Buffalo and East), Seaboard Air Line, Union Railway, and Wabash.

This decision of the board is particularly interesting in that for the first time official recognition is given to the eight-hour day for yardmasters as a general practice, and also because a specific time is set for the starting time of the first of the three daily shifts.

ORAL ARGUMENT on the valuation of the Western Pacific will be heard by the Interstate Commerce Commission at Washington on November 1. The Boston & Maine case has been assigned for hearing before Examiner Marchand at Washington on November 20.

The Transportation Situation and the Farmer*

Farmers Stand to Lose Millions by Railroad Traffic Congestion —Over-Regulation the Cause

By Julius H. Barnes
President Chamber of Commerce of the United States

I WANT to mention the railroad situation at this point. No man today can claim that a public facility such as the railroads, vested as it is with the public interest, touching every man's business and home, can be left entirely devoid of some public regulation. It is inconceivable that there should not be some public control of a facility in whose hands rests the power to make or unmake entire communities by a rate structure resting in its officials. That goes too far, but we can create an informed and fair public opinion which will recognize not only the justice of allowing a field of return for privately owned and operated facilities, and the wisdom, from the public's own standpoint, of allowing such adequate return if there is to be a constant improvement and expansion of their facilities.

You know that today the transportation facilities of this country are inadequate for the business now tendered them. I want to use as an illustration the grain trade of this country and show you how far-reaching this is in its effect. I speak of grain, not because I am provincial enough to believe that it is the major industry of this country, but because out of 30 years' experience in grain exporting I can qualify somewhat as a competent witness on that subject, and because you will lift the similarity out of grain into the lines of industry with which you are more familiar.

You will agree with me that if there is one single menace to the onward march of business activity and prosperity in this country it rests in the dissimilarity between the prices paid for farm products and the prices of those commodities which the farmers must buy.

I do not follow the full way with those who say that the farm is in a state of collapse. It is no such thing. Twenty cent cotton and ten dollar hogs will take care of a large part of our farmers with a measure of prosperity, but the grain-raising country has suffered and the grain-raising country has today the sunrise of hope before it.

Yet this is the situation: From the first of September until the first of October, in the very height of the crop-moving period of this country, the main channel of export outlet for grain in America, from Buffalo to New York, was practically closed. For thirty days the four great trunk lines that serve that channel of movement contracted no grain for movement. The grain moved from the West until it had congested and exhausted the elevator facilities of Buffalo—18,000,000 bushels. As soon as the unloading facilities were thus exhausted, the lake carriers, reflecting the apprehension of their owners that the boats would be tied up with undischarged cargoes instead of being returned, made an advance in the lake rates, in 30 days, from 2 cents per bushel for the carrying of grain from Chicago and Duluth to Buffalo, to 6 cents.

The rail rate from Buffalo to New York, on the published tariff, is nine cents, but as I explained to you practically no grain was moving. The route that was open—the Erie Canal—with totally inadequate facilities, advanced the rate to 13 cents per bushel, paralleling the railroad, which was supposed to carry it for 9.

From Buffalo to Montreal is a water route. It is equipped with the facilities of forty years ago. It can handle a vessel of 250 feet in length, when the lake carrier of today west of Buffalo is 600 feet in length. That means that the carriers that operate on this 40-year-old route are limited in number, and limited more in carrying capacity. Thirty days ago those carriers were operating on a tariff from Buffalo to Montreal of 6 to 7 cents per bushel. Last Saturday 15½ cents was paid for the carriage from Buffalo to Montreal. That is the pressure of grain west of Buffalo seeking an outlet to foreign markets.

The effect of the market rise in prices has been this. In 30 days the foreign price of wheat has advanced 25 cents per bushel, the foreign price of corn has advanced 20 cents per bushel, because those markets are inadequately supplied. The market price in America of wheat has advanced 10 cents per bushel, and of corn 10 cents per bushel. That is, the spread between the ultimate foreign price which should be reflected back to our farms, has widened from 10 to 15 cents per bushel because of the lack of adequate facilities to move the crop pressing on the market in the west.

I make this statement out of 30 years' experience as a grain exporter, watching the diversion of grain from route to route for a half cent per bushel economy of one route against another. As a member of a trade that has been content for years to lift grain from the western primary markets, like Duluth, Port William and Chicago, and deliver it to Hamburg and Rotterdam and Liverpool and London for a charge of one cent per bushel, I make this statement, that we have today four billion bushels of grain in the west, the value of which to the farmer in every market in the west is at least ten cents per bushel below a proper relation with the European consumer markets. You take 10 cents per bushel, assuming this continues through the crop year—and it won't, thank goodness—and it would mean a loss in farm revenues of $400,000,000.

I don't need to tell you businessmen, familiar with business, what the loss of $400,000,000 of enlarged spending power to the grain farmers alone would mean to other industries in this country.

That train of evil, that train of economic loss to a basic industry of this country, follows, I believe from an over-rigid system of government regulation over our railroads, which has extended over ten or twelve years. By a process of control of revenues without any responsibility for operating costs we have destroyed the earning power of our railroads. We have thereby undermined their credit, and from neither source, of earnings nor of credit, have they been able to maintain their equipment in a proper expansion with the growth of this country.

I said that the Chamber of Commerce of the United States claimed some credit for having lightened this hand around the throat of industry in this country and particularly the railroad industry, from over-regulation. Today, with this situation, it is proposed by farm senators in Congress that at this coming session they are going to restore the authority of state commissions to control railroad rates. Just follow that a moment, gentlemen—48 individual state commissions with no responsibility for the operating results of systems which must operate as a whole (many of them national in character) are going to assume a control in the interest of their own states of the revenues from the evil effects of which

*From an address made before the National Conference of Business Papers at New York, October 12, 1922.

we have just escaped. You can depend upon it that the Chamber of Commerce of the United States will stand against that, and I hope with the unanimity of business support behind it.

Southern Pacific Asks Authority to Keep Central Pacific

WASHINGTON, D. C.

THE SOUTHERN PACIFIC COMPANY on October 17 filed an application with the Interstate Commerce Commission for authority to acquire control of the Central Pacific by lease until December 31, 1984, and stock ownership pending the determination of the proceedings now going on before the commission for the consolidation of the railroads of the country into a limited number of enlarged systems. The control applied for is temporary in character, in that it is subject to be terminated by order of the commission when and if found to be inconsistent with the plan of consolidation, which Congress has directed the commission to make. The application is based on provisions of the Transportation Act, 1920, paragraph (2), section 5, which give the commission power to authorize one carrier to acquire control of another by lease or stock ownership, whenever it finds that such control is in the public interest, and which expressly exempt a control, so authorized, from the provisions of the Sherman Act. Its object is to prevent, by resort to this later act of Congress, immediate dismemberment of the Southern Pacific System, which would otherwise result from the recent decision of the Supreme Court, and to preserve the status quo pending an orderly determination and promulgation by the commission of its final plan of consolidation. The Supreme Court recently denied the Southern Pacific's petition for a rehearing.

The relief sought from the commission, the Southern Pacific counsel assert, is not antagonistic to the mandate of the Supreme Court or in conflict with anything decided by that court. The ultimate object of the mandate is to create a situation in harmony with law. The only remedy the Sherman law, considered alone, provides is to tear the properties apart. But the Transportation Act empowers the Interstate Commerce Commission to legalize the control of the Central Pacific by the Southern Pacific, if it finds that to be in the public interest. Hence the purpose of the petition to the commission is to prevent a separation of the properties until the commission can determine whether it is in the public interest for it to bring about a condition in harmony with the law by authorizing for the present a reacquisition by the Southern Pacific of control of the Central Pacific and afterwards by authorizing the consolidation of the two companies.

The application first calls attention to the recent decision of the Supreme Court based on the Sherman Act. It shows further that the suit under the Sherman law was begun, tried, and the record closed before the passage of the Transportation Act, and that the later law was not mentioned in the decision of the Supreme Court. It cites the provisions of the Transportation Act that empower the commission to authorize a control by one carrier over another or a consolidation of one carrier with another in cases where, without the commission's authority, such control or consolidation would fall within the condemnation of the Sherman law. It is shown that such provisions of the later law manifest a radical change in the legislative policy of Congress in respect of the application of the Sherman law to the railroads of the country and "a belief on the part of Congress that there may be combinations of railroads that are in the public interest but are not legally possible under existing anti-trust legislation, and an intention to afford a means of permitting or rendering lawful a control or combination of railroads which in the opinion of this commission is in the public interest but whose creation or continuance is prevented by the operation of the Sherman or other similar laws. Congress has made this commission the sole judge of all questions of public interest which may arise under its administration of the above referred to provisions of the Transportation Act."

The application then proceeds to state that the decision of the Supreme Court "leaves this commission free to exercise the powers and to perform the duties conferred or imposed by the Transportation Act. And it is without prejudice to the right of applicant to acquire lawful control of the Central under the later law, to the extent deemed by this commission to be in the public interest, to the end that the relations between applicant and the Central may be brought into harmony with the existing policy of the law."

The application sets forth at length the reasons why it is in the public interest that the acquisition of the control applied for should be authorized and the consequence of an attempt forthwith to tear apart the interlaced and interdependent properties of the Central and the Southern Pacific avoided, pending the orderly determination and consummation of the commission's plan of consolidation.

In this connection the history of the origin and growth of the Southern Pacific System, with the Central Pacific always as a part thereof, is set forth from its beginning in 1870. It is alleged that in the course of this 50 years of system development railroads have been constructed, terminal facilities located and provided, equipment for the whole supplied, operating divisions and methods established, routes and channels of traffic created, all for a single united railway system, without regard to corporate ownership of the different parts, the result being the creation of a transportation service of "unexcelled efficiency and economy of operation with which the communities thereby served are well satified."

The physical consequences of a separation of the properties at the present time are thus set forth in the application:

> Independent operation of these lines would result in the creation of approximately 20 new junction points between two independent carriers; the breaking up of train service, freight and passenger; the dislocation of division terminals, shops and other facilities; the duplication of facilities involving expenditures running into many millions of dollars; the disruption of an operating organization and a system all parts of which are now working as an harmonious unit, and the substitution of two fragmentary railroad systems to perform the service which for more than 50 years has been efficiently performed by a single system. There would be created in place of the present unified system, each part designed to operate with every other part, two systems neither of which was constructed as a separate system and neither of which could give the public the satisfactory and efficient service which is being rendered by the existing single system.
>
> By reason of the foregoing, applicant alleges that the public service now rendered by these lines will be greatly impaired and the cost thereof will be greatly enhanced unless the applicant is permitted to acquire lawful control of the lines of the carrier to the extent and by the means proposed herein.

It is alleged that the financial inter-relations of the Central and Southern Pacific are no less extensive and involved than their physical inter-relations. The financial complications and the difficult financial problems necessarily attendant upon the separation of the properties are set up as an additional reason why it is in the public interest that such separation should be postponed, by the exercise of the invoked powers of the commission, until the issue in the pending consolidation proceedings determines whether the Central Pacific is to be grouped with the Southern Pacific or with some other system. In this connection it is shown that the Southern Pacific is the guarantor of the four outstanding bond issues of the Central Pacific, aggregating over $150,000,000, and that to secure the inter-related obligations of the two companies the Southern Pacific had pledged and deposited with trustees not less than $150,000,000 of stocks and bonds owned by it.

Referring again to the pending consolidation proceedings it is stated that in the commission's tentative plan the lines of the Central Pacific are grouped with the Southern Pacific, while in the alternative Ripley plan a part of the Central Pacific lines are grouped with the Union Pacific, but that in no rational plan of consolidation is it likely that the operation of Central Pacific as a separate, independent unit will be provided for. If, however, the commission does not grant the Southern Pacific authority to acquire lawful control of the Central Pacific, of the provisional character prayed for, the necessary result, it is said, will be the enforced tearing apart of lines operated for 50 years as interdependent and complementary parts of a single system, and the inauguration of a temporary independent separate operation of the Central Pacific lines, pending the promulgation of the commission's final plan of consolidation. There would thus be brought about the evil effects of a separation, described in the foregoing parts of the application, intensified and rendered more unjustifiable by the temporary character of such independent operation. The petition therefore asks for a temporary continuance of the present unified service, with which in preceding part of the petition it is alleged that the communities served are well satisfied, until the commission shall have opportunity to determine the proper placement of the Central Pacific in its final consolidation plan.

The permanent separation of the Central Pacific and Southern Pacific railroads would restore to California economic railroad independence, according to a statement by Fred G. Athearn, western counsel of the Union Pacific, given out by the Washington office of the California Producers' and Shippers' Association.

"It is claimed," said Mr. Athearn, "that the carrying out of the Supreme Court decision which decreed the separation of the two roads will result in disruption of service and inconvenience to the traveling and shipping public. That such disruption should occur was specifically guarded against by the court mandate which states that the separation shall take place 'in such manner that each line will be able to freely compete with the other to serve the public efficiently.' Inasmuch as the Southern Pacific now owns all of the stock of the Central Pacific it is manifest that the application asked for would not be in furtherance of the plan for dividing the railroads of the country into groups which shall be competitive with each other as commanded in Paragraph 4 of Section 5 of the Transportation Act of 1920, wherein the duty imposed on the Interstate Commerce Commission is set forth in these words, 'in the division of such railroads into such systems under such plans competition shall be preserved as fully as possible.'

"The Supreme Court of the United States has found and decided that the Southern Pacific Sunset Route is competitive with the Central Pacific. That such competition should exist and that such competition has been heretofore suppressed and throttled by the Southern Pacific the Supreme Court has definitely decided, and I submit that this decision of the Supreme Court was made in the public interest.

"The United States District Court of Utah, which will proceed with separation of the Central and Southern Pacific Lines under the mandate of the Supreme Court, has very broad powers over the two roads, and in the exercise of such powers must compel such joint and common use of rails and terminal facilities as will result in no disruption of service at all or inconvenience to the traveling or shipping public; to the contrary, it will re-establish competition between the Central and Southern Pacific as intended by Congress, which competition will insure a quicker and more efficient movement of California products and will give to producers and shippers of the state two strings to their bow in the matter of rail transportation. It will insure to the producers and shippers now in non-competitive territory the same advantages enjoyed by those in competitive territory as to the prompt supplying of cars and equipment for handling their products."

Commenting on the company's application, J. P. Blair, general counsel of the Southern Pacific Company, said that he wished to emphasize the fact that the application "involves no conflict with the decision of the Supreme Court and no attempt to have that decision reviewed or over-ruled."

"The want of antagonism," he continued, "between the application to the commission and the decision of the court becomes clear when it is understood that under the Transportation Act the commission can authorize a control by one carrier of another or a consolidation of two or more carriers whose union, without such authority, would be prohibited by the Sherman law.

"It is self-evident that the consolidation of all existing railway properties into approximately twenty systems could not be accomplished if the commission were to be controlled by the prohibitions of the Sherman act. The wide departure between the policy of the old law and that of the new is shown by the fact that the commission's tentative plan of consolidation, promulgated August 3, 1921, provides for the continued common control of the Reading Railway and the Central of Jersey, which had been declared by the Supreme Court on April 26, 1920, to be in violation of the Sherman law, for the common control of the Burlington and Northern Pacific, two of the companies whose common control was declared by the Supreme Court in the Northern Securities Case to be in violation of the Sherman law, and for the consolidation of the Chicago, Milwaukee & St. Paul and the Great Northern Railroad, although those two great systems are parallel and competing throughout."

P. & A. Photo

Sir Henry Thornton, New Chairman of the Canadian National, Lady Thornton and Their Daughter, Anna, Sailing on the Olympic for England Where Sir Henry Will Terminate His Connection with the Great Eastern Railway.

Laying Dust for Passenger Trains

In the operation of passenger trains on those portions of its southern line crossing the desert east of Colton, Cal., the Southern Pacific has constantly been confronted with the presence on its right-of-way of fine sand which blows over the tracks and rises in clouds during the passage of trains, to the great annoyance of passengers. The occasional application of oil to the track has not remedied this difficulty owing to the constant blowing of fresh sand upon the oil. To overcome this condition an apparatus has been devised by W. H. Whalen, division superintendent at Los Angeles, whereby water is sprinkled over this sand during the passage of the train, laying the dust temporarily. This is accomplished by means of a perforated pipe beneath the locomotive tender, connected with the interior of the tank by a riser pipe and controlled by a gate valve operated from the engine cab.

The sprinkler pipe is 8 ft. long and is hung about 10

Laying the Dust Under a Train

in. above the rails to give adequate clearance. The pipe is 4 in. in diameter to secure a plentiful distribution of water when traveling at high speeds, but the precaution is taken in the design to establish the inlet end of the riser pipe some distance above the bottom of the tank to prevent the draining of all of the water supply through inadvertence or accident to the sprinkler system. The valve regulating the sprinkler supply is controlled by a pull rod extending from the front of the tender to a bell crank, one leg of which is connected to the stem of the valve.

This device was first placed in service on the Los Angeles division between Indio, Cal., and Palm Springs, since which time it has been installed on a number of locomotives on three different divisions. It has demonstrated its ability to settle the dust and cool the air during the passage of the train so that it is planned eventually to equip all passenger trains operating through these sandy sections with these sprinklers.

In a collision on the Boston & Maine near Dover, N. H., on October 8, an engineman was killed and six other persons injured. The accident occurred during a heavy fog when an eastbound passenger train collided with a westbound freight train which was occupying the eastbound track in crossing over to a branch line.

The Highway Problem*

The legitimate function of a highway is, first, the accommodation of private owners of vehicles for their individual pleasure and business. It is not designed or intended as a permanent roadbed for transportation business and can never be depended upon to fulfill that function. We have not yet developed a roadbed which will stand the everlasting pounding of this traffic for which highways were never intended. Roads that were designed and built honestly for 95 per cent of the traffic have been hammered to pieces by five per cent of the traffic.

The early destruction of many of our highways has called for rebuilding on a far more expensive scale and for all new highways to be designed for the heaviest traffic, which is only five per cent of the total. Are we to continue this expensive construction and maintenance to provide a practically free right of way roadbed and maintain it for a traffic which pays nothing for its use except a simple license, the same as any ordinary vehicle which is operated solely for purposes of pleasure?

It is generally conceded that a highway capable of standing the legitimate 95 per cent of travel can be built for $30,000 per mile (16-ft. road). If this abnormal traffic is to be perpetuated, we must pay at least $50,000 per mile, an extra $20,000 per mile for five per cent of the travel. Are we going to stand for this—to make, and maintain such roads for traffic never contemplated, which cannot take the place of railroads and only serves to bankrupt them in the long run?

Electric and steam railroads are the only safe, sane and permanent means of commercial traffic; and no country can prosper without them. Their rights of way must be bought, tunnels and cuts made, bridges and culverts built, tracks laid, engines and cars bought, and all kinds of buildings erected at an enormous cost to operate this essential means of transportation. The same railroads must pay their share of cost and maintenance of the highways which are giving practically free rights to their competitors. Can we do without railroads? If not, we should see that they have the right to a fair return on their investment.

*From an address before the twenty-third annual convention of the Washington State Good Roads Association at Ellensburg, Wash., in September, by Frank Terrace, president.

P. & A. Photo

When a Passenger Train Sidewiped a Freight on the Electrified Division of the New Haven, Near Cos Cob, Conn.

General News Department

The Interstate Commerce Commission has announced a further hearing on the proposed revision of rules for the distribution of coal cars at Washington on November 15 before Commissioner Aitchison.

Dr. Charles P. Neil, manager of the Bureau of Information of the Southeastern Railways, has been appointed by President Harding as one of the members of the federal commission to investigate the coal industry.

Pension and seniority rights of trainmen and yardmen of the Grand Trunk who struck during 1910 have been restored by order of W. D. Robb, vice-president and general manager, according to press dispatches from Montreal. The order is said to affect about 1200 men.

Pennsylvania Plans Electrification at Altoona

The Pennsylvania is making plans for the electrification of its line between Altoona and Conemaugh, a distance of 35 miles. This work has not as yet, however, been authorized by the board of directors.

Rob Crack Santa Fe Passenger Train

As the California Limited of the Atchison, Topeka & Santa Fe was leaving the Kansas City, Mo., union station at 10 p. m. on October 11, enroute for Chicago, a negro boarded the observation car and proceeded by point of gun to rob six men and one woman who passed him in the corridor of the car. After he had gathered about $200 from his victims, he made a hurried exit from the train.

New Directors of Canadian National on Tour of Inspection

The new directors of the Canadian National left Montreal on a tour of inspection of the western lines of the system on October 15. It is stated that all the directors with the exception of President Sir Henry Thornton and Tom Moore, labor member of the board, are making the trip.

The future headquarters of the Canadian National has not as yet been determined and it is stated the selection will be left entirely in the hands of the new board of directors.

Railroad Seeks to Quit "Grave-Yard Town"

Asserting that Searchlight, Nev., has changed from a wide open mining town to "a grave-yard of tumble down buildings," the California, Arizona & Santa Fe (Atchison, Topeka & Santa Fe) has applied to the California Railroad Commission for permission to abandon its line which extends from Goffs, Cal., to Searchlight, a distance of 53 miles. The road began operation in 1908 to serve what was then considered to be a very promising mining territory. Since the decline in the mining industry, however, the road has been operated at a heavy loss.

A Correction

It was incorrectly stated in the *Railway Age* of October 14 that the shopmen's strike on the Gulf Coast Lines and the Houston Belt & Terminal had been settled with a restoration of seniority rights as of June 30. The strike has been settled but seniority rights have *not* been restored. On the contrary these companies agreed only to re-employ sufficient strikers to bring forces up to normal, the strikers coming back as new employees, relinquishing all seniority and other rights which they enjoyed when the walkout occurred. Under this settlement about one-third of the striking mechanical craftsmen of these companies have been re-employed.

Enginemen Urge More Rigid Locomotive Inspection

More rigid enforcement of the safety appliance and locomotive inspection laws was urged by counsel for the Brotherhood of Locomotive Engineers and Brotherhood of Locomotive Firemen and Enginemen at a conference with President Harding on October 11. The President was told that the condition of railroad power and equipment is such as to constitute "a menace to the traveling public" and that many railroads are disregarding the safety laws. They asked the President to compel the railroads to observe the requirements of the laws. The President pointed out that he had recently recommended to Congress an appropriation for additional inspectors for the Interstate Commerce Commission, but that this item was omitted from the bill as it was passed.

President Has Not Definitely Decided Railway Labor Legislation

Although various statements have been published regarding the attitude of the administration as to proposed railroad labor legislation at the forthcoming session of Congress, and Secretary of Labor Davis has proposed the abolition of the Railroad Labor Board, it was stated at the White House on Tuesday that the President has not yet definitely determined his position on this subject. Many phases of it are still under consideration and it is probable that the President will make his views known in an address before Congress at the opening of the session. He has, however, indicated his desire for some form of anti-strike legislation.

Railroad Surgeons Meet

The Association of Railroad Chief Surgeons, of which S. C. Plummer, of the Chicago, Rock Island & Pacific, is president, held a semi-annual meeting on October 17 in the Hotel Sherman, Chicago, where it was followed, beginning October 18, by a joint three-day session of the American Association of Railway Surgeons and the Association of Chicago, Milwaukee & St. Paul Surgeons. The sessions were almost entirely devoted to papers on the technic of handling various forms of injuries as well as the proper practices in claim cases. In the chief surgeons' meeting both the subjects of drinking water for trains and the report of the American Railway Association Committee on Hernia were discussed, the discussion on drinking water revolving around charges made by health departments concerning faulty handling of ice and water, in which discussion it was brought out that a report on drinking water would soon be made by the American Railway Association.

Hearing on Conditions Relating to Issue of Securities

Division 4 of the Interstate Commerce Commission has announced a hearing at Washington on October 26 for the consideration of the following:

1. Whether and to what extent the commission should, by its order in granting or withholding authorization and approval for the issuance of securities, determine, limit or restrict the price at which or the manner in which securities are to be sold and the cost to the carriers of the marketing of securities issued under the provisions of section 20a of the Interstate Commerce Act.

2. Whether it is within the province of the commission to require competitive bidding in the sale of securities and whether competitive bidding should be required.

3. If competitive bidding is required, to what class or classes of securities should it be applicable and under what regulations?

Any person who may be unable to appear on that date may file a memorandum on or before the date mentioned.

REVENUES AND EXPENSES OF RAILWAYS

Month of August and Eight Months of Calendar Year 1922

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Operating revenues: Passenger.	Operating revenues: Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Operating expenses: Maintenance of Equipment.	Operating expenses: Traffic.	Operating expenses: Transportation.	Operating expenses: General.	Operating expenses: Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Akron, Canton & Youngstown	Aug.	170	$176,012	$1,696	$186,745	$26,211	$23,902	$6,052	$59,372	$9,357	$124,894	66.90	$61,851	$51,339	$25,606	$71,981
	8 mos.	170	1,369,161	11,140	1,442,301	160,328	155,384	46,347	397,6[illegible]2	69,999	829,267	57.50	613,034	533,435	321,718	121,7[illegible]
Alabama & Vicksburg	Aug.	141	142,403	57,879	217,574	48,855	38,452	5,758	97,008	11,908	204,028	93.80	13,546	—2,933	604	51,404
	8 mos.	141	1,390,831	454,480	1,985,276	369,062	370,384	68,175	757,165	94,975	1,674,788	84.40	310,488	153,128	187,196	22,239
Vicksburg, Shreveport & Pac.	Aug.	171	137,741	92,881	252,552	53,771	40,389	8,887	115,961	12,430	233,927	92.00	18,625	1,211	—7,164	64,975
	8 mos.	171	1,495,059	728,063	2,393,820	422,554	411,225	81,109	936,630	109,451	1,978,906	82.70	414,914	261,395	197,145	190,173
Ann Arbor	Aug.	293	369,603	48,317	448,471	52,038	87,326	8,913	197,012	18,714	364,016	81.20	84,455	61,861	33,792	100,977
	8 mos.	293	2,775,618	347,905	3,272,125	398,425	575,546	75,883	1,454,418	122,455	2,626,834	80.30	645,291	474,027	300,047	157,053
Atchison, Topeka & Santa Fe	Aug.	8,855	12,167,794	3,447,187	16,797,939	2,852,167	4,060,175	283,734	4,991,771	329,986	12,452,989	74.10	4,344,950	2,774,056	2,865,330	7,362,223
	8 mos.	8,856	78,161,289	28,244,169	115,967,469	20,578,610	27,328,859	2,109,747	36,931,979	2,672,955	89,455,066	77.10	26,512,403	17,743,750	18,758,440	28,413,528
Gulf, Colo. & Santa Fe	Aug.	1,907	1,865,404	384,977	2,356,848	298,842	542,570	45,127	681,924	65,174	1,629,139	69.10	727,709	642,800	575,736	1,885,556
	8 mos.	1,907	10,689,867	2,626,015	14,294,396	2,998,638	3,538,999	338,880	4,752,661	537,443	12,156,649	85.00	2,137,747	1,572,198	1,057,805	4,779,790
Panhandle & Santa Fe	Aug.	857	512,305	128,138	683,249	207,367	160,459	7,112	204,925	21,051	600,558	87.90	82,691	63,770	33,648	560,246
	8 mos.	857	3,569,245	908,795	4,796,377	1,300,533	1,444,232	55,483	1,603,059	151,932	4,548,006	94.80	248,371	69,087	—177,019	1,108,919
Atlanta & West Point	Aug.	93	124,624	78,052	230,167	34,847	48,788	7,125	93,004	10,459	197,569	85.80	32,598	21,489	12,624	36,315
	8 mos.	93	803,931	565,148	1,584,830	208,329	339,849	61,728	621,471	82,132	1,343,581	84.80	241,249	156,498	98,580	75,488
Western of Alabama	Aug.	133	140,340	69,076	231,260	31,606	44,139	7,837	75,393	10,479	172,301	74.50	58,959	43,923	44,432	38,712
	8 mos.	133	944,329	513,285	1,642,657	210,860	355,958	67,156	545,061	85,657	1,290,314	78.50	352,343	267,265	270,063	121,549
Atlanta, Birm. & Atlantic	Aug.	639	248,853	54,955	329,435	58,558	81,544	20,214	159,503	16,046	335,936	101.97	—6,501	—20,510	—26,333	—140,646
	8 mos.	639	1,989,019	300,235	2,495,342	468,142	694,277	168,855	1,270,019	128,409	2,730,387	109.41	—235,045	—352,208	—444,659	—1,304,928
Atlantic Coast Line	Aug.	4,922	3,040,786	1,097,807	4,608,155	599,832	1,149,411	95,589	1,969,602	132,797	3,964,387	86.00	643,768	292,120	431,482	—158,063
	8 mos.	4,922	31,702,321	10,681,088	46,198,075	5,393,369	9,074,855	848,876	16,058,705	1,106,052	33,630,558	72.80	12,567,515	10,325,703	9,815,241	2,960,314
Charleston & West. Carol	Aug.	342	161,187	44,906	221,333	48,790	48,225	6,452	99,542	7,192	210,201	95.00	11,132	24	—5,673	—17,716
	8 mos.	342	1,765,681	302,743	2,184,616	361,446	311,705	52,856	891,076	52,415	1,669,498	76.40	515,118	426,386	358,605	—227,524
Baltimore & Ohio	Aug.	5,235	16,501,265	2,417,601	14,104,234	1,960,739	3,485,627	299,367	7,301,743	481,806	13,590,644	96.40	513,590	—175,520	—648,190	2,558,415
	8 mos.	5,235	100,177,461	17,637,947	126,727,416	15,505,369	28,159,152	2,382,115	51,846,245	3,797,347	102,835,336	81.20	23,892,080	18,185,402	15,157,172	12,215,661
Balti. & Ohio Chic. Term	Aug.	91	......	......	274,673	37,771	45,220	1,736	183,156	10,553	283,378	103.20	—8,705	—60,103	44,236	70,277
	8 mos.	91	......	......	1,998,162	286,843	248,114	15,058	1,135,806	83,020	1,805,589	90.40	192,573	—192,829	719,824	302,258
Staten Isl. Rapid Tran	Aug.	23	68,198	131,627	239,582	60,499	40,694	2,253	129,922	12,918	246,286	102.80	—6,704	—21,708	—33,130	—8,060
	8 mos.	21	613,527	842,015	1,648,232	410,883	257,664	15,780	944,640	108,442	1,737,409	105.40	—89,177	—224,885	—332,108	—203,172
Bangor & Aroostook	Aug.	625	279,806	72,356	377,037	144,330	130,642	4,122	146,972	18,034	446,365	118.40	—69,328	—87,761	—46,907	71,258
	8 mos.	625	4,499,610	388,885	5,271,998	993,427	985,349	31,754	1,471,551	154,808	3,646,166	69.20	1,625,832	1,242,425	1,324,787	373,678
Belt Ry. of Chicago	Aug.	32	......	......	500,753	54,879	38,036	2,272	253,541	9,197	357,925	71.50	142,828	106,914	133,690	134,670
	8 mos.	32	......	......	3,837,393	371,149	378,700	17,030	1,716,740	78,173	2,561,792	66.80	1,275,601	994,026	1,095,829	1,072,438
Bessemer & Lake Erie	Aug.	225	1,505,199	43,070	1,575,265	111,128	301,814	12,144	478,852	25,920	934,476	59.30	640,789	608,031	661,333	615,513
	8 mos.	225	7,235,275	255,547	7,663,772	888,476	2,443,133	119,566	2,516,080	205,099	6,212,781	81.10	1,450,991	1,189,657	1,435,628	1,059,683
Bingham & Garfield	Aug.	34	21,951	852	23,317	12,764	3,877	1,216	6,714	4,476	29,176	125.10	—5,859	—10,095	2,556	—32,033
	8 mos.	34	123,488	859	126,162	129,191	28,303	10,623	40,198	33,826	242,619	192.30	—116,457	—155,969	—72,513	—179,552
Boston & Maine	Aug.	2,287	3,890,163	2,294,741	6,975,504	982,721	1,625,295	57,826	2,968,886	198,060	5,863,765	84.10	1,111,739	882,794	601,043	792,575
	8 mos.	2,287	31,057,308	14,813,165	51,402,683	7,720,898	9,833,546	441,485	23,227,928	1,730,885	43,158,571	84.00	8,244,112	6,631,155	4,575,215	—2,979,502
Brooklyn Eastern Dist. Term	Aug.	9	134,270	......	142,398	6,411	15,772	26	49,724	4,534	76,467	53.70	65,931	59,444	59,444	30,606
	8 mos.	9	999,124	......	1,061,723	45,826	145,958	1,320	396,677	38,809	628,590	59.20	433,133	381,383	381,383	202,399
Buffalo & Susquehanna	Aug.	253	72,990	4,755	81,279	34,481	22,285	1,955	35,069	8,380	102,170	125.70	—20,891	—24,148	—16,741	2,537
	8 mos.	253	787,574	46,045	865,357	251,966	278,930	17,215	331,229	72,089	951,429	109.90	—86,072	—112,116	328	—64,633
Buffalo, Rochester & Pittsburg	Aug.	589	764,790	154,279	990,873	271,142	572,841	20,333	515,659	38,568	1,421,071	143.40	—430,198	—465,671	—414,601	56,587
	8 mos.	589	7,262,683	1,086,861	8,815,025	1,410,284	3,460,152	148,914	3,660,087	304,396	9,001,543	102.10	—186,518	—471,503	—198,733	443,611
Canadian Pacific (Lines in Me.)	Aug.	233	108,333	36,873	158,993	43,087	41,703	4,137	78,993	3,529	171,449	107.80	—12,456	—28,456	—32,181	—51,509
	8 mos.	233	1,401,104	273,966	1,800,218	290,683	3,467,754	34,302	867,788	30,271	1,569,798	87.20	230,420	102,420	13,584	—107,207
Carolina, Clinchfield & Ohio	Aug.	295	534,042	44,145	593,882	75,324	97,246	15,423	153,478	21,229	362,578	61.00	231,304	181,279	255,068	213,003
	8 mos.	295	4,674,237	309,835	5,081,429	595,544	1,069,351	178,898	1,264,822	153,740	3,259,643	64.10	1,821,786	1,491,242	2,082,532	1,421,690
Central of Georgia	Aug.	1,920	1,252,237	461,242	1,947,283	250,080	375,000	63,027	717,537	74,507	1,487,541	76.40	459,742	350,915	383,935	3,921
	8 mos.	1,918	9,846,591	3,332,597	14,630,928	1,944,966	2,793,119	525,622	5,655,414	597,015	11,567,700	79.10	3,063,228	2,317,237	2,469,159	362,255
Central of New Jersey	Aug.	688	3,383,729	1,111,856	3,796,503	547,282	757,922	32,935	1,950,124	99,117	3,408,948	89.80	387,555	124,962	87,271	899,244
	8 mos.	688	22,171,687	6,382,559	30,682,640	3,604,340	8,218,401	269,968	13,374,671	833,230	26,439,071	86.20	4,243,569	2,151,613	1,847,082	5,071,161
Central Vermont	Aug.	532	408,741	128,421	604,638	106,810	81,372	13,844	330,853	20,114	554,254	91.70	50,384	32,788	14,750	—73,398
	8 mos.	532	3,276,208	801,924	4,556,861	725,303	757,167	99,925	2,348,115	188,201	4,130,286	90.60	426,575	285,071	73,470	—1,047,573
Chesapeake & Ohio	Aug.	2,550	4,629,075	1,009,004	5,982,593	882,379	1,468,466	88,510	2,284,925	159,205	4,910,314	82.10	1,072,279	803,113	803,860	1,303,078
	8 mos.	2,548	46,997,078	6,906,993	56,630,225	6,899,163	13,675,317	628,485	20,031,770	1,274,781	42,692,238	75.40	13,937,987	11,789,382	12,139,106	7,878,962
Chicago & Alton	Aug.	1,050	1,191,959	510,018	1,891,713	400,604	508,436	60,915	983,708	52,005	2,011,990	106.40	—120,277	—196,204	—257,025	550,588
	8 mos.	1,050	12,340,738	4,041,606	17,885,495	2,342,290	4,868,936	447,496	7,258,539	454,792	15,457,319	86.40	2,428,176	1,824,969	836,570	609,477
Chicago & Eastern Illinois	Aug.	945	1,258,372	401,306	1,810,522	272,525	464,854	39,554	872,570	59,737	1,719,426	95.00	91,096	—9,093	13,824	559,164
	8 mos.	945	11,342,271	3,007,135	15,502,378	1,885,532	3,963,764	341,924	6,572,905	526,841	13,377,456	86.30	2,124,922	1,411,286	1,235,091	453,978
Chicago & North Western	Aug.	8,403	8,495,985	2,802,035	12,860,888	1,875,883	2,363,934	146,320	5,284,627	311,267	10,051,357	78.20	2,809,531	2,077,329	1,932,944	3,647,086
	8 mos.	8,403	63,008,819	19,876,103	93,202,325	12,398,441	18,260,499	1,219,284	40,525,491	2,485,825	75,440,341	80.90	17,761,984	11,901,597	11,560,635	2,035,996
Chicago, Burlington & Quincy	Aug.	9,393	10,424,760	2,792,199	14,502,539	2,155,318	3,074,612	221,178	6,379,163	357,140	12,206,988	84.20	2,295,551	1,369,748	1,131,461	4,176,191
	8 mos.	9,393	73,708,110	18,586,470	101,747,129	13,444,320	20,941,708	1,551,275	39,079,574	2,783,680	78,434,305	77.10	23,312,824	15,945,741	14,760,273	18,007,837
Chicago Great Western	Aug.	1,496	1,627,325	406,778	2,204,138	448,725	442,903	60,492	843,905	54,127	1,862,194	84.50	341,944	262,573	135,079	324,819
	8 mos.	1,496	11,215,485	2,848,817	15,442,416	2,540,442	3,463,773	513,214	6,558,337	447,861	13,629,102	88.30	1,813,314	1,165,446	123,546	853,562
Chicago, Ind. & Louisville	Aug.	654	887,723	240,539	1,270,995	146,388	298,060	30,884	511,934	34,132	1,035,682	81.50	235,313	174,139	79,305	182,367
	8 mos.	654	7,264,435	2,010,955	10,239,655	1,100,255	2,223,733	260,688	3,867,389	282,018	7,837,975	76.50	2,401,680	1,894,827	1,084,255	275,340

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues—Freight.	Passenger.	Total (inc. misc.)	Operating expenses—Maintenance of—Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Chicago, Milwk. & St. Paul	Aug.	11,030	$10,437,147	$2,344,052	$14,272,931	$1,981,875	$1,859,600	$186,236	$6,167,220	$295,286	$10,558,510	[illegible]	$3,714,421	$2,868,419	$2,465,275	$1,982,774
	8 mos.	11,030	71,539,326	15,982,180	98,124,035	13,136,689	22,522,840	1,489,911	42,038,063	2,575,952	[illegible]	[illegible]	[illegible]	[illegible]	6,416,964	[illegible]
Chicago, Peoria & St. Louis	Aug.	246	104,555	17,909	133,209	24,274	22,127	4,420	93,044	8,675	152,740	114.70	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	246	1,196,045	150,403	1,439,441	234,308	284,845	35,317	851,459	84,139	1,489,968	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chicago River & Indiana	Aug.	38	......	......	563,291	59,452	55,898	398	227,042	11,046	353,836	[illegible]	[illegible]	[illegible]	[illegible]	......
	8 mos.	38	......	......	1,917,857	201,466	192,044	2,308	746,123	29,424	1,171,365	61.08	746,492	[illegible]	[illegible]	......
Chicago, Rock Isl. & Pac.	Aug.	7,661	7,454,826	2,547,678	10,819,211	1,307,710	2,433,031	170,151	4,622,614	225,287	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	7,661	53,564,677	17,562,714	76,903,458	9,763,706	16,001,496	1,426,201	32,733,439	1,830,850	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chicago, Rock Isl. & Gulf	Aug.	461	412,017	80,142	528,638	79,324	65,476	12,588	247,787	13,301	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	461	2,844,492	617,802	3,783,184	551,917	589,997	107,738	1,705,556	110,362	3,071,975	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Chic., St. Paul, Minn. & Omaha	Aug.	1,749	1,975,599	588,066	2,731,206	342,927	317,658	33,879	1,068,578	68,902	1,841,813	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	1,749	12,709,098	4,078,150	18,110,929	2,296,957	3,105,109	266,860	8,234,493	575,018	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Cin., Indianapolis & Western	Aug.	347	[illegible]	37,019	344,135	52,227	64,944	9,721	145,205	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	347	2,196,614	375,801	2,729,461	352,541	581,959	89,351	1,208,275	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Colorado & Southern	Aug.	1,099	861,708	239,712	1,182,087	240,087	218,744	15,314	431,363	39,628	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	1,099	6,441,672	1,348,400	8,419,803	1,197,126	1,733,928	107,175	3,093,594	351,733	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ft. Worth & Denver City	Aug.	456	621,787	[illegible]	898,752	56,523	180,399	12,219	[illegible]	34,172	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	456	4,183,846	1,471,512	6,030,047	498,232	1,084,739	94,924	1,951,461	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wichita Valley	Aug.	256	68,617	22,935	98,204	17,628	7,269	30	41,724	1,212	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	256	530,353	174,150	760,640	160,363	60,601	354	329,749	11,579	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Columbus & Greenville	Aug.	167	99,352	29,658	133,214	34,447	7,818	3,065	43,128	8,545	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	203	718,257	217,526	983,696	227,797	93,243	26,764	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Delaware & Hudson	Aug.	887	1,667,899	508,002	2,399,758	431,520	1,110,169	42,208	1,151,843	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	887	18,720,749	2,495,880	23,487,150	3,721,725	6,492,668	346,682	9,853,848	1,170,694	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Dela., Lack. & Western	Aug.	994	3,653,967	1,353,786	5,773,758	832,275	1,721,009	125,455	2,891,975	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	994	32,134,151	9,159,740	47,205,974	5,551,910	10,451,617	911,415	20,839,515	1,267,560	39,441,231	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Denver & Rio Grande Western	Aug.	2,593	[illegible]	636,624	3,133,441	565,512	513,477	45,300	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	2,593	15,107,561	3,765,733	20,492,224	3,071,071	3,906,613	362,227	6,762,506	[illegible]	15,161,984	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Denver & Salt Lake	Aug.	255	118,126	35,450	165,896	42,342	31,981	1,077	43,650	5,551	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	255	572,423	132,457	765,477	317,785	205,432	7,697	276,918	47,893	855,725	111.80	—90,248	[illegible]	[illegible]	[illegible]
Detroit & Mackinac	Aug.	385	155,818	33,275	201,827	24,848	53,314	3,124	63,294	5,029	149,513	74.10	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	385	868,588	237,816	1,197,940	207,450	408,257	18,965	466,700	42,954	1,143,591	95.50	54,349	[illegible]	[illegible]	[illegible]
Detroit & Toledo Shore Line	Aug.	61	265,733	......	267,884	23,430	16,978	2,668	80,811	8,459	132,346	49.40	135,538	[illegible]	[illegible]	[illegible]
	8 mos.	61	2,276,416	......	2,297,350	219,706	166,764	18,243	630,535	57,443	1,092,691	47.60	[illegible]	[illegible]	[illegible]	[illegible]
Detroit, Toledo & Ironton	Aug.	454	693,309	13,856	719,708	246,104	259,119	6,373	326,924	22,679	861,199	119.70	—141,491	[illegible]	[illegible]	[illegible]
	8 mos.	454	5,853,703	81,639	6,021,610	1,020,476	1,386,133	45,773	2,062,839	155,758	4,670,560	77.60	[illegible]	[illegible]	[illegible]	[illegible]
Duluth & Iron Range	Aug.	281	1,155,688	17,422	1,257,614	133,705	120,204	2,297	260,020	22,316	538,110	[illegible]	[illegible]	[illegible]	[illegible]	415,934
	8 mos.	281	4,285,248	127,876	4,773,220	748,945	754,181	9,547	1,305,458	138,326	2,958,159	[illegible]	1,815,061	[illegible]	[illegible]	[illegible]
Duluth, Miss. & Northern	Aug.	307	2,902,023	36,320	3,170,708	202,764	180,039	3,323	520,543	21,097	929,353	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	306	8,750,228	305,990	9,752,158	1,301,286	1,093,110	25,720	2,149,020	158,887	4,711,843	48.60	[illegible]	[illegible]	[illegible]	2,565,850
Duluth, South Shore & Atlantic	Aug.	591	289,449	105,886	438,596	83,470	26,353	6,157	181,396	9,548	312,528	71.30	[illegible]	93,168	[illegible]	13
	8 mos.	591	1,867,767	689,633	2,838,604	508,416	462,819	52,751	1,470,618	90,027	2,627,240	92.60	[illegible]	—40,906	—72,748	[illegible]
Duluth, Winnipeg & Pacific	Aug.	178	141,243	24,453	170,152	36,647	41,055	3,786	69,709	4,954	156,151	91.70	[illegible]	[illegible]	500	[illegible]
	8 mos.	178	1,105,994	159,614	1,309,134	238,788	331,262	35,035	586,091	43,202	1,234,351	94.30	74,780	3,631	—18,567	[illegible]
Elgin, Joliet & Eastern	Aug.	459	917,387	7	1,097,303	149,365	155,006	11,328	529,715	32,811	877,952	80.00	219,351	[illegible]	[illegible]	[illegible]
	8 mos.	459	11,860,395	35	13,337,175	1,134,537	2,394,934	98,267	4,292,100	271,787	8,189,696	61.40	5,147,479	[illegible]	[illegible]	[illegible]
El Paso & Southwestern	Aug.	1,139	767,485	138,571	964,628	149,133	139,872	29,156	238,944	42,417	607,847	63.01	356,781	[illegible]	[illegible]	[illegible]
	8 mos.	1,139	5,635,263	1,280,063	7,384,899	1,225,875	1,154,032	225,096	1,941,850	377,988	4,987,879	67.54	2,397,020	[illegible]	[illegible]	[illegible]
Erie	Aug.	[illegible]	[illegible]	1,306,157	7,238,682	1,212,670	3,300,939	131,504	3,948,545	275,020	8,924,959	123.30	[illegible]	[illegible]	—1,846,887	[illegible]
	8 mos.	2,029	44,891,015	8,913,652	58,703,158	6,858,664	18,420,323	1,079,588	27,015,863	2,271,259	55,930,884	95.40	[illegible]	526,178	[illegible]	[illegible]
Chicago & Erie	Aug.	269	750,999	75,704	903,307	144,079	236,108	20,018	403,276	33,377	836,659	92.60	[illegible]	11,562	[illegible]	[illegible]
	8 mos.	269	6,231,729	466,836	7,220,640	830,643	1,196,348	156,905	3,181,119	273,415	5,639,677	78.10	1,580,963	[illegible]	[illegible]	[illegible]
New Jersey & New York	Aug.	45	14,516	107,936	128,780	18,126	29,192	1,296	79,530	3,216	131,360	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	45	149,527	803,071	991,781	122,727	156,135	10,700	554,406	26,484	870,449	87.80	[illegible]	97,110	—108,541	[illegible]
N. Y., Susq. & Western	Aug.	135	199,274	66,507	298,429	49,915	82,298	3,332	232,704	10,691	378,940	[illegible]	—80,511	—106,016	—117,832	[illegible]
	8 mos.	135	1,781,480	491,618	2,607,279	371,304	469,284	28,493	1,566,500	78,426	2,514,133	96.40	93,146	—109,268	[illegible]	[illegible]
Florida East Coast	Aug.	764	410,843	173,738	673,897	238,801	213,897	9,444	283,940	26,919	[illegible]	115.30	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	764	5,562,111	2,770,688	9,454,654	1,431,055	1,527,151	105,781	2,877,714	217,616	6,243,927	66.00	3,210,727	2,707,169	2,311,646	[illegible]
Ft. Smith & Western	Aug.	249	114,598	28,744	152,053	28,923	24,128	4,747	47,464	6,822	112,735	74.10	[illegible]	33,167	25,769	[illegible]
	8 mos.	249	764,189	180,638	1,018,004	204,366	191,245	38,215	365,492	55,164	861,200	84.50	156,804	109,510	[illegible]	[illegible]
Galveston Wharf	Aug.	13	......	......	136,410	21,850	2,572	633	27,588	[illegible]	73,040	53.50	63,370	47,301	[illegible]	[illegible]
	8 mos.	13	......	......	929,825	407,844	30,437	6,320	218,290	26,991	825,442	88.80	104,383	—31,631	—30,657	[illegible]
Georgia	Aug.	328	289,435	116,038	440,597	46,108	87,235	19,037	216,430	20,289	389,257	88.30	51,340	40,504	41,956	[illegible]
	8 mos.	328	2,202,339	778,887	3,228,807	324,520	553,095	156,306	1,571,348	154,298	2,761,256	85.50	[illegible]	[illegible]	[illegible]	—17,109
Georgia & Florida	Aug.	405	76,719	15,418	99,424	15,291	15,564	8,279	41,345	6,473	87,168	87.70	[illegible]	5,877	1,799	[illegible]
	8 mos.	405	710,279	99,745	870,447	135,180	136,115	65,515	351,125	51,215	740,862	85.10	129,585	79,049	21,696	—186,085
Grand Trunk Western	Aug.	347	1,446,939	178,730	1,694,650	182,321	339,911	27,308	556,924	46,692	1,159,144	68.40	515,506	458,281	307,955	176,043
	8 mos.	347	8,791,044	1,256,391	10,660,651	1,026,918	2,272,545	223,729	4,321,048	398,582	8,292,464	77.80	2,368,187	1,850,069	333,675	—756,040

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues			Maintenance of		Operating expenses				Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
			Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Atlantic & St. Lawrence	Aug.	166	$172,964	$58,256	$248,568	$116,612	$22,309	$11,723	$104,910	$12,481	$269,410	108.40	—$20,842	—$40,906	—$91,700	—$152,929
	8 mos.	166	1,353,914	299,155	1,797,638	439,454	258,462	42,645	984,532	95,604	1,836,223	102.10	—38,585	—177,002	—680,225	—913,784
Chic., Det. & Can. Gr Tr Jct	Aug.	59	143,775	5,724	172,070	12,644	10,007	3,253	69,503	2,838	98,233	57.10	73,837	60,529	46,391	21,523
	8 mos.	59	1,293,964	71,224	1,493,558	102,829	97,097	28,230	523,511	28,589	780,153	52.20	713,405	637,178	485,003	191,975
Det., Gr Haven & Milwk	Aug.	189	332,336	33,754	393,918	64,239	42,278	8,257	218,867	11,230	344,802	87.50	49,116	45,415	—16,540	79,399
	8 mos.	189	2,889,991	316,354	3,443,117	360,186	363,755	69,612	1,668,206	129,577	2,595,877	75.30	849,240	802,688	278,212	—410,920
Great Northern	Aug.	8,255	7,447,787	1,448,797	9,884,359	1,276,348	1,726,755	134,510	3,936,401	201,381	7,316,834	74.00	2,567,525	1,847,573	1,798,619	1,531,892
	8 mos.	8,263	45,468,120	9,730,855	61,629,935	8,780,701	11,624,360	1,109,320	25,221,038	1,691,590	48,840,993	79.30	12,789,442	7,625,598	8,248,122	993,880
Green Bay & Western	Aug.	262	82,232	11,606	100,791	21,530	6,217	2,259	42,172	2,418	74,596	74.00	26,195	18,195	14,420	6,559
	8 mos.	262	708,671	130,860	905,906	172,583	128,256	19,188	344,521	21,154	685,679	75.60	220,227	156,227	121,655	85,423
Gulf Coast Lines	Aug.	922	662,751	180,141	891,440	142,434	126,445	26,767	226,168	33,837	555,302	62.20	336,138	296,725	299,578	308,787
	8 mos.	922	5,073,387	1,238,380	6,751,185	1,091,221	1,061,473	212,013	1,870,400	282,138	4,607,469	68.60	2,143,716	1,838,978	1,737,542	1,210,466
Gulf & Ship Island	Aug.	307	201,468	41,839	258,616	42,117	37,488	7,367	81,321	11,031	179,661	69.50	78,955	60,982	55,614	24,479
	8 mos.	307	1,516,792	310,723	1,948,829	345,874	293,753	61,583	594,982	92,312	1,390,830	71.40	557,999	414,245	374,088	112,967
Gulf, Mobile & Northern	Aug.	436	271,826	31,918	319,249	48,180	58,731	13,404	118,529	15,073	253,856	79.50	65,393	33,195	23,365	2,440
	8 mos.	436	2,518,472	272,766	2,911,612	437,287	473,625	111,024	1,009,266	123,826	2,145,762	73.70	765,850	612,575	500,382	—63,193
Hocking Valley	Aug.	348	869,739	97,387	1,071,434	125,744	366,400	9,951	411,889	30,319	944,296	88.10	127,138	41,924	51,825	269,994
	8 mos.	348	6,903,819	678,824	8,316,023	855,759	1,917,641	93,130	2,863,348	247,977	5,967,445	71.80	2,348,578	1,630,857	1,707,072	17,010
Illinois Central	Aug.	4,784	11,022,153	2,194,847	14,074,640	1,981,554	3,423,437	162,823	5,242,875	288,248	11,123,776	79.00	2,950,864	2,182,355	2,123,407	1,374,267
	8 mos.	4,784	73,392,184	15,492,061	95,717,659	12,281,894	21,810,061	1,488,776	35,172,942	2,459,524	73,543,367	76.80	22,169,292	14,758,951	15,143,078	12,194,222
Illinois Central and Yazoo & Miss. Valley	Aug.	1,380	1,197,456	364,726	1,652,400	391,548	390,339	23,396	648,634	46,858	1,501,268	90.50	151,132	33,679	22,977	—91,761
	8 mos.	1,381	8,536,250	2,486,193	11,748,446	2,769,586	2,377,076	207,331	4,897,219	391,570	10,629,586	90.50	1,118,860	172,119	151,574	21,556
Illinois Central and Yazoo & Miss. Valley combined	Aug.	6,164	12,219,609	2,559,573	15,727,040	2,373,102	3,813,776	186,219	5,891,509	335,106	12,625,044	80.30	3,101,996	2,216,034	2,146,384	1,282,506
	8 mos.	6,166	81,928,434	17,978,254	107,466,105	15,051,480	24,187,137	1,696,107	40,070,161	2,851,094	84,177,953	78.30	23,288,152	14,931,070	15,294,652	12,215,778
International & Gr. Northern	Aug.	1,159	849,830	216,414	1,177,179	182,274	139,502	26,391	566,892	44,446	965,074	81.80	212,105	177,579	133,523	38,085
	8 mos.	1,159	6,271,448	1,625,904	8,868,205	1,294,696	1,557,265	211,973	3,973,639	376,684	7,460,824	84.10	1,407,381	1,135,126	743,264	—290,006
Kans. City, Mexico & Orient	Aug.	272	92,779	11,426	112,704	21,369	10,199	4,293	57,409	5,591	98,861	87.70	13,843	7,381	3,932	66,203
	8 mos.	272	740,454	84,083	890,827	200,483	195,346	37,351	484,490	51,131	968,801	108.80	—77,974	—142,702	—145,720	—199,884
Kans. City, Mex. & Orient of Tex.	Aug.	465	96,958	10,957	113,988	20,419	10,569	3,963	65,067	6,178	106,196	93.30	7,792	1,777	—14,836	—23,537
	8 mos.	465	824,715	84,277	967,797	197,867	256,370	37,184	586,128	51,806	1,129,355	116.70	—161,558	—209,884	—323,324	—508,321
Kansas City Southern	Aug.	767	1,251,817	188,131	1,549,661	223,231	351,570	34,322	551,976	64,018	1,224,696	79.00	324,965	229,512	197,079	372,734
	8 mos.	767	9,192,850	1,320,673	11,620,597	1,532,059	2,293,763	289,876	4,210,965	547,202	8,867,437	76.30	2,753,160	1,976,914	1,871,876	2,856,701
Texarkana & Ft. Smith	Aug.	81	143,746	14,322	177,909	14,567	—22,131	6,463	52,361	8,840	60,032	33.70	117,877	105,308	86,427	79,670
	8 mos.	81	1,095,092	115,473	1,323,708	142,200	154,027	41,537	399,915	69,616	806,363	60.90	517,345	432,315	301,792	261,475
Kans. Okla. & Gulf	Aug.	314	245,306	11,950	268,425	46,711	24,520	5,150	91,225	10,548	178,403	66.50	90,022	80,425	66,008	—6,528
	8 mos.	314	1,653,024	97,386	1,822,628	351,387	187,756	43,691	664,769	80,156	1,329,084	72.90	493,544	414,487	318,861	—97,316
Lake Superior & Ishpeming	Aug.	33	216,866	47	259,386	23,711	9,437	197	46,205	2,666	82,156	31.70	177,230	171,744	174,863	23,908
	8 mos.	33	615,595	568	735,726	161,153	74,640	1,694	158,463	20,761	416,711	56.60	319,015	273,715	280,430	—251,776
Lake Terminal	Aug.	13	.....	.....	81,406	7,919	10,740	.....	50,288	1,819	70,766	86.90	10,640	6,500	8,148	16,977
	8 mos.	13	.....	.....	711,725	74,282	76,955	.....	338,084	12,961	502,282	70.60	209,443	163,047	225,080	52,696
Lehigh & Hudson River	Aug.	96	137,753	5,550	153,639	25,538	27,494	1,419	105,636	7,999	168,086	109.40	—14,447	—29,285	—43,732	39,005
	8 mos.	96	1,390,906	31,287	1,503,932	217,364	275,613	11,805	668,630	61,366	1,234,733	82.10	269,199	160,155	22,313	289,003
Lehigh & New England	Aug.	235	268,319	1,728	276,091	89,265	44,241	8,559	120,756	14,012	276,781	100.20	—690	—7,335	—11,608	128,135
	8 mos.	236	2,420,525	15,271	2,493,724	430,499	805,520	80,400	940,384	129,668	2,385,773	95.70	107,951	31,790	111,280	631,622
Lehigh Valley	Aug.	1,334	3,584,005	737,131	4,697,562	750,703	1,859,486	110,986	2,444,078	116,757	5,310,142	113.00	—612,580	—769,014	—821,008	826,025
	8 mos.	1,334	32,535,871	4,610,356	40,177,067	4,658,820	11,864,945	848,353	18,556,041	1,076,211	37,193,018	92.60	2,984,049	1,390,911	1,036,808	1,142,012
Los Angeles & Salt Lake	Aug.	1,137	948,026	450,555	1,532,802	286,820	383,637	45,337	499,028	40,511	1,303,982	85.10	228,820	116,421	83,722	54,940
	8 mos.	1,140	8,058,578	3,440,752	12,618,308	2,642,577	2,744,912	382,240	4,150,230	341,304	10,624,690	84.20	1,993,618	1,107,529	792,096	823,712
Louisiana & Arkansas	Aug.	302	240,050	31,169	280,197	51,178	16,243	6,858	75,664	8,215	157,842	56.30	122,355	86,538	87,995	7,299
	8 mos.	302	1,884,564	263,132	2,206,402	427,479	308,656	60,972	673,269	65,660	1,531,837	69.40	674,565	503,018	490,330	118,916
Louisiana Ry. & Nav. Co.	Aug.	343	245,869	33,294	293,588	67,661	18,546	9,394	105,011	9,998	210,418	71.60	83,170	67,058	42,155	130,492
	8 mos.	343	1,815,927	241,186	2,168,578	502,690	316,821	83,205	873,596	92,799	1,868,093	86.10	300,485	170,034	—23,366	203,615
Louisville & Nashville	Aug.	5,038	6,367,939	2,008,185	8,973,394	1,384,976	2,736,610	229,683	3,647,241	216,129	8,263,020	92.10	710,374	407,054	531,517	1,232,089
	8 mos.	5,038	60,980,161	14,620,383	80,600,376	11,495,337	20,074,450	1,695,490	30,597,085	1,831,829	66,032,950	81.90	14,567,426	11,478,194	11,683,426	—487,755
Louisville, Henderson & St. Louis	Aug.	199	222,854	61,259	304,886	51,484	21,956	6,711	109,076	8,059	197,266	64.70	107,618	84,932	65,054	57,423
	8 mos.	199	1,512,024	464,660	2,112,411	406,628	278,511	49,819	727,163	66,375	1,519,496	72.40	583,915	485,956	364,317	147,238
Maine Central	Aug.	1,194	1,091,670	520,118	1,754,220	298,029	266,627	13,407	761,413	47,144	1,391,507	79.36	362,713	275,054	228,467	91,262
	8 mos.	1,194	9,419,300	3,070,096	13,507,096	2,182,719	2,566,517	107,580	5,895,511	373,514	11,116,372	82.50	2,360,124	1,588,921	1,587,763	—694,618
Midland Valley	Aug.	383	254,457	73,507	345,244	62,808	45,000	4,819	117,779	15,814	246,220	71.30	99,024	82,257	69,043	97,791
	8 mos.	383	2,309,175	555,176	2,994,184	435,467	358,871	38,550	902,116	119,242	1,845,734	61.60	1,148,450	1,033,125	949,081	426,431
Minneapolis & St. Louis	Aug.	1,649	1,057,177	149,448	1,277,886	170,806	156,217	21,624	641,891	34,942	1,025,578	80.30	252,308	181,625	153,675	137,290
	8 mos.	1,649	8,170,728	1,721,349	9,940,958	1,408,570	1,768,336	190,338	4,683,628	316,618	8,365,970	84.20	1,574,988	1,047,515	618,151	—557,860
Minn., St. Paul & S. S. Marie	Aug.	4,383	3,346,408	754,410	4,526,505	659,713	350,587	73,092	1,673,138	98,481	2,884,945	63.70	1,641,560	1,390,756	1,294,396	268,501
	8 mos.	4,383	20,549,416	4,778,999	28,043,855	4,305,154	4,543,913	486,540	12,127,617	825,999	22,369,076	79.80	5,674,779	3,646,114	3,332,081	—2,292,484
Mississippi Central	Aug.	258	92,812	17,850	118,341	21,814	28,904	5,961	50,487	7,114	114,280	96.60	4,061	—2,198	3,295	—17,450
	8 mos.	259	795,870	130,027	965,203	151,032	254,344	45,542	338,309	56,221	845,448	87.20	119,755	69,764	76,726	—111,852
Missouri & North Arkansas	Aug.	344	67,935	18,109	91,185	9,418	6,485	2,427	50,547	2,979	71,856	78.80	19,329	23,142	7,940	.....
	8 mos.	294	100,371	52,294	260,480	24,701	36,231	6,668	152,969	13,945	234,514	90.00	25,966	22,610	—16,302	.....
Missouri, Kansas & Texas	Aug.	1,670	1,971,918	466,092	2,651,021	319,069	564,755	51,390	885,806	79,268	1,904,650	71.80	746,371	619,532	664,775	887,166
	8 mos.	1,670	14,333,013	3,746,476	19,940,080	2,119,256	3,853,296	370,520	5,920,403	726,105	13,043,912	65.40	6,866,168	5,539,176	5,961,078	3,770,807

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss)	Net after rentals.	Net after rentals 1921.
Mo., Kans. & Tex. of Texas	Aug.	1,737	$1,126,425	$374,327	$1,645,628	$323,063	$410,721	$39,652	$687,936	$64,344	$1,527,482	92.80	$118,146	$63,978	—$144,667	[illegible]
	8 mos.	1,737	8,675,926	3,325,100	13,222,457	2,157,808	1,963,071	325,841	5,325,235	608,904	10,361,694	78.40	2,860,763	2,442,778	1,050,551	[illegible]
Wichita Falls & Northwestern	Aug.	329	121,090	23,274	153,518	29,917	9,183	1,028	58,248	6,175	104,109	67.80	49,409	38,429	14,184	199,546
	8 mos.	329	717,270	179,876	973,252	219,653	141,826	7,424	423,473	68,462	858,145	88.20	115,107	20,130	—11,495	[illegible]
Missouri Pacific	Aug.	7,230	6,588,014	1,449,489	8,785,538	1,543,190	1,514,566	153,667	3,707,375	249,879	7,174,309	81.70	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	7,318	48,343,518	11,050,961	65,073,700	11,390,025	13,089,291	1,246,106	26,348,711	2,090,066	[illegible]	83.50	[illegible]	[illegible]	5,264,945	[illegible]
Mobile & Ohio	Aug.	1,165	1,160,011	155,827	1,400,073	168,733	308,167	39,237	594,211	44,351	1,155,209	[illegible]	[illegible]	190,754	[illegible]	[illegible]
	8 mos.	1,165	9,545,514	1,123,937	11,253,442	1,375,405	2,267,156	355,726	4,385,751	381,063	8,773,077	78.00	2,480,365	[illegible]	[illegible]	[illegible]
Monongahela	Aug.	106	214,992	32,195	251,293	40,475	53,953	1,211	98,871	8,762	201,272	[illegible]	[illegible]	[illegible]	29,347	[illegible]
	8 mos.	106	1,851,737	233,055	2,118,461	307,876	344,632	11,886	601,791	75,039	1,341,224	63.30	[illegible]	[illegible]	[illegible]	[illegible]
Monongahela Connecting	Aug.	7	......	......	96,035	21,338	27,823	506	60,860	7,610	118,137	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	7	......	......	1,061,837	130,470	188,552	4,225	478,123	59,322	860,692	81.10	[illegible]	[illegible]	[illegible]	[illegible]
Montour	Aug.	56	20,321	763	22,150	19,442	20,812	916	10,382	5,738	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	56	373,073	5,959	387,088	132,436	196,239	7,805	134,154	49,081	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nashville, Chatt. & St. Louis	Aug.	1,258	1,544,649	414,493	2,099,888	306,380	461,957	65,768	859,888	56,265	1,754,708	83.60	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	1,258	10,028,939	3,034,825	14,088,088	2,242,018	3,588,907	548,586	5,534,720	460,747	12,412,032	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Nevada Northern	Aug.	165	56,171	4,729	64,101	12,340	5,756	398	8,949	2,636	30,079	46.90	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	165	247,480	33,321	312,892	75,347	30,283	3,439	63,546	21,484	196,099	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Newburgh & South Shore	Aug.	7	......	......	139,240	17,265	45,225	......	51,654	3,950	118,094	84.80	1,146	[illegible]	[illegible]	[illegible]
	8 mos.	7	......	......	1,204,573	83,826	286,436	......	499,659	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New Orleans Great Northern	Aug.	274	[illegible]	38,451	208,870	28,650	19,646	5,656	67,532	9,387	130,982	[illegible]	[illegible]	[illegible]	[illegible]	9,166
	8 mos.	274	1,331,705	292,773	1,694,939	255,579	251,377	41,550	534,407	80,356	1,165,612	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
New York Central	Aug.	6,098	16,259,572	8,880,749	28,948,947	3,609,854	7,948,725	344,287	12,218,956	709,139	25,202,631	[illegible]	3,740,316	[illegible]	2,424,014	[illegible]
	8 mos.	6,098	129,579,152	59,333,046	215,441,042	25,148,748	55,009,937	2,539,076	79,850,524	6,060,006	171,272,496	79.50	[illegible]	[illegible]	[illegible]	[illegible]
Cincinnati Northern	Aug.	244	200,177	19,949	228,887	64,789	79,652	4,415	92,210	8,454	248,737	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	244	2,021,505	125,490	2,206,703	463,479	474,610	39,883	759,506	66,952	1,749,956	79.30	[illegible]	[illegible]	[illegible]	[illegible]
Cleve., Cin., Chic. & St. Louis	Aug.	2,406	4,885,607	1,528,071	7,003,195	936,312	1,585,938	124,229	2,929,863	174,759	5,803,543	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	8 mos.	2,410	39,286,975	10,684,831	54,179,681	6,243,259	10,387,498	904,394	20,535,167	1,373,894	39,841,570	73.50	[illegible]	[illegible]	[illegible]	[illegible]
Indiana Harbor Belt	Aug.	119	......	......	875,405	106,987	147,941	5,586	313,546	17,981	[illegible]	67.60	[illegible]	244,573	[illegible]	[illegible]
	8 mos.	119	......	......	6,305,071	766,150	655,612	33,067	2,435,098	152,475	4,042,402	63.10	[illegible]	1,551,568	1,335,235	[illegible]
Kanawha & Michigan	Aug.	176	286,241	44,024	344,358	70,759	165,698	3,758	173,852	10,978	425,045	[illegible]	—80,687	[illegible]	[illegible]	106,230
	8 mos.	176	1,670,694	349,904	2,128,921	502,561	862,722	35,638	900,043	87,676	[illegible]	112.20	[illegible]	—474,700	—397,849	[illegible]
Lake Erie & Western	Aug.	Included in New York, Chicago & St. Louis														
	8 mos.															
Michigan Central	Aug.	1,862	4,901,568	2,022,160	7,622,277	695,237	1,620,479	91,806	2,693,784	140,544	5,321,389	[illegible]	[illegible]	1,790,807	[illegible]	1,454,923
	8 mos.	1,862	34,336,455	12,424,259	51,776,358	5,424,528	11,004,208	730,674	18,238,180	1,138,609	37,081,965	71.60	[illegible]	[illegible]	[illegible]	[illegible]
Pittsburgh & Lake Erie	Aug.	227	1,781,345	263,065	2,139,657	327,314	628,531	29,490	913,299	57,961	1,957,761	[illegible]	179,896	110,394	[illegible]	[illegible]
	8 mos.	227	13,550,315	1,773,387	15,892,734	2,103,308	7,179,072	164,108	5,700,743	495,137	15,659,341	98.50	233,393	—347,424	[illegible]	1,372,427
Toledo & Ohio Central	Aug.	503	515,735	69,065	628,022	137,451	283,070	13,377	394,133	31,673	863,042	137.40	—235,020	—282,546	—247,351	[illegible]
	8 mos.	503	3,989,447	498,792	4,732,297	992,545	1,646,122	89,725	2,284,944	206,743	5,243,205	110.80	—510,908	—940,254	—837,194	[illegible]
New York, Chic. & St. Louis	Aug.	1,242	3,088,908	188,189	3,399,713	489,351	621,663	80,391	1,386,465	112,876	2,698,525	79.40	701,188	[illegible]	[illegible]	[illegible]
	8 mos.	1,242	23,432,039	1,152,902	25,356,821	3,123,442	4,814,695	615,779	9,490,538	897,458	18,987,394	74.90	6,369,427	4,987,617	[illegible]	2,641,343
N. Y., New Haven & Hartford	Aug.	1,985	4,891,047	4,467,295	10,534,282	1,750,456	2,458,375	52,813	4,287,183	269,706	9,031,706	85.70	1,502,576	1,115,344	[illegible]	563,817
	8 mos.	1,986	38,180,436	31,907,090	78,858,227	11,133,879	16,228,579	436,335	32,274,043	[illegible]	63,575,212	80.60	15,283,014	[illegible]	8,615,189	[illegible]
Central New England	Aug.	295	405,067	19,073	446,743	132,620	95,746	4,256	190,820	11,398	434,840	97.30	11,903	—10,304	—27,474	[illegible]
	8 mos.	295	3,994,328	153,960	4,366,254	916,669	660,302	33,786	1,575,229	90,598	3,275,660	75.00	1,090,594	910,108	561,438	716,640
New York, Ontario & Western	Aug.	569	371,111	683,438	1,258,472	187,018	192,937	15,442	546,243	27,678	985,328	78.30	273,144	247,973	209,785	[illegible]
	8 mos.	569	4,244,172	2,392,989	8,011,183	1,121,317	1,379,653	121,193	3,778,599	238,305	6,655,077	83.10	1,356,108	1,163,924	[illegible]	[illegible]
Norfolk & Western	Aug.	2,237	6,774,192	851,586	7,903,124	1,103,216	1,871,972	84,988	2,581,140	141,925	5,788,450	[illegible]	2,114,674	1,512,441	[illegible]	1,319,547
	8 mos.	2,237	53,559,598	5,810,963	61,477,819	7,867,712	13,517,390	628,068	18,339,116	1,178,664	41,617,095	[illegible]	19,860,724	15,803,449	[illegible]	7,351,465
Norfolk Southern	Aug.	930	411,253	141,552	585,556	97,105	71,513	21,967	258,525	31,388	472,818	80.70	112,738	80,419	69,660	[illegible]
	8 mos.	930	4,197,337	971,414	5,457,920	811,259	865,601	175,664	2,297,771	243,243	4,388,869	80.40	1,069,051	823,519	[illegible]	[illegible]
Northern Pacific	Aug.	6,630	6,301,662	1,386,510	8,539,793	1,168,056	1,604,141	[illegible]	3,105,669	[illegible]	[illegible]	74.20	2,207,784	[illegible]	1,685,101	[illegible]
	8 mos.	6,645	42,574,663	10,387,069	58,448,288	8,600,482	13,691,704	1,135,789	22,733,504	1,721,888	[illegible]	83.20	9,819,982	[illegible]	[illegible]	[illegible]
Northwestern Pacific	Aug.	496	524,916	276,044	874,785	78,321	141,053	5,842	289,045	14,401	530,482	60.60	344,303	295,129	[illegible]	[illegible]
	8 mos.	502	2,765,221	1,828,291	5,226,200	830,432	644,457	55,299	2,029,252	116,508	3,688,024	[illegible]	[illegible]	1,159,344	[illegible]	1,131,469
Pennsylvania	Aug.	10,290	37,468,415	13,578,193	56,213,501	7,514,353	11,881,316	563,450	22,743,784	1,261,715	46,841,854	[illegible]	[illegible]	6,241,790	[illegible]	[illegible]
	8 mos.	10,290	269,232,173	93,518,170	397,241,938	49,107,972	101,276,438	4,553,476	151,709,082	10,570,730	323,350,951	81.40	73,890,987	[illegible]	[illegible]	20,113,834
Balti., Ches. & Atlantic	Aug.	87	110,181	80,275	197,848	18,499	27,048	2,599	96,271	3,990	148,397	75.00	49,451	33,815	[illegible]	[illegible]
	8 mos.	87	714,729	315,682	1,072,616	110,701	287,093	15,874	604,803	29,721	1,048,197	97.70	24,419	—13,758	—13,594	46,744
Cumberland Valley & Mart.	Aug.	33	73,425	6,340	83,053	11,554	11,513	545	37,023	1,678	62,313	75.00	[illegible]	14,468	11,169	15,564
	8 mos.	33	515,662	46,956	589,680	77,758	132,359	7,164	250,394	20,351	488,026	82.80	101,654	67,255	31,773	[illegible]
Cin., Lebanon & Northern	Aug.	76	79,288	9,828	97,728	27,010	22,172	2,266	62,789	2,076	116,313	119.00	—18,585	[illegible]	[illegible]	350
	8 mos.	76	573,287	67,502	707,715	143,170	135,204	14,601	451,775	18,019	762,769	107.80	—55,054	—111,925	—100,776	—199,265
Grand Rapids & Ind.	Aug.	Included in Pennsylvania														
	8 mos.															
Long Island	Aug.	398	703,608	2,287,539	3,277,691	265,794	446,023	17,014	1,265,483	56,245	2,080,485	63.50	1,197,206	917,291	845,146	1,016,491
	8 mos.	398	5,654,223	13,134,557	20,607,463	2,127,520	3,242,025	139,078	8,811,100	455,365	14,938,925	72.50	5,668,538	4,491,856	3,959,547	1,980,803

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues			Operating expenses					Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
			Freight.	Passenger.	Total (inc. misc.)	Maintenance of—Way and structures.	Maintenance of—Equipment.	Traffic.	Transportation.	General.	Total.				
[illegible] & Va.	Aug.	82	$66,485	$76,066	$146,465	$12,835	$12,882	$6,429	$79,611	$2,720	$114,477	78.20	$31,988	$23,602	$29,056
	8 mos.	82	449,744	243,538	769,207	77,488	207,379	15,883	500,870	19,586	821,206	106.80	—51,999	—70,408	—46,349
New York, Phila. & Norfolk	Aug.	122	645,769	106,365	818,575	58,623	208,218	7,894	352,996	18,697	656,071	80.10	162,504	140,739	99,781
	8 mos.	122	4,112,515	616,798	5,166,843	458,303	1,322,387	60,820	2,483,818	115,404	4,511,231	87.30	655,612	510,079	318,692
Pitts., Cin., Chic. & St. Louis	Aug.	Included in Pennsylvania													—691,782
West Jersey & Seashore	Aug.	359	498,207	1,277,243	1,894,763	185,547	250,173	23,136	720,320	35,612	1,231,415	65.00	663,348	383,978	354,075	414,038
	8 mos.	359	3,179,555	5,418,266	9,316,179	1,294,433	1,655,876	129,541	4,136,911	219,399	7,534,548	80.90	1,781,631	1,102,567	941,216	453,241
Perkiomen & Pekin Union	Aug.	19	15,325	4,597	133,544	18,786	8,036	321	64,380	8,606	100,129	75.00	33,415	18,415	50,908	49,456
	8 mos.	19	99,539	30,688	1,151,174	198,815	116,517	1,819	495,953	72,004	885,108	76.90	266,066	149,566	346,824	110,085
Pere Marquette	Aug.	2,212	2,542,836	515,490	3,386,042	485,493	638,650	51,169	1,177,628	106,129	2,465,820	72.80	920,222	776,208	666,921	1,097,489
	8 mos.	2,218	18,951,555	3,391,932	24,614,000	2,951,904	5,019,765	418,439	9,379,959	836,936	18,664,512	75.80	5,949,488	4,779,357	3,821,168	3,507,166
Philadelphia & Reading	Aug.	1,127	4,298,246	849,805	5,490,608	746,787	1,790,567	63,478	2,360,494	131,482	5,093,540	92.80	397,068	221,009	7,059	1,150,989
	8 mos.	1,127	39,609,436	6,443,849	48,909,096	5,972,333	13,786,013	495,709	18,571,513	1,170,073	40,028,451	81.80	8,880,555	7,265,582	5,397,335	5,052,326
Atlantic City	Aug.	176	133,976	583,163	737,050	51,273	72,206	6,522	344,791	3,994	478,683	64.90	258,367	239,116	170,401	266,516
	8 mos.	176	984,085	2,246,620	3,315,484	469,621	296,448	53,751	1,789,521	38,189	2,646,136	79.80	669,348	509,269	204,400	209,563
Perkiomen	Aug.	41	105,112	10,931	119,515	7,327	3,919	106	43,597	830	55,819	46.70	63,696	58,757	52,791	4,250
	8 mos.	41	742,295	67,114	837,466	58,319	33,711	861	355,365	7,439	455,991	54.40	381,475	339,285	290,505	324,174
Port Reading	Aug.	21	53,423	.....	66,789	17,892	3,527	229	45,478	1,223	68,349	102.30	—1,560	—16,270	—44,361	—7,349
	8 mos.	21	792,905	.....	1,143,678	156,969	103,852	1,832	416,485	14,657	693,793	60.70	449,885	331,122	—52,130	87,462
Pittsburg & Shawmut	Aug.	102	109,064	3,669	117,491	22,717	27,003	1,404	32,975	6,175	90,274	76.80	27,217	27,062	45,956	11,235
	8 mos.	102	621,531	40,681	676,881	206,245	275,681	12,852	226,382	54,775	775,936	114.60	—99,055	—107,730	—12,437	76,407
Pittsburg & West Virginia	Aug.	85	155,370	8,507	191,994	42,418	45,610	3,456	60,816	11,401	175,485	91.40	16,509	—9,073	41,989	—43,972
	8 mos.	85	1,385,622	70,078	1,795,927	251,027	480,431	28,603	442,529	122,231	1,397,389	77.80	398,538	189,476	471,908	—176,994
Pittsburg, Shawmut & Northern	Aug.	210	78,746	6,371	92,088	26,575	29,937	1,646	42,335	5,337	105,834	114.90	—13,746	—17,113	—19,461	—2,089
	8 mos.	210	595,897	52,059	677,118	160,767	351,937	12,945	307,562	52,998	886,249	130.90	—209,131	—228,042	—236,688	—147,395
Quincy, Omaha & Kans. City	Aug.	252	59,477	23,619	93,371	30,516	8,288	756	50,190	1,930	91,344	97.80	2,027	—1,898	—8,501	—56,239
	8 mos.	252	433,362	188,774	693,526	238,252	114,586	6,361	341,077	18,389	716,863	103.40	—23,337	—54,792	—94,683	—191,386
Richmond, Fred. & Potomac	Aug.	117	479,499	274,499	895,213	144,195	131,572	7,727	294,491	29,232	620,898	69.40	274,315	221,936	194,920	99,147
	8 mos.	117	3,660,563	2,328,519	7,138,111	852,383	951,806	64,618	2,469,539	215,274	4,708,646	65.90	2,429,564	2,029,217	1,657,970	758,900
Rutland	Aug.	415	245,654	166,582	519,718	100,369	83,583	8,383	233,758	15,418	443,352	85.30	76,366	55,347	61,089	125,859
	8 mos.	415	1,996,708	979,907	3,742,771	733,373	702,510	65,931	1,716,503	106,560	3,336,994	89.20	405,777	237,635	270,458	169,494
St. Louis-San Francisco	Aug.	4,766	4,276,454	1,553,808	6,309,073	967,040	1,070,516	77,864	2,638,237	173,270	4,895,148	77.60	1,413,925	1,086,434	874,824	2,183,261
	8 mos.	4,760	36,646,426	12,036,464	52,476,719	7,702,185	9,917,740	672,146	19,169,128	1,508,310	38,772,281	73.90	13,704,438	11,022,920	10,700,898	11,595,567
Ft. Worth & Rio Grande	Aug.	235	82,972	30,225	122,836	31,407	25,869	2,460	50,522	5,335	115,577	94.10	7,259	3,751	—7,121	16,699
	8 mos.	235	517,361	230,173	828,221	339,467	175,508	21,646	396,988	45,632	977,008	118.00	—148,787	—178,836	—227,961	—203,651
St. Louis, San Francisco & Tex.	Aug.	134	144,730	14,759	164,256	28,353	19,435	3,601	54,564	6,859	112,790	68.70	51,466	49,504	23,842	8,413
	8 mos.	134	934,803	120,009	1,103,760	245,142	185,731	29,614	459,651	54,981	974,262	88.30	129,498	113,690	—59,976	—324,682
St. Louis Southwestern	Aug.	968	1,322,020	122,678	1,503,532	193,920	128,755	37,483	454,909	49,733	870,858	57.90	632,674	543,119	498,963	431,182
	8 mos.	968	9,683,210	1,027,884	11,181,430	1,556,046	1,577,407	338,908	3,069,859	426,375	7,012,177	62.70	4,169,253	3,625,251	3,367,590	3,025,944
St. Louis Southwestern of Tex.	Aug.	807	489,731	86,039	607,934	135,060	89,634	10,570	358,945	30,088	631,920	103.90	—23,986	—48,100	—44,232	—61,634
	8 mos.	807	3,650,001	694,978	4,647,811	1,417,547	1,164,525	158,850	2,468,024	247,247	5,447,447	117.20	—799,636	—992,555	—930,838	—884,129
San Antonio & Aransas Pass	Aug.	739	430,014	80,126	551,160	87,511	98,292	8,940	197,504	25,651	417,115	75.70	134,045	120,336	111,809	165,175
	8 mos.	739	2,682,547	550,626	3,465,540	730,424	844,101	75,175	1,586,472	211,257	3,442,580	99.30	22,960	—89,615	—180,284	—114,851
San Antonio, Uvalde & Gulf	Aug.	317	76,583	19,680	102,523	18,617	6,116	2,924	33,292	7,104	69,020	67.30	33,503	30,514	17,174	31,707
	8 mos.	317	503,735	138,160	714,028	118,329	87,368	22,680	272,642	52,584	552,331	77.40	161,697	137,799	46,503	92,166
Seaboard Air Line	Aug.	3,563	2,367,958	647,448	3,397,813	414,630	723,031	116,393	1,477,132	166,521	2,990,772	86.00	477,041	301,381	46,687	—166,175
	8 mos.	3,563	20,701,376	5,836,603	29,034,516	3,280,489	4,930,236	982,421	12,443,305	1,251,916	23,136,735	79.70	5,897,791	4,513,619	2,403,682	481,489
Southern	Aug.	6,971	5,937,740	2,712,097	9,482,594	1,397,776	1,206,286	196,887	4,174,320	300,366	7,356,403	77.60	2,126,101	1,630,742	1,154,253	1,682,276
	8 mos.	6,971	55,635,053	19,543,803	81,398,509	11,631,659	14,357,697	1,667,954	32,689,910	2,543,593	63,520,840	78.00	17,877,669	14,081,651	11,232,869	4,989,232
Alabama Grt. Southern	Aug.	318	172,843	157,910	374,446	90,476	142,443	17,604	218,572	24,483	499,907	133.50	—125,461	—167,025	—182,666	63,640
	8 mos.	318	4,074,395	1,192,025	5,570,833	694,611	1,213,277	145,657	2,215,005	197,533	4,500,799	80.80	1,070,034	723,277	701,376	413,626
Cin., N. O. & Tex. Pacific	Aug.	338	228,002	263,606	560,488	173,127	268,427	28,944	416,951	40,982	936,252	167.10	—395,764	—444,805	—569,587	180,968
	8 mos.	338	8,081,339	2,134,422	10,737,258	1,304,404	2,901,647	227,466	3,978,150	336,613	8,822,219	82.20	1,915,039	1,336,573	965,550	1,205,154
Georgia, Southern & Fla.	Aug.	402	196,782	90,940	315,620	60,877	47,059	8,359	151,517	11,076	281,168	89.10	34,452	15,723	15,402	—42,723
	8 mos.	402	2,038,880	787,664	3,041,911	496,522	518,559	70,660	1,335,724	96,342	2,540,543	83.50	501,368	359,455	214,241	—599,738
New Orleans & Northwestern	Aug.	207	69,593	71,531	183,115	59,547	92,313	10,181	157,736	16,533	350,260	191.30	—167,145	—203,951	—221,423	—63,375
	8 mos.	207	2,571,518	616,181	3,575,047	548,620	824,867	85,438	1,682,876	137,648	3,307,773	92.50	267,274	—39,309	—110,130	—240,375
Northern Alabama	Aug.	110	83,224	12,993	99,141	20,005	5,981	1,101	47,093	2,696	76,876	77.50	22,265	18,266	—8,234	306
	8 mos.	110	750,712	90,821	861,742	143,229	44,403	10,372	338,779	23,836	560,614	65.10	301,128	268,773	176,249	—67,378
Southern Pacific	Aug.	7,119	11,085,658	4,138,980	16,717,507	2,040,528	2,750,772	234,212	5,599,650	441,720	11,352,888	67.90	5,364,619	4,031,153	3,782,153	4,405,607
	8 mos.	7,118	75,256,317	29,536,107	115,875,721	15,637,135	20,039,640	1,875,117	40,055,969	3,440,430	83,236,873	71.80	32,638,848	21,842,402	20,973,103	21,088,790

REVENUES AND EXPENSES OF RAILWAYS

Month of August and Eight Months of Calendar Year 1922—Continued

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Operating revenues: Passenger.	Operating revenues: Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Operating expenses: Maintenance of Equipment.	Operating expenses: Traffic.	Operating expenses: Transportation.	Operating expenses: General.	Operating expenses: Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Arizona Eastern	Aug.	382	$230,351	$25,820	$267,448	$41,658	$37,488	$3,316	$79,412	$17,138	$180,010	67.31	$87,438	$63,115	$48,008	—$[illegible],436
	8 mos.	382	1,759,958	225,130	2,061,969	262,797	234,248	25,663	596,558	148,743	1,273,499	61.76	783,470	597,[illegible]46	48[illegible],[illegible]25	—11,653
Atlantic S. S. Lines	Aug.	....	865,746	57,223	977,142	14,556	251,001	18,664	559,486	28,679	882,386	90.30	94,656	8[illegible],445	83,015	115,0[illegible]3
	8 mos.	....	6,704,967	409,705	7,496,861	99,112	1,435,013	152,642	4,330,6[illegible]9	214,897	6,232,273	83.10	1,264,5[illegible]8	1,164,852	1,168,127	133,948
Galv., Harris. & San Ant.	Aug.	1,379	1,397,819	386,218	1,872,596	329,524	323,939	37,266	707,727	69,783	1,43[illegible],073	79.10	390,523	3[illegible]9,985	33[illegible],862	4[illegible]3,995
	8 mos.	1,379	10,[illegible]06,688	2,988,[illegible]27	13,983,419	2,635,221	2,724,853	295,904	5,564,676	576,567	11,873,145	84.90	2,11[illegible],[illegible]74	1,698,053	1,3[illegible]6,507	1,2[illegible]5,0[illegible]7
Houston & Tex. Central	Aug.	9[illegible]3	870,9[illegible]	297,[illegible]29	1,236,624	[illegible]1,613	232,858	24,0[illegible]5	4[illegible]8,671	43,310	930,950	75.30	305,074	259,621	[illegible]7,[illegible]05	142,[illegible]
	8 mos.	923	6,312,125	2,306,863	9,213,478	1,713,122	1,824,590	189,732	3,341,892	336,641	7,3[illegible]0,437	80.[illegible]0	1,8[illegible]3,041	1,468,719	1,[illegible]8,950	243,756
Houston, East & West Tex.	Aug.	191	249,083	47,123	308,215	56,832	55,650	3,981	111,415	7,948	[illegible]34,733	76.[illegible]0	73,432	66,650	4[illegible],556	61,8[illegible]4
	8 mos.	191	1,581,5[illegible]0	329,592	2,003,695	409,227	407,083	27,636	803,613	64,934	1,703,857	85.00	299,838	249,[illegible]98	1[illegible],4[illegible]3	109,117
Louisiana Western	Aug.	207	213,293	88,157	322,948	65,085	58,989	8,540	98,883	16,930	252,977	78.10	70,871	3[illegible],036	43,199	15[illegible],[illegible]6
	8 mos.	207	1,[illegible]8,66[illegible]	693,701	2,709,674	523,703	515,737	70,875	813,525	141,402	2,0[illegible]7,038	77.40	612,636	413,7[illegible]4	42[illegible],7[illegible]1	436,[illegible]54
Morgan's La. & Tex. R.R. & S.S.	Aug.	400	416,069	159,135	620,501	1[illegible]3,760	141,992	14,974	248,930	32,271	556,451	91.30	54,050	[illegible]	—5[illegible]1[illegible]7	3,1[illegible]1
	8 mos.	400	3,397,631	1,209,364	5,013,[illegible]6	1,101,746	1,168,473	1[illegible]8,870	2,085,452	266,158	4,78[illegible],409	95.50	224,817	—14[illegible]5[illegible]4	—[illegible]61,[illegible]5	—544,[illegible]
Texas & New Orleans	Aug.	5[illegible]7	490,3[illegible]0	149,582	680,327	131,389	203,405	10,679	2[illegible]7,467	[illegible]4,215	6[illegible]3	[illegible]	4[illegible],114	[illegible]	[illegible]	[illegible]
	8 mos.	507	5,088,177	1,[illegible]4,153	5,652,009	1,128,072	1,504,707	85,877	2,2[illegible]3,471	204,701	5,188,125	[illegible]	461,[illegible]4	[illegible]	[illegible]	[illegible]4,[illegible]4
Spokane International	Aug.	165	82,873	17,859	107,943	17,225	10,351	3,0[illegible]7	33,896	5,568	70,[illegible]5	65.10	37,6[illegible]1	3[illegible]4	25,467	[illegible]
	8 mos.	165	604,616	98,906	741,449	116,392	65,725	23,061	273,201	47,432	531,5[illegible]9	71.[illegible]	[illegible]	[illegible]	111,[illegible]	[illegible]
Spokane, Portland & Seattle	Aug.	551	393,498	172,044	638,336	65,087	92,810	10,172	212,719	20,628	411,733	64.[illegible]	[illegible]	14[illegible],400	1[illegible],014	147,342
	8 mos.	551	3,095,400	1,140,274	4,663,836	439,301	683,982	82,622	1,59[illegible],075	160,[illegible]96	3,014,[illegible]49	64.60	1,649,5[illegible]7	975,[illegible]01	879,178	[illegible]6,953
Tennessee Central	Aug.	292	13[illegible],471	40,714	185,373	36,408	26,066	5,816	99,150	10,165	177,604	95.[illegible]	[illegible]7,[illegible]7	[illegible]672	[illegible]	[illegible]
	8 mos.	292	990,499	283,487	1,359,242	218,540	190,583	39,396	588,225	56,639	1,093,345	80.4[illegible]	[illegible]65,[illegible]7	[illegible]35,771	[illegible]9,5[illegible]9	[illegible]
Term. R.R. Assn. of St. Louis	Aug.	37	......	......	340,558	88,466	37,281	947	116,034	3,558	249,669	73.30	90,[illegible]9	30,879	156,403	1[illegible],422
	8 mos.	37	......	......	2,978,966	626,085	293,958	8,573	971,615	47,996	1,975,928	66.[illegible]0	1,003,0[illegible]8	560,547	1,[illegible]2,[illegible]7	1,19[illegible],1[illegible]6
East St. L. Connecting	Aug.	1	......	......	180,024	13,794	7,840	269	55,901	2,329	80,133	44.[illegible]0	99,891	91,805	[illegible],954	33,152
	8 mos.	1	......	......	1,351,742	105,758	59,151	2,488	453,346	21,155	641,898	47.50	709,844	6[illegible]1,[illegible]34	551,649	1[illegible]243
St. L. Mchts. Bridge Term.	Aug.	9	......	......	3[illegible]3,655	43,241	31,841	835	132,887	3,659	212,463	65.60	111,192	93,493	110,4[illegible]0	[illegible]3,[illegible]46
	8 mos.	9	......	......	2,366,411	326,630	218,161	7,619	1,116,759	35,882	1,705,051	72.10	661,560	51[illegible],[illegible]3	661,327	361,[illegible]
St. Louis Transfer	Aug.	6	....	....	60,972	10,954	4,954	154	33,188	1,531	50,781	83.30	10,191	9,[illegible]93	419	4[illegible]1
	8 mos.	6	....	....	488,806	81,216	35,647	1,438	264,052	13,288	395,641	80.90	93,165	88,819	[illegible]3,657	2[illegible]5,452
Texas & Pacific	Aug.	1,952	1,838,247	601,477	2,617,790	382,050	512,742	47,935	948,776	79,963	1,997,209	76.30	620,581	5[illegible]0,[illegible]90	471,163	754,497
	8 mos.	1,952	13,167,684	4,659,093	19,302,585	3,476,479	3,730,461	383,622	7,377,550	742,898	15,858,667	82.20	3,443,918	2,566,[illegible]46	2,039,480	2,1[illegible],3[illegible]5
Toledo, Peoria & Western	Aug.	247	95,418	35,047	147,012	34,098	18,683	2,324	78,377	7,407	140,872	95.80	6,140	—4,861	—11,816	—22,416
	8 mos.	247	630,1[illegible]1	348,332	1,069,435	196,585	257,167	22,710	558,898	62,194	1,097,466	102.60	—28,031	—116,488	—144,378	—345,2[illegible]9
Toledo, St. Louis & Western	Aug.	454	940,709	42,605	1,025,764	133,490	132,917	20,497	307,329	18,204	612,363	59.70	413,401	365,401	331,827	[illegible]25,595
	8 mos.	454	6,299,341	236,862	6,839,989	858,755	1,084,193	171,210	2,170,017	193,852	4,477,933	65.50	2,362,056	1,982,985	1,755,5[illegible]8	717,583
Trinity & Brazos Valley	Aug.	368	123,222	21,519	152,422	35,784	19,249	3,314	56,321	19,116	133,675	87.70	18,747	11,743	—8,986	65,564
	8 mos.	368	1,651,968	165,903	1,890,578	463,729	379,497	25,874	692,447	104,687	1,662,1[illegible]5	87.90	228,463	172,315	—157,563	4,322
Ulster & Delaware	Aug.	128	55,928	111,645	[illegible]05,751	33,875	22,249	6,899	97,704	7,746	168,519	81.90	37,232	31,729	26,14[illegible]	79,[illegible]55
	8 mos.	128	470,756	386,557	1,132,284	173,139	364,338	27,580	562,392	64,518	995,883	87.95	136,401	88,347	56,241	55,701
Union	Aug.	45	....	....	1,064,255	82,345	167,991	235	463,437	6,677	720,685	67.70	343,570	3[illegible]6,400	403,513	352,583
	8 mos.	45	....	....	7,304,420	586,027	1,433,808	1,899	2,969,463	56,484	5,047,681	69.10	2,256,739	[illegible],143,994	2,628,025	1,383,367
Union Pacific	Aug.	3,707	7,686,162	1,681,989	10,233,061	1,511,279	1,818,089	127,184	2,930,878	319,278	6,920,473	67.60	3,312,588	2,718,482	2,662,815	3,791,930
	8 mos.	3,686	46,264,042	11,448,[illegible]73	63,731,340	7,760,594	13,203,679	1,116,582	18,793,601	2,473,121	44,698,515	70.10	19,032,8[illegible]5	14,412,807	14,194,894	16,094,010
Oregon Short Line	Aug.	2,359	2,284,458	577,298	3,103,085	574,960	515,809	42,394	1,097,609	113,617	2,411,849	77.70	691,236	412,166	384,467	697,673
	8 mos.	2,359	16,703,842	3,683,727	22,076,635	3,621,566	4,262,387	362,675	7,215,159	928,974	16,871,254	76.40	5,205,381	2,992,379	2,834,898	1,781,[illegible]43
Oregon, Wash. R. R. & Nav.	Aug.	2,237	1,972,102	564,788	2,758,855	623,085	479,764	60,490	1,164,063	128,781	2,491,248	90.30	267,607	86,566	—8,231	1[illegible]7,498
	8 mos.	2,228	12,355,007	3,758,483	17,732,338	3,935,576	3,355,397	484,510	7,912,355	230,375	16,9[illegible]2,667	95.40	809,671	—639,969	—1,267,925	—763,815
St. Joseph & Grand Island	Aug.	258	228,238	25,553	275,271	55,900	43,135	2,575	126,922	12,983	241,515	87.70	33,756	17,565	10,777	24,490
	8 mos.	258	1,679,892	203,003	2,014,567	377,900	367,268	20,497	899,683	96,827	1,762,175	87.50	252,392	111,567	41,313	—68,238
Utah	Aug.	102	194,629	704	196,019	36,145	52,225	494	55,075	5,159	148,941	76.00	47,078	40,934	35,079	2,812
	8 mos.	102	1,099,671	5,855	1,116,999	176,176	297,119	2,976	262,523	38,587	777,079	69.60	339,920	288,778	197,032	—63,038
Virginian	Aug.	526	1,186,395	76,748	1,345,294	185,632	286,600	10,487	414,459	30,111	923,402	58.60	421,892	271,930	294,718	367,629
	8 mos.	526	11,864,716	529,734	13,245,606	1,464,604	3,051,671	91,795	3,024,674	249,899	7,876,373	59.50	5,369,233	4,436,832	4,53[illegible],159	3,769,151
Wabash	Aug.	2,472	3,447,021	812,776	4,703,310	826,654	999,526	107,257	2,087,266	142,221	4,171,773	88.70	531,537	341,646	61,671	708,893
	8 mos.	2,472	29,092,185	6,054,362	37,977,110	5,535,291	7,318,306	918,015	16,150,855	1,204,322	31,302,080	82.40	6,675,030	5,149,656	3,024,979	1,837,068
Western Maryland	Aug.	804	1,434,222	112,032	1,650,378	266,964	372,772	37,342	604,886	45,203	1,355,037	82.10	295,341	[illegible]35,341	256,948	[illegible]57,518
	8 mos.	804	9,630,220	650,424	11,088,245	1,473,660	2,299,980	276,273	3,955,356	368,263	8,549,835	77.10	2,538,410	2,168,410	2,005,475	1,958,634
Western Pacific	Aug.	1,045	816,295	232,160	1,124,213	209,677	224,376	34,655	401,771	35,615	929,467	82.30	194,746	118,498	111,696	[illegible]72,335
	8 mos.	1,043	5,262,211	1,532,903	7,317,204	1,298,655	1,371,872	261,458	2,841,685	301,406	6,238,194	85.[illegible]0	1,079,100	407,876	568,734	699,196
Wheeling & Lake Erie	Aug.	511	811,080	70,16[illegible]	990,118	256,746	317,197	14,446	467,261	36,509	1,095,668	110.70	—105,550	—193,692	—251,507	3[illegible]8,116
	8 mos.	511	7,729,463	568,044	8,995,182	1,455,069	1,923,100	143,431	3,279,237	273,887	7,103,198	79.00	1,891,984	1,008,180	802,616	1,097,246

Shop Strike Leaders Ask for Jury Trial in Injunction Case

Leaders of the recent strike of railroad shopmen, named in the temporary injunction obtained by Attorney General H. M. Daugherty, will seek a trial by jury in an effort to balk the government's move for a permanent restraining order. This announcement, which was hinted at in recent Federal Court proceedings at Chicago, was definitely made on October 13 by Donald R. Richberg, attorney for B. M. Jewell and the other strike leaders. Mr. Richberg formally presented his motion for this procedure to the court on October 16.

At the same time it became known that a motion by Blackburn Esterline, assistant solicitor general, that hearings on the government's request for a permanent injunction be referred to a master in chancery, was granted by Judge James H. Wilkerson.

J. M. Dickinson, secretary of war under President Taft and formerly counsel for the Illinois Central, has been appointed special assistant to Attorney General Daugherty and placed in charge of the government's case against the strike leaders. The appointment of Mr. Dickinson is part of the announced plan to prosecute vigorously the injunction suit now pending before Judge Wilkerson.

Sixteen Roads Sign Agreements With New Shop Organizations

Railroads representing a total mileage of approximately 55,910 miles have signed agreements with "company unions," according to information recently given out by the Railroad Labor Board. This mileage does not include the Pennsylvania System, which was conducting negotiations with its employees through "company unions" before the shop crafts strike began. The new agreements provide, in effect, that the men waive their right to strike and the companies pledge themselves not to carry their controversies into the court, both parties agreeing to abide by the decisions of the Labor Board.

The 16 roads which have signed agreements with new organizations of their employees and which are included in the Labor Board's announcement are: The Southern Pacific (Pacific System); the Missouri, Kansas & Texas; the Southern Pacific, Texas and Louisiana Lines; the Nashville, Chattanooga & St. Louis; the Central of Georgia; the New York, New Haven & Hartford; the Chicago, Burlington & Quincy; the Colorado & Southern; the Great Northern; the Lehigh Valley; the International Great Northern; the Union Pacific; the Illinois Central; the Florida East Coast; the Trinity & Brazos Valley, and the San Antonio, Uvalde & Gulf.

Consolidation Hearings to be Resumed

The Interstate Commerce Commission has announced that hearings on its tentative consolidation plan will be resumed before Commissioner Hall and Examiner Healy at Washington, November 17. Evidence will be received with respect to carriers which, under the tentative plan, should be considered in connection with the following proposed systems as there outlined, or in connection with such alternative systems as may be proposed:

System No. 14—Burlington—Northern Pacific.
Chicago, Burlington & Quincy—Northern Pacific.
Chicago Great Western—Minneapolis & St. Louis.
*Spokane, Portland & Seattle.

System No. 15—Milwaukee—Great Northern.
Chicago, Milwaukee & St. Paul—Great Northern.
Chicago, Terre Haute & Southeastern—*Duluth & Iron Range.
*Duluth, Missabe & Northern—*Green Bay & Western.
*Spokane, Portland & Seattle—*Butte, Anaconda & Pacific.

It is expected that the main affirmative case in respect of each carrier, particularly the documentary evidence, will be presented at the hearing in Washington. In proper case opportunity will be afforded at the western hearings for completing the record as to such carrier. *Carriers starred in the above list, and other carriers not listed, may introduce all their evidence at the western hearings if that course proves more convenient and the commission is so advised in advance. The western hearings will be held primarily to afford state commissions, communities and the public an opportunity to present such evidence as they may desire, and, also, to cross-examine witnesses heard at the Washington hearing, provided the commission is so advised in season to enable it to arrange in proper case for the recall of witnesses for such subsequent cross-examination. The dates and places of the western hearings will be announced before the close of the Washington hearing.

War Finance Corporation Loans to Railroads Repaid, All but Five Per Cent

The War Finance Corporation announced on October 10 that it had received from the Chicago, Rock Island & Pacific $2,930,000, which represents repayment in full of the loans, aggregating $10,430,000, made by the corporation to the railroad in December, 1918, and January, 1919, and reduced to the above amount by several partial payments. Under its war powers, the corporation advanced to steam railroads, either direct or through the director general of railroads, $204,794,520. The repayments to date total $194,794,520 and represent 95 per cent of the amount originally advanced. The $10,000,000 still outstanding represents the extension of a portion of an advance of $12,497,940 made to the Erie on April 1, 1919, and is covered by a note, payable upon demand on or after April 1, 1923, bearing interest at 6 per cent and secured by collateral having a market value of approximately $15,000,000. The agreement with the Erie contains provisions under which the company may be required to substitute for the present note collateral trust notes in marketable form which the corporation may then sell at its option. The new notes would be secured by the same collateral listed above and would mature in not less than three years nor more than ten years from their date, as the War Finance Corporation may determine. They would be secured also by suitable provisions for redemption and would bear interest at not to exceed 7 per cent.

P. R. R. Women's Dance

The Women's Aid of the Pennsylvania Railroad held its grand ball at the Seventy-first Regiment Armory, Thirty-fourth street, New York City, on October 12, in accordance with announcement made some weeks ago, and the affair is pronounced a great success. About 17,000 tickets had been sold—far more than the number of persons who could get into the hall—and a good sum is realized for the uses of the "Aid." The gathering was said to be one of the largest of Pennsylvania Railroad officers, employees and members of their families that was ever assembled at a similar social gathering in the history of the Pennsylvania Railroad. Special trains brought large delegations from Atlantic City, Camden, Philadelphia, Trenton and other points on the New Jersey Division. In the entertainment there were many professional artists as well as talented employees of the road. The Car Service Department Glee Club from Philadelphia, numbering about 50 men, rendered many delightful vocal selections. At the conclusion of the entertainment a 1922 Sport Model automobile, given by the Haynes Motor Car Company of New York, was given to the person holding the admission ticket containing a certain lucky number, J. Weinberger, of New York City. The Women's Aid now has a membership of about 75,000. Among the officers of the railroad who came to New York from Philadelphia to attend the function, accompanied by their wives, were: General W. W. Atterbury, Elisha Lee, C. S. Krick and R. V. Massey. R. J. Sauer, secretary to General Superintendent C. I. Leiper, was chairman of the Committee of Arrangements.

I. C. C. Denies Permission to Inspect Valuation Records and Data

The Interstate Commerce Commission has denied the request of certain carriers to be permitted to examine and make copies, written and photographic, of the original field notes, cost data, copies of contracts, records of construction costs, opinions, sales, assessments and other data reports, records and compilations of the land, accounting and engineering sections of the bureau of valuation. After having considered fully the representations of the carriers and a brief submitted, the commission issued an order saying:

"That the opening of certain records and data of the bureau of valuation to inspection and examination by other than employees of the commission unless and until they shall have been offered in evidence in hearings before the commission upon pro-

tests against the tentative valuations of carriers' properties, or before a court of competent jurisdiction, would be detrimental to the public interest; would make it impossible for the commission to secure as reliable and uninfluenced opinions as to land values and price and cost information as it can otherwise secure; would unnecessarily prolong the work, and greatly increase the expense thereof; and would seriously interfere with due performance of the regular duties of the commission's employees."

It was ordered, "That, until the further order of the commission, office or field notations and memoranda in the bureau of valuation, and opinions or correspondence from or to any branch or employee thereof; land field notes, land computation sheets; cost information secured from manufacturers, dealers, contractors, private parties or carriers other than the carrier making the application for permission to inspect, cost studies and cost analyses prepared by the employees of the bureau of valuation, shall not be open for inspection by other than employees of the commission unless and until offered in evidence either in a valuation hearing under the provisions of section 19a of the interstate commerce act or in a court of competent jurisdiction."

Portable Receiving Set with Loop Antenna Used Inside Steel Coach

Wireless radio messages were received successfully inside a moving steel coach without the aid of an outside aerial on the Pennsylvania train No. 29, the Broadway Limited leaving New York on the run to Chicago, on October 13. On leaving the tubes under the Hudson river, the afternoon program of the W.O.R. broadcasting station at Newark, N. J., was picked up and the remainder of the concert received satisfactorily during the run towards Philadelphia. It is significant that while passing over the electrified section of the road from North Philadelphia

Photo by International

Receiving with a Loop Antenna Within a Steel Car

to Paoli the concerts and organ solo from a broadcasting station in Philadelphia were received without any interference or crackling due to the propulsion circuits. After passing Pittsburgh about midnight when all broadcasting was shut down, code messages from boats on Lake Superior and from the Great Lakes Naval Station were received.

The receiving equipment consists of a tuned 18 in. loop antenna, three steps of amplification, audion detector and two steps of audio frequency amplification. No connections or alterations were made to the steel car, the set being entirely self-contained and compact enough to be packed in a small trunk. The apparatus was furnished by the E-D Manufacturing Company of Philadelphia, Pa., and was set up and operated by Arno Zillger, chief engineer of the company; J. D. Jones, superintendent of telegraph and signals on the Eastern region of the Pennsylvania being the official observer representing the railroad. The E-D Manufacturing Company is now developing a transmitting and receiving set for duplex conversation on long freight trains between the engineman in the cab and the conductor in the caboose. It is claimed that a special equipment has been invented by which the conductor can call and automatically put in operation the receiving apparatus on the locomotive.

Valuation Hearings

The following valuation cases are set for oral argument before the Interstate Commission on November 1:

Valuation Docket No.	Carrier.
2	Texas Midland Railroad Company.
5	Winston-Salem Southbound Railway Company.
6	Elgin, Joliet & Eastern Railroad Company.
15	Tonopah & Tidewater Railroad Company.
21	Carolina Railroad Company.
31	Norfolk Southern Railroad Company.
37	Kinston-Carolina Railroad Company.
60	Central of Georgia Railway Company.
102	Riverside, Rialto & Pacific Railroad Company.
127	Ann Arbor Railroad Company.
159	New York, Philadelphia & Norfolk Railroad Company.

The following valuation cases have been set for hearing at Washington, upon protests to tentative valuations, before the examiners and on the dates named:

Valuation Docket No.	Carrier.	Examiner.	Date.
149	Mobile & Ohio Railroad Co.	Marchand	Oct. 20, 1922
150	Bangor & Aroostook R. R. Co.	Sweet	Oct. 20, 1922
192	New York, Ontario & West'n R. R. Co.	Sweet	Oct. 23, 1922
22	Hampton & Branchville R. R. Co.	Kelley	Oct. 25, 1922
24	New Mexico Midland Ry. Co.	Kelley	Oct. 26, 1922
49	Savannah & Northwestern Ry.	Kelley	Oct. 27, 1922
18	Georgia Northern R. R. Co.	Marchand	Nov. 6, 1922
36	Flint River & Northwestern Ry.	Marchand	Nov. 6, 1922
94	Broxae Tunnel & Wilmington Ry.	Kelley	Nov. 6, 1922
77	Woodriver Branch R. R. Co.	Kelley	Nov. 6, 1922
111	Crafton & Upton R. R. Co.	Kelley	Nov. 6, 1922
64	Goldsboro Union Station Co.	Sweet	Nov. 6, 1922
100	Pacific & Idaho Northern Ry.	Marchand	Nov. 8, 1922
66	Hardwick & Woodbury R. R. Co.	Sweet	Nov. 8, 1922
114	Manistique & Lake Superior R. R. Co.	Kelley	Nov. 8, 1922
88	Gulf, Texas & Western Ry. Co.	Sweet	Nov. 13, 1922
35	Carolina & Yadkin River R. R.	Marchand	Nov. 13, 1922
82	Montana Western Ry. Co.	Marchand	Nov. 15, 1922
93	Gulf Terminal Company	Marchand	Nov. 16, 1922
143	Kankakee & Seneca R. R. Co.	Marchand	Nov. 17, 1922
3	New Orleans, Texas & Mexico R. R. Co.	Sweet	Nov. 20, 1922
86	Trinity & Brazos Valley R. R.	Kelley	Nov. 20, 1922
84	Peoria Railway Company	Pattison	Nov. 20, 1922
221	Boston & Maine Railroad Co.	Marchand	Nov. 20, 1922
123	St. Johnsbury & Lake Champlain Railroad Co.	Marchand	Nov. 21, 1922
11	St. John & Ophir Railroad Co.	Sweet	Nov. 22, 1922
116	Montpelier & Wells River Ry.	Pattison	Nov. 22, 1922
138	Monroe Railroad Company	Pattison	Nov. 23, 1922
168	Chicago, Indianapolis & Louisville R. R. Co.	Kelley	Nov. 23, 1922
46	Joplin Union Depot Company	Sweet	Nov. 24, 1922
165	Baltimore & Sparrow's Point R. R. Co.	Pattison	Nov. 24, 1922
52	Farmers Grain & Shipping Co.	Sweet	Nov. 27, 1922
169	Paris & Mt. Pleasant R. R. Co.	Pattison	Nov. 27, 1922
188	Durham & South Carolina R. R.	Pattison	Nov. 28, 1922
124	Sugarland Railroad Company	Marchand	Dec. 1, 1922
193	Artesian Belt Railroad Co.	Pattison	Dec. 1, 1922
137	Sunset Railway Company	Marchand	Dec. 2, 1922
12	Missouri Southern Railroad Co.	Sweet	Dec. 4, 1922
151	Florida East Coast Railroad Co.	Pattison	Dec. 4, 1922
19	Death Valley Railroad Company	Marchand	Dec. 6, 1922
152	Chicago, Rock Island & Pacific Ry. Co.	Kelley	Dec. 7, 1922
195	Central Union Depot Company	Pattison	Dec. 8, 1922
192	Toledo, St. Louis & Western Ry.	Pattison	Dec. 11, 1922
201	Minneapolis Western Railway	Pattison	Dec. 18, 1922

The Bureau of Valuation has filed its brief in support of the supplemental tentative valuation of the properties of the Winston-Salem Southbound Railway Company, Valuation Docket No. 5.

Rate of Return for Two Years 3.47 Per Cent

The Association of Railway Executives has issued a statement calling attention to the fact that during the first two years since the general rate increase became effective on August 26, 1920, the railroads of the United States have failed by a wide margin to earn a return of 6 per cent on their tentative valuation. For the 24 months period ended on August 31, the net operating income of the railroads was only at the annual rate of return of 3.47 per cent.

"The Transportation Act when passed by Congress proposed that rates be so fixed as to yield the carriers a return of 6 per cent on their tentative valuation," says the statement. "This provision was to stand for two years ending on March 1, 1922. After that date the Interstate Commerce Commission was authorized to fix the rate. This the commission did recently, prescribing that the rate be 5¾ per cent, which is now in effect. Since the general rate increase went into effect on August 26,

1920, thousands of reductions have been made both voluntarily by the carriers and also by order of the Interstate Commerce Commission. There was a guarantee provided for in the Transportation Act to cover the first six months after the government relinquished federal control on March 1, 1920, but this terminated automatically on September 1 that year. Under this guarantee the railways were assured of earning the same net income as during the period of federal control. If their earnings proved insufficient to provide the net income so guaranteed, the deficiency was made up by the government out of the public treasury. This six months' guarantee was provided for the purpose of enabling the railroads to get on their feet after 26 months of federal control. Since September 1, 1920, however, there has been no guarantee to the railroads and even though the Transportation Act provides for the fixing of a certain rate level, there is nothing whatever in the act to assure the roads that such a level will enable them to realize any fixed return. If the railways fail to earn the rate of return so fixed, the deficiency is not made up by the government, but is borne by the carriers themselves.

"In computing the rate of return no consideration is given by the commission, whatever, to the capitalization of the roads, but the compilation is based solely on the valuation of the railroads of the country as tentatively fixed by the Interstate Commerce Commission for rate making purposes.

"During the first 12 months which ended on August 31 last year, the railroads had a net operating income of $523,598,172, which was at the annual rate of return of 2.81 per cent on their tentative valuation. During the second year the net operating income amounted to $781,673,377, or at the annual rate of 4.10 per cent. The net operating income for the two years totaled $1,305,271,549.

"The railroads in the Eastern district during the two year period had a net operating income of $590,006,537, which was at the annual rate of return of 3.46 per cent. Those in the Southern district had a net operating income of $135,630,903 or 3.09 per cent. For the railroads in the Western district the rate of return amounted to 3.57 per cent, net operating income having totaled during the 24 months period $579,634,109."

Revenues and Expenses for August

The Interstate Commerce Commission's summary of railway returns for August is as follows:

Item	August		Eight months	
	1922	1921	1922	1921
Average number of miles operated	235,095.59	234,955.69	235,229.32	234,818.00
Revenues:				
Freight	$326,485,814	$353,814,886	$2,491,204,487	$2,539,370,491
Passenger	[1]101,501,635	[2]109,192,034	[3]705,065,952	[4]793,089,978
Mail	7,292,532	7,449,539	54,166,744	63,876,543
Express	12,201,354	14,309,299	81,043,828	60,117,921
All other transportation	14,935,858	14,378,241	113,630,618	105,495,540
Incidental	10,900,732	9,844,240	73,145,610	79,255,919
Joint facility—Cr.	747,119	610,405	6,644,780	5,123,647
Joint facility—Dr.	187,974	133,617	1,399,821	1,092,438
Railway operating revenues	473,877,080	505,732,265	3,558,582,198	3,645,237,601
Expenses:				
Maintenance of way and structures	68,706,324	71,941,028	480,206,020	507,460,950
Maintenance of equipment	104,056,949	105,403,201	773,792,749	842,335,999
Traffic	7,236,029	6,833,954	57,710,675	56,770,158
Transportation	150,861,031	180,858,319	1,163,964,112	1,556,598,510
Miscel operations	4,356,178	4,163,779	31,327,930	33,532,856
General	13,636,746	13,466,110	104,471,306	114,451,672
Transportation for investment—Cr.	692,139	521,490	4,121,123	3,925,284
Railway operating expenses	347,160,178	382,105,901	2,806,451,659	3,107,215,661
Net revenue from railway operations	126,776,902	123,626,364	722,050,539	537,991,940
Railway tax accruals	67,871,000	26,251,763	290,327,272	183,584,799
Uncollectible railway revenues	133,776	125,206	905,274	784,313
Railway operating income	59,769,776	97,249,395	500,817,993	353,622,828
Equipment rents				
Dr. balance	5,460,480	5,653,323	37,537,031	34,963,965
Joint facility rents				
Dr. balance	1,709,349	1,435,870	12,697,303	12,595,264
Net railway operating income	52,579,797	90,160,202	471,183,599	306,063,599
Ratio of expenses to revenues (per cent)	73.29	75.55	79.51	85.24

[1] Does not include Boston & Albany the revenues and expenses of which are included in New York Central report.
[2] Includes $1,276,019, sleeping and parlor car surcharge.
[3] Includes $ 9,713,484, sleeping and parlor car surcharge.
[4] Includes $1,140,661, sleeping and parlor car surcharge.
[5] Includes $11,771,791, sleeping and parlor car surcharge.

Traffic News

The Northern Pacific restored observation cars on ten of its fast passenger trains on October 7.

M. A. Keith has been appointed traffic manager of the International Derrick & Equipment Company, Columbus, Ohio.

The Kansas City, Mexico & Orient of Texas has been given an increase in freight rates by the railroad commission of that state to the amount of 10 cents per 100 lb. to accrue locally and in the divisions.

The Southern Pacific, on October 17, reduced its freight rates on a number of commodities including automobiles, automobile parts, cotton and cotton linters, when for export from the East to Pacific Coast ports. The reductions range as high as 20 per cent.

The officers and directors of the Associated Traffic Clubs of America met in Cleveland, Ohio, on October 17 and 18, to plan a definite constructive policy for that organization. During the summer a number of new clubs were enrolled. Twenty-eight clubs from as many cities are now members of the association.

The Traffic Club of Des Moines, Iowa, has recently elected the following officers: President, S. W. Leigh, manager, Des Moines Hosiery Mills; vice-president, C. M. Cheney, general manager, Des Moines & Central Iowa; secretary and treasurer, C. A. Moore, general agent, Atchison, Topeka & Santa Fe Railway.

Shippers opposed to the Southern Pacific's efforts to retain the Central Pacific are threatening to organize committees in every county of southern California to take an active part in the campaign being waged by the California Producers' and Shippers' Association to endorse the decision of the Supreme Court, separating the Central Pacific from the Southern Pacific. E. G. Judah, chairman of the southern California committee, says that the membership drive is under way and that civic and commercial bodies of every section of the State are joining the campaign.

Commission Amends Coal Order

The Interstate Commerce Commission on October 18 issued Amendment No. 1 to Service Order No. 25 providing that from and after October 23 the supply and distribution of open top cars suitable for the loading and transportation of coal to wagon mines shall be subject to the following rule:

> Upon any day when any such common carrier by railroad is unable to supply mines upon its line with the required number of open top cars, such cars shall not be furnished or supplied by it to any mine which customarily does not load or is unable to load such cars with coal within 24 hours from and after the time of placement until all mines upon the line of any such carriers have been fully supplied with such cars.

It also adds foundry sand and materials for car and locomotive construction or repair to the list of commodities which may be loaded in open top cars in the direction of but not beyond the mine or mines to which such open top cars are destined for coal loading.

Coal Production

Complete returns on soft coal production for the week ended October 14 will show about 9,900,000 tons, according to the estimate of the Geological Survey. During the five weeks just closed the output has been at an almost uniform rate varying little from an average of about 9,780,000 tons.

The number of cars loaded on Monday, October 9, as reported by the railroads, was 40,596, the largest reported this year; but on Tuesday loadings fell off to 29,239 cars, a figure exceeded on several Tuesdays since the close of the strike. The total cars loaded on the first four days of the week shows an increase of 3.9 per cent as compared with the same days of the week before. Full returns on loadings for the week are expected to show an output of 9,800,000 to 10,000,000 tons.

Since the first of September coal has been offered for shipment up to the ability of the carriers to handle it. Production of bituminous coal in the second week of October of the past six years has been as follows:

	Tons		Tons
1917	10,924,000	1920	12,183,000
1918	12,190,000	1921	9,711,000
1919	11,888,000	1922	9,900,000

Production of anthracite has increased slightly and may reach a total of 2,000,000 net tons for the week. According to present indications the total of all coal raised is therefore about 11,900,000 tons, which is too low to meet current consumption and the heavy movement up the Lakes, and at the same time to rebuild consumers' stocks.

The aggregate of tidewater shipments from Atlantic ports increased to 2,224,000 net tons in the month of September. In comparison with August this was an increase of 404,000 tons or 18 per cent, which was distributed between all ports except Hampton Roads. The total shipments from Hampton Roads decreased although the shipments to New England points increased.

The effects of the strike are reflected in a table which shows that the total of 21,213,000 net tons dumped during the first nine months of this year is 11,000,000 tons, or more than one-third less than the average for the corresponding periods of the three years preceding. The principal decline was in tonnage for export —a drop from an average of nearly 10,000,000 to 1,357,000 tons. Bunker coal decreased nearly one-half. On the other hand, shipments to New England were increased markedly in the effort to offset the decline in all-rail shipments brought about by the strike.

In the opening weeks of the present navigation season only a very small tonnage of anthracite was shipped up the lakes. Following that practically none was moved during the summer. About the middle of September shipments were resumed. The cumulative tonnage moved now stands at less than 5 per cent of the tonnage moved in the corresponding period of 1921.

Although dumpings of soft coal into vessels at Lake Erie piers continued at a high rate, there was a slight decrease in the tonnage handled during the week ended October 8 as compared with the preceding week. The Ore and Coal Exchange reports the total handled during the week ended October 8 as 1,179,298 net tons, as against 1,245,373 tons in the week before. In comparison with the corresponding week a year ago, this was an increase of 56 per cent. Of the total dumpings 1,142,332 tons were cargo coal and 36,966 tons were vessel fuel. During the present season to October 8, inclusive, 10,836,083 tons of cargo coal have been dumped into vessels at Lake Erie piers. Of this quantity 9,829,091 tons were forwarded to regular lake markets and 1,006,992 tons were forwarded to Lake Erie destinations not ordinarily taking lake coal. Preliminary reports of dumpings during the first 2 days of the week show a decrease of about 15 per cent as compared with dumpings on corresponding days of the week before.

Complete reports received later by the Car Service Division of the American Railway Association show that more cars were loaded with coal during the week ended October 14 than on any previous week since the coal strike began on April 1. The total for the week was 220,751 cars. This exceeded the week before by 8,773 cars, and exceeded by 4,539 cars the week preceding that.

On the basis of the loading, coal production during the week approximated 11,950,000 tons, the greatest amount produced during any one week since the strike began. Of this amount, 10,037,000 tons were bituminous and 1,913,000, anthracite coal. Production for the previous week was approximately 11,478,000 tons, and for the week before 11,713,000 tons.

Loading of bituminous coal last week amounted to 182,489 cars, 6,589 above the week before. Anthracite loading amounted to 38,262 cars, which represents an increase of 2,184 over the week before.

A total of 41,201 cars were loaded with bituminous coal on Monday, October 16. This was the largest number loaded on any one day with bituminous coal since December 20, 1920, when the total was 42,004 cars. Loadings on Monday exceeded by 605 cars the preceding Monday, which up to that time had been the high point. It also exceeded the daily average for October last year by more than 10,000 cars, and the daily average for September this year by more than 12,600 cars.

Commission and Court News

Interstate Commerce Commission

The commission has suspended from October 15, until February 12, 1923, the operation of schedules which propose increases in the rates on building and roofing paper, and prepared roofing, carloads, from Cincinnati, Lockland, Carthage, Ohio and other points in Ohio and Indiana to St. Paul and Duluth, Minn.

The commission has suspended from October 17 until February 14, 1923, the operation of schedules published in Agent R. H. Countiss' tariff which propose to reduce the rates on imported shipments of vegetable oils from Pacific Coast points to certain points in Central Freight Association Territory, from 105 to 75 cents per 100 pounds.

The commission has suspended from October 15 until February 12, 1923, the operation of schedules which propose to revise the class rates from Southeastern Freight Association territory to all destinations in Mississippi Valley Freight territory. The proposed changes would result in both increases and reductions in existing rates from and to the points mentioned.

The commission has suspended from October 16, and later dates, until February 13, 1923, the operation of schedules contained in tariffs of various carriers and E. B. Boyd, B. T. Jones and F. L. Speiden, agents. The suspended schedules which are principally published by lines in Official Classification territory, propose to cancel the rule and reference to the rule for constructing combination rates on brick and articles taking brick rates and related articles.

Emergency Fourth Section Order for Cotton

By fourth section order and by special permissions dated October 12, the commission has granted applications of the Illinois Central and Yazoo & Mississippi Valley and other carriers parties to Agent J. H. Glenn's eastern cotton tariff to establish on five days' notice rates on cotton, cotton linters or regins from stations on the Illinois Central, Yazoo & Mississippi Valley and Chicago, Memphis & Gulf to Baltimore, Philadelphia, New York, Boston and other destinations in eastern territory named in the tariff via New Orleans, and the Southern Pacific Atlantic Steamship Lines (Morgan Line) the same as the rates currently in effect via all-rail and rail-and-water routes through Atlantic ports, without observing the long-and-short-haul provision of the fourth section, combinations on New Orleans or other points which may make lower rates to be observed as maximum in all cases.

An emergency is alleged to exist in that the all-rail and rail-and-water routes through Ohio river crossings and Virginia cities over which cotton produced in the Mississippi Valley is ordinarily transported to trunk line and New England territory mill points are either closed by embargoes or so congested as to prevent prompt movement and the establishment of the proposed rates is intended to relieve this emergency and permit shipment of cotton from the Mississippi Valley via New Orleans through which port no joint through rates have heretofore been in effect. The relief as granted is limited to January 1, 1923, and is intended by the commission strictly as an emergency measure to relieve existing conditions and not as a permanent adjustment.

United States Supreme Court

The United States Supreme Court on October 16 dismissed three suits brought by Minnesota state officials to contest the right of the Interstate Commerce Commission to order increased passenger and baggage rates for intrastate transportation. The cases grew out of the state rate orders issued by the Interstate Commerce Commission following its increase of interstate rates in 1920. No opinion was written by the court, but the suits were dismissed on the authority of cases cited, including principally the Wisconsin case.

Equipment and Supplies

Locomotives

THE TOLEDO TERMINAL contemplates buying 3 switching locomotives.

THE DENVER & RIO GRANDE is inquiring for 10 Mountain type locomotives.

THE WESTERN PACIFIC contemplates buying 5 Mikado type locomotives.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA contemplates buying 15 locomotives.

THE CHICAGO, MILWAUKEE & ST. PAUL is inquiring for 50 Mikado type locomotives.

THE RICHMOND, FREDERICKSBURG & POTOMAC is inquiring for 2, 8-wheel switching locomotives.

THE GRAND TRUNK is inquiring for 10, 6-wheel switching locomotives and 10, 8-wheel switching locomotives.

THE NORTHERN PACIFIC, reported in the *Railway Age* of September 23 as contemplating issuing inquiries for from 50 to 80 miscellaneous type locomotives, is inquiring for 20 Mikado type, 20 Pacific type, 15 switching locomotives and 4 Mallet type locomotives.

THE BALTIMORE & OHIO has ordered from the General Electric Company 2, 120-ton, 600 volt, direct current electric locomotives to be delivered in March, 1923. The locomotives will be practically duplicates of those now in use in the Detroit tunnel on the Michigan Central.

THE MINARETS & WESTERN has ordered 5 Mikado type locomotives from the American Locomotive Company, of these 3 locomotives will have 24½ by 28 in. cylinders and a total weight in working order of 250,000 lb. and 2 locomotives will have 20 by 24 in. cylinders and a total weight in working order of 190,000 lb.

THE CHICAGO, ROCK ISLAND & PACIFIC, reported in the *Railway Age* of September 23 as inquiring for 30 Mikado type and 10 Mountain type locomotives, has ordered this equipment from the American Locomotive Company. The Mikado type engines will have 28 by 30 in. cylinders and a total weight in working order of 332,000 lb.; the Mountain type will have 28 by 28 in. cylinders and a total weight in working order of 369,000 lb.

Freight Cars

THE TEXAS COMPANY is inquiring for 100 tank cars.

THE NEW YORK, NEW HAVEN & HARTFORD is inquiring for 2 transformer cars.

THE NEW YORK CENTRAL will have 500 box cars repaired at the shops of the Streator Car Company.

THE ATLANTIC COAST LINE has ordered 500 steel underframes for box cars from the Standard Tank Car Company.

THE ERIE RAILROAD has given a contract to the Magor Car Company for making repairs to 500 cars; most of these are gondola cars.

THE TENNESSEE COAL, IRON & RAILROAD COMPANY has ordered 195 miscellaneous cars from the Chickasaw Ship Building Company.

THE PENNSYLVANIA COAL & COKE CORPORATION has ordered 1,000 hopper cars, of 50 tons' capacity, from the American Car & Foundry Co.

THE CUDAHY PACKING COMPANY, Chicago, will build 200 refrigerator cars in its shops at East Chicago. The cars are to be built in lots of 50.

THE VIRGINIAN RAILWAY is inquiring for from 500 to 1,000 flat bottom gondola cars of 100 tons' capacity, also for from 500 to 1,000 steel gondola cars of 120 tons' capacity.

THE NATIONAL REFINING CORPORATION, Hoboken, N. J., is inquiring for from 5 to 25 tank cars of 40 tons' capacity; also for the same number of cars of 50 tons' capacity.

THE PERE MARQUETTE reported in the *Railway Age* of October 14 as expected to come in the market for 2,000 cars, is now inquiring for 1,500 box cars and 500 hopper cars.

THE WESTERN PACIFIC, reported in the *Railway Age* of September 23 as inquiring for 100 automobile cars, has ordered this equipment from the Mount Vernon Car Manufacturing Company.

THE DETROIT, TOLEDO & IRONTON, reported in the *Railway Age* of October 14 as about to place an order for 500 to 1,000 coal cars, has ordered 500 cars from the Cambria Steel Company and 500 from the Standard Steel Car Company.

Passenger Cars

THE CUBA RAILROAD is building one business car in its shops at Camaguey, Cuba.

THE ARMS YAEGER COMPANY has placed an order with the Pullman Company for 14 horse cars.

NEW YORK CENTRAL.—Car builders are asking for prices on specialties for 20, 70-ft. steel coaches and 80, 60-ft. steel baggage cars, for the New York Central Lines.

THE LONG ISLAND, reported in the *Railway Age* of September 16 as contemplating inquiring for 90 cars for passenger service, is now asking for 40 motor cars, 20 electric trailer cars, 20 trailer coaches for steam suburban service, 10 coaches for steam service and 2 combination baggage and mail cars for steam service.

THE CENTRAL OF NEW JERSEY, reported in the *Railway Age* of October 14 as inquiring for 65 cars for passenger service, has ordered 30 all-steel coaches from the Standard Steel Car Company, 20 all-steel coaches, 10 steel baggage cars and 5 steel combination passenger and baggage cars from the American Car & Foundry Company.

Iron and Steel

THE SAN ANTONIO & ARANSAS PASS has issued an inquiry for 5,500 tons of rails.

THE MISSOURI, KANSAS & TEXAS has purchased five boilers, to be installed in the shops at Bellmead, Tex., from the Babcock & Wilcox Company, and the super-heaters for the boilers from the Superheater Company.

Miscellaneous

THE NORFOLK & WESTERN is asking for bids until 12 o'clock noon November 1, at Roanoke, Va., for about 1,450,000 tie dating nails, 300 steel car axles, 400, 33-in. steel wheels and 500 ft. of wire rope.

Signaling

THE IMPERIAL GOVERNMENT RAILWAYS OF JAPAN have ordered from the Union Switch & Signal Company 275 automatic signals for installation on main line tracks. Of the total number of signals, 135 are "T-2" a.c. semaphores and 140 are color light signals. The order embraces complete track circuit equipment, including a total of 230 Model 15, vane relays, 630 SLV-13 a.c. relays, 450 track transformers, and complete track circuit accessories such as impedances, reactors, etc. This is the same class of material as used in the initial installation of automatic block signaling made by the Imperial Government Railways, now in service on the main line, consisting of 310 complete sets of similar material furnished by the Union Switch & Signal Company.

Supply Trade News

F. N. Bard, president of the Barco Manufacturing Company, Chicago, has also been elected president of the **Argyle Railway Supply Company**, Chicago.

The Geo. W. Fife Engineering Company, 1403 Merchants Bank building, Indianapolis, Ind., has been appointed representative in Indiana for the Conveyors Corporation of America, Chicago.

Walter S. McKee has resigned as vice-president and director of the American Manganese Steel Company and in future will develop the business of the Inland Engineering Company, Chicago, of which he is president.

A. F. O'Connor, mechanical engineer of the **Union Railway Equipment Company**, Chicago, has been elected vice-president, with headquarters at Chicago, **R. C. O'Connor** has been appointed mechanical engineer, and **B. Smith**, purchasing agent, with the same headquarters.

The Krantz Works of the **Westinghouse Electric & Manufacturing Company** have been moved to Mansfield, Ohio, from Brooklyn, N. Y., where they have been situated for a number of years. The transfer to Mansfield offers better facilities for increased production, gives the works location in the central part of the country with easy access to a large number of railroads and to both middle west and eastern offices of the Westinghouse Company.

International

A Compartment in a Third Class Sleeping Car in France

Railway Construction

ATLANTIC COAST LINE.—This company has awarded contracts for the laying of second main track as follows: Ashley River to Bennetts, S. C., 3 miles, to W. W. Boxley & Co., Roanoke, Va.; Ridgland, S. C., to Savannah River, 21 miles to E. W. Parket, Tampa, Fla.; Savannah River to Central Junction, Ga., 12 miles, to F. M. Jones, Savannah; Southover to Burroughs, Ga., 7 miles, to Williams Bros. Construction Company, Roanoke, Va.; Doctortown to Jesup, Ga., 4 miles, to the C. G. Kershaw Contracting Company, Birmingham, Ala.

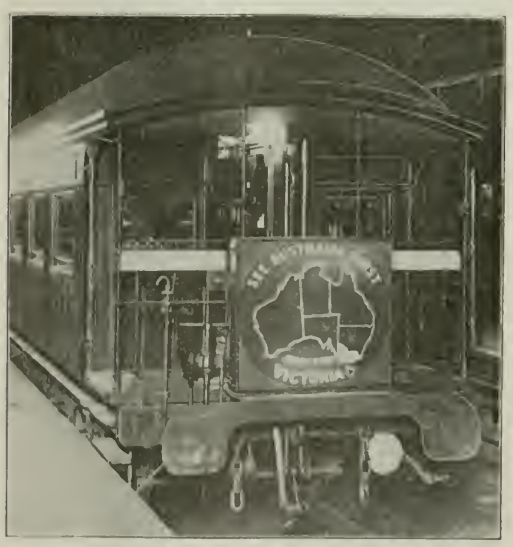
CANADIAN PACIFIC.—This company has awarded contracts to T. Jamieson and Mr. Kenzie, Ltd., Calgary, Alta., for the extension of 12 stalls of the locomotive house at Calgary, Alta.; to A. C. Creelman & Company, Calgary, Alta., for the building of stations, section houses, grain loading platforms, stockyards and water tanks and for the fencing on 50 miles of the branch from Lanigan, Sask., to Naicam; to the Northern Construction Company, Winnipeg, for the completion of the grading on the extension from Cracknell, Man., to Inglis, a distance of 6.2 miles; and to the Hamilton Bridge Company, Hamilton, Ont., for the construction of two 90.-ft turntables, for installation at Brandon, Man., and at North Bend, B. C.

GRAND TRUNK.—This company, which was reported in the *Railway Age* of September 30 as accepting bids until October 4 for a two-story brick freight house 20 by 32 ft. at Harvey, Ill., has awarded the contract to T. S. Leake & Co., Chicago.

MICHIGAN CENTRAL.—This company closed bids October 14 for a car repair shop 30 by 200 ft. at Niles, Mich., to cost approximately $15,000.

PENNSYLVANIA.—See elsewhere in this issue item concerning electrification between Altoona and Conemaugh.

PENNSYLVANIA.—This company has awarded a contract to the McClintic-Marshall Company for extensive additions to its Juniata shops.



Photograph, Kadel & Herbert, N. Y.

A Tourist Train in Australia

Railway Financial News

BUFFALO, ROCHESTER & PITTSBURGH.—*Bonds Offered.*—Lee, Higginson & Co. are offering at 96¼ and accrued interest an issue of $4,500,000 consolidated mortgage 4½ per cent gold bonds due 1957, and non-callable. The proceeds from the sale will be used to retire at maturity on December 1, 1922, $3,655,000 6 per cent bonds, to provide additional working capital and to reimburse the company in part for the purchase of equipment paid for out of earnings. This issue has been authorized by the Interstate Commerce Commission.

CHICAGO, ATTICA & SOUTHERN.—*Asks Authority for Operation.*—This company has applied to the Interstate Commerce Commission for a certificate authorizing the acquisition and operation of that part of the Chicago & Indiana Coal Railroad extending from La Crosse to a point 25.76 miles north of Brazil, Ind., with a branch from Percy Junction to the Indiana-Illinois State Line. The commission recently had authorized the Chicago & Indiana Company to abandon the line and the part mentioned has been purchased by the new company for $250,000.

ELECTRIC SHORT LINE.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $600,000 of 15-year 5 per cent gold bonds to enable it to finance an extension of 44 miles westerly from Hutchinson, Minn., in the direction of Clare City.

LOUISIANA & ARKANSAS.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $470,000 of first mortgage 5 per cent gold bonds to be pledged as collateral security for short term notes.

MACON & BIRMINGHAM.—*Passenger Service Discontinued.*—Judge H. A. Mathews in the Superior Court at Macon, Ga., has ordered all passenger service discontinued on this road, effective October 11. The order followed the recommendation of R. B. Pegram, receiver, who reported that the road was in bad physical condition. Freight service will be continued between Macon and La Grange, 97 miles.

MISSOURI, KANSAS & TEXAS.—*Sale Again Postponed.*—The sale of this road, scheduled for October 16, has again been postponed. The action was taken pending the approval by the Interstate Commerce Commission of the reorganization plan of the company.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*New Director.*—Walter O. Parmer, of Nashville, Tenn., has been elected a director to succeed W. W. Berry, deceased.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $1,800,000 of equipment trust certificates to be issued by the United States Trust Company and sold at not less than 94.89.

PACIFIC SOUTHWESTERN.—*Asks Authority to Sell Stock.*—This company, which was incorporated for the purpose of building a standard gage railroad between Lompoc, Cal., and White Hills, a distance of 4 miles, has applied to the California Railroad Commission for authority to issue and sell its common stock at par, and to use the proceeds for the purchase of right-of-way and the construction of the road. The company is incorporated for $100,000, divided into a thousand shares of a par value of $100 each.

SEABOARD AIR LINE.—*Partial Guaranty Payment Certified.*—The Interstate Commerce Commission has certified to the Secretary of the Treasury a partial payment of $300,000 on account of this company's guaranty for the six months period of 1920.

SOUTHERN RAILWAY.—*Freer Hand Is Asked for Railway Officers.*—The stockholders at their annual meeting in Richmond on October 10 unanimously adopted the following resolution which was introduced by Arthur C. Graves, of New Haven, Conn.:

Resolved, That we, the stockholders of Southern Railway Company, in annual meeting assembled, do hereby take this occasion to express our complete confidence in the corporate management and control of the railway lines of this system, and of the ability of this railway company to furnish to the communities and the territory traversed by its lines, a proper, efficient and economical transportation system at the lowest possible rates consistent with the proper maintenance and sound credit, when operated under the management of its president, the board of directors and its officers; and that to this end we believe a larger degree of managerial responsibility and discretion should be returned to and vested in the president, board of directors and officers of this company free from the artificial restrictions of commission control; and further, that it is to the best interest, not only of the investing owners of these properties and the security holders, but also of the public and shippers in the way of reasonable rates, and of the operatives in respect of a proper standard of wage, and for a just settlement of industrial disputes, that the initiative in all matters of operation and management should be left to the sound judgment and business experience of the operating officers of this company.

Resumes Preferred Dividend.—The company has declared a semi-annual dividend of 2½ per cent on the preferred stock, payable November 15 to stock of record October 31. This is the first distribution on the issue since December, 1920, when the regular semi-annual distribution of 2½ per cent was made.

TEXAS & PACIFIC.—*Asks Authority for Equipment Trust.*—The receivers have applied to the Interstate Commerce Commission for authority to incur obligation and liability for $810,000 of 5 per cent equipment trust certificates.

WESTERN PACIFIC.—*Argument on Application for Authority to Acquire Control of Sacramento Northern.*—The Interstate Commerce Commission has announced that oral arguments will be heard in this case at Washington on December 6 on the question involved in the interpretation of paragraph 1 of section 20a of the Interstate Commerce Act as to the meaning of the words "a street, suburban, interurban electric railway which is not operated as a part of a general steam railroad system of transportation." The request for argument was made by the American Short Line Railroad Association and others.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out to be received from the several roads the following amounts:

Atchison, Topeka & Santa Fe, including following subsidiaries: Gulf, Colorado & Santa Fe, Panhandle & Santa Fe, Rio Grande, El Paso & Santa Fe, Kansas Southwestern, Grand Canyon Railway	$21,500,000
Ashland Coal & Iron Railway	65,000
St. Joseph Union Depot Company	7,300
Port St. Joe Dock & Terminal Railway	4,500
Harlem Transfer Company paid Director General	20,000
Middletown & Unionville Railway paid Director General	45,000

Dividends Declared

Southern Railway.—Preferred, 2½ per cent, payable November 15 to holders of record October 31.

Trend of Railway Stock and Bond Prices

	Oct. 17	Last Week	Last Year
Average price of 20 representative railway stocks	73.63	72.35	54.58
Average price of 20 representative railway bonds	87.85	88.65	76.34

THE LONG ISLAND will receive bids until 12 o'clock noon November 1 for 108 rigid hard frogs, 109 alloy tipped switches and 1,000 twin tie plates. All the above is for use with 100-lb. rail.

THE MISSOURI, KANSAS & TEXAS, reported in the *Railway Age* of October 14, as inquiring for 4,500 kegs of spikes and 2,000 kegs of bolts, has ordered this material from the Illinois Steel Company.

THE MISSOURI, KANSAS & TEXAS has placed an order with the Shaw Electric Crane Works of Manning, Maxwell & Moore, Inc., for an electric traveling crane of 180 tons' capacity, one of 40 tons' capacity and two of 15 tons' capacity.

MONTANA WILL DEDICATE the new engineering building of the Greater University of Montana to William Milnor Roberts, pioneer location engineer of the Northern Pacific. The suggestion of the university faculty that the memory of Mr. Roberts be thus honored has been approved by the State Board of Education. The new building is now under construction on the college campus at Bozeman.

Railway Officers

Executive

S. J. Hungerford has been appointed vice-president with the title of vice-president and general manager of the Canadian National until Sir Henry Thornton, president, takes up the duties of his office. Mr. Hungerford will exercise the authority and perform the duties hereto exercised by the retiring president, D. W. Hanna.

D. E. Galloway, assistant to the president of the Grand Trunk, has been appointed assistant vice-president of the system. Mr. Galloway was born at Crieff, Ontario, in 1882 and entered the service of the Grand Trunk at Hamilton, Ontario, on February 1, 1901. In 1904, Mr. Galloway was appointed secretary to Charles M. Hays, then president of the Grand Trunk Pacific and the Grand Trunk Western. After occupying this position for seven years he was appointed in October, 1911, assistant to the president of the Grand Trunk and served in this capacity until the time of his appointment as assistant vice-president.

D. E. Galloway

T. A. Hamilton, vice-president and assistant to the president of the St. Louis-San Francisco, with headquarters at St. Louis, Mo., has been elected president of the International-Great Northern, with headquarters at Houston, Tex. **J. W. Kendrick**, consulting engineer, Chicago, and formerly vice-president of the Atchison, Topeka & Santa Fe, has been elected chairman of the board.

Financial, Legal and Accounting

L. L. Atwood, has been appointed contract attorney of the Missouri Pacific with headquarters at St. Louis, Mo.

C. H. Moses has been appointed secretary of the Graysonia, Nashville & Ashdown with headquarters at Little Rock, Ark. **G. H. Bell** has been appointed treasurer; **W. E. Collins** has been appointed auditor and car accountant and **J. D. Sain** has been appointed attorney with headquarters at Nashville, Ark.

Operating

E. G. DeLong has been appointed assistant trainmaster of the Pennsylvania, with headquarters at Toledo, Ohio.

C. C. Hill, has been appointed superintendent of the Graysonia, Nashville & Ashdown with headquarters at Nashville, Ark.

A. N. Williams has been appointed general manager of the Midland Valley with headquarters at Muskogee, Okla., effective October 14.

J. H. Fraser, executive general agent of the St. Louis-San Francisco, with headquarters at Memphis, Tenn., has been promoted to assistant general manager, with headquarters at Springfield, Mo.

G. H. Munchin, assistant superintendent of the Atchison, Topeka & Santa Fe with headquarters at Marceline, Mo., has been appointed superintendent of the Illinois division with headquarters at Chillicothe, Ill. He has been succeeded at Marceline by **W. A. Guild**, engineer, East district, with headquarters at Topeka, Kan.

Charles Manning, assistant to the vice-president of the Grand Trunk, has been appointed assistant operating manager, Eastern lines. Mr. Manning began his railroad career with the Great Western at Bristol, England. In 1883 he entered the office of the mechanical superintendent of the Grand Trunk at Montreal and, in 1898, was advanced to chief clerk in the motive power department. He was appointed assistant to the vice-president in charge of the mechanical department on January 1, 1917, and assistant to vice-president in charge of operation in May, 1920, which latter position he held at the time of his recent promotion.

W. D. Dilley, whose promotion to superintendent of the Louisville, Cincinnati & Lexington division of the Louisville & Nashville was reported in the *Railway Age* of August 26, was born on December 7, 1869, at Macksburg, Ohio. He entered railway service in June, 1887, as an operator on the Baltimore & Ohio where he remained until 1890. From that time until 1892 he was consecutively an operator on the Missouri, Kansas & Texas and on the Pittsburgh division of the Pittsburgh, Cincinnati, Chicago & St. Louis (Pennsylvania). He returned to the Baltimore & Ohio as an operator in 1892, and entered the service of the Louisville & Nashville as an operator in August, 1894, since which he has been copy operator in the dispatcher's office, agent, and agent-yardmaster. On June 1, 1907, he was promoted to trainmaster of the Lebanon branch and in 1917, to inspector of transportation, which position he held until August, 1918. He was appointed superintendent of terminals at Louisville, Ky., on the latter date and when the former superintendent of terminals returned from government service on March 1, 1920, he was transferred to the Louisville, Cincinnati & Lexington division as assistant superintendent, which position he held until his recent promotion.

C. J. Bowker, general superintendent of the Ontario Lines of the Grand Trunk, has been appointed operating manager of the Lines East of the Detroit and St. Clair rivers. Mr. Bowker entered the service of the Grand Trunk in 1900 as a train dispatcher at London, Ontario, and shortly thereafter was appointed chief train dispatcher and subsequently to train master, serving at various points on the system until 1909, when he was appointed assistant superintendent of the Stratford division. A year later he was advanced to superintendent of the St. Thomas division and in 1913 was appointed to general superintendent of the Eastern Lines. In that capacity, he handled during the period of the war the heavy war traffic which was carried by the railway to the ports of Montreal, Quebec and Portland. In 1918 he was transferred to the Ontario lines as general superintendent, which position he held until the time of his recent promotion.

C. J. Bowker

D. W. Bowker, whose promotion to division superintendent of the St. Louis Southwestern with headquarters at Pine Bluff, Ark., was reported in the *Railway Age* of October 14, was born on October 9, 1883, at Collinsville, Ill. He entered railway service in 1903, with the Vandalia (Pennsylvania) and was in the employ of the Missouri Pacific from 1909 to 1916. On November 17, 1916, he entered the service of the St. Louis Southwestern as yardmaster and was later pro-

moted to general yardmaster. He held this position until April 1, 1920, when he was promoted to assistant superintendent, which position he held until his recent promotion.

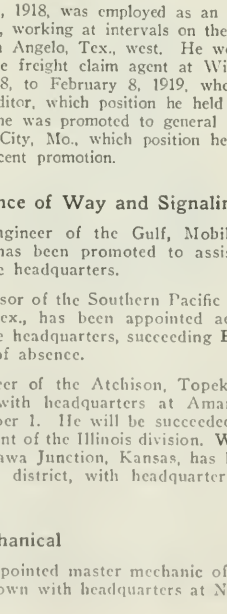
Traffic

A. W. May has been appointed commercial agent of the Illinois Central with headquarters at San Francisco, Cal.

G. W. Wood, has been appointed general agent of the Chesapeake & Ohio with headquarters at Cincinnati, O.

B. Wagner, division freight agent of the New York Central with headquarters at Toledo, Ohio, has been appointed assistant general freight agent with headquarters at Chicago, succeeding E. L. Whitney, promoted. Mr. Wagner will be succeeded by **W. J. Keller**, division freight agent with headquarters at Kankakee, Ill., who in turn will be succeeded by **L. Blue**, general agent, with headquarters at Buffalo, N. Y.

G. Thompson, general agent of the Kansas City, Mexico & Orient, with headquarters at Kansas City, Mo., has been promoted to general freight agent in charge of solicitation with the same headquarters. He was born on February 18, 1888, at Larned, Kan., and entered railway service on August 16, 1906, as a station helper on the Atchison, Topeka & Santa Fe, at Halstead, Kan. From November 20, 1906, to September 17, 1908, he was employed as a baggage and freight checker at Dodge City, Kan., and from the latter date to July 19, 1910, he was a telegraph operator and agent at various points in Kansas. On July 19, 1910, he entered the service of the Kansas City, Mexico & Orient and until December 11, 1918, was employed as an agent and operator at various points, working at intervals on the construction of the line from San Angelo, Tex., west. He worked as a clerk in the office of the freight claim agent at Wichita, Kan., from December 11, 1918, to February 8, 1919, when he was promoted to traveling auditor, which position he held until April 1, 1920. On this date he was promoted to general agent with headquarters at Kansas City, Mo., which position he was holding at the time of his recent promotion.



G. Thompson

Engineering, Maintenance of Way and Signaling

L. P. O. Exley, office engineer of the Gulf, Mobile & Northern, at Mobile, Ala., has been promoted to assistant chief engineer, with the same headquarters.

R. W. Meek, signal supervisor of the Southern Pacific with headquarters at Houston, Tex., has been appointed acting signal engineer with the same headquarters, succeeding **E. E. Worthing**, who is on leave of absence.

F. M. Bisbee, chief engineer of the Atchison, Topeka & Santa Fe, Western Lines, with headquarters at Amarillo, Texas, will retire on November 1. He will be succeeded by **M. C. Blanchard**, superintendent of the Illinois division. **W. C. Baisinger**, roadmaster at Ottawa Junction, Kansas, has been promoted to Engineer, East district, with headquarters at Topeka, Kan.

Mechanical

A. McCormick has been appointed master mechanic of the Graysonia, Nashville & Ashdown with headquarters at Nashville, Ark.

C. Peterson has been appointed acting master mechanic of the Denver & Salt Lake with headquarters at Denver, Colo.

J. D. Young, has been appointed assistant master mechanic of the Central of New Jersey, with headquarters at Ashley, Pa. **David Evans** has been appointed road foreman of engines with the same headquarters.

John J. Hanlin, whose appointment as assistant superintendent of motive power of the Seaboard Air Line was announced in the *Railway Age* of September 23, page 592, was born on June 1, 1871, in Texas county, Mo. He was educated in the high schools of Birmingham, Ala., and left school in 1888 to enter the employ of the Savannah, Americus & Montgomery (now Seaboard Air Line). A short time thereafter he left this road for a private machine shop where he completed his apprenticeship as a machinist and in July, 1891, re-entered the service of the Savannah, Americus & Montgomery as a machinist. From 1891 to 1898 he served the same company as a hostler, fireman and yard engineman at Americus, Ga. From 1898 to 1900 he was in the employ of the Louisville & Nashville at Birmingham as a machinist and gang foreman. From 1900 to 1903 he was general foreman and locomotive engineman for the Birmingham Southern at Pratt City, Ala. During the latter year he entered the service of the Southern as a machinist and roundhouse foreman at Birmingham and, the following year, entered the employ of the Seaboard Air Line in the same capacity at Birmingham; in 1906 he was promoted to general foreman at the same place and, in 1907, to master mechanic of the Georgia division. In this latter capacity he was serving at the time of his recent promotion.

J. J. Hanlin

E. W. Smith, engineer of transportation of the Pennsylvania with headquarters at Philadelphia, has been appointed general superintendent of motive power of the Southwestern region with headquarters at St. Louis, Mo. **W. C. A. Henry**, general superintendent of motive power at St. Louis, has succeeded Mr. Smith as engineer of transportation.

Purchasing and Stores

C. F. Leatherman has been appointed acting purchasing agent of the Kansas, Oklahoma & Gulf with headquarters at Muskogee, Okla.

Special

W. G. Slaughter has been appointed acting chief special agent of the Seaboard Air Line with headquarters at Norfolk, Va., succeeding M. Welsh, resigned to accept service with another company.

Obituary

J. A. Stewart, former minister of railways of Canada died at Halifax, N. S., on October 7.

T. W. Place, who was master mechanic of the Illinois Central with headquarters at Waterloo, Ia., until he retired on a pension on November 1, 1901, died on October 9 at Waterloo after a few months of ill health. He was born on January 2, 1833, at Acworth, Sullivan county, N. H., and entered railway service in 1853 as a locomotive fireman on the Boston & Maine. In 1854 he became a locomotive engineer on the Illinois Central, and on September 1, 1861, he was promoted to master mechanic at Dubuque and later at Waterloo.

EDITORIAL

Railway Age

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Proper Punctuation of Train Orders

This paper for many years has advocated the abolition of complicated train orders (often, perhaps usually, made more complicated by very poor penmanship); that is to say, it has advocated the use of the complete block system, which makes written train orders unnecessary, except in emergencies. In spite of this thousands of 19 and 31 orders are issued every day, and the long-standing veneration in which the American train-dispatching system is held continues unabated in a multitude of offices. This being so, we once more call attention to the fact that each subject in a train order ought to be put into a separate paragraph. A recent collision at Toltec, New Mexico, is reported in another column. The misreading of that train order was, no doubt, due to the lack of a suitable separation after the twelfth word, "Osier." That will be the excuse of the men who blundered in reading. Mistakes of this nature *are not rare*. To write orders properly would in many cases require larger blanks. That, perhaps, is one reason why this improvement remains neglected. If beginning each item of an order on a new line would be too much of a jar to settled habits, perhaps a useful lesson might be learned from the innovation which the machine telegraphers have recently adopted—the insertion of the word "stop" wherever a period ought to appear. It is too bad to go on killing people for lack of so simple a precaution.

Monthly Earnings Reports

The monthly figures of railway revenues and expenses which the Class I railroads render to the Interstate Commerce Commission are made public through their being made available to the press by the commission. A considerable number of the carriers also furnish the press direct with copies of the statements filed with the commission or with statements compiled in a similar manner. Presumably there remains but little doubt as to the value of the monthly statements. There is some criticism of the requirement which calls for the filing of the monthly figures, but it would appear that this is minority and not majority opinion. The value which is admitted to exist in the reports is that the figures in total for all the roads enable the commission, the railway men and the public to check up promptly on railway progress. Monthly figures of railway gross and net serve a variety of useful purposes and are of sufficient use that they are regarded as a very necessary part of business statistical information. The primary value of the figures for the individual roads—as distinguished from the figures of all the roads in total—would seem to lie in the necessity for one railroad to compare its own results with those of its neighbors, and in the necessity for the investor in railway securities to keep himself informed as adequately as he can concerning the property in which he is is interested. The reports, therefore, should be adequate, and should be given a fairly wide circulation. A question that arises is: Are they adequate? Unfortunately they seem to lack that quality to a certain extent. The figures in the reports to the commission show their final results in item 24—"Net railway operating income" or "Net after rentals." The lack of adequacy exists because there does not seem as yet to be a complete understanding of the meaning of these expressions. The monthly reports of the carriers will attain a much greater usefulness when people—railway men, investors and others interested—secure a better understanding of what the commission means when it uses these expressions, when the carriers come to a more universal use of the figure embodied in them, and when, in general, there is a more consistent use of the expressions than there is at present. There is room for much improvement in this regard.

Everybody's Business Is Nobody's

Whenever shortage of equipment imposes on the railroads the necessity for a maximum utilization of the available cars, various measures are called to mind which would encourage, if not actually require, the shippers to load cars to capacity. Among the suggestions offered are increases in the minimum carload, a sliding scale of tariffs favorable to loadings in excess of the minimums and provision for a larger diversity of mixed carloads. But any efforts to obtain relief from this source in a time of stress are much like attempting to repair the roof during a shower—by the time one can borrow a ladder the storm will be over. In short, this is no time to look for outside help; the roads must work with the tools at hand and the most effective tool in this case is the station agent. But unless he takes a sincere interest in the subject, unless he is made to feel that it is a real part of his job, little will be accomplished. Some form of organization must be set up, not only to bring the necessity of increased car loadings to the agent's attention, but to point out to him how he *can* help and institute a follow-up system to see that he *does* help. The form of this organization, the character of its personnel, is in large measure immaterial. It will vary necessarily with the individual roads and the particular divisions. The important thing is to see that it is somebody's business to follow the thing through.

Rate Reductions in Britain

The British public is clamoring for reductions in passenger fares and it appears likely that the railways will soon grant some concessions in this direction. Passenger fares now stand at 75 per cent above the pre-war level and it is proposed that 25 per cent of this increase be removed, leaving the rates 50 per cent above the pre-war level. This proposed reduction is a serious matter for the British railways, because passenger traffic is relatively of much greater importance in that country than in the United States. In 1921, for example, 49 per cent of the operating revenues of British railways were derived from passenger train services, whereas passenger traffic contributes only about 25 per cent of the operating revenues of American railways. The railways of the United Kingdom paid 4.35 per cent on invested capital in 1921, but this was possible only because of compensation by the government; otherwise the railways would have faced a deficit. It is difficult to see just how they are going to meet the falling off in their revenues which reduced passenger fares will occasion. The traveling public in England is not apparently any more

concerned with this side of the question than are the shippers in this country who are continually seeking rate reductions on their products. When the national productive process is out of adjustment and groups of producers, powerful politically or economically, find that they are not making their customary profits, they always find the railways conveniently situated to assume their losses for them. In England, as in this country, these groups shift their burdens to the railways, giving no thought to the plain fact that such action must, in the long run, deprive them of the normal expansion of transportation facilities which the growth of industry and population demands.

It Depends Upon Whose Ox Is Being Gored

Starting with the co-operation of the railways as an aid to the farmer in bringing his produce to the rails for shipment, the construction of hard surface roads has developed until they are today making serious inroads on the earnings of many railway lines. Apparently oblivious and indifferent to this effect on the railways, many communities and individuals are fostering truck competition in every possible way. In doing so few have considered the possibility of the curtailing of railway service made necessary by these inroads on earnings and the effect of such curtailment on their individual interests. Not long ago a highway was built parallel to the main line of a road across a western state. Upon its completion the motor truck and the motor bus appeared in numbers to compete for freight and passenger traffic. This development was encouraged by a leading newspaper in that state with a large rural circulation. This competition soon made such inroads on the local passenger business of the railway that it was forced to withdraw an afternoon local train which had long carried this newspaper to the northern counties. Confronted with the loss of this circulation, which had been developed at large expense, the publisher at once appealed to the railway management for the restoration of this train on the ground that it would mean large financial loss to him. The road replied that it would be willing to restore this train if the publisher would make good the deficit in its operation occasioned by the competition of the motor trucks. This he could not afford to do. Confronted as he was in this way with the results of the campaign he had fostered, he was not slow to see the ultimate interest of the public in a new light, and his paper is now as staunch an advocate of the regulation of motor traffic to restrict it to its legitimate channels as it was formerly for unrestricted competition at the expense of the railways and the tax payers!

Lump Buying of Machine Tools

Does a true sportsman buy his guns, fishing tackle and golf clubs from a mail order house simply because he can get the whole outfit at a relatively low price? Undoubtedly he does not. He is looking for service, and is willing to pay a little more for the privilege of selecting the gun, casting rod, or club which best suits his individual needs. A railroad shop machine tool is also an investment, and first cost is entirely secondary to the amount and kind of service rendered. With the present keen competition in the machine tool industry, price is a pretty accurate measure of serviceability and when it is considered that machine tools and shop equipment are used 15 or 20 years, or more, the productive capacity of a tool is far more important than its first cost. The present more or less common practice of placing big shop equipment orders with one large manufacturer or dealer is objectionable on the grounds indicated above. No one dealer represents all the best lines in the country and in order to quote a lump sum lower than the total aggregate bids, it is evident that he must include some machines not of the first quality. At the risk of being tiresome, the statement is repeated that the sooner railroad shops are operated on a strict business basis, the better it will be for railroad stockholders. No big manufacturer, for example, would consider ordering all his equipment through one dealer, but would require his mechanical men to study each individual job and recommend the specific machines needed to reduce production costs. Those machines would be purchased of the individual manufacturers or dealers as soon as possible and the mechanical men held responsible for reduced shop costs.

The American Railroads and a Centennial

SHALL THE RAILROADS of the United States observe a centennial?

In the issue of the *Railway Age* immediately preceding this, mention was made of an anniversary celebration recently conducted by the Rock Island. As told in that issue, this road, on the 10th of October, three-score-and-ten years to a day since the first train made its trip from Chicago to Joliet, Ill., launched a program of activities, the proportions of which have not been exceeded on railroads in recent years. In commenting on this, the *Railway Age* took occasion to allude to the views it has held and earnestly advanced during the year concerning the importance of ever striving to build up and maintain the good-will of employees, together with the necessity of railroads doing more to "sell" themselves to the public. It referred to this celebration of the Rock Island's seventieth anniversary as a splendid piece of work along these lines. It advanced the thought that a method which had worked so effectively on one road might well be made the subject of consideration on others, and by inference expressed the hope that the railroads would view it in the same light. Passing from the general to the specific, then, consider the question of a railway centennial.

Less than six years remain until the hundredth anniversary of July 4, 1828, when singularly enough, Charles Carroll, better known as Charles Carroll of Carrollton, only living signer of the Declaration of Independence, little catching the full significance of his act, drove home the spike that marked not only the beginning of the Baltimore & Ohio but of American railroads. Only six short years remain to complete a hundred years of American railroad history, a hundred years within which the mileage of the greatest of transportation systems has grown from nothing to 265,000, or more than in all Europe, more than four times that in all Asia, more than ten times that in all Great Britain and which, double-tracked, triple-tracked and more than eight-tracked in places, forms the principal bond between the hundred millions of people with whose prosperity it is inseparably connected. Less than six years remain, in fact, until the rounding out of a period within which, under the impetus of its railroads more than all other agencies combined, this country, initially inconspicuous, has become the most flourishing and prosperous of nations.

A centennial of American railroads then; a celebration of national scope and perhaps even of international interest, representing the combined energies of every American railroad—such, in substance, is the specific question relating to anniversary activities which the *Railway Age* urges all railroads now to consider.

Reviewing the past, when has another topic of railway interest arisen which admits of so universal an appeal? When will so opportune an occasion again present itself for the railroads to engage the attention of the public. Carefully planned, it should accomplish much in renewing that

pride in nearly 2,000,000 co-workers which contributes so much to their contentment; properly supported, it should augment the harmony between railroads which simplifies the working out of mutual problems, and conducted on a sufficiently large scale, it should establish a contact with a great mass of American citizenry which, though but temporary, will mean much to railroads in the future. "There is a tide in the affairs of men," it has been said, "which taken at the flood leads on to fortune." A centennial celebration of American railroads, it cannot be gainsaid, would be an event in a hundred, an opportunity which should not be missed.

Equipment Orders and Freight Business

THE ORDERS the railways have placed thus far this year for locomotives and freight cars show that they are using all available resources to increase their facilities. The number of locomotives which had been ordered to October 15 was 1,792. The average number ordered annually in the 10 years ending with 1921 was 2,118. Thus, orders placed in the first 41 weeks of this year do not equal the annual average orders of the last decade. They do, however, exceed the average number ordered annually in the five years ending with 1921, which was only 1,483.

The number of freight cars ordered to October 15 was 122,953. In only three entire years of the decade ending with 1921 were larger orders placed, namely, in 1912, 1913 and 1916. The average number of freight cars ordered annually in the 10 years ending with 1916 was 100,469, and in the five years ending with 1921 it was 64,619. It will be seen the number ordered already this year exceeds the average annual records of both the last five and the last 10 years.

The new equipment bought will not, of course, result in an equivalent net increase in the amount of equipment in service. The average number of locomotives retired from service annually in the 10 years ending with 1921 was 1,615. This is only 177 less than the total number ordered thus far this year. The average number of freight cars scrapped and retired from service annually in the 10 years ending with 1921 was 76,760. This is only 46,193 less than the total freight cars ordered thus far this year. Because of inability of the railways within recent years to buy a normal amount of new equipment the number of locomotives and cars that ought to be retired is now unusually large.

But two and one-half months of the year 1922 still remained when these statistics regarding the orders placed this year were compiled. Substantial orders are still being placed and probably will continue to be until the end of the year. The total orders placed in 1922 will hardly approach those placed in such years as 1916 and 1912, but they promise substantially to exceed the averages of the last 10 years. They will provide for a normal year's net increase in equipment, but will hardly make up for any of the large deficiency in equipment which has accrued within recent years.

The comparatively large orders for locomotives and cars being placed evidently are predicted on the belief of railway managers that traffic will continue to move in increasing volume. Statistics regarding the amounts of various classes of commodities being shipped seem to support this view.

In the fall of 1920 the railways handled the largest business that they ever did in their history. The total number of cars loaded with freight in the four weeks ending with October 14, 1922, was only 2.9 per cent less than the number loaded in the corresponding weeks of 1920, but there are wide differences in the tonnages of the various classes of commodities handled in the two periods. Study of these differences may suggest what future tendencies are likely to be.

Many people believe that the reason why the railways are now handling such a large volume of freight is that the coal strike has forced upon them an abnormal tonnage of coal and that therefore the present excess in the demand for transportation over the supply will be temporary. The fact is that in the four weeks of 1922 mentioned the number of carloads of coal moved was 13 per cent *less* than in the same weeks of 1920. Furthermore, shipments of ore were 39 per cent *less*, of forest products 5 per cent *less*, and of coke 39 per cent *less*. How, then, was it that the total shipments were only three per cent less?

Shipments of grain and grain products were 21½ per cent larger than in 1920; of livestock 15½ per cent larger and of less-than-carload merchandise 11 per cent larger.

The farmer is sending his crops to market and getting his money for them as fast as he can. He was holding his crops back in 1920 and not getting his money for them. In view of these facts, is he not likely to be a larger purchaser in 1923 than he was in 1921?

Shipments of L.C.L. merchandise thus far this year have been much greater than ever before. They consist chiefly of finished products. Retail merchants must have been buying them from wholesale merchants, and they from manufacturers, in large amounts or they would not have been shipped in record-breaking volume. Since this has been the case, does it not seem probable that there will be activity in general manufacturing for months to come. When there is acitvity in manufacturing there is a large demand for fuel and raw materials. Those engaged in the construction business say there is prospect of a great deal of construction work. Do these things not indicate the prospect of increase in shipments of the classes of commodities which are not now moving in as large volume as two years ago?

Apparently it can be assumed that there will not be a demand for transportation which will equal or exceed all past records only upon the theory that the demand for the transportation of grain and grain products, livestock and merchandise is going to decline as much as the demand for the transportation of coal and coke, forest products, ore and miscellaneous commodities is going to increase. But is there anything in the situation to indicate that the demand for the transportation of commodities now moving in record-breaking volume is going substantially to decline?

The United States is a growing country. There never was a business depression that was not followed by a business revival which made the demands upon the railways greater than ever before. Unless past experience is misleading, the demands upon the railways in months and years immediately ahead are going to increase, and they will have use for more additional facilities than they will be able to provide.

Consideration of Consolidation Plans

THE CONSOLIDATION provisions of the Transportation Act have as yet secured by no means the amount of attention and discussion which their importance will eventually unquestionably bring forth. This statement is made with due regard to the amount of material which has been written or spoken about the subject but nevertheless the fact holds true that the amount of interest which has been taken in the matter still remains relatively small in proportion to the importance of the question. New England and California, however, are exceptions. In the former, as is aptly pointed out in an article by W. J. Cunningham, James J. Hill, professor of transportation at Harvard University, which appears in the first issue of the new Harvard Business Review, the underlying reason is a realization of the importance of the subject as concerns the future welfare of New England industry. In

California the situation is involved in the Southern Pacific-Central Pacific segregation.

The New England discussion represents presumably the more ordinary manner in which the discussions of the various consolidation plans will be carried on. The California situation has its chief measure of interest in the conflict which has arisen between an old and a new idea in railway regulation—the old idea being that represented in the anti-trust acts and the recent decision of the Supreme Court and the new idea that embodied in the consolidation provisions of the Transportation Act. In addition, of course, there is also involved the corporate relationships between Southern Pacific and Central Pacific; it must be remembered that to separate these two companies would not only take away from the Southern Pacific System its line to Ogden but also remove the connecting link between the lines in Oregon and those in southern California.

The California situation should prove of particular value because of the emphasis it will place on the new theory of railway regulation that consolidations may be of value as distinguished from the former theory that they were essentially bad. The expression of this new theory is the best feature of the entire consolidation idea and it deserves considerably more importance than it has thus far received. In truth, the time seems to be approaching for the formulating of a more practical attitude towards the consolidation plans than the railways thus far seem to have felt it necessary to adopt. They are the ones primarily interested and it seems as if they should evidence that they have a keener appreciation of that fact than they have so far shown.

Union Leadership in America and Britain

IT HAS BEEN SAID that trade unionism in the United States is from 25 to 50 years behind that of Great Britain. This is generally taken to refer to the strength of the trade union movement, i.e., that the unions in this country are no stronger, comparatively speaking—numerically, politically or economically—than the British unions were several decades ago. Without arguing this point pro or con, we should like to suggest another phase of the trade union movement wherein Great Britain is certainly many years ahead of us. This is in its intelligent leadership.

One looks in vain among union leaders in this country for men of the calibre, vision and knowledge of economics which are the characteristics of such leaders of the British railway labor unions as J. H. Thomas, J. Bromley, J. Marchbank and C. T. Cramp. The reason for this condition in all probability lies deep below the surface and it is not necessarily a reflection on leaders of labor in this country to say that, generally speaking, they are not as able and as learned as their British contemporaries. Some American labor leaders, potentially as capable, may be restrained from an exercise of their abilities by a narrow-minded membership. Whatever the cause, however, the statement stands—the leadership of the railway unions in this country, generally speaking, suffers by comparison with that of Great Britain.

The outstanding characteristic of most union struggles in this country has been their predatory nature. Most of them have been designed to gain a greater share in the product of industry at present without any effort at all at increasing that product. Anyone with the most elementary knowledge of economic law should be able to see that a continuing increase in the return which any group can receive for its services can come only by an increase in production. Some increases may be obtained, it is true, by wresting a larger share of present production from other economic groups but there is a limit beyond which this sort of thing cannot go. When this limit has been reached the only method of securing increased returns is by an increase in efficiency.

The leaders of labor on the British railways quite evidently recognize this fact and they are exerting their best efforts to interest their membership in improving the efficiency of the railways. By pursuing this policy they are not only doing the very best service possible for their own members, but they are making their unions useful to society as a whole.

How much longer will American labor leaders allow it to be truthfully said that unionism in this country is many years behind the movement in Britain?

New Books

The Alaskan Engineering Commission. 124 pages, 6 in. by 9 in., with map of Alaska. Bound in cloth. Published by D. Appleton & Co., New York.

This is No. 4 of a series of service monographs of the United States Government prepared by the Institute for Government Research and is devoted to the development of railroads in Alaska from the first privately-owned road built in 1898 to the government operations through the year 1920. The monographs are prepared according to a uniform plan and this one is no exception. They give the history of the establishment and development of the service; its functions in detail by specific activities; its organization; the character of the plant; a compilation or reference to the laws and regulations governing its operations; financial statements showing its appropriations, expenditures and other data for a period of years; and lastly, a full bibliography of the sources of information, official and private, bearing on the service and its operations.

The Constitution of the United States: Its Sources and Its Application. By Thomas James Norton, assistant general solicitor, the Atchison, Topeka & Santa Fe Railway Company. 298 pages, 5 in. by 7½ in. Bound in cloth. Published by Little, Brown and Company, Boston.

This is not a railway book, of course, but every American citizen should know what it tells. The Constitution of the United States is the most interesting and important document that ever was produced in this country, if not in the entire history of mankind. It is not only the framework of our federal government, but nobody without knowing its provisions can understand our state governments, since the federal Constitution puts limits upon what the state governments can do.

The federal Constitution was long the object of almost unanimous praise, and even adulation, by American public men and writers on political subjects. Within recent years it has been the object of much criticism. Many young and old persons of radical tendencies have learned to depreciate and denounce it on the ground that it is an instrument of tyranny over the "masses." Nine-tenths of those who think and talk thus know almost nothing about the real provisions of the Constitution and even less about what the author of this book calls "its resources and its application."

Mr. Norton's purpose was "to put within the reach of the American citizen and the young people in school a brief but full and live explanation of the sources of the great clauses of the Constitution and also the applications of these clauses in the great cases which have arisen." There has been great need for such a book. There are numerous ponderous volumes about the Constitution. Most of them have been written for lawyers on the assumption that their readers know the provisions of the Constitution. Only students of jurisprudence would read or could understand them. What was

needed was a book which would tell exactly what the Constitution says and which would set forth exactly what its provisions mean and how they apply in language which anybody could understand.

Mr Norton was admirably equipped to write such a book. He is a successful lawyer of long experience. The study of the Constitution has been almost a life work with him. He was formerly, however, a daily newspaper reporter and writer. In that school he learned how to tell things so that young people and the average man in the street would be interested and would understand. With his unusual experience and great knowledge he has written a book about the Constitution which might well be put in every college and even in every high school. Why should our young people be taught dead languages, history and economics and be allowed to graduate with honors knowing little or nothing about the actual provisions and meaning of the Constitution which is the foundation of our entire government? The book is also one which might well be read by every citizen, for every citizen ought to know what the Constitution of our country really is.

One fault of every book that has heretofore been written on the Constitution is that the Constitution itself has been published either at the front or back and that the history and interpretation and application of its provisions have been given separately in the text. In Mr. Norton's book the various provisions of the Constitution are published in bold face type and run through the entire book, and under each clause quoted from them is given the history, the interpretation and application of this clause. Thus the reader does not have to turn to one part of the book to find what the Constitution says and then to the text to find what is said about it. All through the book references are made to the constitutions of other nations which have copied ours, and to quotations from what great jurists of other countries have said about it.

Mr. Norton has kept out of the book both opinion and propaganda, leaving it to the reader to make his own deductions from the historic facts given. He has, however, written a book which no one who approaches the subject for the first time can read without realizing that much of the criticism of the Constitution and of its interpretation and application by the courts is without justification. The federal Constitution is the bulwark of American liberty and of American institutions. Mr. Norton's book should receive wide reading and use and do great good.

The Canadian Railway Act, 1919, Third Edition. By Angus MacMurchy, K. C., and John D. Spence, barristers-at-law. Toronto, 1922, Canada Law Book Company, Limited.

The second edition of the above work, which was published in 1911, had 80 pages more text and over 400 more decisions than the first edition, which appeared in 1905. About 3,000 cases are cited in the third edition. The first 57 pages of the book are taken up with a comparative statement of the section numbers of The Railway Act, 1919, and amending Acts and the preceding Act as well as with citations of cases. There are 754 pages of text. Readiness of reference is provided for by an index of 43 pages. The present edition has about 100 pages more of text and annotations than the second edition. At the same time, there has been a cutting down in bulk by omitting the Lord's Day Act, the schedule of forms and requirements respecting plans, the regulations of the board, etc., and by adoption of abbreviations in citations wherever possible.

The setting out of the decisions in black faced type in the present edition is an aid to the eye in running down the authorities cited. The text is copiously annotated. Of the total printed text approximately 60 per cent of the space is taken up with annotations. Without attempting to enumerate in detail and simply by way of illustration, it may be noted that of 135 pages of text covering sections 312 to 359 of the Railway Act—the portion peculiarly concerned with freight and passenger tolls—117 are taken up with annotations. The information, especially in the section dealing with tariffs and tolls is rich in citations from decisions of the United States courts and regulative tribunals. The editors in this connection acknowledge their indebtedness to the chief counsel and the assistant counsel of the Interstate Commerce Commission. While these decisions are informative and in various instances indicate the road, at the same time it is recognized that only when the circumstances in Canada are on all fours with those in the United States can the decisions based on the latter be regarded as applicable in their entirety in Canada. Manitoba Dairymen's Assn. vs. Dominion and Canadian Express Cos. 14 C.R.C. 142 at p. 148.

The Canadian Railway Act has developed by accretion and has in form a lack of logic which appertains to such a method of development. It is a code setting out the conditions which, in the absence of express legislation, are to be read with the terms of the Special Act. It sets out the powers of the railway, not only as to the fundamental matter of compulsory taking of land, but also as to the powers in connection with construction and operation. Then, in addition, there is superimposed an extensive regulative jurisdiction extending from the approval of a route map to the sections dealing with tolls. The regulative portions, so far as tolls are concerned, deal primarily with railway tolls. There has not, however, been a development on any rigid logical method. By successive enactments, regulative jurisdiction has been conferred in regard to express, telegraph and telephone tolls. While in respect of railway services there is jurisdiction not only over facilities but also over tolls, the jurisdiction in respect of services set out in the preceding section is a toll jurisdiction alone.

The same lack of thoroughgoing logical organization is apparent when the terms of particular sections are considered. Section 375, sub-section 12, dealing with telephones provides that "The jurisdiction and powers of the Board, and in so far as reasonably applicable and not inconsistent with this section of the Special Act, the provisions of this Act respecting such jurisdiction and powers . . . shall extend and apply to all companies as in this section defined." Such a delegation of law-making power to a tribunal with mingled judicial and administrative functions would give pause to a United States commentator. In dealing with this situation, Parliament has shown that the same laws do not apply to it as those which apply to nature—Natura non facit saltum.

Not only those who desire to deal with the railway law of Canada from a technical standpoint but also those who desire from an informational standpoint to obtain an acquaintance with the evolution of Canadian law in regard to railways will find in the text a clear and compendious treatment applying wherever possible the scientific canons of the comparative method. In sum, it is an excellent and convenient work of reference.

S. J. McLean,
Assistant Chief Commissioner, Board of Railway Commissioners of Canada, Ottawa.

Railroad Freight Transportation. By Leonor Fresnel Loree, president of the Delaware & Hudson and chairman of the board of the Kansas City Southern. 734 pages, 6 in. by 9 in. Bound in Cloth. Published by D. Appleton & Co., New York.

The question sometimes arises as to whether railway men spend much time reading books. If more railway books like Mr. Loree's new volume were available the amount of book reading by railway men would be increased accordingly.

Whether railway men read many books or not, they do not write very many of them; at least, not nearly as many of them as might be desired. It is not often—at any rate not often enough—that readers of railway literature have the opportunity of reading a book by a railway operating officer and still less one written by a leading railway execu-

tive who at the time he writes is playing a leading role in the subjects with which he deals. As concerns Mr. Loree's book, one might wish that it would serve as a precedent. It is interesting and informative enough to serve as a good precedent.

The "jacket," as the publishers term the paper cover which they put on new books to protect the cloth binding and gold lettering, contains this statement: "This book discusses all that enters into freight transportation. It is the detailed and practical work of a railroad officer who draws upon ripe experience in presenting a thorough analysis of every phase of the subject." Careful perusal of the book leads one to remark that this statement is correct but modest, the latter being a characteristic unusual incidentally for book descriptions written by publishers. First of all, the book discusses many more things than freight transportation; it deals rather with railway activity in all its branches, although it is true that operation of the railway freight service is the feature that is given greatest emphasis. Secondly, the publisher, it would seem in all seriousness, might well have said a word or two more about the qualifications of his author. Mr. Loree is remarkably well fitted to write a book of this kind and his fitness is evidenced well in what he has written. There must be a strong tendency on the part of an author who has attained some standing in public life to say a great deal about himself in whatever he writes. Mr. Loree's place in the railway industry could be considered sufficient cause for him to do this very thing. The temptation, however, has not proved too strong for Mr. Loree to combat. The book, therefore, is in no sense whatever autobiographical. It is about railway operation and the author has used his own wide experience only as a source from which to draw some valuable suggestions about railway operating problems and for some extremely interesting examples to illustrate important points in his text.

In 734 pages an author can deal with many subjects and discuss many things, and that is exactly what Mr. Loree has done. Construction, maintenance-of-way and mechanical matters are all given extensive attention. History—notably the history of the locomotive—comes in for considerable space, as also do accounting, statistics and the various other related subjects. The book, however, deals primarily with operation. There are some extremely interesting analyses of the duties and responsibilities of the various workers in the railway service. One section—Part V, Movement of Cars—deals with such subjects as the distribution of time in a typical car journey, car loading, reconsignment, yard and road handling, per diem, the matter of car repairs, car ownership and the responsibilities of the carrier from the standpoint of car supply. The value of the section, as also the value of the other sections of the book, lies not only in the amount of data given but is perhaps primarily embodied in the practical suggestions made to secure improved results in operation and in consideration of what might be done to induce shippers to use cars as transportation facilities rather than as warehouses.

Part VI, dealing with the Movement of Engines and Trains, discusses such subjects as engine ratings, yard work, operation under the standard code of train rules, etc. Some few pages are devoted to signals, although possibly less than the importance of that subject might well deserve. The last 200 pages of the book are devoted to labor. There are discussed the duties and responsibilities of the train and engine crews, after which there follows a long array of details about relations with labor covering such matters as rates of wages, the labor movement as embodied in the long series of wage demands and arbitrations; there is also an interesting section dealing with some of the large strikes which form an important and interesting part of American railway labor history.

The book attracts because of the amount of interesting data which is included; it will have a real value as a book of reference, because some of the information given is not readily available anywhere else. If one were to suggest, however, the book's greatest value, it would be the interesting manner in which it is written. It certainly is characterized by its readibility, and that is an asset which no one in these days can pass without notice. Nor can one read on without thinking when one comes to such clauses as these:

"In a big terminal the difference in value between a good yardmaster and a poor one may amount to a president's salary. The yardmaster who is competent to handle a difficult situation is not always estimated at his full value."

"I have served in a great variety of positions in the railway service from rodman to president. I have always felt that the most desirable of them all, certainly in the vigor of life, is that of division superintendent. Here one knows personally his subordinate officers and men, their character, disposition and conditions, their ambitions, hopes and fears; he knows the customers of the road, their strength and weakness, prosperity or decline; here he can originate projects and follow them through to completion. Under the divisional organization especially he is more nearly master of the situation and of his own fate than in any other office in the service."

And speaking of station agents:

"I am afraid that employees generally have not sufficiently absorbed the fact that it is the use of the car that is wanted, and not the money involved in the collection of demurrage, so that the effects of their efforts with patrons along this line have been somewhat negligible."

"It used to be said that to educate a locomotive engineman cost the company $5,000 and Addison Hills, the vice-president of the Lake Shore, told me in 1886, he thought it cost one million dollars to educate a general manager."

A good example, surely, to illustrate the value of the subject under discussion, in this instance, continuity of employment.

It is not necessary nor is it desirable, however, to be laudatory concerning Mr. Loree's book. One cannot suggest that the book is a perfect production. For one thing, it might, one would suggest, have a better arrangement; subjects sometimes appear under what is patently the wrong heading. In a few places they appear to be dropped and later taken up again. There is considerable extraneous matter and in instances digression from the subject in hand. Other subjects seem to be slighted. Electrification of steam railways, notably, is given scant treatment; the matter of the improvement in locomotive and car design in recent years is given rather less attention than the subject may be believed to deserve. Presumably because the book deals with railway operation, Mr. Loree omits discussing such subjects as railway regulation, valuation, etc., in which he must hold a special interest. He would be expected to be at his best in such subjects as these. On second thought this statement may be a bit too strong. He would have to be pretty good, after all, to be better in them than in the subject around which the present book is written—name, operation.

Taking the book by and large, one has no hesitation in recommending it highly. It is a very informative book by an expert in the subject and it is most interesting.

The review would not be complete did it not acknowledge certain statements concerning the *Railway Age* which Mr. Loree has included in a section dealing with the sources of information which are available to the railway man. On page 194 he says:

"In 1917, it was seen that government operation of our railways as a war measure was contemplated by the administration. From that moment the whole force of the paper was trained against the possible added calamity of government ownership; and not until the railways were actually turned back again to their owners to be operated was there any let-up. The publisher does not claim that the Railway Age fought the battle alone, but he does claim that it was the greatest single factor in bringing order out of chaos and in preventing government ownership."

And on page 195:

"It is probably true that no other technical journal in the world is quoted as frequently and fully by the daily newspapers as is the Railway Age—a great tribute to its strength and a considerable factor in molding public opinion."

Letters to the Editor

[The Railway Age welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

When and How to Eliminate "Whistle Stops" at Crossings

Baltimore, Md.

To the Editor:

Referring to the letter written by "Quaestor" which appeared in your issue of October 21, 1922; the problem is simple.

(a) Capitalize the stops at $1.00 a stop; that will define just what expenditure may be justified to obviate the stops.

(b) Capitalize a crossing collision.

(c) Separate the grades and thus provide permanent relief and prevention against accident; such cannot be obtained either by automatic signals or interlocking.

F. P. Patenall,
Signal Engineer, Baltimore & Ohio.

Get the Employees to Boost

Portland, Me.

To the Editor:

During the life of the ordinary man, combinations of trade and industry have grown to large proportions. The day of production on a small scale is becoming more and more circumscribed. The personal touch between employer and employee has practically disappeared and has been superseded by the impersonal relation between corporation and servant. The duties and responsibilities of the ordinary captain of industry afford him little, if any, time to devote to the human side of his business, even if by temperament and inclination he was prone to cultivate the friendship and good-will of his subordinates. It is gradually becoming more and more apparent that transportation must be concentrated in large capitalized groups. Large competing aggregations of transportation agencies make for efficiency and economy of operation. All workers, from the high executive to the day laborer, depend upon the successful operation of each individual property, the property serving the community and nation in proportion to the loyalty, efficiency, and enthusiasm of the individual worker. Co-operation is the keynote of success in such enterprises. Unfortunately, all do not agree in the definition of the word "co-operation."

All the animal kingdom and mankind work or perform in the hope of reward. To the animals we offer dainties; to the child at school, a good report card, or the approval of his teacher, is an incentive; the executive is compensated for his strain and anxieties by the success of his efforts and the remuneration that comes therefrom; the worker in all ranks is looking for the same reward as the executive, but in a lesser degree. To the worker, success means the commendation of his superior and associates, and the hope of material reward. Alas! deserved commendation is too often withheld; so much so that the worker often believes it is designedly withheld so as to stifle the hope of material reward. How can industry expect full efficiency if conscientious effort is not encouraged?

Co-operation, real co-operation, must be established between the impersonal corporation through its delegated executive and directors, and the rank and file if our railroads are to continue under private control and operation. Many of us have a sure panacea for the troubles of our railroads. Many are sure real co-operation can not come without government ownership. Security owners and substantial business interests are strongly opposed to government ownership. All agree that efficient and dependable service is contingent upon comity between owners and officers of the corporations and the employees. The ordinary workers, that is, those outside the official personnel, must be taught to take a personal interest in the property from which they derive their living. The morale must be built up so that each employee will defend, and know why he defends, his railroad, when it is assailed either within or without the ranks.

There are many and divers theories for bringing about co-operation within the service and co-operation between officials and the other employees. The rank and file must feel that accomplishment will bring definite reward. Many officials contend that agreements hold them from such action, but this is surely a mistaken notion. Man must have an incentive to put forth intensive effort. Some years ago the steel trust evolved a scheme to interest its employees in the securities of the industry. Some railroad systems are following along similar lines. Care should be exercised that the securities are fully as represented or the cure may turn out to be a disease. Employees should be encouraged to own their homes. The floater is never more than a temporary asset to any stable industry. Governments the world over encourage their citizenry to own land, for landowners, great and small, are always patriots, ready to fight for their countries. The bidding system in the train service operates against this principle, but it would seem that some way might be found to reconcile runs with home stations. To the trainman, seniority in service, with its rights and privileges, is a great stabilizer, and an incentive for efficiency in service.

The employee should be educated so as to be able conscientiously to refute false propaganda. In all walks of life we hear false statements as to policy and resources of the railroads, and alleged malfeasance of the directing powers. Too many employees actually believe their own railroads are concealing assets in order to influence a low wage rate. The effort made to refute this false propaganda is not fully effective, being too direct and radical. The lay mind is not impressed with a mass of figures followed by statements to which his mind and reasoning are opposed. The effort should be simple and direct, gradually unfolding the principles to be developed. Monthly magazines in which employees share in shaping the policy, bulletins in stations, and schools of instruction, are all helpful agencies in molding the minds of the employees. In the last analysis, the employee is the medium to turn the mind of the people to right thinking regarding our railroads.

For several years the Interborough Rapid Transit Company of New York has posted helpful bulletins in its car windows, bulletins helpful to both company and patrons. For four years, the writer lived at Fort Washington Heights and was prone to complain of the service rendered. About five years ago, one of these bulletins informed the public that during the rush hours, a car passed over the 96th street crossover switch every so many seconds. Any reasoning mind could realize that the subway service on that line at that time was at the peak. No doubt many were helped and pacified by the simple statements of facts so gracefully put forth.

If the railroads would issue monthly magazines, as before stated, setting forth truths in an interesting, readable style, readily comprehendable by the average lay mind, something would be accomplished in solving the problem of bringing back morale to the rank and file, as well as helping to mold public opinion through the employees. Dry statistics distributed to the ordinary person are a waste of paper and energy.

Let everyone "hoost" co-operation.

William W. Tirrell,
Former Examiner, Interstate Commerce Commission.

When Headlight Meets Headlight

BUFFALO, N. Y.

TO THE EDITOR:

The very interesting article in your issue of October 14, page 703, throws light on a question that has been somewhat dark. This light, however, is so dazzling that the reader is not at first convinced that the darkness really has been dissipated.

In trying to compose the differing and sometimes opposing views of the different observers who are quoted by you, it has occured to me that there are two simple points which did not happen to be mentioned by anybody. A headlight three miles away you can look at; but if it comes close up, you cannot; the glare is overpowering. This may not be a scientific way of looking at the question, but surely it indicates a very practical, if not a very precise, way of measuring the difference between seven miles and one-fourth of a mile.

Then, again, your various correspondents will, no doubt, agree with me that usually the vibration of the locomotive is sufficiently pronounced, when it is moving at ordinary speed, to enable an observer of its headlight to see and note the motion, sidewise or up and down; to tell quite readily whether or not the locomotive is stationary.

R. W. M.

DETROIT, MICH.

TO THE EDITOR:

In the symposium on electric headlights published in your issue of October 14, I notice that those of your informants who lay stress on the difficulty of estimating distances do not give their reasons in much detail. It is obvious that the condition of the headlight and the atmospheric conditions may vary greatly. If we analyze our difficulties, we shall find that in these features will be found, in many cases, the causes of our perplexity.

On the Grand Trunk, dimmers are made use of, intelligently; and in single-track territory an undimmed headlight is always to be taken as a danger signal. Seeing such a light ahead, an engineman must assume either that the engine whose light he sees is foul of the main line or that this is true of some part of the train attached to the engine. When a train goes into a side-track and the switch has been closed, the headlight is either dimmed or is entirely extinguished.

H. E. W.

Mr. Truesdale's Formula—and Hope

BOSTON.

TO THE EDITOR:

I wrote you the other day appealing for more serious attention to the problem of quickly settling disagreements about wages, working conditions and other things (*Railway Age*, September 30, page 508). Since then Mr. Truesdale, president of the Delaware, Lackawanna & Western has made a statement which powerfully reinforces the argument which I tried to present. It was in the annual report of the business of his company. He set forth the need of finding, for the task of solving the whole complex railroad problem, *broad-minded* men who can *inspire the confidence* of the public. The entire pregnant paragraph is worth quoting:

> "It certainly would seem possible that in the not distant future some clear headed, broad-minded, patriotic men who can inspire the confidence of a large majority of the best elements of our citizenship will study this problem and formulate a permanent policy that will fully meet the requirements of our people without the everlasting enactment of new laws, many of which are contrary to those already in effect."

I should like to emphasize a number of Mr. Truesdale's points. I cannot put the words in italics, for the numerous italicized clauses would tumble over each other. Look at the adjectives in the middle of the paragraph. How plentiful are the public men who are patriotic but neither broad-minded nor clear-headed! Those qualifying words must have been put there because of their weight, not for mere rhetoric.

"Inspire confidence!" How utterly impossible, except as a man who has established his reputation by self-sccrificing public service. Conservative people will not have confidence in any man of unknown antecedents; yet half our lawmakers (who should be the originators of what we call public opinion) are essentially unknown; not perhaps because of their own fault, wholly; we citizens, in carelessly ignoring our aldermen and legislators, are neglecting a duty. These public servants ought to be praised for their good deeds and criticised for their errors; but we do this, if at all, in the most haphazard manner.

Confidence of "a *large* majority of the *best* citizens:" what a huge problem! Yet that is our task. It is necessary to convince a large majority of the wise and prudent to overcome the great number of short-sighted or selfish citizens who cannot be reached.

Mr. Truesdale wants competent and exemplary citizens who will *study* the railway problem and formulate a *permanent* policy. Here we come to the nub of the question. Congress has tried hard enough to fix up something permanent, but with what success, nobody at present can tell. Study is the thing; but where is our guide? One could imagine an autocratic president who would compel the 21 members of the House Committee on Interstate and Foreign Commerce to study history and philosophy and become real experts in at least the domestic side of their duties; but, alas! the study would have to begin back a year or two before these gentlemen were elected to Congress. If we desire to accomplish anything toward reform in the immediate future, we must do something besides pray for such a miracle as putting strong and courageous statesmen in these 21 seats of the Lower House of Congress.

In essence, Mr. Truesdale hopes that it is "possible that some clear-headed men will formulate a policy" to obviate the "everlasting enactment of new laws." How can this be brought about? What can a railroad president do besides keeping up a hope?

I am not a president and make no pretensions to being a prophet; and I do not offer a solution. I think I have done a good thing if I have got you to reprint Mr. Truesdale's deliverance and to call the attention of other presidents to the fact that here is a succinct statement of the chief issue of the day; a brief paragraph which ought to be committed to memory by every one of them, so that the duty of keeping the question uppermost shall not be forgotten. As a mere layman I will, however, offer one suggestion, namely, that it is the railroad presidents of the country who ought to take the initiative. Presidents Rea of the Pennsylvania, Markham of the Illinois Central, Loree of the Delaware & Hudson, and others, have made addresses occasionally and have, no doubt, influenced the public in some degree, but they have barely made a beginning; and they can only very slowly convince the man in the street that they speak at all times with truly unselfish public spirit. They must get some other kind of man to make addresses. Chief Justice Taft is no longer available. Of other impartial and wise citizens who might be named, it might be said that their reputations are too local. (It may be, however, that the only way to educate the citizenry of America will be by employing numerous local men; four-minute men, such as promoted Liberty bond buying). I nominate Sir William M. Acworth. Get him to speak and write to the people of this country for a year. It would take months to convince many of our poorly informed and narrow-minded neighbors of Sir William's knowledge, wisdom, integrity and fair-mindedness; but the trial would be well worth while. He knows American railroad life as well as Lord Bryce knew our political and social life.

E. MOSEMAN.

Looking Westward with Both Reversible Track Signals Showing Green (White in Illustration)

Modern Signals Expedite Heavy Suburban Traffic

Color-Light Signals and Traffic Levers Increase Capacity of Available Tracks on Lackawanna

OPERATION of the Lackawanna's suburban trains in the New York district has been facilitated by the adoption on the section of line most difficult to operate of advanced operating methods, made possible by the installation of a highly developed signal plant using color-light indications throughout.

The section where the measures for improvement were taken lies between the Hackensack and Passaic rivers on the

Looking Eastward with Hackensack Bridge in the Distance

The Three Eastbound and Two Westbound Signals Show the Two Reversible Tracks and the One Non-Reversible Eastbound Track. Train Is Westbound on No. 1 Track (Reversible)

road's Morristown branch, its heavy suburban line. Operating troubles, aside from those normally encountered in handling heavy traffic with a limited number of trucks, arise principally from the drawbridges over the Hackensack and Passaic rivers. Traffic in these rivers, particularly the former, is heavy and is increasing. With trains during the rush periods following each other at intervals of from one to five minutes, the opening of either drawbridge for a few minutes results in holding up perhaps as many as a dozen trains. The problem was to secure the greatest possible utilization of available running tracks as soon as the drawbridges were closed. Formerly trains so held up had to follow each other on one track, assuming again the space interval maintained by automatic block signals. Thus the opening of a drawbridge during the rush hour would cause delays to some trains much greater than the period of time when the draw was open.

The seriousness of the open drawbridge as a source of delay to trains can readily be understood when the company's figures of trains thus delayed are examined. In June, 1922, a typical month, a total of 4,491 suburban trains were run. Of these 179 met with delays and the delay to 104 (58 per cent) of these was chargeable to open drawbridges. On at least two occasions in the past the road has joined with others in the attempt to secure a ruling to the effect that drawbridges need not be opened during rush hours. On both occasions, however, river shipping interests with powerful political influence were able to defeat the railroads' proposals. The result is that during almost any rush suburban hour may be seen the ludicrous spectacle of a tugboat towing a sand barge through a drawbridge to the delay and inconvenience of thousands of passengers.

The increase in the Lackawanna's suburban passenger traffic has been very great in recent years. The road is now handling about 21,500,000 passengers a year at its Hoboken terminal and all but about 800,000 of these travel on suburban trains, by far the greater number of which move over the Morristown branch through Newark. Westbound through trains likewise move over this line, while eastbound through trains, a few suburban trains and practically all the road's freight trains move over the Boonton branch through Paterson. It is the line through Newark then, which has had to bear the brunt of the heavy increase in suburban traffic. Over this line are scheduled more than 160 passenger trains a day. Most of these trains are of all-steel equipment and during the rush periods they run from eight to twelve cars. Superheated steam eight-wheel, ten-wheel and Pacific type locomotives are used, frequently double-headed. Originally a double track line, it had been increased to three tracks

from Newark to Roseville avenue and from Orange to Millburn. The addition of a third track from Roseville avenue to Orange to connect these two three-track sections is now under way and, when completed will give the road nine miles of unbroken three-track line westward from Newark. From Hoboken terminal to West End tower, 1.9 miles, where the Boonton branch leaves the Morristown branch, there are four main tracks. It is on the line between West End tower and Newark, 5.9 miles, where the improvements described herein have been made.

The drawbridges over the Passaic and Hackensack rivers are double track. The section of line between these two bridges was also double track, and there was in addition a third track of light construction used for freight switching movements but not for passenger traffic. The first step taken to improve operating conditions was to rebuild this track applying heavier rail and rock ballast and making it available for passenger trains. The double track drawbridges were not altered, however, and no other track changes were

Looking Westward Near Sanford's Crossing

Strong Green Lights of Reversible Track Westbound Signals Show White in Illustration. In the Distance Two More Signal Bridges can be Seen, Showing the Close Spacing of Signals.

made, with the exception of providing crossovers where needed. The company then had (1) a four-track line from Hoboken terminal, 1.9 miles, to West End tower (which is just east of the Hackensack river); (2) a short double track line across the Hackensack river; (3) a three-track line from the Hackensack river to the Passaic river; (4) a short double-track line over the Passaic river to Newark and (5) a three-track line from Newark west. The problem was to secure the greatest possible efficiency from the two double-track sections over the rivers and the three-track section between them, in order to clear away as rapidly as possible any congestion of traffic occasioned by the opening of a drawbridge and any normal congestion which might result by reason of the two short double-track sections in a territory where three or four tracks have been found necessary to meet the demands of traffic.

Ordinarily where three running tracks are provided two of them may be used in one direction only and the third is reversible during certain hours of the day. The Lackawanna has improved upon this practice by making only one of its three tracks, i.e., track No. 2, between the rivers usable in one direction only, viz., eastward. The other two tracks, No. 1 and No. 3, are reversible, and not during certain hours

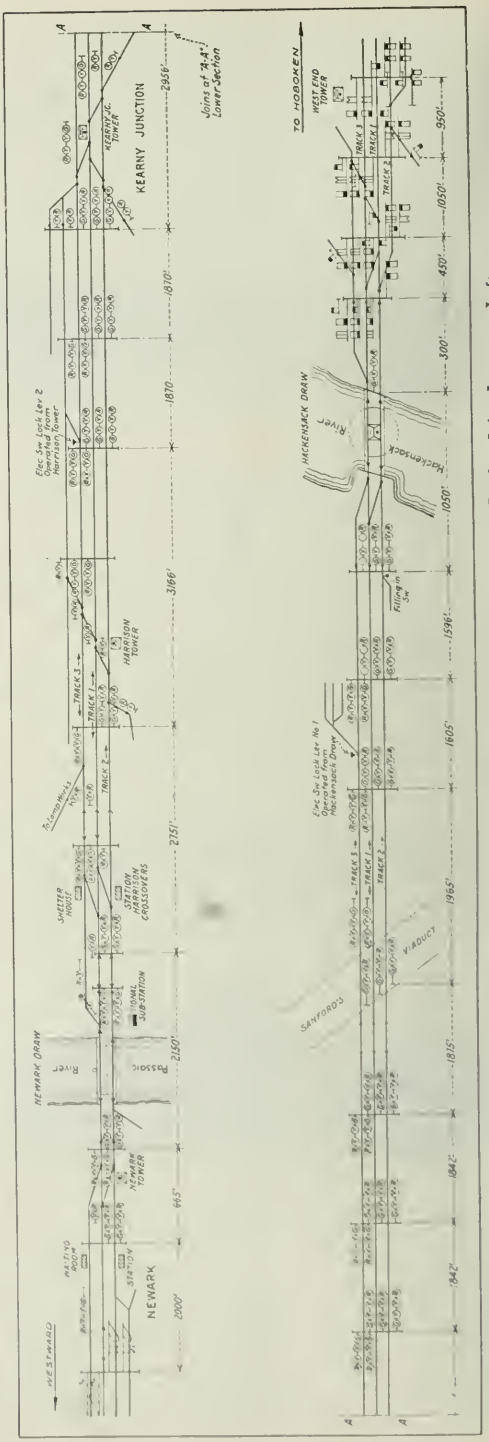


Diagram Showing Color Light Signals Between West End and Newark—Upper Section Joins Lower at Left

of the day only but at all times. Furthermore, both of the two tracks over the rivers are reversible at all times. By the addition of this track the road has doubled the capacity of this section of its line, allowing for ten trains in a given direction where there was room for but five before.

Without the most modern signaling equipment, however, it would not be practicable to reverse the direction of traffic over a given track at any time during the day. Traffic levers, therefore, are provided in all the signal towers between Newark and West End tower to control the operation of the reversible tracks. The traffic lever must be set in proper position before a signalman can display a clear signal to a train on a reversible track and the signalman cannot place his lever in proper position unless the signalman in the next tower places his lever governing that section of track in the same position. This the second signalman cannot do until he has displayed the stop signal against opposing movement.

For example, take the rush period in the morning when the heaviest movement is eastbound. Assume that two eastbound trains arrive at Newark simultaneously, one on track No. 1 and the other on track No. 2. Naturally, during this period one of the two bridge tracks, i.e., No. 2, will have its traffic levers set normally for eastbound movement, so one bound. At the drawbridges one track will normally be lined up for eastbound and the other for westbound movement. Under normal conditions very little changing of traffic levers is necessary, except that governing one of each of the bridge tracks and to allow for freight switching movements over track No. 3. During the evening (westbound) rush both reversible tracks between the rivers are lined up for westbound movement and eastbound traffic moves exclusively over No. 2, the non-reversible track. At the bridges, one track (No. 1) is lined up for west bound and one (No. 2) for eastbound movement and frequent shifting of levers will occur only for one of these tracks on each bridge when they are used, temporarily, for westbound trains.

In spite of the fact, however, that only at the bridges are changes in the direction of traffic sufficiently numerous to bring the levers into frequent use, the provision of them elsewhere makes for a flexibility of operation which in turn reduces to a minimum delays to following trains by derailment or by signal failures. If a reversible track is blocked for any cause, a signalman has only to shift the traffic lever for the remaining reversible track and following trains, crossing over, may proceed without delay.

The automatic signals in this territory are noteworthy.

Looking Eastward at Sanford's Crossing—All Signals Clear—Next Signal Bridge Visible in Distance

of the trains will naturally find the signals in position for its movement. The signalman, however, is aware of the approach of the second train and, let us assume, knows that no westbound trains are due. He will try to move his traffic lever governing track No. 1 to allow the second train to proceed over it. If the signalman at Harrison tower cooperates, sets his signal against opposing westward movement and moves his lever as desired, then the signalman at Newark can allow the second train, as well as the first, to proceed on its journey without delay, using track No. 1 over the bridge. Without the traffic lever, he would have to hold the second train until the first had departed and cleared the block on track No. 2.

Traffic levers are provided similarly to govern the two reversible tracks, Nos. 1 and 3, between Harrison tower and Kearney Junction, Kearney Junction and the Hackensack bridge tower and Hackensack bridge tower and West End tower. In practice there is not much frequency in reversing the direction of traffic except over the two drawbridges. Over the three track section one track, No. 2, is non-reversible eastbound. During the morning rush the traffic levers will be lined up to convert one of the reversible tracks, i.e., No. 1, also to eastbound movement and the other (No. 3) to westbound.

They, as well as the interlocking signals, are exclusively of the color-light type, using high voltage alternating current supplied by the company from its Hoboken power house, with a connection to the power lines of the Public Service Electric Company as an auxiliary source of supply. Fog and smoke often seriously obstruct vision in the Hackensack meadows and the color lights have a higher degree of visibility by either day or night than any other type of signal under these conditions. All interlocking plants in the territory are of the electro-pneumatic type of the latest design. Automatic block signals have four indications, as follows:

	Color given by	Indication
1	Red Light over Yellow Light	Stop and proceed
2	One Yellow Light	Approach Next Signal Prepared to Stop
3	Yellow Light over Green Light	Approach Next Signal at Restricted Speed
4	One Green Light	Proceed

The signals on these tracks are close together, a number of them being only about 1,800 ft. apart. This, of course, makes for high track capacity. Furthermore, with four indications, high speeds when the clear indication is given are safer than where only three indications are provided. The engineman will pass two warning signals, allowing ample time for reducing speed, before he comes to a stop signal.

The Lackawanna has, therefore, not only doubled the capacity of its line across the meadows by the addition of another running track—it has also made safe high rates of speed by the use of four-indication signals.

High interlocking signals have six indications, as follows:

Color given by	Indication
1. One Red Light	Stop
2. Red Light Over Yellow Light	Proceed at Slow Speed Prepared to Stop
3. One Yellow Light	Approach Next Signal Prepared to Stop
4. Yellow Light over Green Light	Approach Next Signal at Restricted Speed
5. Red Light over Green Light	Proceed at Restricted Speed
6. One Green Light	Proceed

Slow speed interlocking signals have two indications: One red light, indicating stop, and one yellow light, indicating proceed at slow speed prepared to stop.

Telephones have been provided at all signal bridges and main line switches have been provided with electric switch locks controlled by towermen.

Officers of the company hold the new signal system and the results they are obtaining from it in high regard. They report, too, that enginemen, although at first rather doubtful about the color-light signal, now are enthusiastic about it. The company is extending this form of signaling westward to Orange in connection with its extensive track elevation work at East Orange. When this work is completed, the company will have 9.4 miles of its line of heaviest traffic equipped exclusively with this type of signal.

Freight Car Loading

WASHINGTON, D. C.

REVENUE FREIGHT loading in the week ended October 14 increased 15,301 cars as compared with the week before, but was still slightly below that for the week of September 30, which was the largest so far this year. The total was 983,470, as compared with 910,529 in the corresponding week of last year and 1,018,539 in the corresponding week of 1920. The loading for that week of 1920 was the heaviest for any one week in the history of American railroads. The loading for the corresponding week this year is 3.4 per cent below that figure.

In the Southern, Central Western and Southwestern districts the loading was in excess of that for the corresponding week of 1920 and in all districts except the Pocahontas it was in excess of that for last year. Increases as compared with the preceding week were shown in grain and grain products, coal, coke, forest products and miscellaneous, but there were decreases in live stock, ore, and merchandise l.c.l. As compared with the corresponding week of last year there were increases in all classes of commodities except merchandise, l.c.l. This is regarded as an excellent indication of the improvement in business conditions as in dull times much freight is shipped in less than carload lots which at other times would be shipped in full carloads. The summary as compiled by the Car Service Division of the American Railway Association is given below.

The car shortage showed a further increase during the first week of October to 141,252, of which 40,499 were coal cars and 71,063 were box cars. At the same time there were surpluses averaging 5,500, including 3,024 coal cars and 97 box cars. During the period October 8-15 there was a further increase in the shortage to 156,309, while the surplus was reduced to 4,275. The shortages included 77,111 box cars, 44,984 coal cars and 7,631 refrigerator cars.

An improvement in the motive power situation is shown by reports filed today by the carriers with the Car Service Division. On October 1, 19,727 locomotives, or 30.6 per cent of the total on line were in need of repairs. On September 15, last, 20,157, or 31.4 per cent were in need of repairs. This was a net decrease during the last half of September of 430 locomotives.

At the same time, the railroads on October 1 had 44,703 serviceable locomotives which was an increase of 538 over the number serviceable on September 15. This increase was due to the larger number being repaired and turned out of the shops, and also to the installation of new locomotives.

Of the total number in need of repairs on October 1 last, 16,313 were in need of repairs requiring more than 24 hours. This was a decrease of 259 under September 15. There were also 3,414 locomotives in need of light repairs which was a decrease of 171 since September 15. From September 1 to September 15, 9,047 locomotives were repaired and turned out of railroad shops, while from September 15 to October 1, the total was 11,213, or an increase of 2,166 over the first half of the month.

The number of serviceable locomotives stored in October 1 was 1,501.

THE PORT HURON & DETROIT is being operated as a separate property, the contract under which it was operated by the Detroit, Bay City & Western having been terminated by mutual consent.

REVENUE FREIGHT LOADED.

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, OCTOBER 14, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year, 1922	Corresponding year, 1921	Corresponding year, 1920
Eastern	1922	8,913	3,281	59,410	1,847	5,776	4,876	62,654	92,441	239,198	.....	.....
	1921	8,799	3,383	51,741	1,889	4,392	1,162	62,150	82,801	.....	216,317	246,966
Allegheny	1922	3,179	3,207	59,503	5,179	3,181	9,350	43,871	74,156	201,628	.....	.....
	1921	2,477	3,290	51,434	2,666	2,949	2,949	48,647	59,288	.....	175,690	214,605
Pocahontas	1922	324	369	18,156	275	1,498	25	5,373	3,579	29,502	.....	.....
	1921	212	474	25,137	172	1,221	111	5,569	4,030	.....	36,826	37,694
Southern	1922	3,632	2,539	22,769	1,074	20,080	1,261	39,064	46,304	136,723	.....	.....
	1921	3,434	2,361	26,990	466	16,838	508	40,324	41,834	.....	132,745	135,338
Northwestern	1922	18,792	9,769	10,005	1,300	15,096	28,314	28,314	43,406	153,996	.....	.....
	1921	15,682	9,030	11,110	741	12,766	13,655	29,189	42,579	.....	134,752	167,939
Central Western	1922	18,554	15,843	19,825	386	7,311	2,108	31,474	61,319	150,820	.....	.....
	1921	11,004	14,065	21,997	218	7,191	736	32,063	56,871	.....	146,145	145,513
Southwestern	1922	5,198	4,133	7,258	147	6,783	425	15,373	32,286	71,603	.....	.....
	1921	4,239	3,416	5,138	147	7,405	799	16,458	30,452	.....	68,054	70,484
Total Western Dists.	1922	36,544	29,745	37,088	1,833	29,190	30,847	75,161	136,011	376,419	.....	.....
	1921	32,923	26,511	39,245	1,106	27,367	15,190	77,710	129,902	.....	348,951	383,936
Total all roads	1922	52,492	39,141	196,925	10,208	59,727	46,362	226,123	352,491	983,470	.....	.....
	1921	47,347	36,009	195,547	6,259	52,762	19,830	234,390	317,855	.....	910,529	.....
	1920	40,810	35,056	236,671	15,278	60,313	76,429	209,692	351,791	.....	.....	1,018,539
Increase compared	1921	4,645	3,132	1,379	3,909	6,965	26,542	.....	34,636	72,941	.....	.....
Decrease compared	1921	.....	.....	.....	.....	.....	.....	8,267	.....	.....	.....	.....
Increase compared	1920	11,682	4,085	.....	.....	.....	.....	16,431	.....	.....	.....	.....
Decrease compared	1920	.....	.....	39,745	5,570	585	30,067	.....	1,300	35,069	.....	.....
October 11	1922	53,192	39,141	196,936	10,208	59,727	46,367	226,123	352,491	983,470	910,539	1,018,539
October 7	1922	50,554	39,359	189,312	9,880	57,844	47,439	229,515	345,267	968,169	899,681	1,011,666
September 30	1922	52,179	39,830	189,549	9,456	58,742	49,777	234,517	354,581	988,381	904,831	992,283
September 24	1922	52,179	36,896	187,896	8,671	58,853	49,587	234,371	344,638	973,291	873,641	1,008,109
September 16	1922	53,090	34,929	172,241	8,188	57,371	53,293	234,513	333,294	945,919	852,552	991,166

Cabinet Officers Discuss Transportation

Various Problems Considered in Campaign Speeches in Different Parts of the Country

Various aspects of the transportation problem are being discussed by members of the President's cabinet in campaign speeches in different parts of the country. While Secretary Davis of the Department of Labor in a speech recently advocated the abolition of the Railroad Labor Board, Secretary Wallace of the Department of Agriculture, in one of his speeches, insisted that quarrels between railroads and their workmen which hang up freight movement must be stopped in some way or other. He also referred to the "burdensome" effect on agriculture of the present freight rates. Secretary Hoover in a speech at Detroit on October 18 laid much of the responsibility for the present inability of the railroads to meet all the transportation demands of the shippers on too much regulation. Attorney General Daugherty also made a speech at Canton, Ohio, on October 21, in which he denounced the radicalism of certain labor leaders and told of the actuating methods which compelled him in the name of the government to institute injunction proceedings at Chicago recently in the railroad strike.

Hoover on Car Shortage

Discussing the rail situation as it now relates to grain and coal shipments, Mr. Hoover said:

"The American roads have been so over-regulated during the last score of years that they find it difficult to finance the cost of acquiring the rolling stock and equipment necessary to keep pace with the ever-increasing industrial and agricultural needs of the country.

"Every year there has developed a serious car shortage and as a result there is today in New York a 5 per cent premium per bushel on wheat for export, due to the inability of the railroads to move grain in sufficient quantity to fill foreign demand. This premium does not add to the wealth of the farmer but is a direct charge against his just profit.

"There also exists a premium on soft coal ranging from 35 to 60 per cent above the normal price because of the car shortage. If there were sufficient cars to transport the coal the mines are capable of producing there would be no such premiums.

"It is safe to estimate that the car shortage levies a direct charge each year on both the producer and consumer of necessities of life, which amounts to no less than the entire annual cost of administering the affairs of the Federal government."

Wallace on the Farmer and Strikes

In an address before the Knife and Fork Club of Kansas City, Missouri, on October 23, Secretary of Agriculture Wallace said:

"There are two things about our transportation system which the farmers want fixed. First, freight rates on agricultural products should be decreased. They are too high with relation to the prices the farmers get. Transportation is a part of production, so far as agriculture is concerned. The farmer pays the freight. He does not want the railroads to reduce freight rates so low that they can not furnish efficient service. Service is important to the farmer. But freight rates are now too high. The farmers want the railroad people to cut down their operating costs, to insist upon a fair day's work for a fair wage, to move their freight cheaper, and thus be able to cut down rates.

"Second, some way must be found to break monopolies of both capital and labor and keep them at work. These quarrels between the railroads and the workmen, which hang up freight movement, must be stopped in some way or other. Farmers are both capitalists and laborers. There is more money invested in agriculture than in any other industry. There are more working people on the farms than in any other sort of work. But farmers get lower returns on their invested capital than the railroads get. They work longer hours and for much less pay than railroad workmen. Being both capitalists and laborers, the farmers can understand and sympathize with the just and lawful aspirations of both capital and labor. More than this, the farmers want both to prosper so they can buy their crops at fair prices. Farmers recognize the right of capital to organize, because only in that way can large business enterprises be carried on. Farmers also recognize the right of labor to organize and be able to bargain effectively with organized capital. But farmers do not recognize the right of labor organizations to conspire and tie up railroad traffic. Farmers have no sympathy with the sort of lawlessness which we had during the railroad strike. There are no words strong enough to condemn murder of men, intimidation of women and children and wanton destruction of property. The right to work is just as sacred as the right to quit work, and must be upheld by all the force of organized society.

"Interference with transportation is a direct attack upon the farmer and his family. Many growers of perishable stuff have gone bankrupt because they could not move their crops. Grain growers and live-stock producers have lost millions upon millions of dollars during the past six months because railroad owners and railroad workmen could not agree. The farmer is sick and tired of this sort of business. He can not stand it any longer.

"There can be no dispute between railroad owners and railroad workmen which can not be settled in an orderly way, with full justice to both, without interference with traffic and without imperiling the business and lives of innocent people. The rejection of lawful means of settlement and the appeal to lawlessness, whether by capital or by labor, must stop. If it does not stop, then in self-defense the farmer will be driven to adopt similar methods. If that should happen people in the cities would starve and we should have anarchy instead of government. The farmer can take care of himself, and he will if he must. He can live on his own farm. But if class is to be arrayed against class, if every group is to organize and fight every other group, our great republic will break down and with it will go the most advanced civilization the world has ever seen. We can not permit that to happen."

Daugherty on the Shopmen's Strike

"The Department of Justice," Attorney General Daugherty said, "had spent a million and a half dollars as economically as possible in a period of seven weeks during the rail strike to preserve 'public interests.' The government and the laws and the courts were being mocked, millions of dollars worth of personal property was being destroyed, and human life, itself, he said, was being sacrificed, as a result of strike conditions.

"The railroads of the country," the Attorney General declared, "are compelled by law to furnish interstate commerce for the country. It is the duty of government to see that this obligation is performed according to the letter of the law. The roads were attempting to keep interstate commerce alive, but conditions had reached a point where this was made impossible through lack of skilled workers, de-

terioration of equipment, and other conditions brought about by the strike of 400,000 members of the federated shop crafts unions.

"When the government acted, it was a duty, not to labor, not to the railroads, but to the American people and to the government itself. More than 17,000 affidavits from every section of the United States concerning anarchy bordering on civil war furnished convincing proof that the people needed the protection of their government as never before.

"Bear in mind that I did not undertake this proceeding as a partisan or as the advocate of the railroads. As between the railroads and those with whom they were in conflict, considering the matters in dispute, I was neutral, and I took no action on behalf of the government until it became apparent to the entire country that interstate commerce and the carrying of the mails were being interfered with to the extent that our people and our industries were being materially affected. The transportation crisis through which we passed came dangerously *near imposing a veto upon the economic readjustment* of our national life."

Mr. Daugherty said that when the railroad workers walked out they were in revolt against organized government. "In practically every other industry in this country and throughout the world," he said, "war-wage scales had been abandoned, but union leaders demanded continuation of wage inflation at the war peak. The government and those chosen to safeguard its integrity and constitutional rights, believe that labor deserves and should enjoy an equitable wage scale. There is no quarrel between labor and government upon this issue.

"Industrial paralysis, human suffering and irretrievable losses confronted the nation as train after train was laid off. Cessation of traffic was destroying the arteries of trade and commerce. Sporadically tales came out of the west, the southwest and the south and from our northern border states of derailments, maiming, sabotage, and even murder.

"Appeals were being made to Washington by countless thousands of American citizens. Scarcely a community in any part of the broad, free land was being spared the iron heel of terrorism. Depredation of property was in full swing, and human life was anything but sacred. All the great trans-continental systems were jeopardized, and the Interstate Commerce Commission, after infinitely painstaking surveys, had found that the rolling stock and equipment of the afflicted roads were so seriously impaired that 50 per cent of the locomotives in use were unfit for service and many were out of commission entirely.

"Then, when all conciliatory efforts on the part of trusted government emissaries had failed, when court proceedings in practically every district in the United States had been instituted by the railroads to safeguard their property and prevent willful and malicious interference with the orderly operation of their lines, when men were willing and anxious to work if permitted to do so, when transportation was impaired 50 per cent or more, the time had arrived when national security no longer made it possible for government to stay its hand.

"Appeal after appeal had come to Washington for troops," Mr Daugherty said, "but they were withheld. Who of you will say that it is not better to lay the hand of government, with its persuasion, its restraint, its admonition and protection, on the shoulder of the citizen, than to call out troops to shoot him down, and, as is always the case, mingle his blood with the blood of innocent bystanders and bruise the hearts of his loved ones?

"It must be remembered," he added, "that the freedom of speech guaranteed under the constitution is *not* that freedom of speech which incites mob violence, destruction of life and property and attacks on government. That is not what our forefathers intended by vouchsafing freedom of speech and liberty of press.

"May I call the attention of the law respecting citizens of this country to the fact that no frenzied voice was lifted by these same pedagogic pawns of profligacy when law-abiding American citizens by the hundreds, all over the land, were dragged into the mire of the woods, stripped of their clothing and there left; when almost as many, according to pre-arranged schedule, well carried out, it seems, by somebody, were tarred and feathered, when others were thrown into streams and their clothing carried off by the vandals.

"Where were those frenzied voices now crying out for freedom of speech, when the loyal engineer and his crew, in the dead of night, faithful to their service and their country, pulled twelve Pullman cars across the continent only to be suddenly switched into eternity without a moment's notice by the vandal and murderer who pulled the spikes and threw the switches that murder might contribute to the cause of anarchy, and anarchy might destroy government.

"The fact of the matter is," Mr. Daugherty said, "that under the circumstances and evidence existing and proved in the case at Chicago, had the attorney general not complied with the provisions of the law by taking the action he did, he could have been impeached, and any attorney general failing or refusing under similar circumstances to do precisely what was done, should be impeached.

"There will be no backward step in the policy of the government as at present organized," the attorney general said, adding that "I think we have reached the day when it may truthfully be said that we have seen in the United States the last extensive strike involving and tying up of transportation."

In a pronouncement to labor the attorney general said: "Your principal trouble lies and your greatest danger is in the radicalism and character of some of your most prominent leaders. Your security lies in the constitution of the United States and in the laws of the United States, and in the good opinion, by you deserved, of all the American people.

"A few irreconcilable railroad executives, who insist upon calling themselves 'hard-boiled,' might also, with considerable benefit to the country, be dispensed with. The fault is not all on one side, but at a time when strife that was almost civil war raged in this country, the government, having the right to do so, insisted upon the railroads performing their necessary functions to serve the people. Those in conflict with the railroads interfered with the performance of this service, and it was to protect the right of all the people that the injunction proceeding was brought."

International

Railway Construction in Kenya Colony, East Africa

Development of Concrete in Railway Construction*

A Study of the Design of the Minor Structures on the Delaware, Lackawanna & Western

By M. Hirschthal
Concrete Engineer, Delaware, Lackawanna & Western

THE MINOR STRUCTURES may be divided roughly into two groups, one for crossings in the sparsely populated country districts, the other for those in the suburban municipalities with well-defined widths of streets. In the country districts where property along the roads is undeveloped, the problems are more simple, since restrictions as to grade and headroom are generally not severe, therefore the semi-circular arch is more generally used for undercrossings. For overhead bridges an arch is more advantageous in both groups, because it permits of commencing the grades on both approaches with only an intervening vertical curve, whose point of intersection is at the center of span, the only disadvantage of this type being the restriction of vertical clearances over the side tracks.

Arch Undercrossings

The semi-circular arches for undercrossings vary in span from 20 to 55 feet, depending on the requirements, usually governed by the density of traffic along the highway in question. A typical 30-foot semi-circular arch is shown in Fig. 6. Exceptions occurred where clearances necessitated the using of flat construction for single spans, in which case either "I" beams or simple slabs were utilized as in Fig. 7.

In rare instances, where it was necessary to provide an exceptionally wide roadway, segmental arches were designed. This occurred near Hopatcong, where a 40-foot segmental arch bridge was constructed and treated architecturally to produce a pleasing structure as may be noted in Fig. 8. Several segmental arches of larger span were also constructed for the Orange improvements.

Overhead Arches

For overhead bridges the elliptical form of intrados for the arches was generally used because of the additional vertical clearance resulting from the use of that curve as compared with the segmental and because of its pleasing appearance. In addition to the unadorned arch bridge of this type (Fig. 9), there are shown two, one of which is this type architecturally treated (Fig. 10), while the other is segmental in form with ornamental details (Fig. 11), and which show the effectiveness of the treatment in each case.

At Kingsland, N. J., where Ridge Road crosses the track, an arch bridge of this elliptical type had been erected some years prior to the decision to locate a new station at the same site, that is, alongside the existing structure. The parapet and railing were torn down on the side adjacent to the proposed station and the arch foundations for the building were then constructed and connections made with the old arch bridge, as shown by the details, Fig. 12.

At Glen Ridge, N. J., the station, grounds and adjacent topography are delightfully rustic in character. Ridgewood Avenue is the thoroughfare that leads to the station and crosses the creek parallel to the tracks by means of a brownstone arch bridge in keeping with the surrounding coloring. It was necessary to renew the bridge over the tracks and the type of structure selected was an elliptical concrete arch with stone face for both arch ring and parapets, the construction being joined to the existing stonework of the arch bridge over the creek in absolute harmony, Fig. 13. Sneeden's Crossing at Convent, N. J., is shown to illustrate the architectural treatment of a basically unsymmetrical two-span structure of this type, Fig. 14.

Where conditions were such as to provide ample headroom, together without crops of rock in locations available for foundations, long span segmental arches were designed which result in striking structures, as shown in Fig. 15. Another structure of this type that is not ordinarily met with is the overhead arch at New Milford, Summit, Pa., Fig. 16. The intrados of this arch conforms to the parabolic curve, the radii and centers of circles being selected so as to approximate very closely the parabola selected to meet the conditions of rise and span existing for this case. These radii and centers are given to facilitate the laying out of the forms for the arch ribs. The abutments for the arch ribs are continuous. The approach and spandrel spans are of the T-beam and slab type. The end piers of the structures are open to permit of the fill sloping through, and short walls are cantilevered from the piers so that the slope will not encroach on the roadbed of the tracks.

Another striking structure which, however, combines sev-

Fig. 6—Typical 30-ft. Semi-Circular Arch

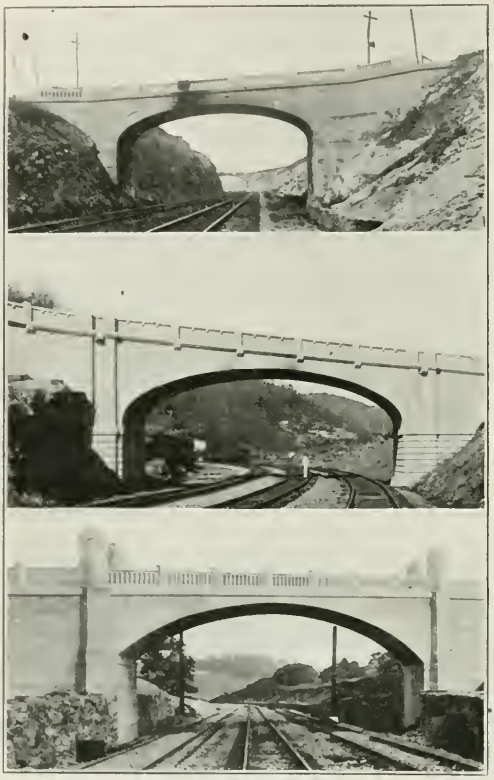
Fig. 7—Flat Top for Limited Clearances

Fig. 8—Segmental Arch for Wide Roadway

Three Types of Undercrossings

* This is the second of three articles; the first appeared in the *Railway Age* of October 14, page 705. The third will appear in an early issue

eral types of construction into a pleasing combination, is the Roaring Brook viaduct at Park street, Dunmore, Pa., which has a structural steel span over the tracks, a long span arch



Three Overhead Highway Crossings

Fig. 9—Lanterman Cut Arch
Fig. 10—Alford Roadway Arch
Fig. 11—Fuller Roadway Arch

over the brook and T-beam girder and column construction for the remainder of the viaduct, Fig. 17.

While the arch is the prevailing type for overhead bridges, the T-beam type has also been largely used. Fig. 18 is the only example of the three-span type of overhead highway bridge on the Lackawanna where the center span is made large enough to provide for the two main tracks and the necessary side clearances while the spans on either side are made long enough to provide for one side track and to take the slope of the fill to the roadbed.

Milwaukee Road at Clarks Summit, Pa. (the beginning of the Pennsylvania cutoff), crosses both the old tracks and the new at an elevation far beyond the requirements for clearance. Long span T-beam construction was selected as most suitable for this case and the beams were somewhat

Fig. 13—A Stone Faced Concrete Arch at Glen Ridge, N. J.

arched for architectural effect. There are six spans of 50 ft. each, center to center of columns, and two of 45 ft. with two expansion joints for a total length of 395 ft. (See Fig. 19 for illustration.)

A viaduct at Willow Grove, Pa., combines several types of floor construction in one viaduct. The road crosses the tracks at an angle of 45 deg. and as the span for two tracks and side clearances is 30 ft., the T-beam type was selected for this portion of the viaduct, the T-beams being at right angles with the center line of tracks; the skew ends are supported by the reinforced concrete fascia girders. The highway provides for a street car track, separated from the roadway by a curb, so that at the approaches the two-way reinforced slab was selected for the roadway, supported on girders along the face and at the curb line, while a simple slab spanning from the curb girder to the other face was selected to carry the street car loading. There is a curve at

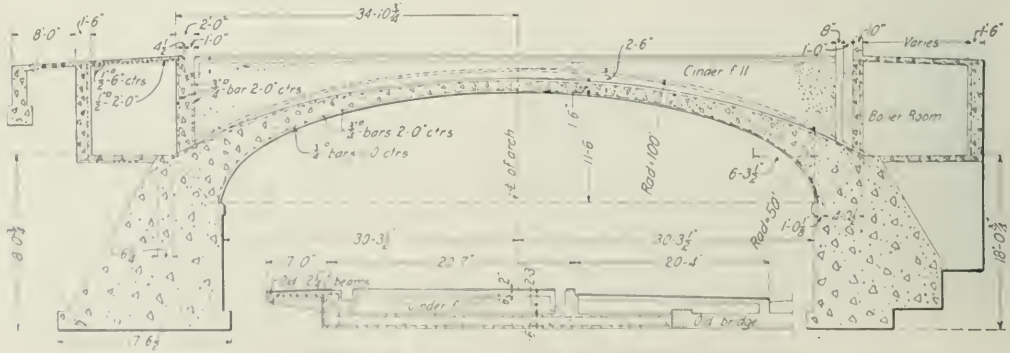


Fig. 12—Sixty-foot Arch Over the Tracks at Kingsland, N. J.

each approach in the opposite direction, the road being on a reverse curve at this point.

Unusual difficulties were presented in the design of the Bloomfield Avenue bridge at Montclair, N. J. Bloomfield Avenue was a busy thoroughfare prior to the improvement, having a double-track suburban car line crossing the railroad at grade at an angle of about 32 deg., resulting in a skew of 58 deg. Under the track was a large culvert, crossing the line of the railroad at an angle of 80 deg. and its bottom at a depth of about 25 ft. below top of rail so that the roadway slab for the new crossing was almost 50 ft. above the brook. Part of the abutment therefore had to be carried on the culvert and its extension, and with rock foundation at one section and soil at another the problem became quite complicated. In addition the approach walls were almost 50 ft. high, which would have resulted in enormous sections if designed as "gravity" sections. The ordinary reinforced sections having been estimated as very expensive, the cellular type of wall was designed, the writer believing this to be the first example (1911), with a thin slab surmounting the walls to carry the sidewalk loads, Fig. 20.

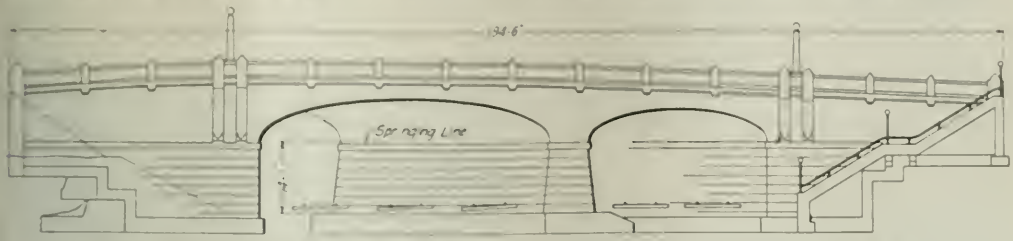


Fig. 14—An Unsymmetrical Two-Span Arch Bridge Over the Tracks at Sneeden's Crossing

Fig. 15—High Arch Span Over a Deep Rock Cut
Fig. 16—Parabolic Rib Arch at Milford Summit, Pa.

A very striking structure is the reinforced concrete footbridge constructed in the suburban district at James Park, Madison, N. J. One similar to this is in course of construction at Maple Avenue, East Orange, N. J. Fig. 21 shows the effective architectural treatment of this type of structure.

There were various farm crossings in the vicinity of Hackettstown that were spanned by bridges that required renewal, whereas the abutments were in good condition. To obviate the necessity of impeding traffic by falsework, the design was of the pre-cast type, the members being molded in Kingsland, transported to the site of the bridge and set in place in the interval between the passage of successive trains, Fig. 22.

Flat Top Undercrossings

Turning to the types used for the thickly populated districts like the cities on the line to Morristown through which the grade crossing elimination projects have been about completed, we find that since the eliminations consist of track elevation, the crossings are with very few exceptions undercrossings, which vary with the width of street. For a 50-ft. street, the bridge consists of two 24-ft. spans with a 2-ft. thickness of pier between. The pier has arched openings to permit of additional light. The bridge floor consists of simple concrete slabs spanning from pier to abutments. Fig. 23 shows a typical bridge of this kind.

An interesting example of this two-span type of bridge, but with smaller spans is the Punch Bowl bridge at Convent, N. J., Fig. 24. The street is 40 ft. wide so that with a 2-ft. 6-in. pier the clear openings are 18 ft. 9 in. each. The slabs were pre-cast and later set in place under traffic. There are really two bridges, one accommodating two railroad tracks and one for two tracks of the Morris County Railroad, which is a suburban street car line, the slabs for which are, therefore, lighter than for the railroad spans.

The architectural and structural features of this bridge

Fig. 17—A beautiful Structure at Dunmore, Pa., Embodying a Pleasing Combination of Construction Types

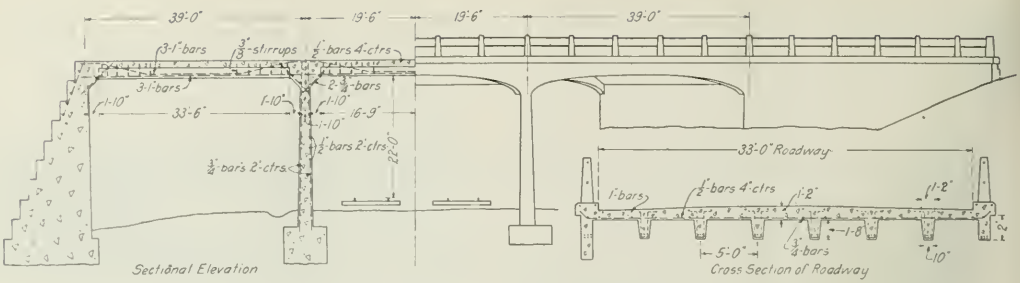


Fig. 18—T-Beam Construction May Be Treated to Give the Effect of a Flat Arch

Fig. 19—An Example of T-Beam Construction in a Concrete Viaduct

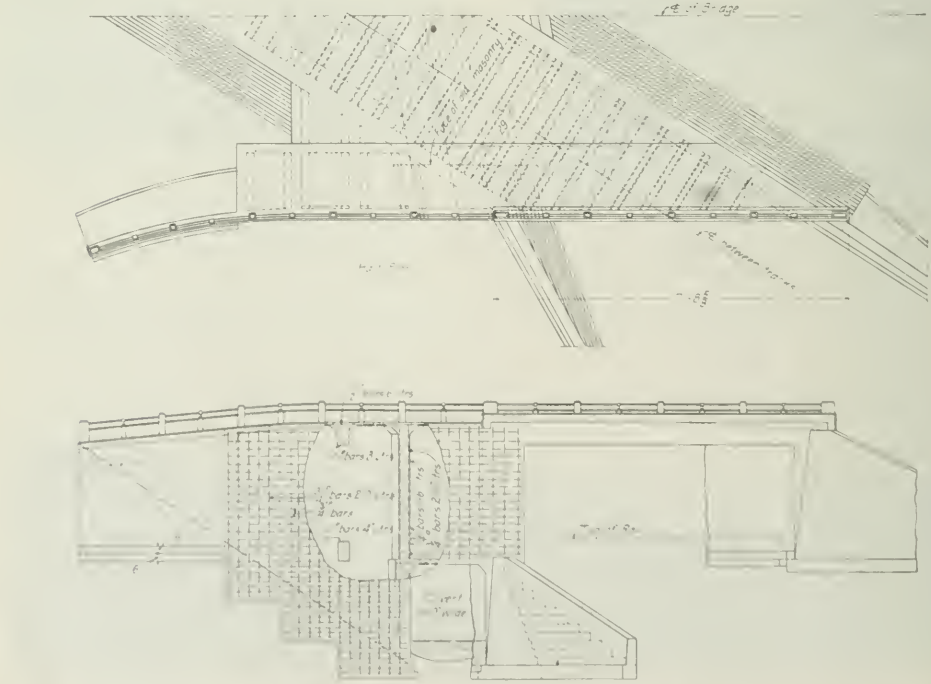


Fig. 20—A Complicated Skew Crossing at Montclair, N. J., Involving Cellular Construction in the Abutments

are the curved reinforced concrete wing walls which beautify the structure materially.

In the case of the 60-ft. streets it was necessary to resort to two types, one where it was permissible to locate a pier along the center line of street as well as along each of the curb lines and the other where it was imperative that the roadway be kept clear from curb to curb. In the first type,

Fig. 21—An Unusual Treatment of a Foot Bridge with Excellent Results

a slab of varying thickness, depending on the relative length of roadway and sidewalk spans, is designed continuous from abutment to abutment over the intervening piers. As a rule the roadway spans are 17 ft. 6 in. clear, leaving 9 ft. 6 in. for clear sidewalk spans, and the reinforcement is carried normal to the pier lines so that where the angle of crossing is skewed the parapets act as fascia girders to carry the loading

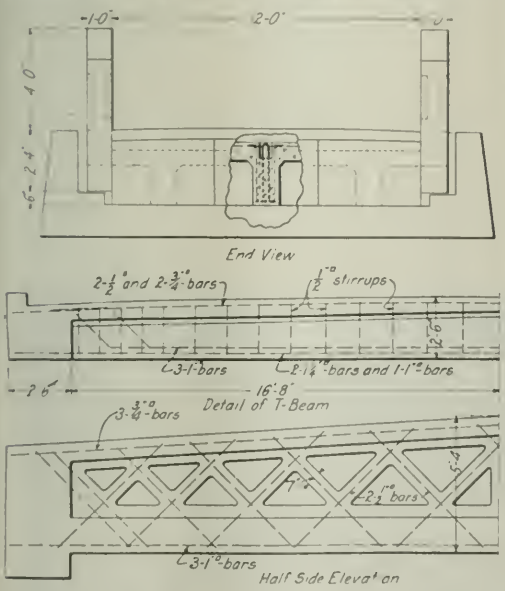


Fig. 22—Precast Unit-Construction Is Well Adapted to Locations Where Traffic Interferes with the Use of Falsework

transferred to them by the slab. The piers, two feet in thickness with arched openings, are carried on continuous footings. In some instances these bridges also carry station platforms which modify the design of the structure somewhat. Figure 25 shows a typical bridge for a 60-ft. street while Fig. 26 shows details of one at Lincoln avenue, Orange, N. J.

Madison Avenue bridge at Madison, N. J., is illustrated in Fig. 27, to show how advantage was taken architecturally of the large skew between the street and the track center lines to produce a structure of exceedingly pleasing appearance.

In the other type, where it was necessary to maintain a clear roadway, a span of 51 ft. clear had until recently been considered too large to permit the use of a reinforced concrete slab to take railroad loading, particularly in view of the limiting thickness of three feet for the depth of the slab. Recently, however, in the case of a bridge at Millburn, by the use of compressive reinforcement, a reinforced concrete slab three feet thick was installed for a 52-ft. clear span and may displace the design heretofore used which consists of I beams imbedded in a solid concrete floor three feet thick, where the structural steel was figured to take the entire load.

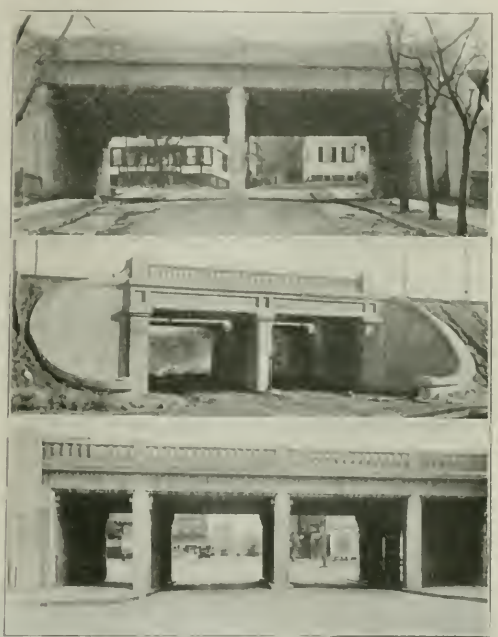


Fig. 23—Two-Span Crossing for a 50-ft. Street
Fig. 24—"Punch Bowl" Bridge with Curved Wingwalls
Fig. 25—A Four-Span Crossing for a 60-ft. Street

This slab is supported by box abutments enclosing the sidewalk spans as shown in Fig. 28.

Streets wider than 60 ft. are rare in suburban cities in the east, but they do occur. Sixteenth street and Fourth avenue, East Orange, are both 66-ft. streets and the side spans are then sufficiently long to permit the use of the four-way slab which was used on both of these bridges. Sixteenth street crosses the tracks at right angles while Fourth avenue crosses the tracks of the Montclair branch at quite a skewed angle, making the design considerably more complicated. The spans on the Fourth avenue bridge are irregular because of the different widths of sidewalks required for the two sides and because of the varying angle of skew of the two parapet faces caused by the location of the stairway from the station platform at one of the abutments.

Bridges for 100-ft. streets begin to partake of the nature of viaducts as expansion becomes a factor to be considered where structures exceed 100 ft. in length. At Madison, N. J., Green avenue is a 100-ft. street with 24-ft. 9-in. clear road-

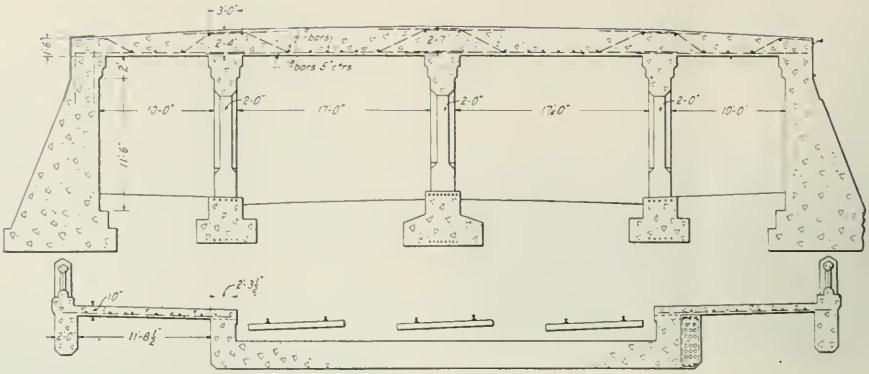


Fig. 26—Typical Details of a Reinforced Concrete Slab Subway Continuous Over Three Supports

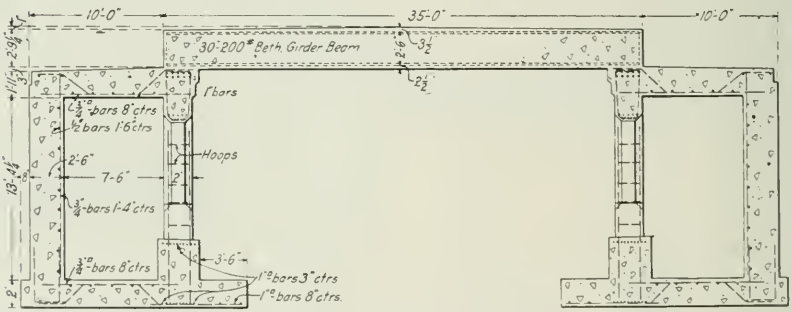


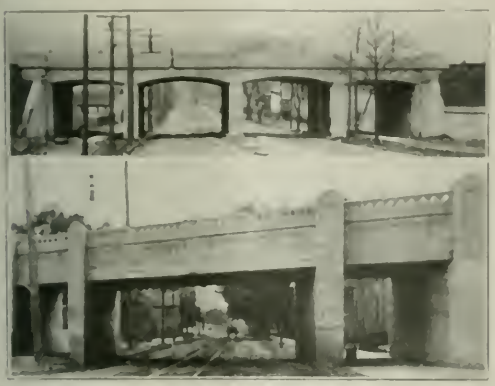
Fig. 28—An Example of Box Abutment Construction Enclosing the Sidewalk Spans

Examples of Two Subways for Wide Streets or Boulevards

Fig. 27—Madison Avenue at Madison, N. J. Fig. 29—Subway for a 100-ft. Street at Green Avenue, Madison, N. J.

way spans, 21-ft. 6-in. clear sidewalk spans and 2-ft. 6-in. arched piers between, bridged over with a 3-ft. thickness of continuous slab from abutment to abutment, the parapets acting as girders to take the load due to the slight skew of the road with the center line of track, Fig. 29.

Another 100-ft. street occurs at Central avenue, Orange, N. J., where the four-way slab was used. While the main spans here are 28 ft. 8 in. center to center of columns the



Two Examples of Slab Construction for Street Subways

Fig. 30—A Four-Span Crossing of 100-ft. Street
Fig. 31—Subway with Center or Roadway Span Consisting of Steel Girders Encased with Concrete. The Side Spans Are of Reinforced Concrete

thickness of floor slab is only two feet, about one foot and a half less than would have been required for a continuous slab of that span with only one line of reinforcement. A feature of this bridge is the use of columns at the abutment lines with the slab cantilevered beyond, to preclude the

Fig. 32—Concrete Coal Pockets at Montclair, N. J.

sliding due to expansion which usually results in spalling at the abutments. The abutments were built around the columns and clear of both the columns and the slab. Figure 30 shows the appearance of the finished structure.

The Springdale avenue bridge on the Montclair branch of the East Orange improvements is another of the four-way slab bridges which is almost long enough to be classed as a viaduct. In fact it is a double crossing, providing two independent roadways requiring a column spacing of 28 ft. center to center each, separated by two smaller spans and having sidewalk spans on either end. The total length of this bridge is 121 ft., end to end of slab.

Glenwood avenue at Bloomfield, N. J., is an example of a bridge with structural steel beams and girders entirely encased in concrete for the roadway spans, while the side spans are of concrete architecturally treated as to give the appearance of a homogeneous structure, Fig. 31.

In connection with various grade crossing elimination improvements, trestles were designed to accommodate sidings for industries adjacent to tracks. Fig. 32 shows the concrete coal pockets at Montclair.

Union Pacific Opposes Southern Pacific Application to Keep Central Pacific

WASHINGTON, D. C.

THE UNION PACIFIC moved promptly this week to meet the application filed with the Interstate Commerce Commission by the Southern Pacific for permission to retain control of the Central Pacific pending a determination by the commission of its disposition in the consolidation plan by filing a petition with the commission for leave to intervene in the proceedings on the Southern Pacific's application. The Union Pacific also filed a motion to dismiss the Southern Pacific application. An interesting feature of the case is that while the Southern Pacific has retained as one of its counsel in the case Max Thelen, former chairman of the California Railroad Commission, the list of Union Pacific counsel includes Edgar E. Clark, former chairman of the Interstate Commerce Commission, as a member of the firm of Clark & La Roe.

The Union Pacific motion to dismiss says that the commission is without jurisdiction to hear and determine the application of the Southern Pacific, that upon the facts and matters already before the commission, or of which it may take judicial notice, the application should be dismissed without the taking of testimony; and that in the exercise of its discretion and in recognition of the comity owed to the federal district court now having jurisdiction of the Southern Pacific-Central Pacific dissolution case, the application should not be entertained. The Union Pacific further moved that its motion be set down for oral argument before the full commission and that, pending the same and the decision of the commission thereon the commission and Division 4 postpone the taking of testimony either in support of or in opposition to the Southern Pacific application. A hearing on the latter had already been set for November 21.

The petition for leave to intervene states that the lines of the Central Pacific and of the Union Pacific together form a through transportation route between the Missouri river and San Francisco and other California points, and with the eastern connections of the Union Pacific constitute a direct transcontinental through route, and that by virtue of such connection and of its participation in such through route, the Union Pacific has an interest in the operation of the lines of the Central Pacific "independently of any control by interests hostile to said through route." It is also set forth that the railroads of intervenor and of the Central Pacific, together with the eastern connections at Council Bluffs and Kansas City, constitute the system of transportation through the Ogden gateway held by the United States Supreme Court in the decision of May 29, 1922, to be normally competitive with the southern routes of the Southern Pacific through the El Paso gateway, "which competition it is the purpose of the said decision of the United States Supreme Court to restore and protect." Some of the contentions made in the petition are:

Throughout the Pacific railroad acts, the lines to be con-

structed by the Union Pacific and the Central Pacific were treated in all respects as parts of a single project and it was specifically provided that the whole line should be operated and used, so far as the public and government are concerned, as one connected, continuous line. This requirement cannot be observed and fulfilled unless the Central Pacific is freed from the domination of the Southern Pacific "because the ownership and/or operation by the Southern Pacific Company of the southern routes through the El Paso gateway creates a primary interest on the part of the Southern Pacific Company in routes highly competitive with and hostile to the direct through transcontinental route formed by the railroads of the Central Pacific Railway Company and intervenor and their eastern connections."

"Upon the faith of the aforesaid requirement of the Pacific railroad acts, and; for the purpose of performing its part of the obligation imposed thereby and of handling efficiently and economically traffic to be routed over said through route and to be interchanged with the Central Pacific Railway Company at Ogden, intervenor has invested many millions of dollars in double-tracking 914 miles of the total 994 miles of its main line between Council Bluffs and Ogden and otherwise improving the same. Unless the statutory obligation shall be fulfilled on the part of the Central Pacific Railway Company or the interests controlling that company, the purpose of said acts will be violated, to the great detriment of interstate and foreign commerce and intervenor will suffer irreparable injury."

By virtue of these matters the Union Pacific said it had an interest in the execution of the mandate of the Supreme Court and in the adoption of a plan for accomplishing a severance of the control of the Central Pacific by the Southern Pacific which would leave the Central Pacific "free from domination by interests hostile to the Central Pacific-Union Pacific through route via Ogden and in all respects able to perform its part of the partnership obligation imposed by the Pacific railroad acts."

In conclusion the petition said that the mandate of the Supreme Court remands the case to the court for the district of Utah for further proceedings.

Car Service Division Orders Cars West

WASHINGTON, D. C.

In order to meet the demands of the farmers, the primary markets and the industries of the West, the Car Service Division of the American Railway Association on October 25 issued orders for a strenuous movement of cars of western line ownership into the western territory. This was done after urgent solicitation on the part of some western roads and representatives of shippers and state commissions. Effective at once and continuing until further notice all box cars except automobile cars belonging to the roads of the North Western, Central Western and South Western districts will be handled, according to the orders, as follows:

First: Eastern lines will discontinue all local loading of these cars and load them only to or beyond Chicago, Peoria, St. Louis or other western points from all territory east of Grand Rapids, Detroit, Pittsburgh and Wheeling, inclusive.

Second. Any cars for which through loading is not immediately available will be moved west empty.

Third: All loading at points west of Grand Rapids, Toledo, Pittsburgh, etc., will be discontinued and cars moved empty west for delivery to owning lines.

Fourth Western line cars will be accepted at junction points from the East regardless of ownership and through route providing home route orders take the cars in the direction opposite from home.

It is believed that these instructions will have the effect of materially improving the car shortage condition in the West.

The Great Northern on October 19 filed a petition with the Interstate Commerce Commission asking it to exercise its emergency car service powers by issuing an order, without notice or hearing, requiring connecting lines to return to the Great Northern at the earliest possible time box, refrigerator and stock cars so as to enable it to haul grain, fruit, vegetables, live stock, lumber and coal that were being offered in greater quantities than could be handled. The commission declined to issue an order as requested, but set the petition for hearing on October 24. Before that date, however, the railroad withdrew the petition.

The Car Service Division has compiled the following report indicating the volume of transportation being handled by the railroads and showing loading for the week of October 14, with various comparisons:

TOTAL CAR LOADING ALL CLASSES OF TRAFFIC

Week ending	1921	1922	Increase	Per cent
Aug. 19	815,147	856,219	41,072	5.0
Aug. 26	828,883	890,838	61,955	7.5
Sept. 2	831,288	931,598	100,310	12.1
Sept. 9	749,552	832,744	83,192	11.1
Sept. 16	852,552	945,919	93,367	11.0
Sept. 23	873,641	973,291	99,660	11.4
Sept. 30	904,831	988,381	83,550	9.2
Oct. 7	899,681	968,169	68,488	7.6
Oct. 14	910,529	983,470	72,941	8.0

GRAIN AND GRAIN PRODUCTS LOADING

Week Ending	1921	1922	Decrease	Per cent
Aug. 19	60,066	55,893	4,173	6.9
Aug. 26	58,838	54,562	4,276	7.3
Sept. 2	60,279	54,019	6,260	10.4
Sept. 9	54,964	47,732	7,232	13.2
Sept. 16	55,170	52,090	3,080	5.6
Sept. 23	52,906	52,379	527	.9
Sept. 30	57,222	52,129	5,093	8.9
Oct. 7	54,457	50,553	3,904	7.2
Oct. 14	47,847	52,492	4,645	9.7

LIVE STOCK LOADING

Week ending	1921	1922	Increase	Per cent
Aug. 19	28,499	29,756	1,257	4.4
Aug. 26	26,919	32,046	5,127	19.0
Sept. 2	27,273	31,847	4,574	16.8
Sept. 9	24,700	29,512	4,812	19.5
Sept. 16	30,098	34,929	4,831	16.1
Sept. 23	32,769	36,896	4,127	12.6
Sept. 30	32,979	39,830	6,851	20.8
Oct 7	33,767	39,359	5,592	16.6
Oct 14	36,00[illegible]	39,141	3,13[illegible]	8.7

COAL LOADING

Week Ending	1921	1922	Decrease	Per cent
Aug. 19	152,513	81,959	70,554	46.3
Aug. 26	159,513	111,030	48,483	30.4
Sept 2	154,586	149,487	5,099	3.3
Sept. 9	142,148	139,570	2,578	1.8
Sept 16	165,511	172,241	6,730 Inc	4.1
Sept. 23	170,156	187,896	17,740 Inc	10.4
Sept. 30	180,354	189,349	8,995 Inc	5.0
Oct. 7	182,595	189,312	6,717 Inc	3.7
Oct. 14	195,547	196,926	1,379 Inc.	.7

SURPLUS SERVICEABLE CARS ON HAND

Week Ending	1920	1921	1922	Shortage 1920	Shortage 1921	Shortage 1922
Aug. 15	1,782	284,338	140,253	....	....	....
Aug. 23	1,267	270,024	120,961	....	....	....
Aug. 31	1,022	246,740	70,455	....	....	....
Sept 8	769	237,972	43,168	....	....	....
Sept. 15	5,045	219,991	22,969	96,114	7[illegible]4	85,906
Sept. 23	4,965	201,153	11,292	89,947	1,470	107,666
Sept. 30	1,916	172,4[illegible]0	5,843	80,141	3,3[illegible]1	130,325
Oct. 8	1,928	142,970	5,500	75,336	5,237	141,252
Oct 15	2,188	1[illegible]1,944	4,[illegible]75	69,517	3,683	156,309

CARS MOVED

Reports of 55 railroads show cars moved during the period from September 9 as follows:

19..	Loads	Empties	Total
Sept 9	481,813	198,856	683,669
Sept 13	548,532	240,957	789,489
Sept 16	51[illegible],[illegible]81	214,555	725,536
Sept 20	[illegible]	47,679	806,916
Sept [illegible]	530,088	[illegible]3,39[illegible]	763,381
Sept 2[illegible]	582,082	[illegible]51,584	833,666
Oct 4	591,953	[illegible]	849,085
Oct 11	[illegible]8,064	[illegible]	855,869
Oct 18	[illegible]86,346	[illegible]	859,860

CARS MOVED

Reports made semi-weekly by 55 representative railroads show average number of cars moved per railroad per day as follows:

	Loads	Empties	Total
April, 1922	7,638	4,132	11,770
May, 1922	8,178	[illegible]	12,468
June, 1922	8,[illegible]	4,596	13,200
July, 1922	7,914	3,64[illegible]	11,559
August, 1922	8,631	3,789	12,420
September, 1922	[illegible]	4,248	14,149
October 11, 1922	11,096	5,053	16,149
October 18, 1922	11,063	[illegible]	[illegible]

Railway Fire Protection—Ninth Annual Meeting

Details of Varied Fire Risks—The Dangerous Cigarette—Fire Prevention Week—Hose Couplings

THE FIRST DAY'S proceedings of the annual meeting of the Railway Fire Protection Association at Washington last week were reported in the *Railway Age* of October 21, page 745.

The first report on Wednesday, the second day, was that of the committee on the use of gasoline trucks in freight stations, E. J. Reilly (Erie), chairman. Mr. Reilly had no written report, but asked numerous questions. The use of gasoline tractors in freight houses is being tried cautiously in a few places, because of the high cost of electric tractors, but every fire insurance man is, as a matter of course, reluctant to approve them. Gasoline tractors are declared also to be cheaper to operate and maintain. Gasoline (street) trucks have been freely admitted to New York City freight piers for years, on the ground floor, and it was the general feeling of the meeting that the railroads will eventually have to withdraw or modify their objections. It is taken for granted that the underwriters will insist that gasoline trucks used in freight stations be always stored outside the building. The Southern Pacific, at Galveston, Tex., uses some gasoline tractors on its piers, which have concrete floors. The gasoline supply is a mile away. A special muffler is used and inspection is rigid.

The Cleveland, Cincinnati, Chicago & St. Louis is trying these tractors. The Illinois Central uses electric tractors on its long pier at New Orleans and G. R. Hurd, of that road, believed gasoline could not be thought of for that service. Cotton is a principal commodity handled there. Mr. Reilly said that in Erie stations, at New York, barrels of sand for extinguishing gasoline fires had been maintained for a dozen years, but there had never been occasion to use them.

This committee was continued for another year.

The United States Chamber of Commerce and its activities were described to the members by J. L. Madden, manager of its fire prevention activities. His first general survey was finished last August and has shown definite good results. Mayors, governors and even the President of the United States have been exhorted in connection with Fire Prevention Week. Following Mr. Madden's address it was resolved that every member ought to co-operate with the United States Chamber and also with local chambers of commerce and any local power that can do good work in fire prevention.

The Question Box

Miscellaneous questions, brought together since the meeting opened, occupied the members for an hour. One of the most interesting of these was that concerning the rule prohibiting smoking. The labor troubles of the past four months have caused a good deal of disturbance of this rule. Many temporary dormitories have had to be maintained. The self-sustaining cigarette was declared to be one of the worst fire hazards. An appeal was made to members to work for the condemnation of all cigarettes but those in which, as in cigars, the fire goes out when the cigarette is abandoned. Shopmen should be allowed, at noon-time, to smoke; but only in designated places looked after by a caretaker. Fire inspectors should never smoke on railroad premises, even where smoking is not forbidden specifically. To cut down smoking, begin at the top. If a station agent smokes there can be no effective discipline of his subordinates.

Risks of fusees were briefly discussed. Dampness is the principal danger to be guarded against in that direction, though one member said that the best kinds now made do not suffer from dampness.

W. T. Krausch (C. B. & Q.) spoke briefly of the recent burning of the Burlington general office building in Chicago. The vaults, with walls 13 in. thick, functioned perfectly. The Burlington is going to provide portable steel cases for drawings which cannot be kept in vaults. B. S. Mace (B. & O.) called attention to the importance of protecting records at other places than headquarters; for example, at freight junction points. Every division of the road should have one fireproof place for records.

The use of radio telephone receivers was discussed briefly. Some members described damage that had been reported, but the majority seemed to think the fire hazard very small. The United States Steel Corporation found 5,600 radio sets in use in its numerous buildings.

Addresses by Messrs. Kimball and Fleming

L. P. Kimball, engineer of buildings of the Baltimore & Ohio, read a paper on co-operation between his department and the fire protection men. Everyone agrees that such co-operation is desirable, but the speaker's emphasis was on the importance of acting together before, instead of after, the building of any structure. He cited an instance of two similar structures, built about the same time, one of which costs for fire insurance $16,000 yearly more than the other, because the designers did not consult the insurance men.

T. Alfred Fleming, representing the National Board of Fire Underwriters, who had been chairman of a committee to carry on "Fire Prevention Week," gave a glowing account of the success of that enterprise. Messages of wisdom on fire prevention were sent out by 227 radio stations and were advertised by 1,400 Rotary clubs, 1,000 Kiwanis clubs and hundreds of other organizations.

Oxy-Acetylene Apparatus in Shops

The committee on safety in the use of oxy-acetylene welding and cutting presented a printed report of 18 pages, made up of a most elaborate code of rules for the guidance of everybody from the purchaser of apparatus to the last detail of inspection, and four pages of rules for shop workmen. The report was read by the chairman, G. A. Hays (U. S. Steel Corp.), and was discussed at some length. On a number of points differences of opinion proved to be marked and the report was referred to the executive committee, being accepted as in the nature of a progress report. One member proposes to put yellow flags on portable shop apparatus.

Fire Protection Views of an Engineer of Buildings

W. T. Krausch, engineer of buildings of the Chicago, Burlington & Quincy, read a paper on protection as looked at from his department, especially in relation to repaired or altered buildings. He outlined the best methods of renovating a frame station. He gave a condensed pen picture of the policy of the Burlington road in fire protection. Reports received from the insurance companies or brokers are dealt with at officers' meetings, thus avoiding the delays incident to correspondence with various departments. Officers of the road when on inspection trips must keep their eyes open and report to the fire department everything needing that department's attention.

Oil on Water

W. F. Steffens (N. Y. C.) read the brief report of a committee on fuel oil on water. Violations of law by oil-burning boats which waste their oil refuse on the surface of New

York and other harbors have been largely abated. This oil or emulsion is likely to remain in a harbor a long time and the evil demands persistent attention. This committee has conferred with the New York Fire Underwriters' Association and others, and had almost prepared for careful chemical experiments when its work was suspended by reason of the railroad shopmen's strike. The National Fire Protection Association has a committee on docks which also is studying the oil-on-water problem.

A Specialist in Railroad Records

Wednesday's session was closed with a brief address by E. M. Hawes of the Safe Cabinet Company, Marietta, Ohio, advocating the use of fireproof fittings and delineating vividly the annoying and costly experiences of railroad officers whose records have been destroyed in conflagrations. Illustrating by the recent Burlington office fire in Chicago, the speaker showed the inaccurate and often false use of the term "fireproof." Sixty per cent of iron safes fail when tested by a large fire. The Burlington's vaults stood the test; but the walls of many vaults are only two-thirds as thick as these.

Standard Hose Couplings

The first business on Thursday was the reading of a report by a committee, F. H. Elmore, chairman, on the Development and Use of National Standard Couplings for Fire Hydrants and Hose. Compiling data received from eight railroads, the committee finds that 92 per cent of the couplings can be standardized and that only three per cent would have to be replaced in adopting the national standards. The National Board is making some progress in standardization. A set of standardization tools can be had for $200 from the Greenfield Tap & Die Corporation, Greenfield, Mass. Railroads feel a drawback in their attempt to adopt national standards because their apparatus must be uniform with that of the city or town in which it is situated and many of the towns are not progressive. New York City, notably, has a standard different from the national. Some roads have made use of "adapters" for making it possible to use diverse sizes of couplings. Standardization can be facilitated by communicating with the National Board of Fire Underwriters, which will furnish paper strips to put around the threading of a coupler and make an impression with which to report sizes of couplings at the different locations. The paper, however, if used on a badly worn coupling might in some cases give a deceptive result.

This report was intended mainly to promote discussion among members during the ensuing months and was accepted as a progress report.

Dust in Grain Elevators

A. R. Small, vice-president of the Underwriters' Laboratories, Chicago, read an address on The Control of Dust in Grain Elevators. Two courses are always to be considered: (1) Remove the dust from the grain; (2) confine the dust in the grain. Removing it is objected to by farmers and others on the claim that good grain is also removed, some objectors going to the extent of alleging theft of grain. To confine the dust in the grain seems almost impossible; but the flour mills have had success in this line and their experience for 30 years should teach grain elevator men that dust can be controlled. For 40 years there has been no serious explosion in a flour mill. A principal safeguard is to provide that air currents shall flow into the chutes, not out of them.

This paper was followed by a long discussion covering many details of the subject. A large elevator at Chicago has a vacuum cleaning system which has displaced 40 or 50 men who formerly were employed as sweepers, but the discussion seemed to indicate that the superiority of the vacuum system, for general use, has not yet been demonstrated. The high standards set forth by Mr. Small in his paper were generally looked upon as suitable and highly desirable when designing new elevators, but difficult of application to old ones. Mention was made of the fact that with the latest forms of machinery the costly safeguards are needed because these machines operate at perhaps 10 times the speed of older designs. The National Fire Protection Association is working on a standard for machinery used in elevators.

Timber-Treating Plants

L. F. Shedd (C. R. I. & P.), chairman of a special committee on Fire Prevention at Timber Treating Plants, read a report, detailing under 14 heads the principles to be followed and the rules needed for the thorough protection of such treating plants. This paper was not discussed, the aim of the committee having been to prepare a complete and detailed code of rules for the consideration of members between now and the next meeting of the Association.

Mr. Shedd's report ended the list of formal papers and some time was spent in informal discussion of miscellaneous matters. Serious fires started by the ignition of locomotive cab curtains by men using torches were briefly discussed.

A meeting held some weeks ago by eastern members was spoken of as a great success and Robert Scott (A. C. L.), expressed the intention of starting a movement for holding district meetings in the south. A proposal to amend the constitution so that members of the executive committee could not hold office for more than one term at a time was discussed for some time but finally was voted down. In practice the rule of rotation in office has been pretty generally followed, so that any objection to individuals remaining in office too long was looked upon as theoretical only.

The officers chosen for the ensuing year are: President, E. A. Ryder (B. & M.), Boston; vice-president, George R. Hurd (Illinois Central), Chicago; secretary and treasurer, R. R. Hackett (B. & O.), Baltimore. Members of the executive committee: C. J. Parker (N. Y. C.), New York City; J. R. Peters (Penn.), Philadelphia, and W. S. Topping, Bureau of Explosives, New York City. The retiring members are R. H. Newbern and G. R. Hurd.

The Foamite Firefoam Company gave a motion picture exhibition of the use of its suds for extinguishing oil fires, including an actual conflagration at a large oil tank farm in Wyoming. This was the only exhibit in connection with the meeting, although the Pyrene Manufacturing Company had a display in the hotel and the Simplex hydrant was demonstrated for members at a point outside.

International

Batignolles Tunnel, Paris, Where Many Accidents Have Occurred, Being Converted into an Open Cut

Railway Treasury Officers Meet At Asheville, N. C.

Railroad Financing, Mechanical Devices and Cash Payment of Freight Bills Leading Topics of Discussion

The Railway Treasury Officers' Association held its sixteenth annual meeting at the Battery Park Hotel, Asheville, N. C., October 19 and 20. Besides the regular business of the association, papers were read by F. L. Paetzold, secretary and treasury of the Great Northern, on the subject of "Mechanical Devices in the Treasury Department;" by T. H. B. McKnight, treasurer of the Pennsylvania Railroad, on "Railroad Bonds as an Investment;" by E. L. Copeland, treasurer of the Atchison, Topeka & Santa Fe, on "The Transportation Act and the Treasury Department." A report was also presented on, "How Shall Essential Uniform Observance of the Rules Governing the Collection of Transportation Charges be Attained?" It was prepared by A. T. Bayfield, treasurer of the Lehigh Valley; W. J. Moody, treasurer of the Erie, and F. T. Dickerson, treasurer of the Central of New Jersey.

The president of the Association for the past year was D. K. Kellogg, treasurer of the Richmond, Fredericksburg & Potomac. New officers elected for the ensuing year are: President, W. F. Ingram, treasurer of the Southern Pacific; vice-president, J. F. Fahnestock, treasurer, Pennsylvania Railroad; second vice-president, J. T. Reid, treasurer, Atlantic Coast Line, and secretary and treasurer L. W. Cox, who is assistant secretary of the Norfolk & Western with office at 1217 Commercial Trust Building, Philadelphia, Pa. Members of the executive committee were elected as follows: A. B. Jones, (C. & N. W.); R. N. Harry, (C. C. C. & St. L.); J. A. Yates, (G. T.); A. F. Bayfield, (L. V.); J. P. Reeves, (C. & E. I.); F. T. Dickerson, (C. R. R. N. J.).

Railroad Bonds as Investments

By T. H. B. McKnight
Treasurer, Pennsylvania Railroad, Pittsburgh, Pa.

We railroad men are not in the habit of looking at railroad bonds as investments—at least not nearly so much as might be wished—but rather as the means by which money may be obtained for construction, equipment, improvements and refunding of maturing prior obligations.

When the first railroads were begun their projectors had but slight knowledge of what sums would be required to construct even the small local roads they had in view, and expected the financing to be made entirely from stock sold to the people in the proposed terminals or along the line of the road who naturally hoped to be benefited by the construction of the railway to serve them by carrying their products to the markets and bringing to them such supplies as they had to procure from a distance. The reason for their subscription toward the stock of the new company was hardly to make an investment, but rather to expend money to secure the benefits which would come to them from having cheap and rapid transportation. Owing to ignorance of what it would cost to construct a practical railway ready for operation, the amount required far exceeded expectations and repeated stock issues were necessary and finally failed to bring any additional funds. To attract more money it soon became necessary to make the investment more secure, and preferred shares were issued, giving the new subscribers a preference over the earlier ones, both in dividends and as to division of the assets in the event of liquidation. This increased security, however, failed to procure all the money required and it was necessary to borrow money on the only security generally known in those days—a mortgage on the property—and bonds were issued, but always in sums insufficient to complete the property for operation, so that one issue followed another, each junior in lien to those that preceded it. There were first, second, third and fourth mortgages on the same property; and then came income bonds, when there was nothing else left to mortgage.

It is interesting to note that during these early years when these bonds were going out in successive series, the railroads always seemed to cherish the hope that someway, somehow, they would be able to pay the mortgage debts off, and elaborate sinking funds were provided for out of future earnings to retire enough bonds each year to extinguish the loan at maturity. The earlier railroad builders seemed to have uniformly been of a hopeful and optimistic temperament!

Very few of these early hopes were gratified by fruition and most of the investors in the bonds and practically all of the original projectors of the railroads lost all the money that they put into the enterprise, though some of the owners of the first mortgage bonds may still, in a reduced amount, have an interest in the stock of the present corporations.

Three Periods

Railroad bonds may roughly be divided into those issued in three periods:

I. *Construction*: Practically all of these bonds were extinguished by foreclosures, the first mortgage bonds sometimes receiving stock in the new corporation, only to be wiped out later by a foreclosure of later bond issues. Those that were not foreclosed were paid at maturity or refunded. These bonds generally carried 6 to 8 per cent, for money was not so plentiful in those days and interest rates were higher.

II. *Growth and Prosperity*: Many of the bonds issued by the stronger roads during this period, which lasted up to about 15 to 20 years ago, are still outstanding and are the best of investments, because the railroad people were still entirely unable to realize the expenditure that would be required in the years to come, and hence put out comparatively small issues, so limited that, when the bonds authorized under that mortgage had been sold, future issues had to be made, which were of course junior liens. From force of habit and with the idea that it improved the sale of the bonds many of these issues had sinking fund provisions that are proving very embarrassing to the present corporations, which have to borrow money on junior loans at higher rates for betterments while much of their income must be applied to buying in low-rate prior lien bonds at exorbitant prices.

III. *Government Interference*: With the gradually increasing domination of the Interstate Commerce Commission and its mistaken policy of steadily reducing traffic charges, notwithstanding that growing operating expenses were every year as steadily reducing the margin of profit, it became difficult and finally almost impossible for the railroads to finance necessary but non-productive betterments, such as elevation of crossings, out of net earnings, as had been the proper method for years, or to provide for productive additions and improvements by sale of capital stock, and forced them to provide the money needed for all purposes by sale of bonds, which were necessarily of inferior lien and were known as consolidated, general or refunding bonds. By this time too the railroad officers began to get a vision of the vast expansion of facilities that would be required to perform the service to the public that would be needed in the not very far distant future, so that these mortgages, though limited at first to definite totals, yet permitted so large an issue that they may be called "blanket mortgages" as they cover all the property "now held or hereafter to be acquired."

Comparatively recently mortgages are being put on the property with no limit as to the amount of bonds that may be outstanding thereunder except one based on the amount of capital stock outstanding; for example, in recent mortgages of two of our greatest companies, the provision is that the bonds outstanding under the mortgage and prior ones

must never be more than three times the amount of the capital stock. In such mortgages too the issue of bonds may only be made for betterments or property acquired or for refunding prior liens. These mortgages are the final ones, because they are practically without limit, they will never be exhausted, as when the early series of bonds mature later series will be issued under the same mortgage to refund them and to pay for additional betterments.

Partly because of these blanket mortgages a new form of security has been and is being very largely issued—equipment trust certificates—which are mortgages placed on new equipment before they pass into the ownership of the railroad and under its mortgage, or, as in the Philadelphia plan, where the title to the equipment remains in a trustee until the railroad has paid the cost, over a series of 10 or 15 years.

Value as Investments

To value these various bonds as investments, it is necessary to consider the security of each class and what may happen in the 40 to 100 years which they have to run before the principal comes due. As practically none of the bonds issued during the period of construction remain outstanding now, we can omit any further reference to them.

The bonds of the period of growth and prosperity are outstanding in large amounts at prices based on the prevailing rate of interest. As many of them were issued at 3½ or 4 per cent they have sold very low during this war period of high interest rates but are now coming back to their own again. As these issues are limited in amount and no more can now be issued, they are, when the obligations of standard, well managed, dividend paying roads, very safe investments, and should steadily get better in security as prior liens are paid off and more value added to the property by improvements and betterments placed out of proceeds of stock or bonds of subsequent liens.

It is difficult to imagine anything that could make these prior lien limited issue bonds of a good road unsafe: Even if the radicals ever achieve their fondest hopes and the government takes over the railroads, it is inconceivable that they should not do so by purchase at an appraised value and these earlier bonds must then certainly receive their full par values.

When we come to the blanket or unlimited issues recently made in the period of government interference, it can only be said that the security of the bonds will depend very much on the amount issued, the prosperity of the road and the good or bad judgment displayed by the management in placing additions or extensions on the property. One large road has a blanket mortgage which permits the issue of bonds for the full cost of branches; and as it lies in a coal country the terms of the mortgage would permit the issuance of long term bonds for cost of branches to mines which would be worthless after the coal was exhausted—long before the maturity of the bonds. The purchase or construction out of bonds of a large extension which might prove unprofitable might seriously depreciate the value of the blanket bonds but could not in any way affect the value of the prior lien bonds.

There are now on the market so many good bonds of public service and industrial corporations which are well secured that a prudent investor will be inclined to diversify his investment. These latter bonds generally contain the provision that additional bonds can be issued under the mortgage only to refund prior lien bonds or for betterments at a certain percentage of their cost—generally 80 per cent—and then only when the income for a period of years has averaged three times the interest on all the bonds, including the new issue. Some such provision as this might well be inserted in the blanket mortgages of the railroad companies and would greatly increase the security of the bonds.

As long as railroad bonds of limited issue can be had the careful investor will naturally prefer them for investment of trust funds in his care, and in fact in many states he could not invest such funds in these new unlimited blanket mortgages until the prior lien bonds have been retired.

Equipment trust securities, especially on the Philadelphia plan, issued by a well managed, prosperous road that keeps its equipment in good repair, are about as safe as anything one can imagine, though they are generally of short term. As they start with a margin of safety of 15 to 25 per cent and are retired faster than the equipment deteriorates, and as equipment is always in demand if the certificate holders have to take it over, these certificates ought to be absolutely secure.

The careful investor will probably consider the various conditions surrounding the properties whose bonds are offered to him and the possibilities of future improvement or deterioration, and will naturally diversify his holdings by buying not too many of one kind of security, or of one company or one region, so that his chances of serious losses will be reduced to a minimum. He will of course have in mind the fact that all corporate bonds are subject to government influences, but he will find so few investments to which this does not apply in one way or another that he will have to decide that he cannot entirely avoid this danger but will have to assume it, and can only minimize it by scattering his purchases. He will also probably feel that there are very few corporations more carefully and honestly managed than the railroads, and none as to which such full and accurate information may be obtained, and in the future as in the past, well secured bonds of well managed corporations will be found to form a substantial part of all large funds, such as are carried by insurance companies, colleges, and endowed institutions of all kinds, and of the contents of the strong-boxes of wealthy individuals.

The investor should remember too that the priority of a security does not always make it safe—a general mortgage bond of a prosperous corporation whose property is well located may be much safer than a first mortgage bond of a less prosperous concern.

The tendency of the courts to continue receiverships indefinitely and to permit receivers' certificates to be issued and placed ahead of even the first mortgage does not make toward the security of railroad bonds of prior lien and has resulted sometimes to their great damage, but it really seems as if this practice has about reached its limit—at least we can hope so.

The Transportation Act and the Treasury Department

By E. L. Copeland

Secretary and Treasurer, Atchison, Topeka & Santa Fe

(Mr. Copeland's paper was in the form of a somewhat detailed analysis of the changes in railway regulation embodied in the Transportation Act. Concerning more particularly the treasury department he spoke in part as follows:)

During federal control the services of soliciting agents had been dispensed with. Freight cars for use of all lines had been distributed over the country as business demanded, and it practically made no difference what line secured the business relative to the earnings, as it was all federal. On the return of the railroads to the owners it was fully realized by all that competition for business would be as keen as ever. Under this situation, and with the treasury of the various lines in a cramped condition from lack of funds, it was important that some action should be taken relative to the payment of all transportation charges on a cash basis.

Advantage had been taken of the railroads by many large

shippers prior to federal control in order to secure a concession in the time required for the settlement of transportation charges, and unusual credit had been extended. The tariff charges to be assessed were declared as on a cash basis rather than a time period. In a hearing before the Interstate Commerce Commission some shippers thought that they should be given 15 to 30 days' credit, but Congress realized the injustice of such a plan, and determined that the service performed by the transportation companies should be paid for before the relinquishment of the freight, leaving it to the commission to establish such rules and regulations as would be consistent with good business requirements.

This conclusion was a fortunate one for the treasury departments of the railroads, assuring them that unlimited credit, delays in settlement, etc., would not be permitted under this law. In the general discussion of this subject it was clearly indicated by the members of Congress, that no industrial or mercantile line of trade should be permitted to transact business on railroad money, as that is practically the situation whenever an extended credit is permitted to railroad patrons.

The treasury department controls the collection of revenue and is expected to take care of the varying conditions relative to the delivery of all shipments, perishable or otherwise. The Interstate Commerce Commission has left the detailed requirements to the railroad treasurers, who are in close touch with the situation, and it placed a responsibility on them greater than ever before. Treasurers must know more about the financial responsibility of their patrons at all points on their line; they most avoid discrimination and at the same time recognize the importance of expanding the method of collection as the various lines of business may require. The iron-clad rules must be elastic in various ways. The handling of perishable freight must receive special attention; diversion and delivery of shippers order shipments, without surrender of original bills of lading must be fully protected; congestion of freight must be avoided by arranging for prompt switching and unloading of cars for further service.

I am enumerating a few of the things that the treasury department must handle without fear or favor. After much discussion, the Interstate Commerce Commission decided that exceptions could be made in the collection of transportation charges to well-known, financially responsible patrons, who would agree to pay the bills within 48 hours after presentation, and that where special conditions were such that additional credit should be extended, on the filing of proper bond with the treasury department, a credit of 96 hours could be extended from the time of presentation of the freight bills. This arrangement places the treasury department in close relation with the shipping public, and it is expected to keep posted as to the financial condition and the ability of parties to make settlement within the stipulated time.

These requirements of the commission are well known and have been published for the benefit of all shippers, but there seems to be a feeling that the railroads now being operated by their owners should extend ordinary business courtesies to patrons and permit them to settle the bills at such times as they desire. The treasurers of the railroads should realize that competition is very keen and readily see that the permitting of such delays would soon cause a large uncollected list of bills to report weekly, and at the close of each month. If continued, we would soon be drifting back to old conditions which existed prior to federal control.

I understand that the treasury departments of several lines are quite careless in this respect and refuse to join with other lines in removing delinquent patrons from the credit list. We shall never be able to force obedience to these rules if we permit a continuation of this condition, and I think the treasury department should decide that the rules must be enforced, and parties not making payments promptly should be eliminated from the accommodation list. Without this co-operation there is but one solution of this entire situation, and that is the establishment of railroad clearing house associations. These organizations are now in operation at Kansas City and St. Joseph, Mo., and we have no trouble at these points to make uniform collections from all patrons.

I would suggest that a survey be made by the treasurer of each railroad as to the cost of handling collections in all large cities, and when this has been secured, estimate the expenditure of a clearing house as operated on the Kansas City plan, and determine as far as possible which system would be the more economical. When you consider that under the clearing house plan the traffic officials are not annoyed with complaints against the department handling the collections and there is less friction between the railroads and patrons for the reason that all are treated alike and must pay accordingly, you will then find it much easier to enforce the law and permit the retention of traffic for each line as may have been solicited, according to the service to be rendered. In other words, under this plan you can insist on the collection of transportation charges without driving the business away from any one line.

(The Address of F. L. Paetzold, Secretary and Treasurer of the Great Northern, on the Subject of the Use of Mechanical Devices in the Treasury Department Will Appear in Next Week's Railway Age.)

French Railway Begins Its Electrification Program

By A. H. Candee* and L. E. Lynde†

AFTER A CAREFUL investigation into the subject of electrification, the railroads of France have decided to electrify over 5,000 miles of their tracks. This decision will enable them to increase the capacity of their present trackage, and will at the same time utilize some of France's tremendous waterpower available in the Alps, Pyrenees and other mountainous sections. A large amount of the coal used by the railroads is imported, which not only is costly but proves a serious handicap in time of war.

The following lines have all made definite plans toward electrification; the Paris, Lyons & Mediterranean running to Marseilles-Nice-Monte Carlo and into Italy, as well as into the Alps where heavy grades were encountered; the Midi operating in the southern part of France; and the Paris-Orleans.

The Paris-Orleans is taking the initial step in electrifying approximately 145 route miles, including its main line extending from Paris to Vierzon. The trains of the Paris-Orleans leave Paris from Quai d' Orsay station, travel through one of the most densely populated sections of Paris, after which they head practically southwest for Orleans, a distance of about 75 miles. Enroute to Orleans the road passes through Bretigny from which point a short branch line to Dourdan will be electrified.

Orleans, a city of over 70,000 inhabitants located on the Loire river, is the terminal for a large number of lines. From Orleans the line runs by Nouan and Sabris in passing to Vierzon. Vierzon, which is approximately 125 miles from Paris, is the terminus of the steam locomotive division and it is this division which the Paris-Orleans is electrifying.

200 Locomotives Will Be Purchased

For operation over this zone and a future extension south of Vierzon, 200 locomotives will be purchased. The orders for the first 120 locomotives have already been placed with a group of French manufacturers, namely Compagnie Electro Mecanique, Societe Schneider, Forges et Ateliers de Construc-

*Engineering Department, Westinghouse Electric & Manufacturing Company.
†Railway Department, Westinghouse Electric & Manufacturing Company.

tion Electriques de Jeumont and Compagnie Thompson Houston, each of whom will build a portion of the locomotives or equipment. Each locomotive will rate approximately 1,400 hp. for one hour and approximately 1,200 hp. continuously, both ratings being at 1,350 volts direct current. A single box cab will be mounted on two 0-4-0 swivel trucks, the total weight of locomotive complete being approximately 66 tons. The mechanical parts, however, will be of sufficient strength to permit of ballasting 79.35 tons, without any modification other than a change in springs. The dimensions of each locomotive are given in Table I.

TABLE I
Locomotive Dimensions

Length between buffers	41 ft.	5	in.
Length of cab	36 ft.	3	in.
Width of cab	9 ft.	10	in.
Total wheelbase	28 ft.	11	in.
Rigid wheelbase	8 ft.	10	in.
Distance between truck center pins	10 ft.	0	in.
Diameter of new wheels	—	47¼	in.
Thickness of steel tires	—	3	in.

The specified tractive efforts for these locomotives are given in Table II, these being with a gear ratio of 21 to 62 and wheels of 1.20 meters diameter (47¼ inches). Each axle will be driven by a series type, 1,500-volt four-pole railway motor rated at 300 hp. continuously at 1,350 volts and 350 hp. for one hour at 1,350 volts.

TABLE II
Specified Continuous Tractive Efforts and Speeds

Tractive Effort (lb.)	Speed (m.p.hr.)		
15,600	6.4	Series connections	Full field.
12,200	8.6	Series connections	Min. field.
15,600	13.7	Series-parallel connections	Full field.
12,200	28.8	Series-parallel connections	Min. field.
15,600	28.4	Parallel connections	Full field.
12,200	36.8	Parallel connections	Min. field.

While the mechanical parts and all but a few of the motors for these 120 locomotives are to be manufactured by European concerns, the complete control equipment will be built by the Westinghouse Electric & Manufacturing Company at its plant at East Pittsburgh, Pa. This is practically the only equipment which in its entirety will be manufactured for this electrification outside of Europe.

Locomotive Control Equipment

The locomotives are designed for double-end control, multiple unit operation and are governed through a low voltage battery train line. Westinghouse type HBF electro-pneumatic control will be used. The motors will be connected first in series, then in series-paralled and finally in parallel. Twelve series notches, nine series-parallel notches, and nine parallel points will be provided. The last two notches of each combination are field control notches, the field strength being reduced by means of inductive shunts. Variations in tractive effort from notch to notch must be kept very low on account of the limited strength of the car couplings. The circuits are arranged so that regenerative control and dynamic braking may be provided later with a minimum change by adding the necessary equipment in space left for that purpose. None of the locomotives will be provided with regenerative control at present, but extensions to the south of Vierzon will be over profiles which will warrant the use of this feature.

Third-Rail and Overhead Collectors Will Be Used

Power is to be received either through third-rail shoes or from overhead wire. It was the purpose at first to use a third-rail along the entire length of line except at stations, crossings, yards, and similar points, but the idea has been modified so that the use of the overhead conductor will be considerably extended.

The pantagraph trolleys will be of the air-raised gravity lowered type. A main knife switch will be provided for isolating the locomotive circuits from the trolleys and another will disconnect the circuits from the third-rail shoes.

The main circuit connections will be made by means of unit switches and cam switch groups, each being operated by compressed air at 70 lb. pressure per square inch. Use is made of cam switch groups only where it is found desirable to provide a mechanical interlocking of switches and where the cam shaft can be arranged for two positions only. Where cam groups must have three or more operating positions, the difficulty of stopping the cam shaft on an intermediate position would introduce a complication in the control and reduce its factor of reliability. Unit switches are also preferable for arc-braking service.

Overload protection is provided by the use of an overload relay for each individual motor circuit and also one for the main feeder circuit. A ribbon type fuse is placed in the circuit of each trolley and one fuse is placed on each side of the locomotive connected between the third-rail shoes on that side and the main knife switch. Provision will be made for installing a high speed line switch at a later date, should this be found necessary in order to further protect the motors against flashing.

One master controller will be placed in each end of the locomotive, to the left of the locomotive center line, with the brake valve to the left of the controller. The controller handle extends to the left of the controller for operation with the right hand. This arrangement is to conform to the standard French system of running on the left hand tracks.

Each locomotive will be provided with two blowers for motor ventilation and two compressors. The blowers will be arranged so that the failure of either will not cut off ventilating air from the motors. Expulsion type fuses will be used to protect these circuits. The control battery will be charged in series with the blower and compressor motors by the use of a battery-charging resistor and relay.

Rigid Acceptance Requirements for Locomotives

Very complete and thorough tests will be made of the various items of equipment both before installation in the locomotive and after the locomotive is complete. Preliminary acceptance of each of the first 10 locomotives will be given only after it has operated satisfactorily for a distance of 25,000 kilometers (15,500 miles). The balance of the locomotives will be given preliminary acceptance after operating satisfactorily for a distance of 1,865 miles. Each breakdown of more than four hours will extend the preliminary acceptance run by 621 miles for every two days or less that the locomotive is out of service due to defects. The preliminary acceptance for the first 10 locomotives, however, will be given within three months after their delivery if the necessary mileages have not been covered by that time. Subsequent locomotives will be given preliminary acceptance at the end of one month if the necessary distance has not been covered within that time.

Final acceptance of each locomotive will be given one year from the date of preliminary acceptance providing the locomotive has operated a distance of 31,000 miles. If the distance operated has been reduced on account of defective construction or design this final acceptance will be extended three months if the locomotive has operated more than 21,700 miles and six months if less than this distance. All dates, however, are based on very reasonable allowances, and afford the manufacturers every opportunity to fulfil their part of the contract with the minimum of hardship. It is expected that the first of these locomotives will be in operation by October 1, 1923, and that the order will be completed by January 1, 1925.

While this division extends over a fairly level country and no such tonnages are encountered as are handled in America, the fact that a complete steam division is to be electrified insures a direct comparison between the operation by steam and electricity and many interesting facts are expected to be obtained from this electrification.

Automatic Train Control From Four Viewpoints

Developments to Date—The Effect on the Mechanical, Signal and Transportation Departments

FOLLOWING ITS PRACTICE of setting aside one night each year for the consideration of automatic train control, the Western Society of Engineers, Chicago, presented a program on this subject on October 23, under the auspices of its Railroad Section. Four papers were presented, covering the development of automatic train control and installations made to date with a brief description of the systems at present in service or under test; train control as it affects the mechanical department; its relation to signaling, and the results to be expected from the transportation standpoint. W. J. Eck, signal and electrical superintendent of the Southern Railway, presented a paper on "Developments to Date and Installations." C. F. Giles, superintendent of machinery, Louisville and Nashville, talked on "Train Control from the Mechanical Standpoint." T. S. Stevens, signal engineer, Atchison, Topeka & Santa Fe, discussed "Train Control from the Signal Engineer's Standpoint," and A. W Towsley, assistant to the vice-president and general manager, Chicago, Rock Island & Pacific, treated "Train Control from the Transportation Standpoint." Abstracts of three of these papers follow:

Development of Train Control

By W. J. Eck

Signal and Electrical Superintendent, Southern Railway

The desirability of some form of control of railway trains to bring a train to a stop safely in case of conditions endangering the train, independently of the driver, was recognized in the very beginning of railroading. No feasible method of accomplishing this result seemed possible, however, before the invention and general adoption of the power brake. The knowledge that the opening of the brake pipe line and the escape of the compressed air to the atmosphere, would cause an application of the brakes was recognized immediately as affording a means for stopping a train automatically independently of the action of the engineman. All train control devices have been based on this property of the air brake system.

A majority of the inventors who have worked upon this problem have considered that the opening of a valve in the brake pipe line was all that is necessary for a successful train control system. It involves much more than this, however, particularly in the case of heavy freight trains. Of the hundreds of schemes that have been proposed from time to time—(there are more than 5,000 patents on file in the United States Patent Office on the subject)—only about a score have been considered worthy of service tests and development under actual railroad operating conditions. Many of the inventors had little or no knowledge of these conditions and their devices have little or no value; on the other hand many of the appliances have merit and a vast amount of intelligent and conscientious work has been done during the past 30 years.

The First Permanent Installation

The first permanent installation of automatic stops, so far as known, was made on the Boston Elevated Railway in 1899. It is still in use and consists of a controlled mechanical trip ground contact worked in conjunction with electro-pneumatic block signals. A similar installation was made on the Interborough Rapid Transit, New York, in 1903; also upon the Philadelphia Rapid Transit and the Hudson and Manhattan in 1908. This device consists of a lever arm operated by compressed air in conjunction with the signal system so that the arm is raised above the track when the block in obstructed. This arm engages the handle of a valve in the train pipe if a train should attempt to pass a signal indicating "Stop." The opening of this valve causes the brakes to be applied. A speed control feature devised by J. M. Waldron was added to the Interborough installation in 1912 which has materially increased the capacity of the road over that formerly existing with the plain automatic stop.

In 1910, the Washington Power Co. installed an automatic block signal system with automatic stops on 29 miles of a single-track electric interurban line. The device was similar to that originally used on the Pennsylvania, viz., a glass tube mounted upon the top of the cars and positioned so as to be broken by an arm attached to the block signal in case the signal is passed improperly when in the stop position. As there are no tunnels or overhead structures on this line its use here was not objectionable.

The Pennsylvania Railroad in 1911, in connection with the terminal improvements undertaken by it upon entering the city of New York, installed a system of automatic stops to protect trains using the tunnels under the Hudson river and throughout the electrified zone, extending to Manhattan Transfer, New Jersey. This automatic stop is of the mechanical trip type, electrically controlled. The valve in the brake pipe and the trip upon the ground are of special design and so arranged that ordinary obstructions along the track will not operate the air valve. Ballast, snow, frozen mud, etc., will sometimes operate a valve of the design used in subways and thus interfere with traffic. In this case the

ground grip is provided with a rotating member which raises the valve stem vertically when engaging and thus applying the brakes. It is shielded so that a horizontal blow will not affect the valve as is the case in the ordinary design.

The next installation of importance was one installed during the same year, 1911, by the Key route at Oakland, Calif. This is an electric line and the device protects 54 miles of double track, an important part of this mileage being upon a three-mile pier which extends out in the bay to the terminus of the ferryboats from San Francisco. The automatic stop consists of a mechanical trip overhead contact, in the shape of a metal arm attached to the signal. This arm is operated by a valve handle on top of the cars when the signal is disregarded. The tripping of this valve results in a service application of the brakes and it can only be restored to its normal position by the motorman's brake controller after the automatic brake application has become effective.

In 1912 the Brooklyn Rapid Transit made an extensive installation similar to that in the subway in New York and that on the Boston Elevated.

The next year, 1913, the Miller Train Control Company's intermittent electrical contact type automatic stop system was started on the Chicago & Eastern Illinois. This was not only the first permanent, but up to the present time it is the most extensive installation on a steam railway in the world. It is now in service on a double track division between Danville, Ill., and Dolton, a distance of 107 miles. There are 189 ramps, one of which is located braking distance from the signal governing the entrance to each block. These are controlled by the indication of the signal and the condition of the block in advance. Only one ramp is used per block without preliminary or caution indication.

The Chesapeake & Ohio Railway in 1916 and 1917 undertook the next permanent installation on a steam operated road in the United States by installing the American Train Control on 21 miles of single track between Charlottesville and Gordonsville, Va. An extension of this installation to Staunton, Va., a distance of 39 miles, is now being made and is practically ready for service at the present time.

In 1915 the American System was the subject of an experimental trial upon the Maryland & Pennsylvania Railway. It was then known as the Jones system and as such was tested by the Bureau of Safety of the I. C. C. The installation on the Chesapeake & Ohio, however, has been materially improved from the form originally tested and now consists of an intermittent electric contact system, the indications on the locomotive being picked up by the contact of shoes carried upon the locomotive, with rails located parallel with the main running rails. * * * The control circuits have been specially designed to meet local conditions and are a modification of those used in single-track automatic block signaling. The fixed signals along the roadway are of the light type; the day and the night indication both being given by colored lights.

The next installation in the United States in point of time was one made in 1918 by the United Railway & Electric Co., of Baltimore, Md. This is an electric road operating on the surface with two draw-bridges and 150 trolley cars protected with an overhead mechanical trip device. It consists of a valve with an extended arm mounted upon the top of the cars where it will be struck by an extension from the signal if the stop indication is disregarded.

The Chicago, Rock Island & Pacific, in 1919, started the installation of an automatic train control system, manufactured by the Regan Safety Devices Company, between Blue Island, Ill., and Joliet, a distance of 22 miles. The device is of the intermittent electrical contact type with speed control. Ramps are installed along the right-of-way in connection with the three-position upper-quadrant signals already protecting the tracks in this territory. These ramps are 120 ft. long and located 150 ft. in the rear of the signal. * * *

The system is designed to make an application of the brakes by the automatic control apparatus when any of the following conditions exist:

(a) When a train passes a signal in the caution position at an excessive speed.
(b) Whenever a train exceeds a predetermined speed while running in a caution block.
(c) At a stop signal, or when a block is occupied.

Work of Joint Committee on Train Control

The Interstate Commerce Act of 1920 empowered the Interstate Commerce Commission to order the installation of automatic train stops or train control that would comply with the commission's specifications and requirements upon the lines of any carriers subject to the Act. To assist in carrying out the provisions of this act and the request of the commission a joint committee representing the various sections and divisions of the American Railway Association was appointed and started work in September, 1920. Specifications and requirements of automatic stops and train control were formulated, all existing installations investigated, and arrangements made with the New York Central and the Southern Pacific for the installation of types of train control for test purposes that have not heretofore been fully tried out under service conditions.

Upon the Southern Pacific, the National Safety Appliance Co. has installed a system of intermittent inductive train control between Haywood, Calif., and Halveen, a distance of 4½ miles. This system was tested by the Interstate Commerce Commission on the Western Pacific at Oroville, Calif., in 1919. Material improvements have been made recently and the system is now under observation by representatives of the joint committee.

A permanent magnet of laminated steel, located between the rails, is installed at each indication point. This is neutralized by a situable coil energized by a roadside battery when the block is unobstructed. The locomotive apparatus consists of magnetic valves mounted under the tender in such a position as to come within the field of the track magnets. An air valve controlling the brake application is connected to the magnetic valve by suitable piping. No electric energy is required on the engine.

On the New York Central tests are to be made upon the apparatus of the Sprague Safety Control and Signal Corporation. The installation consists of equipment on one locomotive and about six miles of track in a very busy electrically operated section near New York City. The system is of the intermittent non-contact induction type, with speed control, cab signals and a recording device. Electrical energy from storage batteries is used for neutralizing the normal danger track magnets when the block is clear. This is controlled by the relays of the wayside signal system so that the track magnets are not neutralized when the block is obstructed and by their influence upon the engine receiver cause the display of the proper signal in the cab and the application of the brakes. * * * The installation has been under observation for some months by the joint committee and official tests will probably be started within the next few days.

Order No. 13413

The Interstate Commerce Commission issued its now famous order No. 13413 on June 13, 1922, requiring automatic train stop or train control devices upon 49 carriers in the United States. Installations on one passenger locomotive division on each of the lines to be completed by January 1, 1925. Largely on account of the strike of the railway shopmen, starting of this work has been delayed so that few have been able to announce the type and character of the device to be used in compliance with the order. The matter is being actively handled at the present time and it is expected

that work will be started at an early date on all of the lines specified.

The Pennsylvania and the Chicago & North Western have already announced that they will make experimental installations of a practical nature to determine the characteristics of the system selected by them and its performance under the various operating conditions met in railroad service previous to its installation on the very large scale required by the Interstate Commerce Commission.

The Pennsylvania has under construction at the present time the automatic train control system developed by the Union Switch & Signal Co., and the Westinghouse Air Brake Co. The test installation will extend from about one mile from Lewiston, Pa., over a single-track line for 45 miles to Selinsgrove junction, thence over a double-track line to Sunbury, Pa., the latter portion being now equipped with [illegible] track circuits and automatic position light signals.

Wayside signals will be installed where none are now in service, approximately one-half of which will be controlled by the train dispatcher at Sunbury and the other half of

Automatic Stop and Train Control Systems Tested on American Railroads

Name	Type	Where Tested	Year
[illegible]	Insulated truck	Southern Ry.	1906
[illegible]	Ramp	E. P. & S. W. Ry.	1919
[illegible]	Inductive	Pere Marquette	1921
[illegible]ford	Auxiliary Track Circuit	Erie	1922
[illegible] (A. H.)	Inductive	New York Central	1911
[illegible]nigan (G. P.)	Inductive	I. R. T. Co.	1911
[illegible]n Safety Appl. Co.	Ramp	Spokane Inland R. R.	1919
[illegible] Thurber	Insulated truck	Penna. Lines	1911
[illegible]	Ramp contact	C. & N. W. Ry.	1912
[illegible]ral	Ramp contact	B. R. T.	1912
[illegible]rington	Overhead trip	Erie	1908
[illegible]ion Sig. Co.	Inductive	New York Central	1913
[illegible]ternational	Mechanical trip	D. L. & W.	1912
[illegible]n Beggs	Ramp contact	C. N. O. & T. P.	1916
[illegible]nes (D. C.)	Ramp contact	Southern Ry.	1910
[illegible]nes	Ramp contact	Maryland & Pa.	1913
[illegible]mon	Ramp contact	Staten Is. R. T.	1911
M. V. All Weather	Inductive	Raritan R. R.	1922
[illegible]s Wallace	Mechanical trip	B. & M. R. R.	1919
[illegible]rnett	Ramp type contact	B. & A. R. R.	1919
[illegible]ton	Ramp	Canadian Pacific	1920
[illegible]tsburgh (H. D.)	Inductive	New York Central	1909
[illegible]ntic's	Wireless	Canadian Pacific	1911
[illegible] Ry. Auto Safety Appl. Co.	Mechanical trip	Pere Marquette	1911
[illegible] Safety	Ramp contact	Hunt'g'n & B. R. M. R. R.	1912
[illegible]ner & Conkell	Third Rail	W. & L. E. R. R.	1913
[illegible]Saddle	Ramp contact	C. I. & W.	1919
[illegible]ssen	Ramp	A. T. & S. F.	1908
Simplex	Insulated engine wheels	B. R. & P. R. R.	1921
[illegible]hweyer	Inductive	P. & R. Ry.	1918
[illegible]ndebrand-Woticky	Track circuit	N. Y., C. & H. R. R.	1913
[illegible]egelmeyer	Ramp	Big Four	1909
Union	Ramp contact	D. L. & W.	1913
[illegible]rthen (H. J.)	Overhead trolley	B. R. & P.	1911
Webb [illegible]	Ramp contact	Erie	1922
[illegible]ding	Ramp contact	D. L. & W. R. R.	1916

the single-track line will be operated by a modified absolute permissive block system controlled by trains. This system is unique in that it provides continuous control, all other installations of any material size being of the intermittent type. * * * Continuous control system, such as this, provide full speed control and transmit the indication to the cab of the locomotive at all times, thus giving immediate indication of any change in conditions in the same block or the block ahead.

The Chicago & North Western has announced that a contract has been signed with the General Railway Signal Company for an extensive test of its intermittent inductive train control with inert roadside elements. This system requires no energy on the roadway or physical contact between engine and roadway parts. The roadside element consists of a "U"-shaped laminated iron core with a coil winding which may be opened and closed by the contacts on a relay in the signal system. The engine equipment includes a pair of coils mounted so as to pass directly over the track element, a storage battery, relays, an electro-pneumatic valve and means for applying a service application of the brakes through the engineman's regular brake valve. * * * It can be arranged, if desired, so that the application will not take place at the caution signal if the engineman acknowledges the signal by operating a lever, thus indicating that he has seen and understands the indication of the signal and will properly control his train. The acknowledgment valve cannot be tied down to permanently cut out the device. * * *

The systems that have been described include only the most prominent of those that have been installed on an extensive scale for regular service. In addition, there have been many experimental trials of various devices made upon railroads of the United States during the past 34 years. For the record, I have compiled a list of some 35 of those that have come to my personal attention. It is no doubt incomplete. Some of the devices are no longer being advocated, while the proprietors of others are quite active in their development. Much, however, still remains to be done, for there are yet many unsolved problems in the art of automatic train control.

Automatic Train Control from a Mechanical Standpoint

By C. F. Giles
Superintendent Machinery, Louisville & Nashville

Aside from the expense of the initial application of an automatic train control device to a locomotive, proper and adequate maintenance will undoubtedly prove the most vital and perhaps the most difficult factor to contend with from a mechanical standpoint. The modern locomotive, representing such a large capital investment, must necessarily be handled and placed in serviceable condition at terminals with all possible dispatch so as to minimize the unproductive period of time during which this investment remains idle. It goes without saying that every additional device applied to a locomotive requires a certain amount of care and attention, more or less proportionate to the intricacy of the mechanism, the intensity of use or the importance of its function. Additional devices tend to retard the prompt completion of the work of inspection and repairs to locomotives at terminals. Therefore, unless such devices effect economies at least commensurate with the time and labor expended for their proper maintenance, they will prove to be a burden and a distinct loss from a financial standpoint.

The only device on a locomotive today to which the maintenance and inspection of the automatic train control may be considered as being comparable is the automatic air brake equipment. In this connection, educational plans and the organization of forces have proved necessary to insure the successful maintenance and operation of the automatic air brake. The methods used for instructing and training the employees must also be carried on regularly and constantly to effect satisfactory results in the operation of the air brake equipment by the engineman, upon whom evolves the making of emergency repairs on the line with the least possible delay, and to insure proper inspection and repairs to the apparatus on the part of the shop and engine house mechanics specially assigned to this work.

It appears only reasonable to predict that somewhat similar methods, more or less extensive in their scope, will have to be inaugurated to care for the inspection and maintenance of the automatic train control apparatus successfully when applied to locomotives. However, the insurance of the successful operation of the latter device will quite probably prove more difficult of attainment than the air brake, for the reason that no occasion may arise for the automatic train control to function during one or many complete trips, and consequently no reports from the enginemen concerning its operative condition can be anticipated; whereas, the condition of the air brake equipment, which is regularly operated on every trip, can and must be reported on intelligently by enginemen after arrival at terminals.

Thus, in the case of a locomotive equipped with an automatic train control device, it is quite apparent that a com-

plete and extensive test of the latter must necessarily be conducted on arrival at, and before departure from, each terminal to determine whether it will perform the important automatic function that may be required of it on the following trip satisfactorily and unfailingly, and to locate and repair any defects that may exist in the equipment. The extent of the maintenance required will, in a measure, depend on the nature of the particular installation, the number of locomotives equipped, the type of device selected and the extent of train control that is desired. Nevertheless, it is obvious that additional forces of expert employees will have to be assigned to maintain this important and intricate mechanism properly, in addition to keeping accurate and infallible records of its conditions so that such records may be produced whenever required for any cause. The additional work of repairs and inspection demanded of this equipment will tend materially to increase the time required for the completion of repairs to locomotives held at engine terminals for that purpose.

Train Control from the Operating Standpoint

By A. W. Towsley
Assistant to Vice-president and General Manager, Chicago, Rock Island & Pacific

The advantages and disadvantages of train control are evident only after an opportunity has been afforded one to study the various devices under test. In my opinion the advantages are: (1) safety, (2) the elimination of long interruptions to traffic, (3) increased productiveness of track, or ability to run an increased number of trains with minimum interruption. If an engineman does not perform this work, this apparatus will perform it for him without taking away from him the initiative for the proper performance of his functions.

Among the disadvantages is the possibility of tying up power at terminals because of interruptions or reported failures of the mechanism to operate. This may result from the engineman neglecting to report the failure of the apparatus because there is no check on its operation. It has been estimated that we are only getting productive service out of freight locomotives 43 per cent of the time. Any measure that will increase the amount of this unproductive time is a disadvantage. The advantages of train control outweigh the disadvantages.

(The Paper on Automatic Train Control from a Signal Engineer's Viewpoint, Presented by Thomas A. Stevens, Signal Engineer of the Atchison, Topeka & Santa Fe, and the Discussion on All the Papers Will Appear in Next Week's Issue of the Railway Age.)

Senator G. W. Pepper, of Pennsylvania, speaking before members of the Philadelphia Chamber of Commerce recently discussed the efficacy of public opinion as a means for solving the problems that hinder industrial peace. "It may well be worth while to provide adequate machinery for making an appeal to the jury of American public opinion. It might be a fine thing in a particular industry or in groups of industries to provide for impaneling the American public. A governmental organization which in an emergency can function by calling into existence a jury or commission composed of those whom the public will trust, may both enlighten the public as to the merits of the controversy and focus public opinion in such a way that the parties to the dispute cannot withstand it. . . . But if our hearts are not right, all we can hope to do is to make the best of a bad situation. If employers and unions not only lack confidence in one another, but if the lack of confidence is deserved and if the stabilizing of industry does not itself minimize the labor problem, then we must inevitably flounder. Let us set up sufficient governmental organization to give us official forecasters who will scan the skies and sense the air currents. Let them be empowered to invoke executive action for the impaneling of emergency juries. . . ."

Interstate Commerce Commission Issues First Final Valuation

Washington, D. C.

The Interstate Commerce Commission on October 21 made public its first order establishing a final value of a railroad in accordance with the valuation act, in the case of the Evansville & Indianapolis Railroad Company as of June 30, 1915. The case, however, which is Valuation Docket No. 51, was decided on July 11. The valuation in this case was made final by default because, although the receiver filed a protest against the tentative valuation, the railroad was later acquired by the Evansville, Indianapolis & Terre Haute, the stock of which was purchased in June, 1921, by the Cleveland, Cincinnati, Chicago & St. Louis, and neither company offered any evidence in support of the protest which had been filed. The commission, therefore, finds and declares that the tentative valuation contained in its order of October 18, 1919, as modified by the supplemental tentative valuation as contained in its order of June 11, 1921, has become and is the final valuation of the property. The tentative valuation and supplemental tentative valuation, as modified because of the repeal of the clause in the valuation act which requires a finding of the present cost of condemnation and damages or of purchase of lands in excess of original cost or present value, have been combined and are set out in the order embodying the final valuation. The final value of the property owned is given as $2,250,000 and that of the property used as $2,250,291.

Commissioners Eastman, Potter and Cox dissented from the finding of the commission and Commissioner Daniels concurred only in part. He said he made no question of the propriety of the figure reached as the final value as the company has not seen fit effectively to prosecute a protest, but that the method of reaching the valuation in this case seems to be in disregard of the express mandate of the statute. He was of the opinion that the report is defective in failing to follow the express mandate of the statute requiring the ascertainment and report separately of other values and elements of value and an analysis of the methods of valuation employed and of the reasons. He stated that his reasons for non-concurrence in certain of the methods of valuation employed had been set out more at length in the Kansas City Southern case and for those reasons he takes similar exceptions to this report.

Commissioner Eastman in his dissenting opinion, in which Commissioners Potter and Cox concurred, said:

"This is the first case in which the commission has fixed the so-called final value of the property of any carrier. The report does not indicate in any way the method or process by which that value was determined, and yet this is the thing of crucial importance in our valuation work. Fundamental questions of law and public policy are involved, many of which have been argued before us in contested cases, no one of which has yet been decided. So far as I know, these questions have not been determined by the commission. Until they are determined and the reasons for the conclusions reached have been made known I believe that we ought not to attempt to fix the 'final value' of any property. The fact that in this case no protests are now outstanding is not conclusive that the value stated is the correct value."

The Committee on Freight Claim Prevention of the American Railway Association will issue a series of prevention suggestions entitled, "Thoughts," for various classes of employees. It is not expected that these thoughts will fit all conditions. They are gathered from various sources and some applying in one instance will not apply in another, but all will serve the purpose indicated in the title as providing thoughts for those particular employees.

The du Pont-Simplex Type Locomotive Stoker

Simplicity and Ruggedness Are Features of New Design Brought Out by Standard Stoker Company

A NEW DESIGN of locomotive stoker, known as the du Pont-Simplex type, has recently been developed by the Standard Stoker Company, New York. The principal features of the machine are clearly shown in the assembled view, Fig. 1. When applied to the locomotive the tender trough, shown at the right, is built into the floor of the tender. The engine is located under the cab deck and the vertical conveyor and housing, shown at the extreme left, are placed against the inside rear wall of the firebox, the housing being just above the level of the grate.

The operation of the stoker is briefly as follows: Coal from the tender drops into the trough below the tender deck by gravity and is moved forward by a screw conveyor which carries the coal through a crusher and into a covered trough extending forward under the engine deck and mud ring. At the front of this trough the coal is delivered into a housing containing a vertical lifting screw, which raises the coal until it overflows onto a horizontal surface, from which it is distributed to the various portions of the grate by continuous steam jets manually controlled. The amount of coal fired is determined by manual control of the speed of the driving engine and its distribution to various parts of the firebox is effected by manipulation of the valves controlling the steam supply to the jets.

The construction of the stoker has been carefully worked out to insure continuous operation with the minimum of maintenance. The tender trough is of steel plates and angles and is so secured that it may be removed when the engine and tender are separated. A cast-steel gear casing at the rear of this trough drives the entire horizontal conveyor screw which delivers the coal into the vertical housing. The coal drops from the tender into the tender trough through a longitudinal slot in the deck. Sliding plates permit closing off the coal entirely from the trough, or allow admission to any section desired. The crusher consists of a heavy steel casting with rearwardly projecting spikes at the front of the tender trough, against which oversize lumps of coal are broken. The portion of the conveying system between the locomotive and tender is made in two parts, one of which slides inside the other. The entire construction is such that the tender may be backed away from the locomotive without disconnecting any portion, or removing any bolts. A section of the locomotive trough is open at the top and provided with a slotted cover through which the movement of the coal may be seen.

The vertical, cylindrical housing into which the coal is discharged from the horizontal conveyor has a vertical screw which makes two revolutions to one revolution of the horizontal screw. This avoids any possibility of choking when the coal changes its direction of movement. The weight of the locomotive trough and the vertical housing is carried directly on the locomotive frame.

To adapt the vertical housing to various designs of locomotives, it is made in two parts, the lower half of standard construction, and the upper of variable length to suit the grate of the locomotive to which it is applied. The lower section contains the gears which transfer the motion of the driving engine shaft to the vertical screw. The construction is such that it is impossible for any of the coal dust to work into the gear housings. Even if moisture is carried over with coal, the water can drain from the trough before it can gain access to the gear casing. The gears are all steel with cut teeth and run flooded in oil.

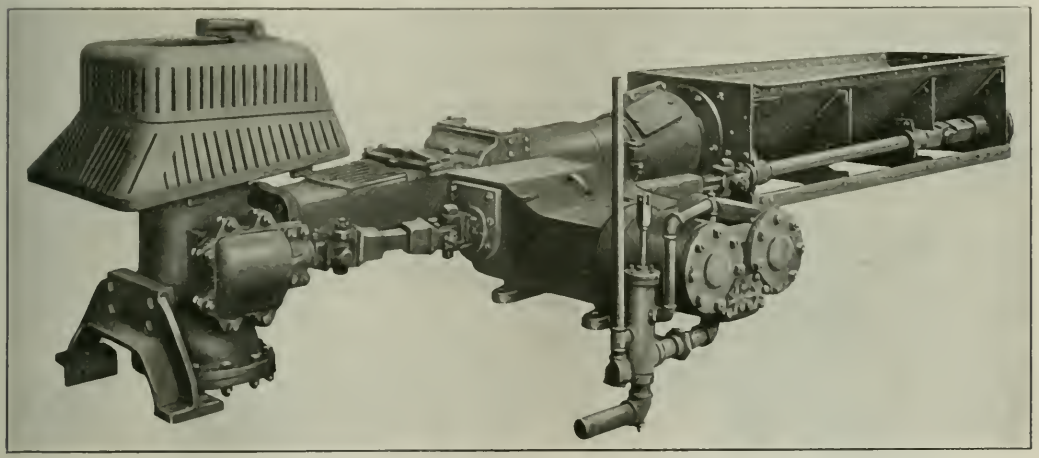


Fig. 1—Assembled View of du Pont-Simplex Stoker

The upper portion of the vertical housing extends above the level of the grates, and would be subject to overheating if provision were not made to protect it. For this reason the vertical section of the housing is enclosed in a cast-iron protecting grate with an air space between. This protecting grate is provided with slots through which air is drawn from the ash pan by the stack draft when the locomotive is running. This air serves a dual purpose, preventing overheating of the protecting grates, and supplying above the fuel bed an amount of air sufficient to furnish the oxygen necessary for the combustion of the volatiles from the coal.

The coal as it rises to the top of the vertical housing overflows on the upper surface of the protecting grate. From this surface it is blown into the firebox and down upon the

surface of the fire by steam jets. These steam jets are divided into five groups, each group being controlled by a separate valve, and by manipulation of these valves varying amounts of coal may be discharged to different portions of the grate so as to maintain an even and uniform depth of fuel bed. The control valves are placed in a convenient position on the boiler front where they may be readily reached by the fireman.

The driving of the stoker is effected by means of a two-cylinder, double-acting, slow moving engine and the amount of coal discharged by the stoker is controlled by varying the speed of the engine. During normal operation and when normal run of mine coal is being fed, this engine runs along with very low cylinder pressure, the throttle valve being only slightly open. If an unusually large or hard lump of coal reaches the crusher plate, the speed of the engine will be checked and the pressure in the cylinders will rapidly rise until the obstruction is crushed, after which the engine will make one or two revolutions at increased speed, dropping back at once to its normal rate. The amount of reserve power is ample to crush the hardest fuel employed and the design is such that all parts have sufficient strength to permit the engine to be abruptly stopped when running at delivery speed without anything giving away.

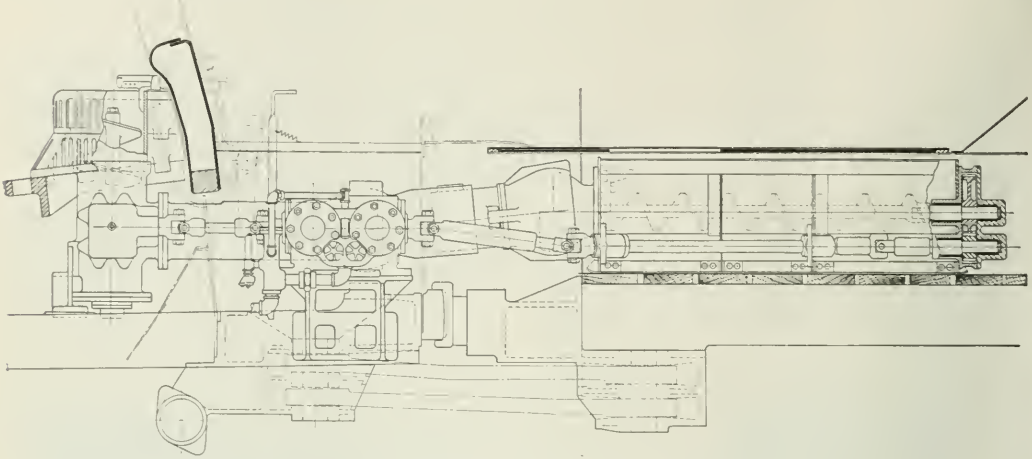


Fig. 2—Side Elevation Drawing Showing Arrangement of Parts on the Locomotive

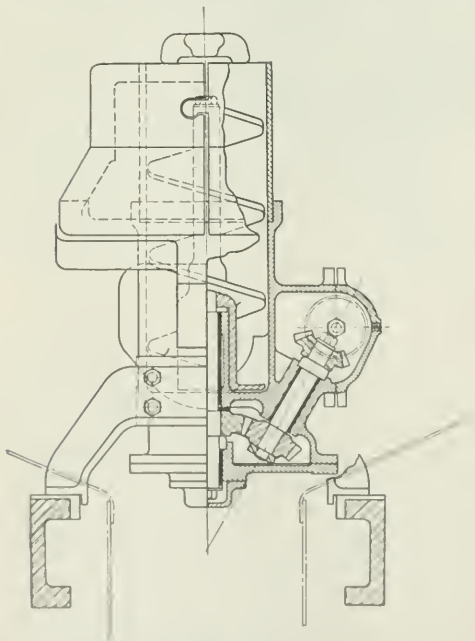


Fig. 3—The Vertical Housing Is Carefully Designed to Prevent Coal Dust or Water from Reaching the Bearings

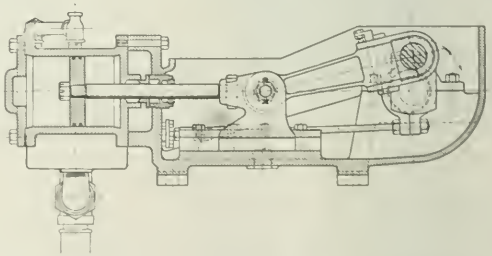


Fig. 4—Section Through Engine, Showing Simplicity of Construction

The design of the engine as will be noted from the illustrations, is extremely simple and rugged. The crank shaft, connecting rods, cross-heads and valve gear are all enclosed in a box casting, the cover of which is made of sheet metal for easy removal to provide accessibility. With the exception of the cylinders, all working parts are lubricated by splash lubrication. The box and the cover are of such a design as to avoid loss of oil and to prevent admission of dust to the enclosed box itself.

The valves of the engine are of the piston type, each driven by a single eccentric. It is necessary in any stoker to be able to reverse the driving engine to loosen a jam, and to effect this a simple outside valve is provided which interchanges the functions between the inlet and exhaust passages.

At each end of the crank shaft of the driving engine is a universal joint, which on the rear side connects to the driving shaft for the horizontal conveying system. A slip joint is provided to allow for the movement between the tender and the locomotive which occurs when rounding curves.

The universal coupling on the forward end of the driving engine crank shaft is connected through universal couplings to a short section of a shaft on the end of which is the first gear of the enclosed train which drives the vertical screw. The details of this drive are clearly indicated in the illustration and have been referred to above.

One of the special features of the stoker is that the coal is delivered into the firebox at a relatively low level. This method of delivery, together with the downwardly directing force of the steam jets, it is stated, avoids fuel losses due to the fine particles being swept above the arch by the action of the draft before being consumed. The continuous introduction of the fuel is also claimed to be a decided advantage.

Extreme care has been used in the design of this stoker to avoid all elements of weakness which have apeared in past practice. The flexibility of the arrangement provided by the universal couplings and slip joints makes it relatively easy to apply the standard design to the many varying types of locomotives.

New Officers for International—Great Northern

J. W. Kendrick and T. A. Hamilton to Take Charge as Chairman of Board and President on December 1

By action of J. & W. Seligman & Co. and Speyer & Co., in charge of the reorganization of the International & Great Northern, J. W. Kendrick, private consultant in matters pertaining to railroad construction, operation and maintenance, Chicago, has been selected as chairman of the board, and T. A. Hamilton, vice-president in charge of operation and assistant to the president of the St. Louis-San Francisco, president of the reorganized company. These officers will assume charge of the property on the termination of the receivership on December 1.

T. A. Hamilton

J. W. Kendrick

This step brings to an end another chapter in the checkered history of this road of 1,160 miles, all of which is located within the state of Texas. Its principal lines extend from Longview to Galveston and to Laredo and from Galveston to Fort Worth.

The International-Great Northern was chartered on September 27, 1873, under the laws of Texas as a consolidation of the International Railway and the Houston & Great Northern. To aid the company in completing the road, the bondholders funded a portion of their coupons—four on the first mortgage and eight on the others—into 7 per cent gold bonds, preferred, and ranking ahead of the original bonds. In April, 1878, upon the suit of the second mortgage bondholders, the road was placed in the hands of a receiver and was sold to a committee of the bondholders, by whom it was reorganized. By the terms of the reorganization, holders of the old H. & G. N. bonds received $1,278.95, and holders of old International bonds, $1,294 for each $1,000 bond, which amounts were paid, one-half in new first mortgage 6 per cent bonds, and one-half in new second mortgage 8 per cent income bonds.

On May 1, 1888, default was made in payment of the interest on the first mortgage bonds and this was followed by default in the payment of the second mortgage interest.

The road was placed in the hands of receivers on February 21, 1889, and in 1892 was reorganized without foreclosure. Under the new plan one-half of the total amount of the defaulted coupons of the first mortgage bonds with interest was paid in cash and the remaining half was deposited with the Central Trust Company, which issued its trust receipts that bore interest at the rate of 5 per cent per annum, payable semi-annually beginning November 1, 1892, and were to be payable in 6 yearly installments. Of the amount of defaulted coupons of the second mortgage, half the coupon interest was paid in cash and the remainder exchanged at their face value for new third mortgage bonds.

The new organization continued until February 26, 1908, when a receiver was appointed upon default in payment of the coupons of the third mortgage bonds and the road was sold under foreclosure on June 13, 1911, to a representative of the third mortgage bondholders, who undertook its reorganization. On August 11, 1914, a receiver was appointed at the instance of the noteholders protective committee as it was impossible to meet either the interest or principal of the notes and in June, 1922, the company was reorganized.

Under the new plan, as outlined in the *Railway Age* of June 3, 1922, page 1312, the International-Great Northern will reduce its fixed charges from $1,597,175 to $1,179,000 and will have a working fund of approximately $4,000,000 that will enable the company to make the necessary improvements outlined in the *Railway Age* of June 10, page 1347, and continue those interrupted by lack of funds.

In recommendations which were included with the reorganization plans, J. W. Kendrick estimated that the property should be able to have a net income available for interest and dividends of $3,031,512 in 1923 and that the operating ratio should not exceed 76. Indicative of the breadth of the measures which are contemplated, special attention will be given to the elimination of the boll weevil and malaria fever which, if successful, will add greatly to the traffic of the road and increase the efficiency of employees respectively.

J. W. Kendrick

In becoming chairman of the board of directors of this property, Mr. Kendrick will bring to it a detailed knowledge of its present condition and its possibilities, based upon his thorough studies of this property during the last five years and supplemented by nearly half a century of active experience in the construction and rebuilding of important western railways. He was born on October 14, 1853, at Worcester, Mass., and graduated from Worcester Polytechnic Institute in 1873. In 1878 he entered railway service as a levelman on a construction party on the Yellowstone division of the Northern Pacific and was engaged in the location of the Yellowstone and Missouri divisions of that road until 1880. In the latter year he was promoted to engineer in charge of constructing the above divisions, 160 miles of line, and remained in this capacity until 1883, when he became chief engineer of the St. Paul & Northern Pacific (Northern Pacific) in charge of the construction of a line connecting Staples, Minn., Brainerd, Minneapolis and St. Paul, with the necessary terminals and shops. At the end of five years he became chief engineer of the Northern Pacific and its leased lines, and in July, 1893, was made general manager for the receivers of the Northern Pacific and later of the reorganized company. His success during the 6 years as general manager is shown by his promotion on February 1, 1899, to vice-president in charge of operation, which position he held until June 5, 1901, when he became vice-president in charge of operation of the Atchison, Topeka & Santa Fe and remained in that capacity until June, 1911, when he established a private practice in Chicago as consultant in matters of railroad construction, operation and maintenance.

During the 11 years in which he has been engaged in private practice, he has made over 50 investigations, large and small, in connection with railroad construction and reorganizations and for the purpose of determining the basis for improvements in operation. Among the more important of these are operating reports on the Wabash and the Chicago & Eastern Illinois; a valuation report on the Canadian Pacific line between Windsor and Montreal in 1912; an operating and financial report on the St. Louis-San Francisco in 1913; a grade reduction study of the Erie and an operating report on the Pere Marquette in 1914; operating reports on the Chicago, Rock Island & Pacific and Minneapolis & St. Louis in 1915; an investigation of accounting methods and proposed changes for the Missouri, Kansas & Texas in 1916; an operating report on the International & Great Northern in 1917; an investigation of traffic tributary to proposed feeder lines and estimates of cost of such lines for the Western Pacific in 1917 and 1918; a valuation of rolling equipment and shops of the Pullman Company in 1919; a report on the cost of construction and operation of a proposed line of the Itabira Railway in Brazil in 1920, 1921 and 1922; and an operating report on the International Railways of Central America in 1921.

T. A. Hamilton

Mr. Kendrick will be ably assisted by T. A. Hamilton, who as vice-president in charge of operation and assistant to the president of the St. Louis-San Francisco, has had an important part in carrying out the plans outlined by Mr. Kendrick for the rehabilitation of that property. Mr. Hamilton is another example of the large number of railway officers who have worked their way up through the ranks to executive positions. He was born on January 21, 1874, at St. Louis, Mo., and was educated in the public schools of Toronto, Ont. In 1887, he entered railway service as a messenger boy in the superintendent's office of the Canadian Pacific and at the end of two years became a clerk in the assistant general manager's office of the Chicago & Grand Trunk (Grand Trunk) at Detroit, Mich., which position he held until 1890, when he was transferred to the general freight agent's office at Chicago. He left the service of the Chicago & Grand Trunk in 1892 to become a car accountant in the local freight office of the Missouri Pacific at St. Louis, Mo., and in the following year he obtained a similar position with the Galveston, Harrisburg & San Antonio (Southern Pacific) at Houston, Tex. In 1894 he returned to the Missouri Pacific as an assistant in the general auditor's office at St. Louis, Mo., in charge of agents' accounts, reconsignments and overcharge claims, and two years later he entered the service of the Illinois Central, where he remained until 1899, holding the positions of rate clerk, chief bill clerk and chief yard clerk at East St. Louis, Ill. On the latter date he again returned to the Missouri Pacific as chief clerk to the superintendent of De Soto, Mo., and from 1901 to 1907 was employed by the Louisville & Nashville, where he was successively chief bill clerk, chief yard clerk, chief clerk to the terminal superintendent and chief clerk in the traffic department.

For the next four years his former experience was utilized and extended by his association with Haskins & Sells, certified public accountants, New York, where he was engaged in railroad cost studies, examinations and miscellaneous accounting work. The period from 1911 to December 1, 1922, was devoted to the St. Louis & San Francisco and its successor, the St. Louis-San Francisco. During the first four years he was a special assistant to the vice-president of operation, part of the time holding the title of supervisor of efficiency and working in all branches of the operating department, and for the next year and one half he was in charge of the reorganization of the accounting department. While the road was under federal control he was vice-president of the corporation, and on March 1, 1920, he was made vice-president of operation and assistant to the president.

General News Department

The Interstate Commerce Commission has set for hearing on November 21, at Washington, the petition of the Southern Pacific for authority to retain the Central Pacific.

Position-light signals, in use extensively on the Pennsylvania Railroad, have been made standard on the Lehigh Valley. Considerable numbers of them have been installed, at various points, in place of semaphores which needed renewal.

Near Williamsport, Ind., on October 19, Wabash eastbound passenger train No. 2 was derailed, resulting in the death of the engineman, an express messenger and a baggageman. Belief has been expressed that spikes were purposely loosened, permitting the rail to spread and derail the train.

The Eastern Railroad Association announces that James T. Wallis, chief of motive power of the Pennsylvania, has been elected president of the Association, in the place of A. W. Gibbs, deceased. John M. Henry, Long Island Railroad, has been elected a member of the executive committee. The office of the Association is at 614 F Street, Washington, D. C.

Friday, October 13, was the 20th anniversary of the first operation of the radio telegraph, using Hertzian waves, from a station to a moving railroad train. It was on the Grand Trunk, between St. Dominique, Que., 30 miles west of Montreal, and a special train carrying members of the general passenger agents' association on the way to their annual meeting at Portland, Me.

The Northern Pacific has asked the Interstate Commerce Commission to modify its automatic train control order so that it may make the required installation on that part of its main line from Mandan to Dickinson, N. D., comprising a full passenger locomotive division of 109.6 miles, instead of between St. Paul and Mandan. The application states that this line has recently been equipped with a thoroughly modern automatic block signal system that would lend itself to the changes.

T. P. Healey, examiner of the Interstate Commerce Commission, last week resumed hearings in the southern states on the tentative plans of the Commission for the consolidation of railroads, as called for by the Transportation Act of 1920. Hearings were conducted in Mobile, Ala., and Jacksonville, Fla., early in the week, and on Thursday there was a hearing at Atlanta. Representatives of numerous small roads gave their views as to how the different companies ought to be combined.

Illinois Central Roundhouse at Council Bluffs Partially Destroyed by Fire

Fire broke out in the roundhouse of the Illinois Central at Council Bluffs, Ia., on October 16, presumably due to defective electric light wiring which ignited the roof of the building and destroyed all of the wooden parts of the structure. Eight engines were in the building at the time of the fire. The total damage to the engines and the roundhouse is estimated at $21,000.

A Love-Feast

The shopmen of the Central of Georgia at Macon, Ga., several hundred of them, on October 18 entertained the Rotary Club of Macon, and other friends, at luncheon in the mammoth machine shop; 92 Rotarians and 60 other guests. The tables were decorated with chrysanthemums and the colors of the Rotary Club. A number of officers of the railroad were present, and one of them, John D. McCartney, assistant to the president, acted as spokesman for the hosts. Following the luncheon, the visitors inspected the shops. This luncheon appears to have been given in recognition of the friendly relations existing between the railroad and the people of the city during the recent disturbances due to the strike.

A. R. A. Convention Postponed

The American Railway Association, through a notice issued by R. H. Aishton, president, announces that in view of the present situation in the railroad world the Board of Directors has decided to postpone the annual session of the Association. Announcement will be made later of a date which will be selected for a session.

Train Control Order Changed

The Interstate Commerce Commission, by an order issued on October 14, in lieu of the requirement in its previous order, has authorized the Southern Pacific to install automatic train control between Oakland, Cal., and Tracy; has authorized the Philadelphia & Reading to install between Camden, N. J., and Atlantic City; and the St. Louis-San Francisco to install between Springfield, Mo., and Sapulpa, Okla. In all other respects, the order of June 13 is to remain in full force and effect.

A. R. A. Asked to Repeat Careful Crossing Campaign

The executive committee of the Steam Railroad Section, of the National Safety Council, at a meeting at Washington last week, unanimously recommended that the American Railway Association be urged to repeat during the summer of 1923 the Careful Crossing Campaign which it conducted this year. Statistics to show the result of the campaign are now being compiled and will be announced as soon as completed. L. G. Bentley (C. & O.) Richmond, Va., is chairman of the Steam Railroad Section.

O. H. & E. Abandoned

The Oberlin, Hampton & Eastern, a railroad extending from Oberlin, La., to Hampton, 10 miles, has been given permission by the Louisiana Public Service Commission to discontinue operations and to dispose of its tracks and equipment. It appears that this line, like many others in that section of Louisiana, was constructed primarily for the transportation of forest products, and its operations as a general carrier have been but incidental. The log and lumber tonnage has disappeared; the mills have discontinued operations and there is now no freight to be handled. Heavy deficits have been incurred for the past several years and with the completion of a gravel highway paralleling the applicant's line these deficits will be increased.

Traffic Records on the Central of Georgia

The Central of Georgia in the month of September established four new efficiency records: (1) Moved the greatest number of tons of freight in its history; (2) Moved freight cars an average of 34.19 miles per car per day; (3) 613 net ton miles per car per day; (4) Per cent of loaded car miles to total car miles, 78.

This is the salient point in one of the railway company's usual advertisements printed in daily and weekly papers throughout the company's territory during the past week or two. The advertisement, signed by President W. A. Winburn, contains a hearty tribute to the loyal and energetic efforts of the officers and men who carried on this traffic. Other statements in the advertisement (to substantiate the road's recent declaration that it had overcome the shopmen's strike) tell of increased efficiency in maintaining train schedules and in keeping cars and locomotives in good repair. During the month, the company had in use only about 7,000 freight cars, which is but 81 per cent of the number of cars owned by the company, an abnormal number of its own cars being in use on other roads.

Operating Statistics of Large Steam Roads — Selected Items for the Month of August, 1922

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross, excluding locomotive and tender	Ton-miles (thousands): Net, revenue and non-revenue	Average number of locomotives on line daily: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany ... 1922	394	252,014	265,245	24,786	4,928	73.3	229,689	87,565	110	32	22.6	...
1921	394	237,289	256,462	29,707	4,479	65.8	232,576	90,975	123	29	19.1	...
Boston & Maine ... 1922	2,455	514,072	574,956	49,658	12,095	77.7	548,356	222,885	319	127	28.4	32
1921	2,469	509,399	564,573	46,610	11,094	70.6	561,444	230,743	325	132	28.9	62
N. Y., N. H. & Hartford ... 1922	1,959	430,654	468,405	28,604	11,550	75.3	528,533	217,013	248	98	28.4	4
1921	1,960	452,517	487,934	30,355	10,498	66.9	537,299	222,152	309	79	20.3	45
Great Lakes Region:												
Delaware & Hudson ... 1922	887	234,728	312,812	31,878	6,825	77.9	361,256	175,266	251	51	17.0	172
1921	880	339,046	445,083	33,260	8,556	62.2	561,387	276,773	276	35	11.3	114
Del., Lack. & Western ... 1922	994	428,168	510,235	100,473	14,105	73.3	701,914	302,205	271	92	25.3	24
1921	995	511,787	625,962	115,829	15,943	69.9	875,637	416,323	303	56	15.5	46
Erie (inc. Chic. & Erie) ... 1922	2,309	777,452	844,068	74,107	27,099	72.0	1,469,102	648,421	476	278	36.9	45
1921	2,259	951,327	1,066,507	48,796	31,682	67.6	1,867,603	859,152	550	177	24.3	53
Lehigh Valley ... 1922	1,316	489,956	545,908	80,931	14,723	74.6	777,746	367,949	402	164	28.9	102
1921	1,316	559,876	614,036	59,717	15,883	62.9	963,836	431,654	439	107	19.6	129
Michigan Central ... 1922	1,827	517,260	534,737	24,227	18,444	72.5	905,995	376,718	306	94	23.6	73
1921	1,829	449,153	457,183	18,260	13,836	66.3	742,532	298,868	329	83	20.2	111
New York Central ... 1922	5,675	1,559,945	1,745,118	140,613	61,077	72.3	3,180,883	1,381,143	822	765	48.2	131
1921	5,655	1,677,716	1,856,719	133,471	59,097	62.3	3,435,860	1,455,922	977	622	38.9	248
N. Y., Chic. & St. Louis ... 1922	1,225	471,183	475,640	3,097	13,967	75.6	680,009	290,419	151	73	32.6	23
1921	1,225	424,529	428,219	1,610	12,182	68.1	625,415	253,836	187	80	29.8	69
Pere Marquette ... 1922	2,182	327,065	334,116	5,637	8,585	73.4	440,611	203,542	144	65	31.1	1
1921	2,196	345,847	351,558	6,881	8,689	68.1	475,349	206,794	163	45	21.5	18
Pitts. & Lake Erie ... 1922	228	101,310	106,222	1,046	3,639	73.9	232,084	139,561	57	24	29.6	10
1921	225	67,273	70,156	599	2,374	63.9	166,136	93,149	59	27	31.5	22
Wabash ... 1922	2,418	463,090	483,844	5,680	14,613	80.5	697,116	316,499	262	83	24.0	14
1921	2,418	595,359	627,690	9,632	16,308	68.5	874,616	372,818	276	71	20.4	39
Ohio-Indiana-Allegheny Region:												
Baltimore & Ohio ... 1922	5,235	1,177,378	1,348,092	90,190	31,367	70.5	1,814,338	910,367	648	730	53.0	10
1921	5,185	1,671,430	1,772,764	137,693	40,623	61.2	2,690,838	1,322,018	1,002	393	28.2	192
Central R. R. of N. J. ... 1922	689	255,424	278,906	33,345	5,490	71.1	290,924	132,667	204	56	21.4	30
1921	679	264,944	297,263	40,173	6,237	62.6	390,383	192,294	206	56	21.3	14
Chicago & Eastern Ill. ... 1922	945	197,323	199,655	2,646	4,952	73.9	256,559	125,525	92	76	45.1	23
1921	1,131	246,902	248,431	3,895	5,803	62.2	354,866	177,114	127	49	27.7	46
Clev., Cin., Chic. & St. L. ... 1922	2,378	549,221	571,096	13,239	18,783	73.0	1,039,043	508,022	234	217	48.1	1
1921	2,382	626,808	652,912	2,912	17,213	60.4	1,067,098	468,447	299	143	32.4	32
Elgin, Joliet & East. ... 1922	459	39,096	41,382	1,739	1,172	67.4	86,973	47,394	87	20	18.9	21
1921	456	87,348	94,207	4,716	2,714	67.6	197,412	106,104	97	11	10.0	43
Long Island ... 1922	394	43,128	45,257	7,125	517	60.0	29,614	10,816	35	13	26.9	...
1921	395	46,290	53,044	8,585	588	59.5	32,861	12,833	35	10	22.6	1
Pennsylvania System ... 1922	10,903	4,467,630	4,822,558	359,104	126,883	71.0	7,590,867	3,775,994	2,500	880	26.0	328
1921	10,877	3,944,882	4,278,363	300,264	100,933	63.8	6,776,305	3,376,523	2,615	854	24.6	843
Philadelphia & Reading ... 1922	1,119	458,335	498,566	51,954	11,427	69.4	681,402	347,554	416	72	14.8	239
1921	1,119	503,999	568,105	70,229	12,390	63.5	835,302	432,037	367	85	18.9	168
Pocahontas Region:												
Chesapeake & Ohio ... 1922	2,551	533,380	585,045	13,582	15,551	61.7	1,157,772	635,651	336	210	38.5	35
1921	2,548	641,697	694,937	20,147	18,473	58.3	1,395,262	749,688	456	102	18.3	126
Norfolk & Western ... 1922	2,228	824,720	980,237	38,397	21,544	57.7	1,778,131	972,189	552	173	23.9	96
1921	2,221	665,948	800,708	29,845	18,164	60.1	1,373,981	744,037	614	89	12.5	216
Southern Region:												
Atlantic Coast Line ... 1922	4,923	570,097	572,105	11,093	13,261	74.0	646,119	281,292	333	99	23.0	19
1921	4,887	474,410	478,1[illegible]3	6,809	9,952	65.[illegible]	568,139	197,763	295	113	27.6	68
Central of Georgia ... 1922	1,907	233,976	[illegible]35,790	3,463	4,873	77.9	24[illegible],1[illegible]3	114,637	120	13	9.5	...
1921	1,899	227,007	2[illegible]0,216	2,022	4,427	66.4	2[illegible]9,958	98,910	110	25	18.8	17
Ill. Cent. (inc. Y. & M. V.) ... 1922	6,135	2,038,510	2,087,787	51,540	58,11[illegible]	69.8	3,453,4[illegible]2	1,649,617	746	95	11.3	5
1921	6,151	1,549,470	1,555,055	30,251	40,852	62.9	2,579,683	1,147,793	712	95	11.8	16
Louisville & Nashville ... 1922	5,021	1,303,678	1,382,955	47,805	21,919	66.5	1,35[illegible],730	667,940	598	93	13.5	...
1921	5,020	1,461,786	1,556,544	55,523	[illegible]5,033	59.6	1,625,062	766,006	551	103	15.8	37
Seaboard Air Line ... 1922	3,537	415,459	4[illegible]1,834	11,845	9,[illegible]58	74.5	461,049	202,144	145	123	46.0	...
1921	3,537	351,147	360,355	6,708	7,156	71.2	355,145	144,844	166	90	35.2	6
Southern Ry. ... 1922	6,942	1,016,017	1,039,377	35,459	21,709	77.1	1,059,658	474,909	790	253	24.3	9
1921	6,942	1,181,316	1,2[illegible]2,071	24,863	24,955	66.2	1,322,754	553,821	879	239	21.4	65
Northwestern Region:												
Chicago & N. Western ... 1922	8,427	1,229,367	1,278,396	27,4[illegible]8	28,094	71.4	1,477,562	666,059	697	344	33.0	8
1921	8,371	1,631,875	1,680,576	22,430	34,517	61.6	2,034,514	787,534	813	262	24.4	62
Chicago, Milwau. & St. P. ... 1922	11,027	1,637,844	1,686,[illegible]44	81,451	42,506	72.4	2,216,316	1,031,607	777	286	26.9	83
1921	10,992	1,590,4[illegible]0	1,631,084	64,028	38,862	66.6	2,175,658	992,748	880	203	19.1	137
Chic., St. P., Minn. & Om. ... 1922	1,726	378,126	411,167	19,979	7,107	72.9	3[illegible]8,065	[illegible]	153	67	30.4	11
1921	1,726	345,988	366,276	15,005	6,481	69.0	354,545	155,930	156	57	26.6	23
Great Northern ... 1922	8,255	886,[illegible]6	[illegible]	38,569	27,099	65.8	1,636,290	838,499	551	174	24.0	6[illegible]
1921	8,15[illegible]	[illegible]	853,05[illegible]	26,049	[illegible]3,038	64.4	1,386,607	664,0[illegible]5	592	189	24.[illegible]	215
Minn., St. P. & S. Ste. M. ... 1922	4,355	581,660	587,9[illegible]7	10,749	14,377	76.4	67[illegible]	[illegible]	347	57	13.1	8
1921	4,260	468,897	[illegible]	7,404	10,428	72.4	518,444	[illegible]	34[illegible]	61	[illegible]	28
Northern Pacific ... 1922	6,388	[illegible]	[illegible]	45,775	26,749	75.2	1,419,9[illegible]7	[illegible]	588	[illegible]	18.7	81
1921	6,408	783,139	819,334	51,365	22,465	66.8	[illegible]	[illegible]	[illegible]	157	22.4	114
Oreg. Wash. R. R. & Nav. ... 1922	2,143	233,[illegible]77	[illegible]59,431	39,596	5,706	72.5	[illegible]	154,93[illegible]	[illegible]	35	20.6	7
1921	[illegible]	[illegible]	[illegible]45,655	33,689	5,529	71.3	320,8[illegible]5	156,846	119	40	25.0	1
Central Western Region:												
Atch., Topeka & Santa Fe ... 1922	9,798	1,759,947	1,839,915	80,537	49,[illegible]74	68.7	2,777,446	1,117,540	754	196	20.6	85
1921	9,771	1,6[illegible]4,796	1,71[illegible],694	85,362	43,665	66.2	[illegible]	[illegible]	777	[illegible]	20.5	119
Chicago & Alton ... 1922	1,010	[illegible]	[illegible]	3,661	4,532	76.5	[illegible]	[illegible]	78	67	46.3	6
1921	1,010	[illegible]	[illegible]	4,941	7,680	60.7	[illegible]	[illegible]	131	4[illegible]	23.6	17
Chic., Burlington & Quincy ... 1922	[illegible]	1,53[illegible],754	1,598,349	90,257	41,919	70.8	2,303,1[illegible]6	1,091,464	751	228	23.3	63
1921	9,326	1,591,780	1,663,6[illegible]7	79,741	41,345	63.9	[illegible]	1,183,770	681	264	27.9	92
Chicago, Rock I. & Pacific ... 1922	7,66[illegible]	[illegible]	[illegible]	18,781	29,875	76.4	1,516,895	705,177	536	207	27.8	34
1921	7,661	[illegible]	1,539,709	15,718	31,597	67.7	[illegible]	833,384	59[illegible]	165	21.8	25
Denver & R. G. Wn. ... 1922	[illegible]	[illegible]	[illegible]	64,939	5,731	67.4	[illegible]	[illegible]	225	99	30.6	9
1921	[illegible]	[illegible]	[illegible]	61,690	5,236	61.4	[illegible]	[illegible]	220	75	24.8	48
Oregon Short Line ... 1922	[illegible]	[illegible]	[illegible]	[illegible]	8,375	61.4	519,013	[illegible]	188	49	20.6	40
1921	[illegible]	[illegible]	[illegible]	[illegible]	8,819	62.8	[illegible]	236,514	18[illegible]	4[illegible]	18.8	47
Southern Pacific ... 1922	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	613	186	23.3	8
1921	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	731,876	570	198	[illegible]	15
Union Pacific ... 1922	[illegible]	[illegible]	[illegible]	[illegible]	33,111	70.5	1,760,931	[illegible]	425	[illegible]	[illegible]	110
1921	[illegible]	[illegible]	[illegible]	63,875	34,703	65.6	[illegible]	749,609	308	136	25.4	51
Southwestern Region:												
Gulf, Colo. & Santa Fe ... 1922	[illegible]	[illegible]	[illegible]	6,611	[illegible]	66.7	398,093	190,416	[illegible]	[illegible]	[illegible]	15
1921	[illegible]	[illegible]	[illegible]	5,716	7,704	55.8	509,083	[illegible]	[illegible]	40	23.6	10
Mo., Kansas & Texas ... 1922	[illegible]	[illegible]	[illegible]	5,470	[illegible]	67.6	384,832	160,867	[illegible]	82	43.1	37
1921	[illegible]	[illegible]	[illegible]	4,847	[illegible]	69.0	[illegible]	[illegible]	146	[illegible]	18.2	51
Mo., Kans. & T. of Tex. ... 1922	[illegible]	[illegible]	[illegible]	[illegible]	3,364	71.5	[illegible]	[illegible]	60	72	50.9	8
1921	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	69.8	[illegible]	119,613	[illegible]	41	28.9	17
Missouri Pacific ... 1922	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	74.7	[illegible]	[illegible]	[illegible]	215	36.4	1
1921	[illegible]	[illegible]	[illegible]	14,084	[illegible]	67.1	[illegible]	[illegible]	[illegible]	158	28.0	3
St. Louis-San Francisco ... 1922	[illegible]	[illegible]	741,666	17,239	[illegible]	68.3	[illegible]	[illegible]	314	[illegible]	28.7	1
1921	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	66.1	[illegible]	[illegible]	[illegible]	[illegible]	28.6	31
Southwestern Lines (in Texas) ... 1922	[illegible]	[illegible]	665,831	[illegible]	[illegible]	67.9	731,479	333,393	187	104	35.8	10
1921	[illegible]	[illegible]	536,[illegible]75	[illegible]	10,963	65.5	637,078	[illegible]	168	[illegible]	42.5	1
Texas & Pacific ... 1922	[illegible]	[illegible]	[illegible]	5,315	[illegible]	72.3	[illegible]	[illegible]	97	112	53.7	16
1921	1,953	51,[illegible]70	251,[illegible]	1,437	[illegible]	67.1	306,834	1[illegible]5,157	118	70	37.1	26

[1] No passenger train service.

Compiled by the Bureau of Statistics of the Interstate Commerce Commission. Subject to revision.

Compared with August, 1921, for Roads with Annual Operating Revenues Above $25,000,000.

Region, road and year		Average number of freight cars on line daily: Home	Foreign	Total	Per cent unserviceable	Stored	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles, including locomotive and tender	Passenger service: Train-miles	Passenger-train car-miles
New England Region:															
Boston & Albany	1922	[illegible]	[illegible]	[illegible]	6.4	....	911	347	17.8	[illegible]	[illegible]	7,171	[illegible]	[illegible]	[illegible]
	1921	[illegible]	[illegible]	[illegible]	[illegible]	845	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Boston & Maine	1922	[illegible]	[illegible]	[illegible]	[illegible]	747	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	161	[illegible]	[illegible]
	1921	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,102	451	[illegible]	247	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
N. Y., N. H. & Hartford	1922	[illegible]	[illegible]	[illegible]	[illegible]	203	[illegible]	514	18.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6,061,5[illegible]1
	1921	[illegible]	[illegible]	[illegible]	[illegible]	1,797	1,717	401	21.2	185	13.1	3,677	[illegible]	1,116,[illegible]	7,1[illegible]1,4[illegible]1
Great Lakes Region:															
Delaware & Hudson	1922	[illegible]	[illegible]	[illegible]	7.7	5,[illegible]7	1,[illegible]39	747	25.7	[illegible]	15.6	[illegible]	[illegible]	[illegible]	[illegible],866
	1921	[illegible]	[illegible]	[illegible]	14.6	817	[illegible]	816	32.3	561	27.9	10,14[illegible]	[illegible]	[illegible]	[illegible],458
Del., Lack. & Wn.	1922	15,7[illegible]	[illegible]	[illegible]	13.4	781	1,639	70[illegible]	21.4	[illegible]	24.5	[illegible]	[illegible]	[illegible]	3,722,[illegible]48
	1921	17,[illegible]	7,[illegible]	[illegible]	15.7	44	1,711	813	26.1	522	2[illegible].6	11,5[illegible]	[illegible]	[illegible]	[illegible]
Erie (inc. Chic. & Erie)	1922	[illegible]	[illegible]	14,[illegible]	17.6	1,55[illegible]	1,[illegible]90	8[illegible]4	23.9	[illegible]	21.1	9,017	146	66[illegible],17[illegible]	5,670,447
	1921	[illegible]	1[illegible]	14,[illegible]	21.9	[illegible],844	1,[illegible]63	903	27.1	51[illegible]	27.[illegible]	12,[illegible]70	1[illegible]4	6[illegible]6,855	5,274,842
Lehigh Valley	1922	[illegible]	1[illegible]	[illegible]	11.[illegible]	3,778	1,5[illegible]	751	25.0	271	14.5	9,017	188	[illegible]18,147	2,865,983
	1921	11,7[illegible]1	[illegible]	[illegible]	9.3	2,711	1,7[illegible]	771	27.2	351	2[illegible].6	10,57[illegible]	159	[illegible]	3,1[illegible]4,05[illegible]
Michigan Central	1922	12,4[illegible]	1[illegible],[illegible]82	[illegible],947	14.6	....	1,752	728	20.4	420	2[illegible].3	6,653	1[illegible]8	6[illegible],77[illegible]	5,490,017
	1921	[illegible]	[illegible]	[illegible]	21.9	2[illegible]9	1,653	665	21.6	297	29.7	5,[illegible]70	11[illegible]	6[illegible],114	5,773,786
New York Central	1922	[illegible]	[illegible],[illegible]11	[illegible]	14.6	8,368	2,039	885	2[illegible].6	357	21.8	7,851	131	2,507,[illegible]	[illegible]
	1921	8[illegible],915	46,[illegible]16	[illegible]	17.[illegible]	16,987	2,048	868	24.6	348	[illegible]2.7	8,305	116	2,455,237	[illegible]
N. Y., Chic. & St. L.	1922	[illegible]	[illegible]	[illegible]	16.8	....	1,443	616	21.8	7[illegible]7	46.[illegible]	7,645	123	[illegible]	8[illegible]0,305
	1921	7,[illegible]	7,[illegible]	14,[illegible]	[illegible]3.0	732	1,473	598	20.8	554	39.0	6,[illegible]	10[illegible]	155,5[illegible]	8[illegible]4,367
Pere Marquette	1922	8,7[illegible]1	12,1[illegible]	[illegible]	18.4	....	1,347	622	23.7	30[illegible]	17.7	3,0[illegible]0	12[illegible]	[illegible]	1,37[illegible],6[illegible]7
	1921	11,2[illegible]4	11,[illegible]	[illegible]	18.2	5[illegible]0	1,375	598	23.8	297	18.3	[illegible]	1[illegible]4	[illegible]43,3[illegible]6	1,8[illegible]7,982
Pitts. & Lake Erie	1922	10,611	10,[illegible]	[illegible]	[illegible]4.7	3,651	2,281	1,378	38.4	16[illegible]	6.[illegible]	19,75[illegible]	90	116,[illegible]19	6[illegible],412
	1921	1[illegible],[illegible]95	7,[illegible]28	[illegible]	[illegible]6.1	1,749	2,470	1,385	39.[illegible]	110	4.4	1[illegible],[illegible]77	75	11[illegible],[illegible]61	616,351
Wabash	1922	9,9[illegible]1	1[illegible]	[illegible]	11.1	2[illegible]3	1,505	683	21.7	454	26.0	4,[illegible]23	136	373,76[illegible]	2,411,[illegible]52
	1921	11,9[illegible]2	11,[illegible]1	[illegible]3,2[illegible]3	11.4	644	1,469	626	22.9	517	33.0	4,974	148	53[illegible],903	2,[illegible]85,568
Ohio-Indiana-Allegheny Region:															
Baltimore & Ohio	1922	62,688	41,[illegible]62	104,530	14.2	2,980	1,541	773	29.0	281	13.7	5,610	[illegible]	1,313,255	[illegible]
	1921	6[illegible],[illegible]73	[illegible]	[illegible]	10.6	3,926	1,610	791	32.5	429	21.5	[illegible]	177	1,416,158	9,171,4[illegible]6
Central R. R. of N. J.	1922	18,657	9,361	2[illegible],01[illegible]	5.9	10,701	1,139	519	24.2	15[illegible]	8.9	[illegible]	2[illegible]4	417,1[illegible]8	[illegible]
	1921	19,[illegible]3	8,345	[illegible]	20.4	4,896	1,473	726	30.8	219	11.3	9,143	1[illegible]1	403,970	2,050,825
Chicago & Eastern Ill.	1922	13,375	4,5[illegible]3	17,[illegible]	18.2	474	1,300	636	25.3	225	12.0	4,284	160	186,175	1,351,673
	1921	14,48[illegible]	3,8[illegible]5	18,[illegible]77	1[illegible].2	846	1,437	717	30.5	311	16.4	5,05[illegible]	15[illegible]	[illegible]2,873	1,442,963
Clev., Cin., Chic. & St. L.	1922	15,70[illegible]	[illegible]1,9[illegible]	3[illegible],6[illegible]	15.3	4,277	1,892	9[illegible]5	27.0	435	22.0	6,8[illegible]	1[illegible]2	707,65[illegible]	4,287,572
	1921	17,651	15,[illegible]4	32,6[illegible]	13.2	[illegible]62	1,702	747	27.2	462	28.1	6,344	127	734,657	4,355,661
Elgin, Joliet & Eastern	1922	8,97[illegible]	5,648	14,6[illegible]1	16.0	.....	[illegible],2[illegible]5	1,225	40.9	106	3.8	3,365	102	(¹)	(¹)
	1921	9,7[illegible]6	3,[illegible]8	13,714	8.1	1,915	2,260	1,215	39.1	250	9.4	7,5[illegible]0	113	(¹)	(¹)
Long Island	1922	2,061	3,008	5,069	5.4	.....	687	251	20.9	69	5.5	8[illegible]5	330	230,028	1,435,123
	1921	[illegible],159	[illegible],925	5,07[illegible]	4.0	193	710	277	21.8	82	6.3	1,049	312	2[illegible],514	1,378,696
Pennsylvania System	1922	18[illegible],45[illegible]	101,216	281,6[illegible]8	13.9	12,622	1,699	845	[illegible]9.8	432	20.5	11,17[illegible]	145	5,316,096	35,792,262
	1921	219,75[illegible]	64,071	2[illegible]3,830	14.3	57,670	1,718	856	33.5	384	18.0	10,013	133	5,401,59[illegible]	35,886,764
Phila. & Reading	1922	20,519	11,625	3[illegible],144	5.3	5,555	1,487	758	30.4	349	16.5	10,017	185	515,606	2,336,300
	1921	27,653	10,362	3[illegible],015	7.1	8,778	1,657	858	34.9	367	16.6	12,459	172	542,724	2,492,139
Pocahontas Region:															
Chesapeake & Ohio	1922	32,747	17,[illegible]40	50,687	16.5	476	2,171	1,192	40.9	405	16.0	8,039	1[illegible]9	451,09[illegible]	2,492,[illegible]13
	1921	40,4[illegible]6	9,764	5[illegible]	9.3	3,100	2,174	1,168	40.6	481	20.3	9,490	126	453,51[illegible]	2,551,[illegible]
Norfolk & Western	1922	28,[illegible]42	14,253	4[illegible]	6.5	.....	2,156	1,179	45.1	741	28.5	14,077	175	398,299	2,480,484
	1921	36,635	5,[illegible]72	4[illegible],907	9.6	4,868	2,063	1,117	41.0	573	23.2	10,807	165	41[illegible],4[illegible]7	2,717,032
Southern Region:															
Atlantic Coast Line	1922	13,497	9,369	[illegible]2,866	19.0	.....	1,133	493	21.2	397	25.3	1,843	123	70[illegible],892	4,0[illegible]8,698
	1921	21,222	5,792	27,014	24.2	.....	1,071	417	19.9	236	18.2	1,305	135	708,[illegible]78	4,110,252
Central of Georgia	1922	2,408	4,414	[illegible]	16.1	.....	1,035	4[illegible]0	23.5	542	29.6	1,939	164	328,703	1,5[illegible]0,014
	1921	4,677	3,313	7,9[illegible]	14.4	.....	1,013	436	2[illegible].3	399	26.9	1,672	147	320,502	1,521,986
Illinois Central (inc. Yazoo & M. V.)	1922	31,145	35,778	66,923	9.5	2,573	1,694	809	28.4	795	40.1	8,674	131	1,468,676	8,430,145
	1921	44,346	19,336	63,6[illegible]	12.8	3,858	1,665	741	28.1	581	32.9	6,019	132	1,442,874	8,20[illegible],023
Louisville & Nashville	1922	27,572	21,409	48,9[illegible]1	12.5	66	1,038	512	30.5	440	21.7	4,291	191	1,006,4[illegible]3	5,81[illegible],961
	1921	39,859	14,773	54,632	[illegible]9.3	90	1,112	5[illegible]4	30.6	452	24.8	4,9[illegible]2	159	943,548	5,46[illegible],554
Seaboard Air Line	1922	11,194	1[illegible],585	23,779	35.0	.....	1,110	487	21.8	274	16.9	1,843	170	433,746	2,63[illegible],541
	1921	11,6[illegible]8	6,162	17,790	32.2	.....	1,011	413	20.2	263	18.2	1,321	186	563,749	3,166,312
Southern Ry.	1922	31,263	38,831	70,094	15.3	.....	1,043	468	21.9	219	13.0	2,2[illegible]7	213	1,30[illegible],972	7,331,823
	1921	39,746	17,846	57,592	13.5	2,208	1,128	469	22.2	310	21.1	2,574	197	1,329,184	7,899,819
Northwestern Region:															
Chic. & N. W.	1922	40,811	32,890	73,701	9.3	.....	1,202	54[illegible]	23.7	292	17.2	2,550	160	1,405,293	9,53[illegible],596
	1921	49,102	26,241	75,343	10.0	6,679	1,747	483	22.8	337	24.0	3,035	161	1,675,159	10,873,303
Chic., Milw. & St. P.	1922	45,889	[illegible]6,725	72,614	18.7	.....	1,353	629	24.3	458	26.1	3,016	136	1,485,783	9,329,283
	1921	49,760	26,125	75,885	19.1	3,261	1,368	624	25.5	422	24.8	2,913	145	1,545,941	9,779,383
Chic., St. P., Minneap. & Om.	1922	3,540	10,108	13,648	14.2	47	1,000	442	23.5	395	23.0	3,125	147	270,297	1,747,650
	1921	4,378	11,504	15,882	15.7	2,516	1,025	451	24.1	317	19.1	2,914	152	374,986	1,867,450
Great Northern	1922	45,140	12,268	57,4[illegible]8	11.6	.....	1,845	945	30.9	47[illegible]	23.2	3,[illegible]77	122	883,051	6,055,155
	1921	46,796	6,[illegible]00	5[illegible],996	14.2	.....	1,665	797	[illegible]8.8	404	[illegible]1.8	2,625	14[illegible]	1,008,463	6,331,177
Minneap., St. P. & S. Ste. M.	1922	17,905	7,248	[illegible],153	8.3	2,613	1,157	558	22.6	416	24.1	[illegible],405	100	435,6[illegible]8	[illegible],762,487
	1921	20,733	5,765	26,498	11.6	5,034	1,106	506	22.8	289	17.5	1,757	129	447,454	2,864,049
Northern Pacific	1922	32,756	11,402	44,15[illegible]	15.2	419	1,536	736	25.4	497	26.0	3,434	109	761,505	5,51[illegible],167
	1921	38,416	6,939	45,355	15.8	4,999	1,623	722	25.2	40[illegible]	23.9	2,[illegible]46	126	86[illegible],652	6,[illegible]08,196
Oreg.-Wash. R. R. & Nav.	1922	5,263	3,64[illegible]	[illegible]	1.9	.....	1,391	665	27.2	520	26.4	[illegible],332	206	26[illegible],181	1,830,106
	1921	6,755	3,502	10,[illegible]57	3.9	1,521	1,454	711	28.4	493	[illegible]4.4	[illegible],30[illegible]	199	[illegible]57,749	1,786,[illegible]12
Central Western Region:															
Atch., Top. & S. Fe	1922	44,6[illegible]1	19,154	63,[illegible]75	7.3	3,769	1,578	635	22.4	565	36.7	3,679	130	1,5[illegible]1,496	12,019,171
	1921	45,100	14,552	[illegible]	11.5	3,280	1,53[illegible]	577	21.2	501	35.7	3,057	136	1,594,1[illegible]	12,014,94[illegible]
Chicago & Alton[1]	1922	(²)	(²)	(²)	(²)	1,0[illegible]	1,193	636	27.3	(²)	(²)	4,976	1[illegible]0	[illegible]	1,441,[illegible]
	1921	10,870	6,17[illegible]	17,0[illegible]	3.3	200	1,291	586	27.4	398	23.9	6,70[illegible]	174	30[illegible],352	1,777,[illegible]83
Chic., Burl. & Quincy	1922	42,803	[illegible]5,957	6[illegible],760	9.[illegible]	.....	1,500	711	[illegible]6.0	51[illegible]	[illegible]	3,7[illegible]5	143	1,567,256	11,050,778
	1921	47,589	[illegible]1,237	6[illegible],8[illegible]6	13.4	400	1,560	744	28.6	555	30.3	4,095	151	1,558,176	10,833,839
Chic., Rock I. & Pac.	1922	27,464	[illegible],465	43,[illegible]29	16.4	1,080	1,[illegible]0	567	[illegible]3.6	518	[illegible]8.7	[illegible],96[illegible]	149	1,31[illegible],563	7,894,[illegible]18
	1921	[illegible]	21,715	51,[illegible]44	1[illegible].9	1,650	1,183	550	26.4	5[illegible]5	29.4	3,509	161	1,378,[illegible]16	8,033,37[illegible]
Denver & R. G. Wn.	1922	11,748	4,677	16,4[illegible]5	1[illegible].1	1,892	1,324	647	30.0	33[illegible]	16.7	[illegible],13[illegible]	[illegible]	[illegible],623	[illegible],178,886
	1921	1[illegible],7[illegible]6	[illegible],[illegible]15	1[illegible],6[illegible]1	1[illegible].0	[illegible],113	1,30[illegible]	57[illegible]	27.6	264	15.6	1,7[illegible]	[illegible]64	[illegible]66,071	1,95[illegible],[illegible]75
Oreg. Short Line	1922	6,411	[illegible],[illegible]63	10,704	3.4	38	1,[illegible]99	54[illegible]	[illegible]6.[illegible]	6[illegible]	41.1	3,061	13[illegible]	316,773	2,383,329
	1921	7,[illegible]	[illegible],9[illegible]1	1[illegible],[illegible]70	1.1	1,6[illegible]4	1,45[illegible]	6[illegible]8	[illegible]6.8	605	41.3	[illegible],2[illegible]4	1[illegible]8	301,9[illegible]	[illegible],248,106
Southern Pacific	1922	23,[illegible]	20,899	43,9[illegible]1	8.1	.....	1,573	634	[illegible].4	583	37.7	3,675	150	1,388,667	11,892,607
	1921	24,75[illegible]	21,074	45,83[illegible]	7.7	2,11[illegible]	1,546	6[illegible]	23.3	515	3[illegible].9	3,38[illegible]	14[illegible]	1,391,407	11,187,588
Union Pacific	1922	13,191	9,554	[illegible],745	9.7	1,409	1,671	646	[illegible]0.6	965	66.6	5,923	137	890,[illegible]86	7,523,477
	1921	16,763	[illegible],5[illegible]3	[illegible]6,[illegible]86	1[illegible].4	1,[illegible]	1,670	638	[illegible]1.6	9[illegible]	65.1	6,6[illegible]0	141	913,471	7,2[illegible]7,[illegible]9
Southwestern Region:															
Gulf, Colo. & S. Fe	1922	5,951	4,330	10,[illegible]81	3.6	285	1,532	711	[illegible]8.[illegible]	598	31.7	3,[illegible]42	13[illegible]	197,9[illegible]0	1,143,788
	1921	8,805	4,579	13,[illegible]45	5.2	426	1,478	651	29.1	511	33.[illegible]	[illegible]	131	1[illegible]4,380	1,136,504
Mo., Kans. & Tex.	1922	8,596	7,687	16,[illegible]83	7.[illegible]	..	1,554	649	[illegible].3	319	21.1	3,1[illegible]9	13[illegible]	[illegible]9,861	1,837,[illegible]36
	1921	7,765	6,091	13,[illegible]56	7.3	927	1,[illegible]70	5[illegible]1	[illegible].7	3[illegible]0	[illegible]8.7	3,159	1[illegible]8	275,851	2,0[illegible]2,100
Mo., Kans. & Tex. of Tex.	1922	[illegible]74	10,664	10,[illegible]38	6.7	165	1,00[illegible]	440	23.7	235	13.9	1,181	165	18[illegible],716	1,319,7[illegible]5
	1921	[illegible]72	13,[illegible]	13,561	4.8	...	1,131	481	[illegible]5.6	[illegible]84	18.3	[illegible],218	15[illegible]	[illegible]73,065	1,677,690
Missouri Pacific	1922	24,8[illegible]5	25,781	50,5[illegible]6	10.8	.....	1,338	63[illegible]	[illegible]	398	21.1	2,797	15[illegible]	80[illegible],316	4,914,030
	1921	31,257	24,69[illegible]	55,949	9.0	1,648	1,36[illegible]	579	25.7	400	25.0	3,078	14[illegible]	937,578	5,658,103
St. Louis-San Francisco	1922	18,104	20,940	39,044	9.6	...	966	41[illegible]	[illegible]5.6	[illegible]66	15.[illegible]	[illegible]	196	665,857	3,745,065
	1921	20,790	12,408	33,198	5.9	.....	1,01[illegible]	446	24.8	34[illegible]	[illegible]0.8	[illegible],425	18[illegible]	781,1[illegible]	4,463,732
Southern Pacific Lines (In Texas and La.)[3]	1922	6,008	1[illegible],878	18,886	7.9	500	1,2[illegible]4	558	[illegible]6.5	569	31.7	[illegible],898	1[illegible]5	547,899	3,486,08[illegible]
	1921	8,479	13,819	[illegible]	19.9	768	1,193	5[illegible]0	[illegible]5.3	40[illegible]	[illegible]	2,45[illegible]	1[illegible]4	5[illegible]7,197	[illegible]
Texas & Pacific	1922	4,505	7,401	11,906	18.0	.....	1,414	6[illegible]	[illegible].4	368	22.7	[illegible],[illegible]41	139	235,681	1,57[illegible]
	1921	5,580	4,436	10,016	27.5	....	1,2[illegible]1	498	22.1	403	27.0	[illegible],068	143	301,155	1,9[illegible]8,8[illegible]

[1]Figures for August 31, 1922, not included. [2]No data available. [3]Includes Galveston, Harrisburg & San Antonio, Houston & Shreveport, Houston & Texas Central, Houston East & West Texas, Iberia & Vermilion, Lakes Charles & Northern, Louisiana Western, Morgan's La. & Tex. R. R. & S. S. Co., and Texas & New Orleans.

Striking Shopmen Reopen Relations With the Labor Board

The first move to reestablish relations between the Railroad Labor Board and the Railway Employees' Department of the American Federation of Labor was made on October 21 when B. M. Jewell, leader of the shopmen's strike, called upon Chairman B. W. Hooper of the Board and gave notice that the shop crafts would present a petition for the reopening of a case against the New York Central, involving the question of the piece work system in the Elkhart (Ind.) shops. It was unofficially intimated at the board that Mr. Jewell's petition would be granted and that the Labor Board would resume its status as umpire in disputes affecting this organization and those roads on which it still retains a majority of the shop workers.

The Daugherty Injunction

The legal battle over the "Daugherty Injunction," restraining striking railway shopmen from interfering with commerce or with the operation of railway shops, continues at Chicago, despite the fact that the shopmen's strike is now practically a matter of history. Donald R. Richberg, attorney for the shopmen, on October 19, filed a motion before Federal Judge James H. Wilkerson to dissolve the interlocutory injunction obtained by Attorney General Daugherty. The principal plea for the shopmen at that time was that "the conditions described in the bill of complaint, if they ever existed, no longer exist," because a large number of the railroads and the workers involved have settled their differences. Following this plea several continuances were made and at the present time hearings on Mr. Richberg's motion are set for November 6.

Collision at Toltec, New Mexico

On the Denver & Rio Grande Western at Toltec, N. M., on September 29, there occurred a collision which, according to the report of the inspector of the Interstate Commerce Commission, may be classed as due to error in reading a meeting order which was not properly punctuated (though, of course, everybody recognizes that train orders are never punctuated). This collision occurred on a narrow gage line and the trains met on a curve of eight degrees where, on account of rock bluffs, the range of vision is restricted to about 60 ft. The trains were moving at between 15 and 20 miles an hour; engineman and fireman of passenger train killed and 21 passengers and two employees injured. Westbound passenger No. 115 met eastbound locomotive No. 411 (without train). Engineman Smith, of No. 411 had received the following order:

> No 115 Eng 169 run
> one 1 hour late Lava
> to Osier fifty 50 mins
> late Osier to Cumbres

On receiving this order, Smith "glanced at it" and got into his mind the impression that No. 115 was one hour and 50 minutes late. He claims that he thus remarked to the operator and that the operator nodded assent; but the operator claims that this and other orders were read to him by the engineman and that the reading was correct. While the engineman was reading the other orders, the fireman entered, and read this one aloud. He seems also to have got the same impression. Thus they encroached on the time of the passenger train. The report calls attention, as in previous similar cases, to the "inherent deficiency of the time interval system."

First Aid Training on the D. & H.

A tournament of the Delaware & Hudson First Aid Teams was held at Hotel Champlain, Bluff Point, N. Y., on September 7, during the annual meeting of the Delaware & Hudson Company Freight and Ticket Agents' Association. In 1919 the Delaware & Hudson Company created a department for the education of its employes in the matter of personal safety, under the direction of J. E. Long and the work of the department was in 1920 extended to embrace first aid work; and today some 260 certificates of proficiency have been issued. This was the first public demonstration. Contests are to be held annually between teams representing the different divisions of the railroad.

By a process of elimination four teams, consisting of a captain and four men each, met in the finals of the tournament at Bluff Point. The contest consisted in working out eight problems in first aid, with Dr. Larkin, company surgeon, at Plattsburg, acting as judge. Of a possible 800 points, the team from Wilkes-Barre, Pa., representing the Pennsylvania division, scored 781, the Saratoga division 778, the Champlain division 770, and the Susquehanna division 766.

There has been a marked decrease in the number of accidents to employees. In 1921 there were only ten fatalities among all the employees of the entire system.

Work Progressing on P. & R.'s New Camden Terminal

Approximately 150,000 cubic yards of earth have already been filled in on the site of the new terminal of the Philadelphia & Reading seashore lines at Kaighns Point, Camden, N. J. It is expected that the fill-in will have been completed, the tracks laid, and the new terminal ready for service during the 1923 summer season. The entire site of the new terminal was under high tide three years ago. The area which the new terminal and its yards will cover is approximately 1,800 feet long and 700 feet wide. The filling in is being done by the American Dredging Company. The material used is being brought up by hydraulic pressure from the bottom of the Delaware River 30 feet below the surface of the water. The plans for the new terminal call for a modern two-story structure of steel frame and brick with

At Work on New P. & R. Terminal at Camden, N. J.

stone trimmings on a concrete foundation, built on piles. It will house the ferry slips, a large train shed and concourse, waiting rooms for men and women, a restaurant and the offices of the Delaware River Ferry Company, and of the seashore lines of the Philadelphia & Reading Railway. There will be ten platform tracks for use in the company's regular service and four additional tracks for use at times when travel is especially heavy. Each of these tracks will be gated and practically all of them will be long enough to accommodate a train of 14 cars. Extensive driveways leading into the terminal will be laid out, each of them wide enough to accommodate four lines of vehicles. There will be separate driveways for baggage and express. Adjoining the terminal proper will be large storage yard for cars and a Y. M. C. A. building for the use of trainmen.

Improper Billing for Foreign Car Repairs

The American Railway Association has issued a circular calling attention to the lack of compliance with the rules regarding billing for foreign car repairs and determining the responsibility for damage to foreign equipment necessitating repairs. This difficulty, the circular states, is largely due to incomplete supervision, lack of knowledge of the rules on the part of local shop officers and, in some instances, to improper practices. Railroad executives are urged to provide such supervision as will insure the proper observance of the Rules of Interchange with respect to repairs to foreign cars and billing therefor.

The Mechanical Division of the association has a small force of inspectors investigating these conditions. This work will be continued and in addition to calling the attention of the officers of the railroads concerned to the conditions found, similar reports will be made quarterly to the board of directors of the association.

Bridge and Building Association Selects Subjects for Next Year

At the closing session of the thirty-second annual convention of the American Railway Bridge and Building Association at Cincinnati, Ohio, on October 19, the following subjects were selected for investigation and report during the ensuing year:

The repair and renewal of ballast deck trestles.

Water facilities at stock yards—other construction and maintenance.

Methods of installing or replacing sewers and pipe lines under traffic.

The heating of small passenger stations.

Tool equipment for bridge building and water service maintenance gangs.

The relative merits of cast iron, concrete and corrugated metal pipe culverts.

The practibility of a uniform paint program for the entire year.

Specifications of bridge and building forces.

Seattle was the unanimous choice as the location for the next meeting, this point being selected because of the rapidly increasing use of western timber in bridge and building work and the desire of the members to study this timber in the forest and observe its manufacture into lumber for their use.

The Bridge and Building Supply Men's Association elected the following officers for the ensuing year. President, G. R. McVay, the Barrett Company, Chicago; vice-president, A. J. Filkins, the Paul Dickinson Company, Chicago; secretary, John Nelson, Joseph E Nelson & Sons, Chicago; treasurer, D. J. Higgins, the American Valve & Meter Company, Chicago; directors, T. W. Snow, the T. W. Snow Construction Company, Chicago; F. M. Condit, Fairbanks, Morse & Co., Chicago; C. H. Hunsacker, the Massey Company, St. Louis; H. C. Brown, Chicago Bridge & Iron Works, New York City.

Block Signals and Train Speed Control on the C. & N. W.

The Chicago & North Western has awarded a contract to the General Railway Signal Company, Rochester, N. Y., for the installation of automatic block signals, with train speed control, from West Chicago, Ill., north to Elgin, a distance of 12 miles.

The line is double track from West Chicago to Wayne, five miles, and the balance is single track. The double track will be equipped with Model 2A, direct current signals located on bridges and the single track will be equipped with the absolute permissive block system, Model 2A direct current signals being mounted on masts in the usual manner. The system of automatic train control will be the General Railway Signal Company's train speed control, described in the *Railway Age* of March 4, 1922, page 521.

Fixed limited speed is to be imposed at certain locations, as approaching the end of double track and interlocking plants, *i.e.*, there are certain fixed speed limitations that are in effect which will be enforced through the use of pairs of inductors without windings. The speed control scheme generally contemplates the use of three pairs of inductors governing the approach to stop signals which force the deceleration of trains to insure a safe stop. Speed will be so tapered as to handle the trains as they are normally handled now, automatic braking being used only when speed limits are exceeded.

There is an interlocking plant a short distance from the West Chicago station from which it has been customary, under certain traffic conditions, to advance trains to the station on "Call-on" signals. The limited speed indicated by the "Call-on" signals will be enforced by the application of pairs of inductors suitably placed between the interlocking plant and West Chicago station.

The speed control and receiving apparatus will be the same for freight and for passenger locomotives, except for the timing of the time element contactor. Locomotives that may be used in either passenger or freight service will be equipped with time element contactors that may be adjusted for either class of service.

Traffic News

Intrastate passenger fares in Alabama will, from November 15, be calculated at three cents a mile, in compliance with an order of the Public Service Commission of the State issued some months ago. The railroads, by way of protest, asked the Interstate Commerce Commission to investigate the matter with a view to forbidding the reduction proposed by the State Commission, but the Federal body has decided that no hearing will be given on the petition of the railroads, and the State Commission now announces that no further delay will be permitted.

Loading of bituminous coal on Monday was the largest since December 20, 1920, according to reports received by the Car Service Division of the American Railway Association. The total was 43,243 cars, an increase of 2,042 cars over the total for Monday, October 16, which up to that time had marked the high point reached in bituminous coal loading since the miners' strike. The loading on Monday eclipsed the daily average for October last year by approximately 12,200 cars, and also was approximately 13,000 cars in excess of the daily average for the first three weeks in October this year.

Anthracite loading on Monday amounted to 6,398 cars. This exceeded the previous Saturday by 93 cars, and also surpassed the daily average loading for the first three weeks this month by more than 200 cars. It also was approximately 500 cars above the daily average for October, 1920, and 1921.

Chicago Shippers Meet November 7

The annual meeting of the Chicago Shippers' Conference Association will be held at Hotel La Salle in that city on November 7. This association was organized some years ago by the principal industrial concerns of the Chicago district in order to co-operate with the carriers in the handling of freight. The business of the organization is done through committees which deal with similar committees appointed by the railroads.

Want Competing Express Company in Chicago

The Chicago Association of Commerce has issued a circular containing a plea for the entrance of the Southeastern Express Company into Chicago to compete with the American Railway Express Company. The circular says in part:

"At the present time Chicago is served only by the American Railway Express Company. The Southeastern Express Company, is operating over the following lines: Southern; Mobile & Ohio; Tennessee Central; Maryland & Pennsylvania; Washington, Baltimore & Annapolis Electric; Merchants & Miners Transportation Company and Baltimore & Philadelphia Steamboat Company.

"We have received complaints from Chicago shippers of the refusal of the American Railway Express Company to respect routing via the Ohio River gateway over the most direct routes even though a detour of many miles is necessary in order that the American may enjoy the longest possible haul. The final link of the journey is made by the Southeastern, resulting in delays from 24 to 72 hours. The Southeastern has a through line to St. Louis to New York City and to Cincinnati as well as to other cities competing with Chicago for business throughout the Southeast. Please advise by letter if you are interested in having the Southeast enter this market and state the approximate annual tonnage that could move via this route, and if you will support such a service if it is established."

Rate Hearings by Trunk Line Association

The Trunk Line Association began in New York City this week hearings on a proposed general revision of the freight rate structure throughout trunk line territory, invitations having been sent to all interested mercantile organizations. At the first session, the principal speaker was J. C. Lincoln, of the Merchants Association, New York City, who argued that rates on the trunk lines within 500 miles of New York ought to be lower than in New England and in some other territory where advances in

rates had been authorized because of the precarious financial condition of the roads. He thought also that the starting point for the proposed new rates was wrong, the minimum rate of 30 cents per 100 lb. for carload freight for the shortest distance being too high. Arguments of Mr. Lincoln and others protesting against the increase of any rates were replied to by R. N. Collyer, chairman, with the statement that the only purpose of the proposed revision was to clarify the rate structure. Representatives of commercial interests were present from Philadelphia, Rochester, Boston, Buffalo, Brooklyn, Trenton and other places. H. C. Baxter appeared for the Port of New York authority.

George P. Wilson appearing for the Philadelphia Chamber of Commerce expressed the opinion that the carriers and the shippers are getting a little closer together. He said that his constituents were very much interested in knowing how the committee had ascertained the key rate, for upon that answer depends what would be the shippers' views with respect to the application of the rates to particular traffic. Continuing, he said:

"We are much concerned with respect to the accuracy of the distances to be used. We have been informed that some errors have occurred. Another important factor that must be considered in the construction of any rate base, is the relationship between communities; also the action to be taken with reference to industries located on branch lines. In any mileage scale the industry on the branch line is at a serious disadvantage with its competitor on the main line."

Coal Production

Complete returns on coal production in the third week of October show an increase to about 10,200,000 tons of soft coal, according to the weekly bulletin of the Geological Survey. Production of anthracite was at about the same rate as during the preceding week and will be at least 2,000,000 tons. Indications were, therefore, that the total of all coal raised during the week is about 12,200,000 tons.

The number of cars loaded on Monday, October 16, as reported by the railroads was 41,201 cars, establishing a new record for this year. Full returns on loadings for the week are expected to indicate production of 10,200,000 tons.

Transportation remains the limiting factor in the current rate of production.

Production of anthracite passed the 2-million ton mark in the second week of October. Preliminary reports to the American Railway Association show that 24,682 cars were loaded on the first four days of the week of October 16-21.

According to reports from the Northwestern Coal Dock Operators' Association the stocks of soft coal at Duluth, Superior, Ashland and Washburn increased from 120,384 net tons on September 1, to 1,034,520 tons on October 1. Stocks of anthracite declined from 14,475 to 12,370 tons.

The market was able to absorb all the coal that it was possible for the carriers to transport to market, and the only serious losses due to lack of demand were in Iowa and Missouri. In comparison with transportation losses, those due to other cause were negligible.

There has been a gradual decline in tonnage of soft coal dumped into vessels at Lake Erie piers since the week ended September 24 during which was established the high record in Lake traffic. The Ore and Coal Exchange reports the total handled during the week ended October 15 as 1,090,596 net tons as compared with 1,179,288 tons the week before. In comparison with the corresponding week a year ago this was an increase of 37 per cent. Of the total dumpings last week 1,052,043 tons were cargo coal and 38,550 tons were vessel fuel. During the present season to October 15 inclusive, 11,888,126 tons of cargo coal have been dumped into vessels at Lake Erie piers. The quantity sent to receiving Lake markets this season is 38 per cent less than in 1921, 32 per cent less than in 1920, and 40 per cent less than in 1919.

According to reports received by the car service division of the American Railway Association coal loading for the week totaled 223,411 cars. This exceeded by 2,000 cars the week before which had marked the high point in coal loading. Loading of bituminous coal amounted to 186,295 cars. This was an increase of 3,800 cars over the week before. Anthracite loading amounted to 37,116 cars which was a decrease, however, of 1,446 under the week before.

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has issued a decision finding that a proposed increased rate on iron and steel articles in carloads from Utah common points to certain destinations in California is not justified. The suspended schedules were ordered cancelled.

State Commissions

The Railroad Commission of California has addressed a letter to the Interstate Commerce Commission urging that body to visit California in order to obtain first hand information in connection with the Southern Pacific Company's application to retain control of the Central Pacific. This application was recently made following the unmerger decision and is based on the provisions of the Transportation Act of 1920 authorizing the Interstate Commerce Commission to permit railroad consolidations where they are found to be in the public interest. The letter says, in part: "You are aware, of course, that this matter is of great importance to the State of California. * * * We are the more ready to extend this urgent invitation because we know it is extremely difficult, if not impossible, to come to a correct understanding of the somewhat complicated factors from an oral and written record alone and as far away as Washington. If you should find it possible to make a personal investigation of the territory and property in question, the California Commission will be happy to extend to you, while in California, every facility at its disposal in a spirit of helpful co-operation."

Omnibuses Authorized to Compete With Railroads

The New York State Public Service Commission has issued a certificate of public convenience and necessity to an omnibus line running between Syracuse and Norwich, in spite of vigorous protests from parallel railroad lines, steam and electric. The decision was written by Commissioner Blakeslee. It is on the petition of Walter E. Aldrich for a certificate for the operation of a motor bus line between the cities of Norwich and Syracuse, Norwich is about 45 miles southeast of Syracuse.

The application was opposed by the New York Central, the Delaware, Lackawanna & Western, the New York, Ontario & Western, the Lehigh Valley, the Syracuse & Suburban and the New York State Railways.

The decision says: "The inception and growth of motor transportation is a natural development. Extensions of the improved highway system and betterments of good roads already built will continue for years to come. Consequently competition between motor buses and railroads in the transportation of freight and passengers will continue, and this will be true not only as to short haul traffic but with an increasing tendency to lengthen the distance of haul. This is a period of transition and to require those living at a distance from fixed railroad stations to journey to the stations and there await the arrival of trains, rather than to be allowed to take advantage of buses, stopping at their front doors, merely because this would result in financial loss to the established carrier (the railroad) is not in keeping with ideas of progress. . . . When more convenient and adequate service is offered to the public it would seem that necessity requires such public convenience should be served."

The commission, however, observes the wide discrepancy of taxation between railroads and their contributions toward the support of highways and the taxes paid by bus lines.

The route of the bus line extends from Norwich northerly through the Chenango Valley traversing a populous and prosperous rural community and running through numerous villages and over improved highways for the entire distance. Along the route are about 500 families living outside of villages who are not directly served by any other public carrier. The petitioner has been running over this route for two years but has suspended opera-

tions in the winter, last winter for a few weeks and the year before for three months. He operates three buses carrying 15 passengers each and three cars carrying six passengers each. The large buses are heated in winter. A regular timetable is followed and the chauffeurs have a share in the profits. The proprietor has an accident insurance policy for the benefit of passengers. He has snow ploughs with which he proposes to keep the road open at all times. The present business is 75 to 100 passengers daily. The fare is lower than on the railroads for a comparable journey.

On the New York Central from Syracuse to Earlville the business has fallen off since the buses began to run. The distance from Norwich to Syracuse by this line is 58 miles. The other steam railroads are less affected by the competition. The petitioner promises not to compete with the New York State railways in the city of Syracuse and there are also other sections where he refrains from competing with local carriers.

The difficulties incident to unequal taxation of railroads and omnibus lines are discussed in the report, but are not settled, apparently being left for the legislature; the commission holds that all it has to decide is whether the proposed route is demanded by public convenience and a necessity.

In granting the petition, the commission prohibits competition with the local lines referred to and also with a bus line owned and operated by Nellie E. Bushlev, of Norwich, who has a certificate to run between Oxford and Sherburne, through Norwich.

Court News

Fireman's Primary Duty Is Firing

The Virginia Supreme Court of Appeals holds that it is the duty of a fireman primarily to fire his engine, and the railroad cannot be charged with negligence for his failure to keep a lookout at a time when his duties require him to be firing.—Director-General v. Hubbard's Admr. (Va.) 111 S. E. 446.

Terminal Carrier Not Liable for Initial Carrier's Negligence

The North Carolina Supreme Court holds that under a bill of lading covering shipment from New York to Asheville, providing that no carrier shall be liable for loss or damage not occurring on its own line, unless liability is imposed by law, the initial carrier was not the agent of the connecting roads so as to make the delivering carrier liable for the initial carrier's negligence, in the absence of allegation and proof of partnership or special contract.—M. V. Moore & Co. v. Southern (N. Car.) 111 S. E. 166.

United States Supreme Court

Lessor of Railroad Not Liable for Injuries During Federal Control

An employee of the Southern Railway was killed in March, 1919, while engaged in intrastate commerce on a line in North Carolina held by the Southern under a 99-year lease from the North Carolina Railroad Company. Action was brought in the State court against the lessor company, its liability being asserted under a local rule by which a railroad corporation is liable for injuries resulting from a lessee's negligence in operation. The defendant set up the fact that the Southern system was being operated solely by the Director-General of Railroads under the Federal Control Act. The State court, however, instructed the jury that, if the Government was operating the railroad, it was doing so in the capacity of a lessee and that the defendant "would still be responsible for the acts and conduct of the Government * * * *" Verdict and judgment for plaintiff were affirmed by the State Supreme Court without opinion.

The Supreme Court of the United States holds that the Government operated this railroad not as lessee, but under a right in the nature of eminent domain; it operated through the Director-General and to entertain this suit would be inconsistent with the Federal Control Act.—North Carolina Railroad Co. v. Lee. Decided October 16, 1922. Opinion by Mr. Justice Brandeis.

Foreign Railway News

Second Simplon Tunnel Opened

The second, or parallel, tube of the Simplon Tunnel, the largest in the world, has been completed, according to press dispatches from Geneva, Switzerland. This will make possible the double track operation of the Simplon line, which handles a heavy international passenger traffic. Both tubes of the tunnel are electrified.

Suit Against Mexican National

The Oliver American Trading Company has brought suit against the Mexican government and the National Railways of Mexico in the state supreme court at Rockland County, New York, seeking to recover $1,250,000 which it alleges it lost when the railway "endeavored to repudiate its arrangements" with the company.

The Oliver company at one time operated trains over the lines of the Mexican National and it alleges that the railway violated a contract in stopping this practice and that, furthermore, engines and cars belonging to the company were confiscated.

British Concern to Build Locomotives in India

LONDON.

A group of influential Indian gentlemen, early in the year 1921, invited Kerr, Stuart & Company, Ltd., of Stoke-on-Trent, England, to form a company in India for the purpose of building railway locomotives. In their annual report submitted to the shareholders, the directors of the company state that they have decided to accept this invitation after having fully considered and investigated the position. An undertaking known as the Peninsular Locomotive Company has been formed, the capital having been subscribed privately in India. The production of locomotives on an extensive scale is expected to begin shortly.

To Install Automatic Signals on the New Zealand Railways

The New Zealand Government Railways are planning to equip the new line connecting Otira and Arthur's Pass on the South island with automatic signals and two interlockers. The proposed installation is the result of a connecting line being constructed between the two terminals of the Midland railway division of the Government railways at Arthur's Pass in the Southern Alps. Owing to the mountainous country the railway terminated on each side of the pass and passengers and freight had to be conveyed between the two rail heads by means of stage-coaches and trucks. The construction of a tunnel has been completed between Otira and Arthur's Pass, a distance of 5.25 miles on a grade of 1 in 33, and will be opened for ordinary traffic early next year.

It was decided that a power interlocking frame should be installed at each of these stations and Messrs. McKenzie and Holland, Ltd., Australasian representatives of the Westinghouse Brake & Saxby Signal Co., Ltd., London, were given the contract of supplying two 19-lever electric power interlocking frames and the necessary signaling material for single line operation. The Midland railway connects Christchurch on the East side of the island with Greymouth on the West; between Christchurch and Rolleston, and Greymouth and Singleton there is double track, and between Rolleston and Singleton, a distance of 121 miles, it is single track on 3-ft. 6-in. gage. The government decided to equip the single track with automatic signals and gave a further contract to Messrs. McKenzie and Holland, Ltd., for 166 three-position color-light signals and other necessary material. The absolute permissive block system has been adopted with normal danger starting signals. The "vane" type of relay will also be used, both single and double-element classes to be installed. The transmission will be a.c. single phase, 3,300-volts at 50 cycles and step-down transformers will reduce this pressure to 100-volts for signal operation.

Equipment and Supplies

Locomotives

THE ILLINOIS CENTRAL is inquiring for about 75 locomotives.

THE MINNEAPOLIS & ST. LOUIS contemplates the purchase of from 25 to 30 locomotives.

THE TENNESSEE CENTRAL contemplates buying 4 Mountain type or Pacific type locomotives.

THE INTERNATIONAL & GREAT NORTHERN is said to be considering the purchase of some locomotives.

THE GREAT NORTHERN is said to be preparing to issue an inquiry for 50 or more locomotives of various types.

THE MAINE CENTRAL, reported in the *Railway Age* of September 23 as inquiring for 12 locomotives, has ordered eight 4-6-0 type locomotives from the Lima Locomotive Works.

THE CHICAGO, MILWAUKEE & ST. PAUL, reported in the *Railway Age* of October 21 as inquiring for 50 Mikado type locomotives, has increased this inquiry to 100 Mikado type locomotives.

Freight Cars

THE NORTHERN PACIFIC is inquiring for 3,000 box cars.

THE NORTHERN PACIFIC is inquiring for from 300 to 500 gondola cars.

THE LIVE POULTRY TRANSIT COMPANY, Chicago, will build 100 poultry cars in its own shops.

THE CHICAGO, MILWAUKEE & ST. PAUL is inquiring for 3,000 gondola cars, 1,500 box cars and 500 automobile cars.

THE KINGAN REFRIGERATOR LINE, Indianapolis, Ind., contemplates coming in the market for 100 refrigerator cars.

THE BEAUMONT EXPORT & IMPORT CO., Beaumont, Texas, is inquiring for 40 refrigerator cars for export to Mexico.

THE LOUISVILLE & NASHVILLE is inquiring for 2,000 steel hopper cars of 55 tons' capacity and 1,000 box cars of 40 tons' capacity.

THE WESTERN PACIFIC is inquiring for 800 general service gondola cars of 70 tons' capacity and 500 stock cars of 50 tons' capacity.

THE LEHIGH & NEW ENGLAND, reported in the *Railway Age* of July 29 as inquiring for 100 gondola cars of 50 tons' capacity, has ordered this equipment from the Magor Car Corporation.

THE PERE MARQUETTE is inquiring for 500 composite gondola cars of 50 tons' capacity. As reported in the *Railway Age* of October 21, this road is also inquiring for 1,500 box and 500 hopper cars.

FRUIT GROWERS EXPRESS.—The report in the *Railway Age* of October 14 that this company ordered 1,000 steel underframes from the American Car & Foundry Company is in error, as this equipment was ordered from the General American Car Company.

THE MAINE CENTRAL, reported in the *Railway Age* of September 30 as inquiring for 560 cars of miscellaneous types, has ordered 350 single-sheathed box and 100 open rack cars of 40-tons' capacity, 10 dairy products cars from the Keith Car & Manufacturing Company, and 50 all steel self clearing gondola cars of 50-tons' capacity from the Standard Steel Car Company.

Passenger Cars

THE CHICAGO, ROCK ISLAND & PACIFIC has awarded a contract to the Pullman Company for repairs to 5 dining cars.

THE MAINE CENTRAL, reported in the *Railway Age* of September 30 as inquiring for 7 steel combination baggage and mail cars, has ordered this equipment from the Osgood Bradley Car Company

Iron and Steel

THE BALTIMORE & OHIO has ordered 2,500 tons of bridge steel from the McClintic-Marshall Company.

THE NEW YORK CENTRAL, reported in the *Railway Age* of September 30 as inquiring for 600 tons of steel for bridges at various places, has ordered this tonnage from the McClintic-Marshall Company.

Track Specialties

THE PENNSYLVANIA has issued an inquiry for 100,000 tie plates for its western lines.

Machinery and Tools

THE GRAND TRUNK has ordered two 72-in. spring formers from Joseph T. Ryerson & Son.

THE CHICAGO & NORTH WESTERN is soon expected to issue an extensive machine tool inquiry.

THE SOUTHERN RAILWAY is inquiring for a 32-in. shaper, a 16-in. portable engine lathe and a 36-in. planer.

THE CHICAGO, BURLINGTON & QUINCY has issued a new machine tool inquiry for its reclamation yard near Aurora, Ill.

THE ATLANTIC COAST LINE has ordered a 60-in. planer and a 6-spindle multiple drill from the Niles-Bement-Pond Company.

THE NEW YORK CENTRAL has ordered a car wheel lathe and one or two engine lathes from the Niles-Bement-Pond Company.

THE CRUCIBLE STEEL COMPANY has ordered from Joseph T. Ryerson & Son an equipment for the repairing of locomotive boiler tubes, to be installed at its shops at Harrison, N. J.

THE BALDWIN LOCOMOTIVE WORKS, reported in the *Railway Age* of September 30 as inquiring for a number of machine tools, has ordered two triple-end frame slotters and several frame planers from the Niles-Bement-Pond Company.

THE PENNSYLVANIA, reported in the *Railway Age* of September 30 as inquiring for a number of overhead traveling cranes, has ordered from the Niles-Bement-Pond Company two cranes of 250 tons' capacity, two of 60 tons', two of 25 tons' and 10 of 15 tons' capacity. A list of heavy machine tool requirements has been issued by this company. These include: Three No. 5 knee type milling machines; 17 engine lathes with 16-in. to 48-in. swing; six, 36-in. and three, 42-in. vertical turret lathes; two, 36-in. and two, 48-in. planers; two, 90-in. driving wheel lathes; three, 5-ft. and one, 6-ft. radial drills; four horizontal turret lathes; five, 24-in shapers; two, 15-in. and three, 18-in. slotters; ten, 36 in. by 4 in. wet emery grinders; three turret lathes, an axle lathe; journal-turning lathe; 42-in. coach wheel lathe; 90-in. tire mill; 2-in. pipe machine; crown and staybolt threading and reducing machine, 6 spindles; bolt turning machine, 4 spindles; bolt pointing machine and bolt heading machine.

Miscellaneous

THE NEW YORK CENTRAL will receive bids until 12 o'clock noon November 6, for a number of oil storage barges.

THE NEW YORK CENTRAL is having 25 electric motor trucks built at the shops of the Standard Steel Car Company. These trucks are for use on 600-volt d. c. cars.

THE GREAT NORTHERN is inquiring for one, 65,000 gal. steel oil tank with 30 ft. steel tower for Troy, Mont.; one, 10,000 barrel steel oil tank and one, 65,000 gal. steel oil tank with 30 ft. steel tower for Whitefish, Mont.

THE SOUTHERN PACIFIC, during the past 10 years, has distributed more than 80,000,000 pieces of literature exploiting the agricultural, scenic and industrial resources of the territory served by its lines, at a cost of more than $5,500,000. Leaflets and pamphlets are frequently issued to 14,000 coupon ticket agents of other railroads in the United States and Canada.

Supply Trade News

R. S. Dean has been appointed district sales manager of the machinery and crane departments of **Manning, Maxwell & Moore, Inc.**, Chicago district. His headquarters will be in that city.

S. G. Johnson, president of the Johnson Railway Supply Corporation, New York, has been appointed sales representative of the **Magnetic Signal Company**, Los Angeles, Cal., for the territory east of Pittsburgh, with headquarters at 30 Church street, New York.

Dwight P. Robinson & Company, Incorporated, New York, has been awarded a contract for the construction of a cement mill at Birmingham, Ala., for the Lehigh Portland Cement Company, Allentown, Pa. The mill will have a capacity of 1,000,000 barrels a year.

Trade Publications

War Surplus.—This is the title of a little booklet issued by the Sales Promotion Section of the Office of the Director of Sales. It describes in a general way the methods of sale resorted to by the War Department in the disposal of its vast stocks of surplus property and tells what these stocks contain at the present time.

The Gap Crane.—The H. K. Ferguson Company, Cleveland, Ohio, has issued a four-page leaflet illustrating the adaptation of the gap crane to an erecting shop for the handling of heavy locomotive repairs as worked out for the Hornell (N. Y.) shop of the Erie now under construction. This leaflet shows the manner of handling locomotives with this crane and points out the advantages of this new equipment.

Timber Statement.—The Century Wood Preserving Company, Pittsburgh, Pa., has published timber bulletin No. 24, which is devoted to the consideration of treated timber for flooring and pavements, poles, cross arms, fencing, bins, sheds, platforms, walks, trestles and similar industrial uses. The bulletin is well illustrated and contains data on the proper piling of ties, as well as tables showing the amount of preservatives required for crossties, poles and piling.

Holt Roof Leader and Vent Connections.—This 28-page booklet recently issued by the Barrett Company, New York, is descriptive of the eight types of Holt roof connections manufactured by this company. The different types are discussed in relation to their use in flat roof and saw-tooth construction and in places where vent pipes, leader lines, steam stacks, etc., passing through a roof, require flashings. The illustrations show by photographs and drawings actual installations and the way in which they are made.

International

An Accident at Montalvo, Cal.

Railway Construction

Baltimore & Ohio.—This company has placed a contract with McClintic-Marshall Company for the fabrication of approximately 2,500 tons of structural steel required in connection with its program for bridge renewals during the 1923 working season. The bridges in question are of various types, including "I" beam spans, deck and through plate girders. The contract also includes new steelwork required in connection with the remodelling of second-hand girders in the railroad company's stock for use at new locations. Delivery is to be made March 15, 1923, and it is the intention to prosecute the erection vigorously as soon as the steelwork reaches the respective bridge sites and the weather conditions become favorable.

Chicago & North Western.—This company has been ordered by the Board of Railroad Commissions of the state of South Dakota to construct a station not less than 16 ft. by 24 ft. at Oral, S. D.

Los Angeles & Salt Lake.—The Interstate Commerce Commission has authorized the construction of a branch line from a connection with its main line at Lund, Utah, in a southeasterly direction to Cedar City, 32 miles.

Missouri, Kansas & Texas.—This company has awarded a contract to James Stewart & Company, Chicago, for the construction of a grain elevator of 1,000,000 bushel capacity at Glen Parks Yard, Kansas City, Mo.

Missouri Pacific.—This company has awarded a contract to the Ogle Construction Company, Chicago, for the construction of a 300-ton reinforced concrete coaling station at Bald Knob, Ark.

New York, New Haven & Hartford.—This company will construct a half-through girder bridge carrying six tracks over the proposed Capitol avenue extension, at Hartford, Conn. The bridge will be three spans, giving a clear roadway width of forty feet with two sidewalks, ten feet each, with supports on the curb lines.

Pennsylvania.—This company has awarded a contract to H. F. Curtis, Philadelphia, for an eastbound gravity hump yard at its West Morrisville, N. J., yards.

Texas & Pacific.—This company will construct a 100 ft. turntable and a three stall extension to its roundhouse at El Paso, Tex.

The Louisville & Nashville announces that an agreement on wages and working conditions has been reached in conferences between officers of the road and representatives of the new association of shopmen, which has been formed on that road. This association is said to have about 13,000 members. The agreement provides for a working day of eight hours for skilled labor and one of ten hours for unskilled. No provision is made for an extra rate of pay for work on Sundays or holidays.

Employees of the Long Island Railroad who have been in the service of the road over 20 years are forming a Veteran Employees' Association, and plan to have a dinner in New York City on November 18. About 1200 men are eligible to membership, and large numbers have joined already. President Ralph Peters was one of the first to join. C. D. Baker, general superintendent, will act as chairman at the organization meeting on November 18, when the officers and board of governors will be elected. The temporary committee is made up of F. W. Nichols, auditor of revenue; W. E. Wilkins, chief clerk to superintendent of motive power; H. E. Lewis, train master; J. W. O'Loughlin, supervisor or signalman; Samuel E. Booth, retired engineer; H. L. Merker, baggage trace clerk, baggage department; N. L. Barton, passenger conductor; H. M. Ashmead, engineman, and R. G. Richardson, secretary to the president.

Railway Financial News

CHICAGO & NORTH WESTERN.—*Stock Offered.*—Kidder, Peabody & Co. and Salomon Brothers & Hutzler are offering a limited amount of preferred stock of this company at prices to yield about 5.65 per cent, based upon its present dividend rate of 7 per cent per annum. Dividends are payable semi-annually, January 15 and July 15, and the stock is free from normal federal income tax. The preferred stock is entitled to preference as to dividends to the aggregate amount of 10 per cent out of the net earnings for any one year, in the following manner: First, to a preference of 7 per cent and after dividends of 7 per cent on the common stock, to a further preference of 3 per cent. After a further dividend of 3 per cent on the common stock, both classes of stock shall be entitled to equal rates per share on any further dividends.

CHICAGO, ROCK ISLAND & PACIFIC.—*Partial Payment of Guaranty.*—The Interstate Commerce Commission has certified a partial payment of $1,000,000 on account of this company's guaranty for 1920.

COLORADO SPRINGS & CRIPPLE CREEK DISTRICT.—*Sold.*—This railway, extending from Colorado Springs, Colo., to Cripple Creek, Colo., 71 miles, was sold on October 16 to W. D. Corley, of Colorado Springs, for $375,000, to satisfy a judgment obtained against it by the Guaranty and Union Trust Companies of New York City.

DENVER & RIO GRANDE.—*Holland Bank a Sub-depositary.*—The Sutro committee, headed by Richard Sutro, and including Lewis L. Clarke, President of the American Exchange National Bank, and William Loeb, Jr., which has asked for the deposit of Denver & Rio Grande first and refunding 5 per cent bonds, has appointed the Rotterdamsche Bankcreeniging of Amsterdam as a sub-depositary for these bonds, a large amount of which are held in Holland.

ILLINOIS CENTRAL.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $568,000 of refunding mortgage 4 per cent gold bonds to refund some first mortgage bonds which mature on August 1, 1921.

INTERNATIONAL-GREAT NORTHERN.—*Reorganization Plan Approved.*—The Interstate Commerce Commission has authorized the proposed issuance of securities and other transactions involved in the proposed plan of reorganization of the International & Great Northern by the International-Great Northern Railroad Company. The commission has issued a certificate that public convenience and necessity require the acquisition and operation by the applicant of the lines formerly belonging to the International & Great Northern, and the acquisition of trackage rights over the Galveston, Houston & Henderson between Houston and Galveston, Texas, the acquisition of control of the Austin Dam & Suburban by the acquisition of all of its stock and the acquisition of 50 per cent of the stock of the Galveston, Houston & Henderson. Authority was also granted to issue $20,000,000 of first mortgage, 30-year, 6 per cent gold bonds, of which $2,750,000 was to be pledged with the director general of railroads, $17,000,000 of adjustment mortgage, 30-year, 6 per cent gold bonds and $7,500,000 of common stock. The commission held that its authority was not necessary for the issue of the proposed note or notes to the director general in respect of additions and betterments during the period of federal control. Details of the reorganization plan were given in the *Railway Age* of June 3, page 1312.

The commission's report contains the following additional details:

It appears that the earnings of the International & Great Northern have shown improvement during 1922 as compared with the earnings of the past few years. During the first eight months of 1922, the net railway operating income was little short of eight months' actual fixed charges on basis of the present capitalization, notwithstanding the recent strike. The applicant estimates, on basis of apparently normal increases in traffic and rates, and reduced prices of fuel and other supplies, decreased wages and increased economies in operation, that the net income available for interest for 1922, 1923, 1924 and 1925, will be $2,497,018, $3,031,512, $3,178,135 and $3,326,821, respectively.

It appears further, that as of June 30, 1922, the investment in road and equipment, less accrued depreciation on equipment, was $41,406,847. The applicant will acquire approximately $2,000,000 in materials and supplies and will also acquire $4,000,000 in cash in the reorganization. These amounts added to the net book investment of $41,406,847 will make a total of $47,406,847, which excess will be increased by such amounts as may be determined as representing the value of $500,000 capital stock of the Galveston, Houston & Henderson, and $100,000 capital stock of the Austin Dam & Suburban, to be acquired. The total capitalization proposed, $44,150,000, seems to be reasonable when compared with the book assets of the new company, aggregating over $47,406,847.

We have not yet established the final valuation of the properties involved in the reorganization. It is, therefore, impracticable to compare the proposed capitalization with the underlying value. It appears, however, that the fixed charges will be materially reduced, with a consequent improvement in credit. The evidence also indicates that the new capitalization will not be disproportionate to the prospective earning power of the applicant. Under these circumstances, in view of the manifest desirability of ending the long period of receivership, we think that the proposed capitalization should be approved.

LEHIGH & HUDSON RIVER.—*Guaranty Certified.*—The Interstate Commerce Commission has certified the amount of this company's guaranty for the six-months period following federal control as $384,750, of which $184,750 was still to be paid to the company.

MACON & BIRMINGHAM.—*Service May Be Stopped.*—A hearing will be held in the courthouse at Macon, Ga., on October 28, so that interested persons will have an opportunity to present their views as to a reasonable expectation of continued service on this line. Passenger service on the road was discontinued October 11. J. E. Hall, attorney for the road, said that the entire system had suffered financial losses annually of such magnitude that continuance of regular normal railroad service was out of the question. He added that automobiles and motor trucks have burrowed deeply into the freight and passenger traffic that the short line railroad used to get.

The Transportation Department of the Macon Chamber of Commerce is working on possible ways of keeping the road in operation. It is said that 200,000 peach trees with an estimated average output annually of $3 per tree would show a loss of $600,000 to the farmers along the road, if service were to be stopped. The melon crop would also be practically a total loss. Large timber holdings and about 20 sawmills are dependent on the line for transportation.

MADISON SOUTHERN.—*Asks Authority to Abandon Line.*—This company has applied to the Interstate Commerce Commission for authority to abandon the operation of its line of 6.7 miles, in Madison county, Florida.

MARSHALL & EAST TEXAS.—*Application for Authority to Dismantle.*—The United States Court for the Eastern District of Texas at Texarkana, Tex., will hold a hearing November 11 on the application of Bryan Snyder, receiver of the Marshall & East Texas for authority to dismantle the remaining property of the railway between Gilmer and East Winnsboro for the benefit of its creditors.

MINNEAPOLIS & ST. LOUIS.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to issue $1,500,000 of 10-year, 5½ per cent equipment trust certificates to be sold at 95½.

MISSOURI PACIFIC.—*Bonds Sold.*—Kuhn, Loeb & Co. have sold at par and interest $5,500,000 first and refunding mortgage 6 per cent gold bonds, series "D," due February 1, 1949, similar to bonds of series "D" at present outstanding. The purpose of this issue is to reimburse the company for capital expenditures and to provide funds needed in payment for the purchase of new equipment.

NASHVILLE, CHATTANOOGA & ST. LOUIS.—*Bonds Sold.*—J. P. Morgan & Co. have sold $1,800,000 4½ per cent one to 15-year equipment bonds at prices to yield 4.90 per cent.

NEW YORK CENTRAL.—*Asks Authority for Equipment Trust.*—The New York Central, the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis have filed a joint application with the Interstate Commerce Commission for authority for the issuance of $12,660,000 of New York Central Lines 4½ per cent equipment trust certificates to be issued by the Guaranty Trust Company. The application states that the companies are in negotiation with

J. P. Morgan & Co. and it is expected to sell the certificates at 95 or on a net basis of 5.3.

NORFOLK & WESTERN.—*Declares Extra Dividend.*—The directors have declared the regular quarterly dividend of $1.75 on the common stock and an extra dividend of $1 per share. The road has paid 7 per cent annually on the common stock regularly since 1918. The extra dividend on the common is the first since 1917, when the road paid a total of 8 per cent for the year, 1 per cent extra being paid on March 19, 1917.

NORTHERN PACIFIC.—*Vote Director.*—Theodore F. Merseles of Chicago has been elected a director to fill an existing vacancy.

PENNSYLVANIA.—*Restores 6 Per Cent Dividend Rate.*—The directors have declared a quarterly dividend of 1½ per cent, payable November 29 to stock of record November 1. Since May, 1921, the quarterly dividend paid has been 1 per cent, having then been reduced from the long established rate of 6 per cent per annum. Until last year the Pennsylvania had not paid less than 6 per cent since 1900. The stock closed at 49½ on Wednesday.

The declaration of a quarterly dividend of 1½ per cent by the Pennsylvania, restoring the stock to a 6 per cent annual basis, was followed by an advance in the stock to the high price of the year and the highest price since 1918.

ST. LOUIS-SAN FRANCISCO.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized an issue of $6,000,000 of equipment trust certificates by the Guaranty Trust Company of New York to be sold at not less than 96.

SEABOARD AIR LINE.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $2,560,000 of equipment trust certificates to be issued by the Chase National Bank, at not less than 96.63.

SOUTH GEORGIA.—*Asks Authority to Issue Stock.*—This company has applied to the Interstate Commerce Commission for authority to increase its common stock from $58,000 to $495,500 for the purpose in part of purchasing the West Coast Railway for $205,500. It is also proposed to issue $250,000 of preferred stock to liquidate the company's bonded indebtedness.

SUPERIOR & SOUTHEASTERN.—*Asks Authority to Abandon Line.*—This company has applied to the Interstate Commerce Commission for authority to abandon the operation of that part of its line extending southeast from Grandview, Wisconsin, 11.8 miles.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out to the several companies the following amounts:

Chicago Great Western Railroad Company	$1,600,000
Galena Signal Oil Company	150,000
Atlanta, Birmingham & Atlantic Railway Co.	1
Short Lines	
Frankfort & Cincinnati Railway Co.	1

Dividends Declared

Delaware & Hudson.—2¼ per cent, quarterly, payable December 20 to holders of record November 27.

Illinois Central.—Common, 1¾ per cent, quarterly, payable December 1 to holders of record November 3.

Norfolk & Western.—Common, 1¾ per cent, quarterly, and 1 per cent, extra, both payable December 19 to holders of record November 29.

Pennsylvania.—1½ per cent, quarterly, payable November 29 to holders of record November 1.

Pullman Company.—$2.00, payable November 15 to holders of record October 31.

Reading Company.—First preferred, 1 per cent, quarterly, payable December 14, to holders of record November 28.

Trend of Railway Stock and Bond Prices

	Oct. 24	Last Week	Last Year
Average price of 20 representative railway stocks	72.40	73.63	55.23
Average price of 20 representative railway bonds	87.13	87.85	76.43

Railway Officers

Executive

Thomas L. Handy has been elected president of the Port Huron & Detroit with headquarters at Bay City, Mich. **C. W. Handy** has been elected vice-president.

John G. Walber, executive secretary of the Bureau of Information of the Eastern Railways with headquarters at New York, has resigned this position to become vice-president in charge of personnel of the New York Central System, effective November 1.

Financial, Legal and Accounting

O. W. Dynes, general attorney of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to general solicitor, with the same headquarters, succeeding H. H. Fields, promoted. He was born in Columbus, Wis., and studied law at Cornell University. After being admitted to the bar in 1895, he aided in the first revision of the Starr & Curtis revised statutes of Illinois, and from 1897 to 1908, he was trial attorney with the Fidelity & Casualty Company, and was engaged in general corporation practice. In the latter year he entered railway service as assistant general solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, which position he held until 1912, when he was promoted to commerce counsel. In 1918, he was promoted to general attorney and has held this position until his recent promotion to general solicitor.

O. W. Dynes

C. S. Jefferson, assistant general solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to general attorney, succeeding O. W. Dynes, promoted. Mr. Jefferson was born on Aug. 31, 1876, at Madison, Wis., and graduated from the University of Wisconsin Law School in 1896. Two years later he entered railway service as a law clerk in the office of the Chicago, Milwaukee & St. Paul at Chicago. He held this position until 1900, when he was promoted to attorney, which position he held until 1910, when he was appointed assistant general solicitor. During the war he served as judge advocate in the United States army, and at the termination of his service he returned to his former position with the Chicago, Milwaukee & St. Paul, which position he held until his recent promotion to general attorney.

C. S. Jefferson

J. N. Davis, solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to commerce counsel, with the same headquarters.

Leo. C. Van Laan has been appointed auditor of the Port Huron & Detroit with headquarters at Bay City, Mich. Mr. Van Laan is also assistant secretary of the company. G. W. Handy has been elected treasurer and Helen M. Handy secretary. A. C. McDannel is assistant treasurer.

H. H. Field, general solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to general counsel, with the same headquarters. He was born on May 17, 1857, at Leverett, Mass., and entered railway service on September 24, 1880, as an attorney with the Chicago, Milwaukee & St. Paul at Milwaukee, Wis. He was appointed assistant general solicitor in 1887. From November, 1905, to January 1, 1912, he was general counsel of the Chicago, Milwaukee & Puget Sound at Seattle, Wash. On the latter date he was promoted to general solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, which position he has held until his recent promotion to general counsel.

Operating

G. C. MacDonald has been appointed trainmaster of the Michigan Central with headquarters at Bay City, Mich.

L. F. Donald, chief clerk to the assistant general manager of the Chicago, Milwaukee & St. Paul at Chicago, has been promoted to trainmaster, with headquarters at Bensenville, Ill.

G. L. Whipple, superintendent of transportation of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to general superintendent of transportation with the same headquarters.

F. D. Keeler, acting assistant chief clerk to the General Superintendent of the Pere Marquette with headquarters at Detroit, has been promoted to assistant superintendent of car service with the same headquarters.

A. C. McDannel has been appointed general manager of the Port Huron & Detroit, with headquarters at Bay City, Mich. F. E. Pinkerton has been appointed superintendent of car service and G. H. Greenway has been appointed superintendent.

Traffic

H. L. Toland has been appointed general agent of the Graysonia, Nashville & Ashdown with headquarters at Ashdown, Ark.

F. D. Gouldburg has been appointed general freight and passenger agent of the Port Huron & Detroit with headquarters at Bay City, Mich.

F. McD. Quinn has been appointed assistant general passenger agent of the Central region of the Pennsylvania, succeeding Roy L. Stall, deceased.

J. X. Kinberger has been appointed commercial agent of the Chicago & Alton with headquarters at St. Louis, Mo., succeeding C. F. White, resigned.

W. A. Lowe has been appointed district freight agent of the Canadian Pacific with headquarters at Fort William, Ont., succeeding J. J. Weegar, transferred.

F. S. Griffin has been appointed division freight agent of the Louisville & Nashville with headquarters at Pensacola, Fla., succeeding W. C. Dillard, transferred.

J. H. Fox has been appointed district freight agent of the Canadian Pacific with headquarters at Vancouver, B. C., succeeding A. J. Cambie, on leave of absence.

T. O. Jennings, freight traffic manager of the Chicago & Eastern Illinois with headquarters at Chicago, has been promoted to traffic manager with the same headquarters.

E. A. Montgomery, has been appointed general agent of the Mississippi Central and the Louisiana & Arkansas, with headquarters at New Orleans, succeeding J. D. Youman, resigned.

A. E. Enoch has been appointed assistant general freight and passenger agent of the Lehigh & New England with headquarters at Bethlehem, Pa., succeeding Richard Macsherry, resigned.

G. D. Williams, formerly of the Nashville, Chattanooga & St. Louis, has been appointed general agent of the traffic department of the Chicago, North Shore & Milwaukee, with headquarters at Chicago.

G. H. Griffin, city passenger agent of the Canadian Pacific, with headquarters at St. Louis, Mo., has been promoted to general agent, passenger department and steamship lines, with headquarters at Cleveland, Ohio.

J. Webster, assistant traffic manager of the New York Central with headquarters at Chicago, has had his jurisdiction extended over the recently leased Toledo & Ohio, Kanawha & Michigan, Kanawha & West Virginia and Zanesville & Western.

F. E. Jones has been appointed general agent of the Kansas City, Mexico & Orient with headquarters at St. Louis, Mo., succeeding G. W. Neudling, resigned. J. J. Lane has been appointed assistant general freight agent with headquarters at Wichita, Kan.

Mechanical

J. A. Buechler has been appointed master mechanic of the Port Huron & Detroit with headquarters at Bay City, Mich.

F. A. Torrey, general superintendent of motive power of the Chicago, Burlington & Quincy, with headquarters at Chicago, will retire on November 1.

A. W. Novak, district boiler inspector of the Chicago, Milwaukee & St. Paul, with headquarters at Minneapolis, Minn., has been promoted to general boiler inspector succeeding E. W. Young, assigned to other duties.

W. J. O'Brien, master mechanic of the Kanawha & Michigan, with headquarters at Middleport, Ohio, has been appointed master mechanic of the Toledo & Ohio Central, with headquarters at Bucyrus, Ohio, succeeding C. Bowersox, who has resigned to engage in other business.

J. E. Friend, assistant master mechanic of the Fort Worth division of the Texas & Pacific, with headquarters at Marshall, Tex., has been promoted to master mechanic of the Louisiana division, with headquarters at Alexandria, La. He will be succeeded by D. L. Ringer, general foreman at Baird, Tex.

Engineering, Maintenance of Way and Signaling

W. N. Boyd has been appointed chief engineer of the Port Huron & Detroit with headquarters at Bay City, Mich.

Purchasing and Stores

J. D. McCarthy, purchasing agent of the Minneapolis & St. Louis with headquarters at Minneapolis, Minn., has been promoted to general purchasing agent in charge of purchases and stores of the Minneapolis & St. Louis, the Railway Transfer Company of the City of Minneapolis and the Hocking Coal Company.

Special

M. Welch, chief special agent of the Seaboard Air Line, has resigned to accept a similar position on the Chesapeake & Ohio, with headquarters at Richmond, Va.

Obituary

A. F. Vick Roy, superintendent of the Union Pacific with headquarters at Denver, Colo., died on October 17.

EDITORIAL
Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

Obey the Order of the Car Service Division!

THE CAR SERVICE Division of the American Railway Association has issued an important order requiring a large and immediate movement of box cars from eastern to western lines.

This order should be carried out promptly and literally. The western lines, especially those in northwestern and central western territory, recently have suffered a very serious reduction of the number of box cars on their lines, and they need all of them they can possibly get, and more, to satisfy the demands of their shippers. The order issued may be criticised as drastic. The plain fact is, that the conditions which have caused it to be issued are due to extensive violations of car service rules. If the railways on whose lines the cars have accumulated had obeyed the car service rules in the past, the present condition would not exist and the order issued by the Car Service Division would not have been necessary.

The existing situation presents plainly and directly the question whether, in respect to freight car distribution, the railways are capable of self-government. Having brought about the present situation by extensive violations of rules made by themselves, and which they are pledged to observe, they have now made it necessary to raise the question whether they will or will not promptly, faithfully and completely carry out an order issued by the Car Service Commission, which they themselves created and maintain to deal with just such situations as the present.

The railways are always on trial. They are especially on trial now. Will they show they are capable of self-government by obeying the orders of their own Car Service Division, or will they fail to do so, and thus afford good reason for the exercise by the Interstate Commerce Commission of its legal authority to take control of the distribution of cars when the railways themselves do not handle it efficiently and satisfactorily?

Every railway officer knows what will be said if the Interstate Commerce Commission has to take control of the distribution of cars. It will be said that *the machinery of the railways for handling the distribution of cars under private operation has broken down, and the statement will be true.*

The railways would have to obey an order pertaining to this matter issued by the Commission or take the heavy penalties provided for violations of the Transportation Act. If they could and would obey an order of the Interstate Commerce Commission they can and should obey the order of the Car Service Division.

The Human Versus the Machine Flagman

The State of New Hampshire was the first state to take effective legal action to have warnings set up on the highways, 300 ft. short of each railroad crossing, so that the reckless automobile driver should no longer excuse himself by the plea that he did not know the railroad was there. Its public service commission has now taken another notable step, in setting forth the truth concerning the watching of crossings. Deciding a case at Newfields, on the Boston & Maine, the commission says unequivocally that a good visual and audible signal, on a post, in service 24 hours a day, is a better watchman than the human attendant on duty 12 hours a day. The decision is reported on another page. To thoughtful and well-informed persons, this truth is already well-known, but it is a very good thing to have it formally and officially set forth in this definite fashion. Like many other truths, many people know it, but do not know it well enough. The New Hampshire decision abolishes a practice of *fifty years' standing.* It also voices another economic idea which needs to be kept in mind much more than it is, namely, that a wayfarer who gets in the way of a train and causes damage to the locomotive or other property of the railroad ought to pay a proper penalty in money. This theory is being put to the test occasionally. The Central of New Jersey secured a verdict for $300 the other day against the owner of an automobile truck that was wrongfully on a crossing.

Economics for Railway Men

One of the most important sessions of the coming meeting of the National Personnel Association, the program of which is noted elsewhere, is that on "Economics for Employees." Incidentally, it is, of course, first necessary that the executives and managements have a thorough understanding of economics as applied to their particular industry. Unfortunately much is still to be desired in this direction. The Christian Century in an editorial comparing labor unions in England and in America, in one of its recent numbers, makes this statement: "It is quite likely, too, that British employers, as contrasted with American, read economics rather more than their American cousins. Hence, they do not have the blind reactions in labor disputes that so often characterize American business men." A leading authority on this question—a practical economist of rare talent—in commenting upon editorials on the personnel question which have recently appeared in the *Railway Age*, makes this suggestion: "I feel that until the managers begin to instill some knowledge of economics into their personnel relations, there is not going to be very much progress in solving the labor problem. Bonus plans, profit sharing, welfare work, and all the numberless schemes for industrial democracy will never get far until they are tied up closely with the economic significance of their bearings. I believe if you could get in a few licks on the subject of the necessity of getting the right kind of economic information to the employees that you would be working right at the heart of the question rather than on the

edges." It is hardly necessary to make further comment except possibly to again remind our readers that this is one of the greatest tasks now confronting railway managements and that it demands immediate attention.

Allies End Control of Chinese Eastern

With the withdrawal of allied troops from Siberia the United States, along with Great Britain, France, Italy and Japan, has relinquished all control which it has exercised over the Chinese Eastern—the Chinese section of the Trans-Siberian Railway. The affairs of the Chinese Eastern have, since 1918, been managed by an inter-allied committee at Vladivostok and a technical board at Harbin. In the management of the road the United States has been represented by John F. Stevens. In relinquishing control of the railway to the Chinese government, our government has called to its attention the necessity for increasing the efficiency of the road's operation, making provision for greater safety for employees and passengers and safeguarding the interests of foreign investors and creditors. Attention is called to the important contribution which our government has made toward the maintenance and operation of the property, "both materially and through the services of the distinguished American engineer, John F. Stevens, and his assistants." The future operation of the Chinese Eastern will be watched with interest in this country, not only from a railroad standpoint, but from that of national policy. When order returns to Russia and the Trans-Siberian Railway is made into an avenue of traffic in keeping with its potentialities, the Chinese Eastern will assume a place of increasing importance; keeping it in efficient operation and free to the traffic of all nations will be a task which the Chinese government should exert every effort to carry out.

Pennsylvania Again Pays 6 Per Cent

Over a week has now passed since the Pennsylvania directors voted in favor of restoring the dividend rate to 6 per cent. One writing at this time, therefore, has been given the opportunity of seeing the interesting reaction which has been evidenced in the press and elsewhere. In truth, one hesitates to decide which is the more important (a) the significance of the restoration of the 6 per cent rate as indicating that the Pennsylvania has finally left behind it for good and all the adverse effects of the war and government control period, or (b) the congratulatory manner in which the Pennsylvania's action has been received by the editorial writers. From the point of view of news probably the latter is the more important. The Pennsylvania this year continued with the remarkable come-back which it staged following the end of government control; it came through the shopmen's strike rather better than almost any other road and its earnings statements have been so uniformly good for several months that the declaration of the 1½ per cent dividend was quite according to expectations. The Pennsylvania management has been conducting its operations so as to aim at the 6 per cent for several months past and the stockholders have had a promise that the higher rate would be restored at the earliest opportunity. In speaking of the other angles of the situation it is difficult to refrain from platitudes about such things as the Pennsylvania's reputation for conservative financing, the wide distribution of the stock in small holdings and the favorable public opinion concerning its activities in general. The Pennsylvania has for many years been in that much to be envied position that these attributes have been regarded almost as commonplaces. These things serve to emphasize that the Pennsylvania stockholders were called upon—when their dividend was reduced to 4 per cent—to bear a considerably heavier burden than stockholders in a company of the Pennsylvania's standing should in all fairness have been called upon to bear. The situation will enter railroad history as a standing indictment of the way in which the railroads were treated during the war period. There is a great deal of pleasure in noting the manner in which the press shows its realization of this very patent fact.

September Railway Earnings

It is a bit early to attempt to say what the total earnings of the Class I carriers will show for September when all the monthly reports are in. Those reports that have been made public, however, indicate plainly that the net for the month will probably not prove as good as many expected. The end of the coal strike, which was finally brought about in the latter part of August, was reflected in gradually increasing coal loadings during September. Whereas the coal loadings for the week ended September 2 were reported by the Car Service Division as 149,487, for the week ended September 30 they had reached 189,349. This increased business, however, has not been reflected in any appreciable manner in the September net. The explanation is, of course, simple, for it lies in the expenses due to the railway shopmen's strike. Most of the roads whose September reports we have seen show fairly imposing increases in their maintenance of equipment expenses with corresponding effect on the operating ratio and, of course, on net income. The following gives an abstract of the figures of net railway operating income for a small group of roads for September and for the nine months. It will be noticed that the larger part of them show net for September this year less than that for September last year; in two cases there are actual deficits. The outstanding feature in the figures, however, is of opposite character in the form of the Pennsylvania's report. Its increase in net for the nine months —$32,811,515—is interesting commentary on the recent restoration of the six per cent dividend rate:

NET RAILWAY OPERATING INCOME

Road	Sept., 1922	Inc. or Dec. compared with Sept., 1921	Nine months 1922	Inc. or Dec. compared last year
Atlantic Coast Line	1,024,367	1,011,390	10,839,608	7,866,317
Baltimore & Ohio	def. 2,665,952	—5,721,488	12,491,220	—2,779,977
Chicago, Milwaukee & St. Paul	1,564,107	—817,721	7,981,071	5,410,325
Great Northern	1,836,120	—1,382,636	10,084,242	5,871,607
Lehigh Valley	def. 295,976	—1,867,263	740,832	—1,972,467
Illinois Central	2,677,011	1,072,125	17,971,663	4,150,999
New York Central	3,111,204	—2,317,209	35,657,023	2,839,643
New York, New Haven & Hartford	1,245,279	576,788	9,860,468	12,879,647
Pennsylvania Railroad	6,298,532	2,456,637	56,712,505	32,811,515
St. Louis-San Francisco	731,032	—1,163,513	11,139,414	—1,767,166
Southern Pacific System	5,805,586	604,978	31,304,080	3,967,640
Union Pacific System	3,325,281	—2,261,276	19,879,242	—3,642,265

A Constructive Machine Tool Program—Its Fate

It is self-evident that the small annual net earnings of the railroads in recent years have discouraged investors to such an extent that capital needed to expand the railroad plant in proportion to the normal expansion of business could not be obtained. Necessary new equipment could not be purchased nor repair facilities properly maintained. This is why, in many cases, railroad shops and enginehouses are equipped as at present with so many machines which are antiquated, inefficient and costly to operate. The second reason may be laid to mechanical department men who have taken old machinery too much for granted, either entirely failing to show the managements how much money could be saved by the installation of modern equipment, or else becoming discouraged after once pointing out the needs and getting no action. There are

many progressive mechanical department officers on the other hand who do realize the savings possible by new equipment, but whose hands are completely tied by the physical inability of the railroads to provide the appropriations needed. For example, about two years ago the superintendent of motive power of a road having four repair shops of medium size made an exhaustive survey of all his shop machinery, listing separately the machines which were over 30, 20, 15, 10, 5 and under 5 years old. The exact order in which these machines were to be retired was indicated, together with the types of machines needed to replace them and the savings possible. This constructive program was to be spread over a period of ten years, it being proposed to spend $275,000 for new machinery each year. Owing to financial stringency, the railroad in question was absolutely unable to carry out this program and in the two years since it was initiated, *three* machine tools only have been purchased. It is important that railroad mechanical departments present constructive machine tool programs to the managements as forcefully as possible; in many cases, money thus spent will pay higher returns than if invested in new rolling stock. The greatest need of all, however, is the abolishment of those phases of government regulation which prevent the railroads from operating their own properties with sufficient net earnings to provide for normal growth and expansion. Incidentally, the case mentioned affords a striking example of railroad shop neglect, be it avoidable or otherwise, which is all too common. For years the railroads have not spent enough money for new machinery and shop equipment to replace that which was worn out, let alone take care of new and heavier rolling stock.

Another Personnel Vice-President

The appointment of John G. Walber as vice-president in charge of personnel for the New York Central System is significant, and particularly so at the present time. No definite statement has been given out as to his exact duties and responsibilities, but presumably they will include those ordinarily associated with an executive personnel officer in the industrial field. It was A. H. Smith, president of the New York Central System, who made the statement in testifying before the Senate Committee on Interstate Commerce a year or more ago, that "the efficiency of a railroad depends principally upon its men. It is estimated that 95 per cent of railroading is human." Unfortunately entirely too little attention has been paid to the human element on the railroads, as was noted particularly in the editorial in the *Railway Age* of September 16 on "Developing Machinery and Neglecting Men." On the other hand two of our largest railroad systems, the Pennsylvania and the New York Central, now have vice-presidents who are charged with the responsibility of seeing that the human element is fully understood and developed. Other railroads are taking a keen interest in these developments and many of them are working on similar programs, but of less ambitious nature. Students of industrial progress in Great Britain and America have stated that American industrial managers were many years behind those of Great Britain on this personnel question, because the British industrial leaders had recognized the folly of fighting organized labor and had awakened to the remarkable possibilities of having the unions work with them rather than against them. The events of the past year have apparently made a deep impression upon the minds of many of the leaders of organized labor in this country and upon the more thoughtful element among the employees. Is the time not now ripe for taking advantage of this and developing within each of the individual railroads that spirit of co-operation and teamwork which is so essential to the success of any organization?

Entertaining Guests in Shops

Entertaining business men at luncheon in its shops is one of the recent activities for improving public relations which the Central of Georgia has undertaken. At Macon, Ga., the Rotary and Civitan clubs have thus far been guests of the railroad, and other organizations of business men will be entertained in a like manner. Luncheon is served in the machine shop to employees and guests. There are a few short talks and then the guests are taken for a tour of inspection of the shops. Business men thus have an opportunity to see something of the railroad at first hand and, perhaps, to revise any unfavorable opinions they might have concerning the effects which the strike has had on the efficient operation of the railroad. These luncheons have been a decided success. Not only have they aroused the interest of the guests and tended to make them think favorably of the railroad; they have also aroused the same feelings in the employees, putting them in the position of hosts to leading business men of the community. The Central of Georgia has been unusually successful in its public relations work and one of the reasons for this is that it has not been content with half-measures. Before us is a copy of the menu of the luncheon given to the Civitan club at Macon on October 20 and on it are listed, not sandwiches and coffee and such simple fare as one might expect to be served in a railway machine shop at lunch time, but an elaborate five-course luncheon—a worthy example of the Central of Georgia's thoroughness in its public relations work. The menu was attractively printed for the occasion and, in addition to the bill of fare, gave some facts about the railway of interest to Macon business men, i.e., number of employees in Macon, annual payroll, value of shops, taxes paid to city and state, etc. The cost of the entertainment to the railroad would be well worth while if it did no more than fix firmly in the minds of the guests the few facts printed on the menu card, but it undoubtedly in every case has done more than that. The management of the Central of Georgia evidently agrees with the assertion which has often been made in these columns that "selling" the railroad to the public and to its employees is as important a task as is running trains or maintaining its equipment and track. Having this belief, it is translating its faith into performance.

An Important Step for Transportation

The decision by the University of Michigan to establish a chair of Transportation Engineering and the announcement of the appointment of John S. Worley, formerly a member of the Engineering Board of the Bureau of Valuation of the Interstate Commerce Commission, to that position, means much to the railways and to those dependent upon this industry for service. As expressed by an officer of the university who has been largely instrumental in the development of the plans for this department, it is not the intention of the university to turn out a large number of mediocre men who may ultimately rise to the positions of instrumentman or division engineer, but to help develop a few high-class men who may rise to executive positions in railway service and to give courses which will be taken by many students who will never enter the transportation industry but who through that work will make more intelligent citizens. This action by the University of Michigan, like that which led to the creation of the James J. Hill chair of Transportation at Harvard University, is a recognition on the part of educators and leaders in the transportation industry of the need for trained men for executive service on the railways. Railway operation is rapidly becoming an intricate science which not only requires the highest ability but training in the methods of analysis. The new era of transportation in which we are now entering is requiring greater refinement in methods and

the development of economies not heretofore realized through the more intensive use of facilities of all kinds and the rendering of the maximum transportation service with the minimum expenditure. A recent compilation showed there are one or more men of engineering and maintenance of way training now holding executive positions on roads aggregating more than 50 per cent of the mileage of the United States and Canada. When to this number are added the men who have had collegiate training in other courses the influence of college training in transportation can be realized. The decision of universities of the standing of Michigan and of Harvard to undertake the training of men specifically for transportation service is a development of much importance to this industry which it should foster in every way.

Dealing with the Labor Problem

THE MANAGEMENTS of some of the railways recently have made or are now making important changes in their organizations to deal with the labor problem. The Pennsylvania system has had for some time a department of personnel with a vice-president in charge. The New York Central has just created the office of vice-president in charge of personnel. The Rock Island some time since created the office of assistant to the president in charge of personnel and public relations. A few other examples of the same kind might be cited.

Such changes in railway organizations are being made in recognition of the fact that the labor problem on the railways, as well as in many other industries, has undergone a radical change within recent years.

The conditions of employment in industry have been revolutionized by the great increase in the size of industrial concerns, by popular education and by other important causes. In consequence the attitude of employees to their jobs, especially in large scale industries, has changed greatly within the last quarter century, and especially the last 15 years. Of no other industry has this been more true than of American railroads. The great increase in the size of railroad systems has increased even geographically the distances between most railway employees and the owners and chief executive officers. When a railroad with 3,000 miles of line was a big system, most of the employees were nowhere near as far from the principal executive officers and the owners in merely a geographical sense as they are now when many systems have from 3,000 to 20,000 miles. But in another sense the distance between the employees and the executive officers and owners has been increased much more. It has been increased so much by the results of government control and by radical propaganda that in the minds of many railway employees the ownership of the railways is indicated by two words—"Wall Street," and the executive officers are regarded as agents of Wall Street who are paid high salaries to do its bidding in dealing with employees and the public.

How many reflect upon what these conditions mean to the railroads in relation to efficiency of operation and to their future operation and ownership? There is an old warning regarding the results of trying to put new wine into old bottles. New conditions demand new methods. All change is not progress, but no progress was ever made without change. In spite of the revolution which has taken place in the labor problem no important changes in organizations or methods for dealing with employees have been made on most railways. The view seems to prevail on most of them that if the old methods are used long enough and energetically enough they will finally restore the old labor conditions of efficiency and loyalty. On the other hand, the managements of some railways believe that changes in organization and methods must be made if the labor problem of today is to be solved. They are acting accordingly, and they are right. The plans they are adopting differ, but they have the same purpose. This purpose is to find out what the employees are really thinking, what they really want, and what must be done to bring about new relations between them and the railways which will be beneficial to both.

The first prerequisite to the solution of any new problem is to find out that there really is a new problem and exactly what it is. There always has been a labor problem in industry. There always will be. It always has been a changing problem, and it always will be. It has changed so much on the railroads within recent years that it has become a new problem. Anybody who does not recognize the fact as it presents itself today it is a new problem will struggle with it in vain.

It having been once determined that there is a new problem and what it is, the next thing needed is to work out a new method for solving it, and try it. If it does not work, still another method should be tried.

Neither on the railroads nor in any other industry will the labor problem be solved until the employees are treated fairly and as well as economic conditions will permit. One of the primary duties of a personnel department is to investigate working conditions and provide remedies for all conditions about which employees reasonably complain or might reasonably complain. Another essential to any real solution of the labor problem under modern conditions is that the door of the management shall be kept wide open to receive the complaints and suggestions of employees. But every employee cannot come to headquarters with his complaints and suggestions. Therefore, employees must be given an opportunity to communicate and deal with the management through representatives of their own choosing.

The railways have persistently opposed national negotiations and agreements with labor unions. Those railways which have not made settlements with striking shop crafts unions have a real opportunity to make satisfactory agreements for dealing locally with employees in their own shops. The greatest mistake which these railways could make—and it is a mistake some, if not many of them, seem in danger of making—would be to attempt to dictate the exact kind of organization their shop employees should form, the way that they should choose their representatives to deal with the managements, and the way in which the dealings between these representatives of the employees and the officers of the railway should be carried on. The entire scheme for local dealings between the shop employees and the railway managements should be worked out in conferences between representatives freely chosen by the employees and managements.

In the long run, no plan for local negotiations and settlements which is merely "handed down from the top shelf" by the managements will satisfy the employees and bring about a good understanding and close co-operation. There is a spirit among the working class today which causes intelligent working men, whether conservatives or radicals, to desire a real voice in settling questions the settlement of which will affect their welfare, and no management which does not recognize this spirit as reasonable and laudable will establish relations with its employees which in the long run will inspire loyalty and secure efficient work. The so-called "company unions" must be allowed and encouraged to become real employees' unions, or in the long run it will be found that most of the shop employees have become members of other and larger unions and that these other and larger unions will again have to be dealt with.

One of the most important influences which have made the labor problem on the railways what it is today is the propaganda against private management of railways, and the still more radical propaganda against the entire present industrial system, which has been and still is being so extensively carried on among railway employees. How many railway officers who deal with labor read the weekly and monthly

publications of the labor organizations which are being read by employees? Those officers who do not read them should begin to do so. If they read them they would get light which they much need on one of the principal reasons why the railway labor problem has become what it is today. This propaganda has poisoned and is still poisoning the minds of hundreds of thousands of employees against their officers, against private management of railroads, and against the entire present industrial system. If the railroad labor problem of the present is to be solved, this propaganda must be met and its effects nullified by presenting to employees the real facts about the railroad business, including the part of total railway earnings that go to labor, the part that is spent for materials and supplies, the part that is paid out in salaries and the reasons why some large salaries must be paid, and about the part that goes to capital. Railway employees must be shown why it is to their interest to do efficient work and why it is contrary to their interest to destroy the earning capacity and stop the expansion of the concerns for which they work. They must be shown why it is not practical to give them more favorable working conditions or higher wages, and why their own situation and those of other working men in these respects could not and would not be improved by the adoption of government ownership or the Plumb plan or other revolutionary policies.

The machinery adopted for bringing about a better understanding and close co-operation between the employees and the railways never has been and never will be so important as the spirit in which the problem is attacked by railway officers. The essence of the matter is "Not of the letter, but of the spirit; for the letter killeth but the spirit giveth life." Most men are governed much more by their sentiments and prejudices than by their reason. No amount of presentation of statistics and arguments will ever solve the problem until more employees have their confidence in the fairness and efficiency of their officers and managements built up until they will again speak proudly of "our railroad." As this is done, however, the facts regarding the railroad business in general and about the business of the railroad for which they work in particular which are or should be presented to them, will become more and more effective in nullifying the reckless anti-railroad propaganda which is being carried on.

The Largest Car Shortage in History

THE CAR SERVICE DIVISION of the American Railway Association reported for the week ended October 15 that the railways were unable to furnish 156,309 freight cars for which shippers had made requisition, and that, on the other hand, there were scattering surpluses of cars in different parts of the country amounting to 4,275. This made a net "car shortage" of 152,034. This is the largest car shortage ever reported. The largest net shortages reported in earlier years were as follows:

On February 6, 1907	137,847
On May 1, 1917	145,449
On March 1, 1918	138,102
On September 1, 1920	146,070

There is a prevalent belief that the largest car shortages usually have been reported in the fall or early winter. This is based upon the assumption that the largest amount of freight always is transported in the closing months of the year. The foregoing figures show that the largest car shortages have not always, in the past, developed in the fall or winter. Furthermore, it is not true that within the last five years, at least, the peak of the year's business has always been reached in the fall. In 1917 the largest month's freight business was handled in May; in 1918 in August; in 1919 in October; in 1920 in August, and in 1921 in October.

Unquestionably the general tendency is for the largest freight business to move in the later months of the year, but the time when the largest amount of freight actually has been moved and shortages of cars have come have been determined by whether the tendency of general business has been upward or downward. In 1906 the tendency was one of increasing activity of general business and this tendency caused the freight movement to continue so heavy that the peak of the car shortage in that period was reached in the spring of 1907. Eight months later came the panic of 1907, which caused a heavy decline in freight business. In 1916 the tendency of general business was to increase, and the peak of the car shortage was reached in the spring of 1917. The same tendency of general business prevailed in 1907, while the severe winter of 1917-1918 seriously interfered with the movement of freight. In consequence, the peak of the car shortage was reached in the next spring. The peak of the car shortage in 1919 was reached in October, because late in 1918 and early in 1919 general business activity declined. The largest volume of freight movement and the peak of the car shortage in 1920 were attained in August, because general business activity was at its height and tending to decline, and in the preceding spring the movement of freight had been seriously interfered with by the switchmen's strike. This combination of conditions caused the total freight moved, a large amount of which had accumulated in the spring months, to be the largest in the four months May to August of any four months in history.

Unless most of the present indications are misleading, the tendency of general business is now to increase. There always has occurred in the winter months a decline in the amount of freight moved, even when general business has been extremely active. Undoubtedly this has been mainly due to the fact that the cold and storms of winter have interfered with railway operation and reduced the amount of freight it has been physically possible for the railroads in the northern part of the country to handle, even when general business has been active and growing. The result of this decline in freight movement in the winter months has been, as facts already given show, to increase the car shortage until spring weather has made it possible for the railways to again increase the amount of freight handled.

What do these facts indicate as to the transportation situation which is likely to prevail this winter and next spring? As there is no sign that the activity of general business is going to decline, the conclusion suggested is that the shortage of cars will reach its peak in the spring of 1923, as it did in the springs of 1907, 1917 and 1918. The railways for the last five weeks have been loading an average of over 970,000 freight cars weekly. After they had been making practically the same record for some weeks in the falls of 1918, 1919 and 1920, the demand for cars declined. Some experts on car service advance the theory that after the railways have been moving almost a million carloads of freight weekly for some weeks the supply of commodities received by the purchasers catches up with their demands, and that therefore after some weeks of such heavy traffic there is likely to be a decline in the demand for transportation. But this conclusion is based only on figures for carloadings for the last three years. Now, the decline in the demand for transportation late in 1918 and early in 1919 undoubtedly was largely due to the termination of the war and to resulting industrial readjustments. The decline in the demand for transportation late in 1919 was brief and was followed by a large increase in the demand for it. The decline in the demand for transportation toward the close of 1920 was due to the fact that for months the country had been heading into a period of drastic liquidation and decline of general business.

It would seem that the present conditions are more similar to those which existed late in 1906, 1916 and 1917, and as

has been shown, the conditions existing then resulted in increases of general business activity, of freight movement, and of car shortage. The United States is a growing country. Its periods of depression always have been followed by periods of revival and expansion of business and by consequent increases in the demands for transportation. The country is in the midst of a period of business revival now. Possibly the demands for transportation will not continue to increase, but certainly there seems more in past experience to indicate that they will than that they will not.

At any rate, nothing can be lost and much may be gained by railways, shippers and consignees acting on the assumption that the demand for transportation is going to increase for some time, and that every effort should be made to provide for meeting this increased demand if it comes. The railways, with unfavorable conditions in the shops of most of them, are pushing repairs of locomotives and cars as fast as they can; but while the number of bad order locomotives and cars is being reduced, it is not declining as rapidly as could be wished. The railways are ordering more new locomotives and cars this year than for some time. These are being received and put in service as rapidly as the builders can turn them out.

If, however, the expansion of general business is to continue it is evident that more must be done to secure the maximum utilization of the transportation facilities now available. While the shortage of cars is the best measure of the existing shortage of transportation, it is merely a symptom of the general transportation situation. Even if the railways should immediately put into service hundreds of thousands of new freight cars, the problem presented would not be solved. It would still be necessary to get more service from the tracks, the terminals and the locomotives.

The best immediately available means of partially solving the present problem is to improve the distribution of cars, to increase the average miles traveled daily by each car and to increase the average load per car. There is an acute shortage of cars for the shipment of grain on the central western and northwestern lines. The Car Service Division is trying to remedy this by ordering an extraordinary movement of box cars to these lines. If the railways act wisely they will fully and promptly carry out these orders, which probably would not have been necessary if car service rules had been strictly observed up to this time. The increased average movement and average loading of cars required cannot be secured without the co-operation of shippers and consignees, and the Car Service Division has called upon them for their help. In a recent bulletin it has shown that at least 150,000 cars are unloaded every day, and that if 24 hours were saved in unloading only one car out of every ten, this would increase the number of cars available for shippers by 15,000. The number of cars available could be increased 30,000 by saving 24 hours in unloading one car out of each five. Shippers are also urged to order only cars that will be loaded within a 24-hour period, and to place orders for reconsignment promptly in order to prevent unnecessary delays to cars that are reconsigned. They are also urged to load cars to the limit of their capacity, and to load and release them with the utmost promptness.

It is always obviously to the interest of the railways themselves in periods such as this to accelerate the movement of cars and increase their loading as much as possible. It is not always so plain to the individual shipper and consignee that it is equally to his interest to co-operate with the railways. Nothing could be plainer, however, than that whatever will increase the average movement and loading of cars will have the effect of increasing the available supply, and that, other things being equal, whatever increases the available supply will increase the amount of freight that every shipper can ship and that every consignee can get shipped to him

In the efforts to secure the greatest possible amount of service from the facilities already available, the one most important fact which the existing transportation situation emphasizes should never be overlooked. This is that for the first time in its history the country is confronted, at the beginning of a period of business revival, not only with a shortage of transportation but with the most acute shortage that ever existed. There is only one real remedy for this situation, and this is the expansion of railroad facilities. Whether they will be adequately expanded or not will depend upon future government regulation of railways. The public will determine what regulation will be in future. Therefore, whether the existing shortage of transportation will be remedied or become more acute and serious, will be determined by the public.

Net Railway Operating Income

IN AN EDITORIAL which appeared in last week's issue of the *Railway Age* a suggestion was advanced that the monthly reports of the earnings and expenses of the Class I carriers would perhaps have even a greater usefulness than they now have if there were a better understanding of the terms "Net railway operating income" and "Net after rentals." These two terms are synonymous; the chief difficulty in connection with their use lies in a certain amount of confusion between them and such other terms as "Net revenue from railway operations," "Railway operating income," "Net income," etc. In other words there is a lack of understanding as to what different things these various terms mean and a failure to differentiate them properly.

The best way to define the term "Net railway operating income" is to show what the Interstate Commerce Commission requires on the form on which the monthly reports of the carriers are rendered. That form requires the carriers to fill in six figures for each of a total of 29 items. The form—which measures 9½ in. by 11 in.—thus has seven columns which include the figures for the month (a) this year, (b) last year, (c) increase or decrease. Column (d) contains the items and (e) the figures for the cumulative period this year, (f) last year and (g) increase or decrease. The 29 items in column (d) are as follows:

OPERATING REVENUES:*
1. Freight (Accounts 101 and 121).
2. Passenger (Accounts 102 and 122).
3. Mail (Accounts 106 and 125).
4. Express (Accounts 107 and 126).
5. All other transportation.
6. Incidental (Accounts 131 to 143).
7. Joint facility—Cr. (Account 151).
8. Joint facility—Dr. (Account 152).
9. Railway operating revenues (Account 501).

OPERATING EXPENSES:*
10. Maintenance of way and structures (Accounts 201 to 279)
11. Maintenance of equipment (Accounts 301 to 337).
12. Traffic (Accounts 351 to 359).
13. Transportation (Accounts 371 to 420 and 431 to 433).
14. Miscellaneous operations (Accounts 441 to 446).
15. General (Accounts 451 to 462).
16. Transportation for investment—Cr. (General Account VIII).
17. Railway operating expenses (Account 531).

INCOME ITEMS:
18. Net revenue from railway operations (Item 9, less Item 17).
19. Railway tax accruals (Account 532).
20. Uncollectible railway revenues (Account 533).
21. Railway operating income (Item 18, less Items 19 and 20).
22. Equipment rents (Accounts 503 to 507 and 536 to 540), net.†
23. Joint facility rent (Accounts 508 and 541), net.†
24. Net railway operating income (Items 21, 22, and 23).

MILEAGE:
25. Average number of miles of road operated.

OPERATING RATIOS:
26. Ratio of expenses to revenues (Item 17÷Item 9).
27. Ratio of total maintenance to revenues ([Item 10+Item 11]÷Item 9).
28. Ratio of total maintenance to expenses([Item 10+Item 11]÷Item 17).
29. Sleeping and parlor car surcharge included in Item 2.

* Includes figures for water lines, if any.
†Debit balance should be entered in red.

It will be noted that "Net railway operating income" is item 24 and that what it shows is a "Net after rentals" but before fixed charges. Item 24 is the figure around which the present discussion is based.

Letters to the Editor

[The Railway Age welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

Statistical Comparisons Should Consider Business Conditions

New Haven, Conn.

To the Editor:

In an article entitled "Suggestions for Greater Efficiency and Economy," on page 702 of the *Railway Age* of October 14, Franklin Snow makes certain suggestions for improving the efficiency and economy of the railroads. His remarks on train dispatching are necessarily read without the information in regard to conditions on the line as a whole which only the dispatcher had at the time. As to the use of official cars and the cost stated—30 cents per car mile—Mr. Snow does not give full consideration of the lesser cost of these movements on trains operating for other purposes, the necessity of traveling offices for officers, the number of which has not increased as rapidly as has transportation. In the matter of passes he neglects the long established considerations of employees, particularly those older in the service. His adverse criticism of 1921 freight operation as compared to 1919, which criticism is apparently based on certain selected unit performance figures, may well be the subject of comment.

His figures for the month of July are quoted below for reference:

	1919	1920	1921
Per cent of cars loaded	67.9	71.1	63.6
*Average number tons per car mile	27.9	28.2	27.8
Average car miles per car day	24.1	24.4	21.3
Net ton-miles per car day	455	490	375
Average speed per freight train mile	10.8	10.8	11.9
†Gross ton-miles per freight train mile	1,571	1,470	1,472
Net ton-miles per freight train mile	757	725	674
Per cent of net to gross ton-miles	48	49	46
Cost per freight train mile	$1.54	$1.87	$1.88
Average per cent locomotives unserviceable	27.2	24.2	23.3
Average per cent freight cars unserviceable	8.7	6.6	15.9

*Some of the titles are not correct, this one obviously refers to the average ton-miles per *loaded* car mile.

†The Bureau of Railway Economics summary shows in 1920, 1,512 tons instead of 1,470, and in 1921, 1,459 tons instead of 1,472.

It is common knowledge that the greatest efficiency of any plant is obtained when it is working to 100 per cent capacity and before it is overworked, which in the case of a railroad is when it becomes congested. When business is light and plants work only to part capacity, the performance units always suffer as compared to those accomplished under 100 per cent operation. This point should be borne in mind when comparing July, 1921, with July, 1919, the latter month, according to Mr. Snow, being a normal one, with war traffic replaced by a heavy commercial traffic.

Therefore as the above factors of car use and train performance are influenced by the volume of business offering, no attempt to judge the relative operating efficiency should be made without knowledge concerning the amount of freight business handled during the different periods. Using as a measure the gross ton-miles handled in July of the three years (and net ton-miles would show 1921 at an even greater disadvantage), we find that 1920 was 12 per cent greater than 1919, but that 1921 was 14 per cent less than 1919.

Without taking any credit from the managers for their successful efforts in 1920, it should be realized that the increases in the percentage of loaded car miles and in the tons per loaded car were due in large part to the heavy freight movement at that time. Following federal operation and the period of heavy traffic, empty car mileage necessarily increased, incidental to the return of cars to owning roads, a movement necessary, moreover, in the interest of car maintenance. When business is heavy every car is required and there is opportunity to load more cars at the point where made empty, except in the cases of specialized equipment, such as coal or stock cars, where but little lading is available for the return movement. These conditions are responsible for the improvement in 1920 and the slump in 1921, rather than any falling off in efficiency.

Car loading is pretty well in the control of the railroads' patrons, so long as they load to the tariff requirements, which is all the railroads can insist upon. Car loading depends somewhat on car supply. When cars are scarce, naturally shippers load the cars they do receive heavier than when there is a car surplusage. Here again, considering the volume of business, 1921 compares favorably with 1919.

What has been said concerning the effect of varying freight movements also applies to the miles per car per day, but there is another important explanation for the decrease in the 1921 figure. That unit, of course, is obtained by dividing the car miles run during the month by the car days of that month. Miles are made only by cars that move, consequently any increases or decreases in the number of cars standing still (bad order and stored cars), affect the average miles per car day. Without entering into a discussion as to the cause of the large number of bad order cars in 1921, whether a result of under maintenance in previous years or, as Mr. Snow suggests, due to a cessation of shop activities in 1921, no criticism can be attached to the managers on that score, bearing in mind the large number of surplus cars available and the slack business of 1921, and the financial situation of the carriers. In 1921 the percentage of bad order freight cars had increased to 15.9 from 8.7 in 1919. If the 1921 percentage had been the same as 1919, the number of bad orders in 1921 would have been 212,000 instead of 375,000, and the average miles per car per day (with the same number of bad orders each year) would have increased from 21.3 to 23.1, or within one mile of the 1919 average. Similar adjustment for surplus cars, 150,000 in July, 1919, and 350,000 in July, 1921, would add another 2.2 miles to the 1921 average or give an adjusted mileage of 25.3 miles per car day, with cars standing (bad orders and surplus) on the same basis as 1919, or a considerably better performance than in 1919. Mr. Snow's remark that "It is indeed poor policy to allow car mileage to fall off as it has," does not appear to be justified.

Nothing need be said of the low figure of 375 net ton-miles per car day. It is simply the product of the three factors previously discussed and when they decrease, it follows.

The statement that the drop in the train load in 1921 is really an economy, because of higher average train speed apparently assumed possible because of the lighter train, and assuming further that the higher speed eliminated a large amount of overtime and other expense, is open to serious doubt. It is by no means an established fact that relatively high freight train speeds mean economy. On the contrary, many railroads have found that their lowest unit costs have resulted when heavy trains were being operated. The average tractive effort of locomotives increases from year to year; it was higher in 1921 than in 1919. Consequently the average locomotive of 1921 should have handled a train of equal tonnage to 1919 at a higher speed or more tonnage at the same speed. Operating men know that the best train loading records are made when there is a strong run of business for the simple reason that when this is true there are ample cars to load locomotives to capacity, while in times of light traffic, such as July, 1921, certain service must be maintained regardless of the train load, consequently many trains leave their terminals with several less cars than they would handle under 100 per cent operation. This argument is somewhat

weakened by the low train load figure shown in Mr. Snow's table for 1920, but as stated the 1,470 tons shown for 1920 is considerably below the figure reported by the Bureau of Railway Economics, while his 1921 figure is higher. While the fact that the gross ton-miles per train hour, which takes into account both load and speed, where higher in 1921, denotes more economical handling—still greater saving would have resulted had the 1,919 train load been handled at the 1921 speed.

The net tons per train were lower in 1921 for reasons previously given, i.e., less loaded cars per train and less tons per loaded car, the same explanation holding for the decreased percentage of net to gross ton-miles.

Everything considered, there seems to be no reason for discouragement so far as freight operation is concerned, and what Mr. Snow terms the temporary spurt of 1920, was really the beginning of improved operation which is continuing, as indicated by the fact that some roads have established new operating records since that time. Of course certain unit figures which necessarily reflect the influence of light business, or at the present time the effects of the coal and shopmen's strikes, will not evidence the improvement. Very likely the railroads will have their troubles during the coming months, but when conditions again become normal, with respect to personnel and business, it is to be expected that our railroads will establish new high marks of operating efficiency.

DON. M. NEISWANGER.

Why Are Dining Cars Unprofitable?

OMAHA, Neb.

TO THE EDITOR:

It is generally known that dining cars are not self-supporting, in fact, in many instances are operated at a loss; that were it not necessary to use them for the purpose of advertising and satisfying patrons, railroads would withdraw most of them.

What is the reason they cannot be made to yield a moderate profit? One view is that some dining car superintendents have fallen into a rut; that is, are too prone to copy menus and methods of some other roads. They cater only to about 15 per cent of their patrons, apparently ignoring the ability to pay and the wants of the other 85 per cent of the 150 passengers on the average train. High prices and small portions are other reasons why the diners are not more liberally patronized; also the tipping abomination, which is more in evidence and seemingly more exacting in dining cars than in any other place.

When a passenger is handed a bill of fare he is at once dismayed and discouraged. True, there is a goodly list of food specialties, but very little offered in the way of real food such as roasts, vegetables and desserts at prices which can be afforded, and which the man who is neither rich nor poor is accustomed to find on his table at home.

A steak costing about 50 cents at home and which is ample for three adults is offered at $1.25. The result of this exorbitant price is that steaks go a-begging. Many are carried on hand until they become unsalable and are a total loss. A passenger traveling alone often finds it necessary to buy enough, in quantity, to feed two or three persons because of ill-adjusted portions.

Why cannot dining cars be made a paying proposition on a basis of 50 per cent profit on the food served?

It is now the custom to serve club breakfasts at from 50 to 90 cents, but an inspection will show that a combination rarely lists the articles of food that you usually eat, or for which you care. If a selection of certain articles could be made from each combination the result would be more pleasing; but this is not allowed.

Why not make some experiments along the following lines:

Distribute menus throughout the train showing in display type "THIS COMPANY PAYS ITS DINING CAR EMPLOYEES A LIVING WAGE. KINDLY REFRAIN FROM OFFERING TIPS IN ANY FORM WHATEVER."

Show only two prices for breakfast—75 cents and $1—specifying in each combination one choice of three or more kinds of fruit, cereals, eggs, bacon, ham, rolls, hot cakes, and drinks.

Serve luncheon at the same prices and list in same manner.

Provide six o'clock dinner at $1.25 and $1.75, permitting passengers to make one selection from, say four kinds of meat, two selections from the same number of vegetables and supply dessert which is appetizing, instead of the usual "cottage pudding," for which about 35 cents is charged. The average American likes baked potatoes and pie, but these are rarely shown on menus now. Soup and bread are inexpensive and should be served as a matter of course. More attention should be given to the quality of the coffee, which on many diners is very poor indeed and is the one thing above all others desired by the traveler. Unquestionably poor coffee has provoked more criticism than anything else.

Since there is delay in changing, why use table cloths at all? They soon become soiled, must be removed while passengers are at table, and are an unnecessary expense. Also, napkins are fully one-third too large. The expense for table cloths at least could be saved by using a dining table having a soft-toned, mottled, cream-colored top, surrounded by a band about 1½ inches wide—cherry, mahogany or walnut—or a pure white composition closely resembling marble, with slightly turned up edges. Such tables may be seen in many first-class public dining rooms and are quite attractive.

A study of the printed part of bills of fare will show that nearly everything offered is canned; therefore, it would cost nothing additional to continue offering these edibles should it be desired to amplify the menus. For the 15 per cent of patrons who desire to be served with something out of the ordinary, the same specials as now appear could be shown; but these articles should not be featured so prominently that the other 85 per cent of the patrons would be stampeded by the prices, the moment they are seated.

One of the inconsistencies of menus is an offering of ham and eggs for 65 cents, while one must pay about $1.25 for a steak that should not cost the railroad more than the ham and eggs. Nearly everyone would prefer the steak.

Following is the cost of an average meal as now shown on many cars:

Meat order (not very much nor very good quality)	$ .80
One vegetable	.30
Bread	.10
Dessert	.35
Pot coffee	.15
Tip	.20
Total	$1.90

A dollar and ninety cents for barely enough to satisfy hunger. Often patrons even forego the dessert in order to pay the tip, as it is felt that both cannot be afforded.

Is it any wonder that dining cars are being operated at a loss? Who will be the first to leave the beaten path and offer passengers food worthy of the name, which they have at home, and upon which at least 50 per cent profit can be made?

H. W. F.

L. F. THOMPSON, of Parkersburg, W. Va., is now 99 years old and the Baltimore & Ohio calls attention to the fact that he is "the oldest employee of the oldest railroad" in the United States. He has been retired on pension for the last 22 years. Mr. Thompson was born in 1823, and until 1857, he was a school teacher and tutor in college. Because of failing health, he then went to work as a brakeman and remained in the railroad service the rest of his active life.

Gondola Cars with Slight Modifications Are Well Adapted for Holding Containers

Recent Developments in Use of Container Cars*

Saving in Manual Handling by Container System—Application to Transportation of Milk in Bulk

By F. S. Gallagher
Engineer of Rolling Stock, New York Central

THE CONTAINER SYSTEM of handling L. C. L. freight is too young to enable any definite or concrete figures in connection with costs to be given, but I will endeavor to draw a word picture that will show the economy and safety effected through the handling of less than car load freight by the container system.

Loading a 600 Gal. Milk Tank Container

The L. C. L. method of handling less than car load freight, permitting the unloading of a car in a few minutes, will be very far reaching, taking into consideration the railroad equipment of the country and the inability of the railroads to control this equipment during the peak load of business, when, in some cases, it is known the shippers use the car as a temporary storage place, tying up equipment that is badly needed. This results in a loss to the railroad company for car revenue which it would have had if the car had been unloaded promptly and returned to service, and an expense to the public at large due to the inability of the railroads to handle promptly shipments because of the lack of equipment.

With the use of the L. C. L. containers, this condition should be greatly reduced, if not altogether eliminated, because the containers can be removed from the car, immediately taken to the shipper's warehouse, and while there might some day be a demurrage charge for holding the containers, it would not keep the rolling stock out of service. In other words, the container methods of handling freight permits the quick unloading, and, of course, the quick unloading permits the quick return to service of the car, and during periods when there is a shortage of cars, which is almost chronic, the quick unloading of the freight car is a benefit to all concerned—the railroads, the shipper and the public.

Thirteen Manual Handlings for Each L. C. L. Shipment

Few people realize the number of times that L. C. L. freight must be handled from the shipper to the consignee. Following one package from start to destination, we will find it is manually handled as follows: (First) From the packing room to the warehouse platform; (second) from the warehouse platform to the wagon by hand truck; (third) from the hand truck into the wagon. The wagon then proceeds to the freight house, and the next manual handling (fourth) is from the wagon to the freight house platform; (fifth) from the freight house platform to the hand truck. The

*Address delivered before the Society of Terminal Engineers, New York, October 10, 1922.

individual package must be weighed and proper record made, and then taken into the car (making the sixth movement). The seventh handling would be the stowing into the car. The car is then sealed and moved to destination.

The next handling (eighth) is the unloader lifting the freight to the floor of the car for the hand trucker; (ninth) the hand trucker carries this freight to a designated place in the freight house. When the consignee calls for the goods the hand trucker takes the shipment to the wagon for loading (tenth handling). When the package is delivered by the hand trucker to the wagon loading platform, it is dumped at the tail gate of the wagon (eleventh handling), and must be handled the twelfth time to place it into the wagon. At the consignee's receiving platform the goods must be unloaded from the wagon, making the thirteenth time that this package has been handled.

Assuming that a car load of L. C. L. freight is 20,000 lb., this means that it must be handled manually lifted 13 times, or man power must be provided to lift 260,000 lb. in order to transfer one car load of 20,000 lb. of freight. This does not include the numerous checkings and records that must be made of this freight, which in itself is a big item of expense. By the container system the container is delivered to the shipper, who will have a light overhead crane or some other means of carrying the container into his warehouse, so that one handling of the original package into the container is all that is necessary. The expense of crating is eliminated. Being loaded with one handling of the freight, the container is lifted by hoist from the floor of the shipper's warehouse to the truck and is lifted by hoist from the truck to the car.

At destination, the operation is just the opposite. The container is lifted from the car onto the truck and then from truck to the consignee's platform, where it is unloaded and is ready for return shipment, or the container is ready to be picked up by the truck for the use of some other shipper. While the container is being unloaded the truck is released.

Instead of having to handle this container shipment of L. C. L. freight thirteen times by man power, it is handled twice, saving on the same basis as before; that is, on a car load of L. C. L. freight weighing 20,000 lb., the man power lifting of 220,000 lb. This is an economy that we cannot lose sight of, and while it would be said, of course, that there will be an expense incident to the installation of equipment for handling these containers at the various shippers' and consignees' plants, when this equipment is once in, the expense ceases.

Saving on Loss and Damage

We are all familiar with the enormous amount of money returned to the shippers by the railroads and by the express companies on account of loss and damage to freight. In L. C. L. freight it amounts to more than 8½ per cent of the revenue. The express companies pay claims to the amount of $25,000,000 a year for loss and damage. A great portion of this can be saved by the container system, because there is no chance of damage if the goods are properly packed in the container unless there is a disastrous smash-up, and no chance of loss en route from the shipper's platform to the consignee's platform, because it is impossible.

Containers for Shipping Liquids

There are other commodities handled by the railroads beside L. C. L. freight, express and mail where the container should play a big part; that is, in the handling of liquids, especially milk, fruit juices, edible oils, acids, etc., where the temperature is an important factor. The New York Central now has containers arranged for the transportation of milk in bulk.

The container and tank for milk or other liquids is shown in Fig. 1. A glass lined tank built by the Pfaudler Company of Rochester, N. Y., is used, but is encased in an insulated container. Time saving and labor saving is accomplished in every operation of handling milk or liquid by the use of the container car tank. The liquid being placed in the tanks at the proper temperature and the container being properly insulated, eliminates the use of ice.

These tanks may be made as large as may be transferred over the highways. In actual service all of the containers from the car will be hoisted and placed on a motor truck regularly in about a minute or a minute and a half per container. To transfer the same amount of milk between truck and railway car in the standard ten-gallon cans would require over two hours in manual labor. The cleaning of one of the large containers could be accomplished within five minutes, while it would require fully an hour to clean 60 cans required to carry 600 gallons of milk. Platforms requiring extensive space for handling the ten-gallon milk can will be done away with.

Any milk station shipping 600 gallons or more, or multiples of any designated size of tank, could utilize the container car tank service and lessen the handling at the shipping point and at the receiving point. The limiting feature of a liquid container would simply mean the capacity of

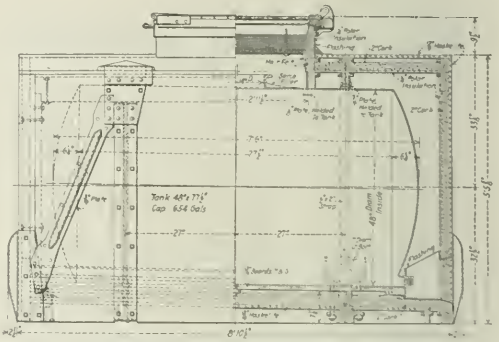


Fig. 1—Container and Tank for Milk

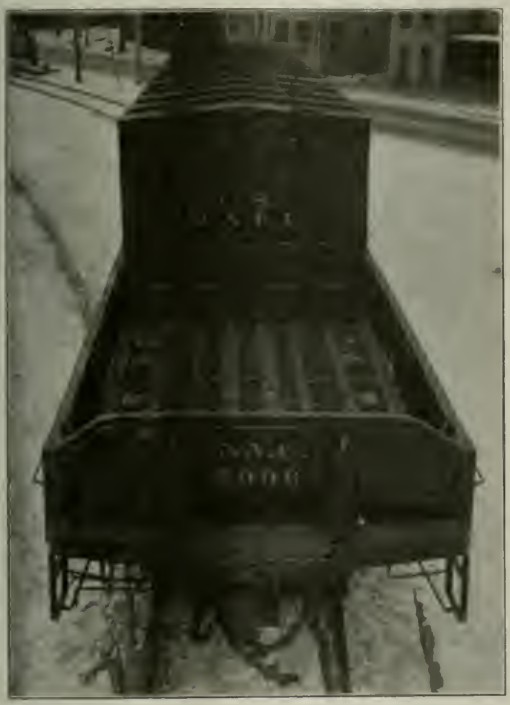
the truck for transferring over the highways. The tank can be made to carry in bulk any amount: 600, 1,000, 1,500 or more gallons of milk.

There is no chance of getting water into the container, because the top of the Pfaudler glass-lined tank is sealed and locked, and in addition a regulation refrigerator car ice hatch plug is used for insulating purposes. This plug is dropped into the opening and then the container cover is fastened down and sealed.

With regard to the actual handling of L. C. L. freight by the container method, a tariff was arranged for between Chicago and Cleveland, and the container system of handling freight put into regular service. The containers were handled as I described, thus making a store door delivery, or in proper words, from store door to store door delivery. This system of handling L. C. L. freight is now in operation between New York and Buffalo and intermediate points, where the "from store door to store door" handling of L. C. L. freight is made possible, and all the equipment that is necessary to put this system in operation is the crane for lifting the container from the car, and at the shipping or consignee's plant the container can be left on the truck and unloaded, but if they have lifting means it would be quicker and cheaper to lift the container from the truck and place it on the shipping or receiving platform, releasing the truck for other work while the container is being loaded or unloaded, as the case may be.

These containers are 7 ft. wide, 9 ft. long and 8 ft. high, and they have a carrying capacity of 7,000 lb. This keeps the gross weight within the carrying capacity of a five-ton truck. They are made of steel throughout, except the floor, which is made of laminated wood. The containers are well braced, and there is very little chance of damage with ordinary handling.

By the container system, when we can arrange for the proper equipment for handling the containers, a car can be



Container Cars for Mail Service Have a Wire-Mesh Floor

unloaded and released for service in a very few minutes; also it will permit the shipper and consignee to transfer or haul their goods from their warehouse or to their warehouse, as the case may be, by auto truck, without waiting at the freight house and without the loss of time necessary to load the truck with individual packages, because it will take only about a minute to load the truck when goods are shipped in an L. C. L. container, thereby saving an hour or two in getting the goods from or to the railroad.

THE LAST WOODEN DINING CAR on the Pennsylvania Railroad has been replaced by a modern steel car. The new cars, when fully equipped, represent an investment of $38,000 each. If all the Pennsylvania dining cars were in operation simultaneously, 4,236 people could be served at one sitting. This company serves 3,575,500 meals annually, requiring a total force of 1,555 employees. The meals are prepared in kitchens having a floor space of 19 ft. 6 in. long and 2 ft. 6 in. wide, where a chef and three assistants prepare and cook 10,000 meals a day. Approximately 2,600,000 eggs are required every year to feed the dining patrons; also 1,500,000 lb. of fresh meat, 1,300,000 lb. of potatoes, 500,000 lb. of sugar, 5,000,000 rolls, 150,000 lb. coffee and 500,000 quarts of milk and cream.

Automatic Highway Crossing Signals Authorized in Place of Gates

AT NEWFIELDS, N. H., on the Boston & Maine, the Public Service Commission of New Hampshire has authorized the railroad company to install, at a crossing 300 ft. south of the station, an "automatic wig-wag flasher and bell warning" signal for the protection of wayfarers at the crossing, in place of gates, which gates, with an attendant 12 hours a day, have been in use 50 years; and this order is issued notwithstanding protests received from the citizens.

When the railroad company announced its intention, the selectmen of the town and, later, 118 citizens, entered a protest, and the commission held a hearing on October 2. Newfields is a town of about 500 inhabitants. It is on the main line between Boston and Portland, where the number of trains is large; but the highway travel is not heavy, consisting mostly of the people who live on the east side of the railroad, on their trips to and from the trading center of the village, which is on the west side.

The commission in its report discusses quite fully the question of reasonable protection, and decides that an audible and visual warning, in service 24 hours a day, properly maintained, is better than the present arrangement, the gates being unattended for 12 hours of the 24. The "automatic flagman" is on duty 24 hours and never forgets. "It has met with universal approval by all regulatory bodies and is fast displacing the gate and human flagman," says the report. The visual apparatus and the audible are each operated by separate batteries and the railroad company reports that, in its experience, there has been no case where both of these warnings at a crossing have failed simultaneously. The

Visual and Audible Signal at Oak Hill, Maine

signal will be inspected daily; and, being near the station, failure to operate will be soon detected. As the view at the crossing is short, the road proposes to install two signals, one on each side of the railroad.

The report of the commissioners, signed by William T. Gunnison, chairman, reminds the public that the duties of the traveler and of the railroad at a crossing are reciprocal; the traveler must exercise due care, the same as must the railroad; and "whichever party fails in the performance of this reciprocal duty is liable for injury done to the innocent party."

The signal to be installed at Newfields is like that shown in the illustration, which is in service on the same railroad at Oak Hill near Portland. As shown, the signal is out of order as indicated by the appearance of the word STOP. Normally, when a train is on the track circuit approaching

the crossing, the stop disk swings back and forth, a bell rings and the six red lights at the top flash, successively, thus making three appeals to the attention of travelers on the highway. When no train is approaching the stop disk is normally hidden behind the case bearing the Look and Listen Sign, the bell is silent and the six red lights are dead.

University of Michigan Establishes Department of Transportation

Announcement was made last week that on October 27, the Board of Regents of the University of Michigan had established in its School of Engineering a new department of transportation intended to cover what may briefly be termed the broader aspects of that subject in its various branches. John S. Worley, a prominent consulting engineer of New York City has been appointed to head the department with the title of Professor of Transportation and Railroad Engineering.

Although the new department is to be identified with the School of Engineering, it is not the university's intention that the courses to be given will emphasize the engineering angle alone. They are intended to be open to students in the academic departments as well as those in the engineering school and through the co-operation of the various engineering departments and others, such, for instance, as that of economics it is expected that the treatment of the subject will be such that the courses will be of value to students interested in public utility and transportation matters generally.

J. S. Worley

The Board of Regents of the University of Michigan have in mind the development of work in transportation beyond anything that has been done in the past through an ordinary professorship in railroad engineering. While it is expected that work will be given in courses in railway engineering and that a number of the best young men may be induced to enter railway service each year, yet it is believed that the university has a much more important office in the creation of a right public sentiment towards the railroads and a more complete recognition on the part of the people of the complete dependence of the United States on the various agencies of transportation. Similarly, the prospective worker in public utility work will be led to see, it is intended, the reciprocal character of this situation, so that he may be able to formulate a proper understanding of the attitude of the public and to realize the utility's obligations in its community.

The relationship that will have to be developed between the railways, the waterways and the growing traffic on the highways is a matter that calls for most intelligent study and for the full co-operation of the railways and the colleges. One of the first elements in the program which is now in more or less tentative stages is, therefore, that of co-ordination. In the School of Engineering, at present, for instance, there are departments dealing with highways, naval architecture or water transport, steam and electric railways and beginnings have been made with a new department dealing with aviation. The department of transportation will have as one of its first aims an analysis and study of the co-ordination of these various modes of transport so that a man specializing in one of these subjects may be able to understand the problems of the others and secure an adequate picture of the existing and possible relationships of the one to the other. Similarly it is intended to cover the subject in such a manner that there may also be encouraged a proper understanding of the various related economic, legal and engineering aspects of the subject so that the student will have a broader understanding of the transportation situation as a whole.

Plans as to the curriculum are as yet not completely formulated. It is the university's idea in the beginning to have as a part of the new work, a course in the history of transportation, as it is believed that this will permit the desired understanding of the relationships of the various modes, as already mentioned, or to put it in other words, it is believed that a course of this kind will enable the student to regard each kind of transportation in its proper economic place. It is later intended to deal with the public utility problem as such, the idea being to give those not necessarily intending to take up that work in later life a better understanding of public utility activities and those actually intending to enter public utility work—such as engineering students trained in the technique of the subject—a better understanding of the broader aspects of the work which they are taking up.

John Stephen Worley, who has been appointed to the new chair of Professor of Transportation and Railroad Engineering is a man of wide experience in railway and public utility work. He was born in Jackson County, Mo., April 19, 1876 and received his education at Odessa (Mo.) College and at the University of Kansas, receiving his M.S. degree from the latter in 1904. In 1900 he entered railway service as an assistant engineer for the Kansas City, Mexico & Orient; was later assistant engineer of construction of the Arkansas & Choctaw, a Frisco subsidiary; from 1901 to 1905, assistant engineer of construction and assistant chief engineer of the St. Louis & North Arkansas and in 1905, engineer in charge of construction of the Toledo, Urban & Interurban. From 1904 to 1908 he was associated with Riggs & Sherman, consulting engineers at Toledo, Ohio, in the capacity of principal assistant engineer of design and construction. In 1908, with H. E. Riggs and M. W. Thompson, he participated in the Central of Georgia income bond case having charge of engineering work which included examination of the accounts and certain valuations. From 1909 to 1914 he was connected with the firm of Worley & Black, consulting engineers at Kansas City, Mo. and engaged in the design and construction of waterworks and water purifications, light and power plants and sewerage and sewerage purification plants in a considerable number of cities in Kansas. At this same time he was also retained in consulting work on various other public utility work such as electric railway construction, preparation of reports on steam railroad properties, etc. On May 1, 1913, he was named a member of the engineering board of the Division of Valuation of the Interstate Commerce Commission and was in direct charge of the Western district. From January 1, 1920, to July, 1921, he was retained as consulting engineer of the Bureau of Valuation. Since January, 1920, Mr. Worley has been the junior partner of the firm of Thompson & Worley, financial accountants and engineers with headquarters in New York. From June, 1921, to November, 1921, he was a director, comptroller and special representative of the creditors of the Habirshaw Electric Cable Company, Inc., New York, and since November, 1921, he has been receiver of the properties of the company.

Labor Board Again Rejects Living Wage Theory

Shopmen's Strike Called "Egregious Blunder" in Formal Decision in M. of W. Wage Dispute

THE THEORY of the "living wage" as advanced by representatives of railroad employees before the Railroad Labor Board "if carried to its legitimate conclusion would wreck every railroad in the United States and, if extended to other industries, would carry them into communistic ruin." This is the manner in which the majority of the members of the Labor Board, including all of the public representatives, present more or less of a final answer to this moot question. The quotation is from a supporting opinion attached to the board's formal decision on the plea of maintenance of way employees for a wage increase. The actual decision of the board in this case was quoted in the *Railway Age* of October 21, page 741. The complete ruling of the board was subsequently held up in order to include a dissenting opinion filed by A. O. Wharton, a member of the labor group on the board; a short statement by W. L. McMenimen, another member of the labor group, and a supporting opinion which, in addition to replying to Mr. Wharton's argument, contains what may be considered more or less of a final word on the part of the majority on the principle of the "living wage" as advanced by the labor organization economists.

The plea of the maintenance of way employees for an increase in wages was based upon (1) a reconsideration of the evidence presented in the hearings which resulted in the wage reduction order for these employees last July and (2) the contention that changes in industrial conditions since March, when this evidence was presented to the board, justify an increase. The board denies in the formal decision the first contention of the employees, "a majority of the board being of the opinion that the previous decision was just and reasonable." Referring to the second contention put forward by the men, the board recognizes a sharp upturn of industrial wages beginning in April of this year and affecting particularly common labor. The board cited that, whereas during the period from February 15 to March 15 there were no increases in other industries and 35 cases of wage reductions reported by the National Industrial Conference Board, during the period from August 15 to September 15 there were 119 increases and only four wage cuts reported.

Referring to the minimum wage of 25 cents an hour, which has been used extensively by labor leaders in the propaganda, the board said:

"The minimum of 25 cents an hour will prevail in very restricted territory and applies comparatively to a very small number of men. As a matter of fact, this 25 cent minimum is a higher wage than the 37 cent mimimum when considered in relation to the living conditions of the respective territories."

In support of this contention, the board cited the fact that whereas the New York, New Haven & Hartford is paying 40 cents an hour to trackmen, several of the larger southern roads are *by agreement* with their men paying between 17½ and 22 cents an hour at the present time.

"Living Wage" Is Primary Consideration; Cost of Living and Competitive Wages Secondary

Mr. Wharton in his dissenting opinion reiterates the argument he made on this same question in the board's previous decision reducing the rates of pay of maintenance of way employees. His arguments at that time were abstracted in the *Railway Age* of June 3, page 1280.

"The specific and fundamental mandate of the law is that wages shall be just and reasonable," Mr. Wharton says in addition. "The relation of rates of pay to those established in private industry, or the relation of rates of pay to the cost of living, is a *secondary* consideration which does not come into play until the *primary* requirement of a 'just and reasonable' or an adequate or living wage has been satisfied."

From this premise Mr. Wharton argues that a "living wage" must be fixed for those at the bottom of the wage structure and "just and reasonable differentials above this basic wage be established for the other classes of railway employees in accordance with the seven relevant circumstances mentioned in section 307 of the Transportation Act."

In support of his contention that the "living wage" is legally sound, Mr. Wharton quotes at length from statements by Senator Albert B. Cummins and from the rulings of several arbitration bodies, including the Kansas Court of Industrial Relations and the National War Labor Board.

Mr. Wharton Again Defends Budgetary Method of Determining "Living Wage"

The use of a family budget is essential to any attempt at ascertaining practically what a "living wage" should be, Mr. Wharton contends, and follows with a lengthy argument, the gist of which is contained in his statement that "a tribunal such as the Railroad Labor Board, in attempting to give practical application to the 'living wage' principle, cannot rely on what is, but must find out what should be."

In this connection Mr. Wharton also analyzes at length the objections which have been raised to the budgetary method of determining what a "living wage" consists of, his contention being that none of the objects raised are insurmountable and "all can be overcome by the exercise of sound judgment and discretion by the board." That the application of the living wage principle by the budgetary method would be financially impossible, or would involve such a financial outlay as would constitute a grievous burden to the shipper and the consumer, is denied by Mr. Wharton on the grounds that "similar arguments and prophecies have been developed in the past against the establishment of the eight-hour day and other measures of industrial equity or amelioration" and that the "dire results which have been predicted have never materialized."

Mr. McMenimen also appended a short statement to the effect that, although he does not feel that the increases awarded in this decision are sufficient, he voted for the proposition "when it appeared that the long delay in reaching a decision was working to the detriment of the men affected." The board's delay in arriving at a decision had already meant a loss to the employees involved of about $1,000,000 in earnings, he says, and justifies his vote on the grounds of expediency.

Labor Board Has Already Granted Railway Employees a "Living Wage"

The supporting opinion attached by the majority of the board says in part:

The fundamental difference between this decision and the dissenting opinion is that the former is based upon the Transportation Act, and the latter upon a fantastic theory, the very essence of which its own proponents expressly characterized in the hearing before the board as a "guess and a makeshift." The theory of the dissenting opinion, if carried to its legitimate conclusion, would

wreck every railroad in the United States and, if extended to other industries, would carry them into communistic ruin.

The contention of the expert economists for the employees was that the board should fix for common labor "the living wage." This is likewise the basis of the dissenting opinion. If the contentions were that the board should establish "a living wage," the majority would readily accede to the proposition, and, as a matter of fact, the board in this instance, as in all others, has granted a living wage. But the abstract, elusive thing called "the living wage," based upon a makeshift and a guess, can not receive the sanction of the board, because it would be utterly impractical and would not be "just and reasonable," as the law commands.

The living wage is defined by its proponents before this board as follows: A wage which will support a family of five in health and reasonable comfort, such family being assumed to consist of a husband and wife and three dependent children under 16 years of age.

This constitutes a bit of mellifluous phraseology, well calculated to deceive the unthinking. It has frequently been demonstrated that a melodious slogan contains more possibilities of danger and destruction than a dynamite bomb.

To ascertain what is reasonable comfort, it is proposed that experts shall prescribe a standard of living for a family of five, setting out in minute detail what the experts think such a family should have in food, clothing, furniture, housing and all the other necessaries of life. The fallacy of this proposal is inherent and fundamental. That it would be wise and practical to undertake to establish an arbitrary standard of living for several millions of people is not apparent. That the desires and requirements of all men are equal and alike is not correct, and that any committee of experts could set up an average living standard upon which a wage scale could be practically based has not been demonstrated anywhere. If theorists should evolve such a standard of living, it would not be possible to obtain any general conformance to it by those for whom it was designed. Standards of living have never been theorized into men. A man cannot be picked up by the scruff of the neck and hoisted into a new standard of living. Such a change in the individual man is a matter of growth and development. When brought about by natural processes, it is socially and economically beneficial, but, if attempted by legislation, it is a wasteful absurdity. To provide a somewhat expensive standard of living for a man who by habits, training and ambition is not prepared for it, wastes money and confers no real benefit on the individual.

It may well be observed that this theory of standardization necessarily fails to take into account many of the economies that are practiced by thrifty peole who desire to get ahead in the game of life.

That standards of living are gradually improving in this country is undoubtedly true, and this is as it should be. There is no member of the board who does not profoundly desire improved living conditions for common labor, but it is our belief that this movement must be continued along the lines indicated by human experience and that it cannot be consummated in the twinkling of an eye by artificial expedients. As a matter of fact, the expert representative of the employees in this case, admitted that the immediate establishment of "the living wage" would, to adopt his language, "throw a monkey wrench into the industrial machinery." He therefore suggested that the board only make a start in that direction at this time. Such a proposition is entirely illogical. If the living wage is the just and reasonable wage authorized by the statute, it is the duty of the board to establish it now. If it is not the just and reasonable wage commanded by the law, then it is not the duty of the board to adopt it now or hereafter, unless the law be changed.

If it would now be equivalent to a monkey wrench thrown into the machinery, as its advocate says, it might amount to the same thing later on, and the board made no mistake in declining to commit itself to this theory.

The adoption of the family of five as the typical family is "arbitrary and questionable," the opinion continues. The facts that the typical family has, according to the 1920 census, 4.4 persons, that there is an average of 1.4 dependent children to a family and not five, and that for each family there are 1.36 male workers instead of one, are cited by the majority.

The opinion further shows the effect of the application of the "living wage" in the railroad industry by pointing out that the establishment of a 72 cent minimum rate with the existing differentials would add $3,112,952,387 to the annual payroll and would result in an annual deficit of $2,241,639,518. Even if the 48 cent minimum rate were to be applied, as the representatives of the employees requested, the result would be an annual deficit of $378,078,125, the majority show, adding:

In either instance, there would not be a cent of returns for stockholders. Of course, for those who desire government ownership this would be a quick method of getting it, for it is a sure thing that the public would not stand for the imposition of higher rates to pay such a deficit.

It must be remembered, in the last analysis of the matter, that the public would have to pay this wage bill, and when we say the public, everybody, rich and poor, is included. A vast percentage of the burden would be passed on to laboring men and women in other lines of industry in the form of increased living expenses. From the effort to meet such increased expenses there would necessarily result a wide extension of the struggle to raise wages in all other lines of industry, and the disturbance and disorganization of business in general.

It is our belief that the people of this country are perfectly willing that railway labor, with its hazard, skill and responsibility, should be well compensated, even to the point of liberality. In view of this friendly public sentiment, it is not wise for labor organizations to seek to impose upon the farmers and producers of the country a crushing burden at a time when the losses of readjustment are so keenly remembered.

The citation by Mr. Wharton of an editorial written by Wm. R. Hearst and containing the statement that "the unjustifiable lowering of the shopmen's wages caused the strike" brings from the majority on the board the following interesting comment on the strike and its justifiableness:

In the judgment of a majority of the board, and, we believe, of a great majority of the people, the shopmen's strike was an egregious blunder without any real justification, and this is said with the kindliest feeling for the employees who have suffered most from its effects. It has wrought harm to all and good to none. It has burdened the railways with an unjust expense, has inflicted great losses upon the public, especially the food producers, and has resulted in approximately $177,535,524 loss to the strikers. For all this, the men on strike have won nothing. They have gained no concession as to any matter upon which they struck. For months the strike has been merely a struggle upon the part of the men to regain their positions.

In vivid contrast stands the course of the maintenance of way employees, whose officials wisely prevented a strike. Since July 1 this class of employees has received in wages approximately $147,656,866, which would have been lost on strike, and now, by orderly and legal processes, they are receiving under the present decision an increase in wages approximating $20,000,000 per year.

Perhaps there is no better time and place to emphasize the belief of a majority of the board that railway strikes are utterly useless and wasteful, and that the employees will always gain better results at the hands of any tribunal fairly constituted and representative of the people than they will by making war on the carriers and the public.

The most disturbing influence prevalent in railway operation today is the continuous preachment that the laboring man can not trust the courts and tribunals of his country and must therefore resort to force for the attainment of justice.

Nothing here said should be construed as an effort to discourage the legitimate activities of organized labor. It serves an essential purpose in the body politic. The conduct of the maintenance of way organization in connection with this wage controversy exemplifies the exalted service that may be rendered to labor and to our Republic by statesmanlike leadership of the railway employees.

The Careful Crossing Campaign, so far as can be judged by the experiences of the four months on the Baltimore & Ohio, was a gratifying success and a statement issued by the road says that if the Baltimore & Ohio's average of reduction of casualties is maintained on all the railroads, the expense of the drive will have been well spent. Actual collisions between trains and automobiles were reduced 13 per cent, as compared with the same four months last year. There was a reduction of 17 per cent in all kinds of accidents at crossings, including those to pedestrians, automobiles, other vehicles, etc. The reduction in persons killed in crossing accidents of all kinds amounted to 41 per cent; 37 fatalities last year, 22 this year. The reduction in injuries amounted to 9 per cent. There were 37 accidents due to the absolute disregard of gates or the fact that a train already was on the crossing. There seems to be little chance at all of saving drivers of this kind.

The Use of Mechanical Devices in the Treasury Department*

By F. L. Paetzold
Secretary and Treasurer, Great Northern.

THIS paper will outline some of the mechanical devices and methods used in the secretary and treasury department of the Great Northern.

Record of Stockholders and Payment of Dividends.—The original stockholders' record, transfers of stock and the payment of dividends are handled from our New York office, but the Great Northern, being a Minnesota corporation, is required under the Minnesota law to keep a record of its stockholders in Minnesota. The New York office sends us at St. Paul at the close of each day transfer sheets showing all transfers of stock which are posted and the stockholders' record is thus kept up to date.

We have about 45,000 stockholders and until recently the St. Paul record of stockholders was kept in approximately 45 large, heavy, clumsy, loose-leaf books, which were moved about on a truck. It took two strong men to wheel the truck into the vault at night, and the books were so large and heavy that it was difficult for the clerks to handle them when posting. The work was becoming so heavy that an additional clerk would have been necessary under the old system, but by discarding the loose-leaf books and installing a Library Bureau card system, using cards 8 in. by 5 in., housed in two small, steel trucks, each made up of a truck base, with three five-tray sections, a top and a truck handle, the need for an additional clerk was eliminated. During the day one truck is kept on each side of a flat top desk so that the operator sitting at a desk has within reach any and all of the 50,000 cards. At night these two small trucks can easily be rolled into the vault. A great saving in time has been made by the new card system as the filing index is exceedingly good.

We use an addressograph machine in connection with the stockholders' record. A stencil is cut of each new stockholder's name and address, and the stencils kept up to date as to changes of address so that when dividend payments are made it is an easy matter to run off a set of envelopes or dividend checks if the window envelope is used. The addressograph is also used in connection with sending out proxies for the annual meeting of stockholders. The name of each stockholder is printed on the proxy so when it is returned signed it is easy to sort and check. Those who have had experience with a large number of stockholders' proxies will appreciate how extremely difficult it is properly to decipher the names from the signatures.

Signograph Machines.—We have two ten-pen signograph machines manufactured by the Signograph Company, New York, one machine at New York, which is used in connection with dividend checks, and one at St. Paul, which is used in signing pay-checks. This permits the signing of 10 checks at a time, two sheets of checks, five checks to the sheet.

Electric Cancelling Machine.—An electric cancelling machine manufactured by the American Perforator Company, Chicago, is installed in the treasurer's office, which is used in cancelling all paid drafts, checks, agents' and conductors' remittance slips, etc., which perforates the date the item passed through the office. The perforation serves two purposes—it cancels the item and shows on its face the date the item was recorded in the treasurer's office.

Perforating Machine Used on Postage Stamps.—All postage stamps for the system are handled by the treasurer on requisitions and all stamps are perforated with the initials "G. N." before being sent out. The machine used is manufactured by the B. F. Cummins Company, Chicago.

Check Writers and Protecting Machines.—In the paymaster's office two electric F. & E. check writing machines are used in the preparation of pay-checks. With the use of these machines the amount of the check is written in and perforated for protection by one operation.

Hand operated check writing machines manufactured by the Todd Protectograph Company of Rochester, N. Y., are used in the treasurer's office for ordinary checks, writing in the amounts and protecting them with one operation.

Adding Machines.—The adding machine is so necessary to the work of the treasurer that it hardly needs mention for no treasurer today could get along without it. All our items, such as drafts, pay-checks, time checks, agents' and conductors' remittance slips, etc., after being proven are listed on statements in duplicate, the original going to the comptroller with the daily cash statement, the duplicate being retained. This saves a great deal of bookkeeping for the cash book merely shows the total paid or received, the details being found on the duplicate statement prepared on the adding machine which is filed in a separate binder. Burroughs machines are used exclusively.

Loose-Leaf Cash Book.—It might be of interest to call attention to the form of loose-leaf cash book used. We have one book for the disbursements and one book for the receipts so that when the work is heavy, one bookkeeper can handle the receipts and the other the payments. As a matter of policy we have banking arrangements in all large cities on the system, and on account of the number of banks, the balancing of the daily work was difficult until our present system was worked out. In our loose-leaf cash receipt form and cash payment form after allowing two columns for the explanation of the item, we have a column for each bank, the name of the bank being placed at the top of the column.

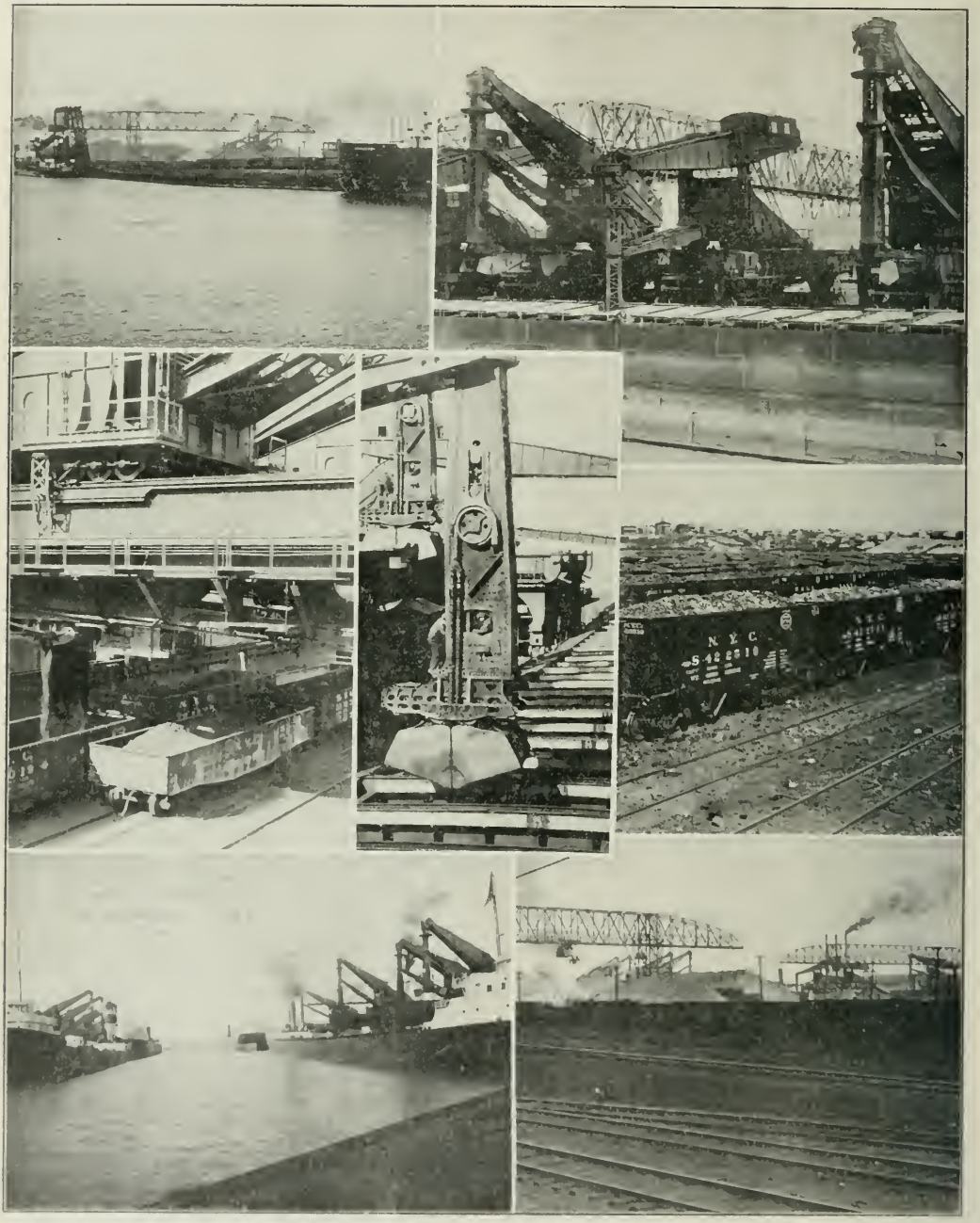
The items credited or charged against each bank each day are entered in the column for the proper bank. At the end of the day after the receipts and disbursements of each bank have been totaled, the total disbursements for each bank are transferred and placed under the total receipts for each bank and the differences brought down to show the balance in each bank at the close of the day. By this method, if the books are not in balance we can quickly locate in which bank the discrepancy is to be found.

The banks report to us daily on a statement which we furnish. When these statements are received each day by express, one clerk proves and checks the items sent in for credit or debit and then distributes the agents' remittance slips, pay-checks, vouchers, drafts, etc., to the various clerks handling those items, showing total and name of bank. He then notes on the face of the statement the net amount to be added or deducted from the bank for that day, after which an entry is made from the cash statement into a loose-leaf running bank balance book which we keep.

In order to show at a glance the total cash on hand and the balance in each individual bank the balance is transferred from the loose-leaf running bank balance book to a daily cash book which has the name of the bank in a column at the left and the balance in a column for each day of the month in succeeding columns. If after balancing the day's work there is any discrepancy, the balances shown at the end of the day on the loose-leaf cash book are checked against the balances shown in the daily bank balance book to ascertain in which bank the difference occurred. Every treasurer realizes the importance of balancing his accounts daily in the shortest possible time in order to settle with the bank and furnish a daily cash statement to the comptroller, and while our method may not be the most practical on other roads, we have found that by this method errors can be quickly detected and the bookkeeping handled most efficiently.

Recording Minutes.—We use an Elliott Fisher machine for writing minutes of meetings into permanent bound minute books, which makes a neat, permanent record.

*A paper read at the Railway Treasury Officers meeting held at Asheville, N. C., October 19 and 20.



A Variety of Views of the Coal and Ore Handling Equipment at the Ashtabula Docks of the New York Central Lines, Where Lake Coal Is Being Transshipped at a Record Rate for That Road. For a Period of 32 Days Coal Has Been Dumped at the Average Rate of a Car Every Three Minutes

A 90-Car Coal Train Headed for Ashtabula

New York Central Handles Coal at Record Rate

End of Five Months of Mining Inactivity Results in Heavy Tonnage Movement at Ashtabula, Ohio

As a result of the coal strike and the mining inactivity, which lasted for about five months, many of the railroads were faced with the problem of getting to destinations in three and two-thirds months "lake" coal in a quantity which they would ordinarily have nearly nine months to handle. This has brought about a very heavy coal movement in the neighborhood of the lake ports, necessitating the use of every facility. It is, therefore, interesting and timely to see what is being accomplished by the New York Central at Ashtabula where new records for this road have been made in the transshipment of lake coal.

Central Handles About 16 Per Cent of Northwest Coal Shipments

Of the 25,000,000 tons of bituminous coal sent annually to the northwest, approximately 4,000,000 tons, or 16 per cent, is hauled to the lake by and transferred to lake steamers at the docks of the New York Central Lines at Ashtabula Harbor and Toledo, Ohio, the facilities at the latter point being on the Toledo & Ohio Central. Between September 10, when coal first began to reach Ashtabula after the resumption of mining, and October 18 this year, that port saw the largest bulk of coal traffic passing through it which the records have ever shown for such a period. During that time 765,405 tons, all bituminous, in 14,559 cars were transshipped. In the 32 working days between the dates mentioned a daily average of 456 cars of coal loaded into vessels was attained. This means that 19 cars were unloaded per hour, or an average of one about every three minutes for a 24-hour day. The actual operation, however, of dumping a car consumes about a minute.

Tonnage for the Current Year Far in Excess of Previous Years

The work of the harbor docks in handling this tonnage since resumption of mining is also brought to mind more clearly by a comparison of business handled in similar periods of previous years. The figure of 765,405 tons for 1922 is many times higher than that of 1921, a slack year, and 67 per cent greater than that of 1920, when 457,338 tons of coal were handled. In 1919 the tonnage for the similar 32 working-day period was 305,126 tons in 6,309 cars, and in 1918, 478,185 tons in 7,913 cars.

The heaviest weekly period of coal-car loadings to vessels occurred during the week ended September 24, when 4,176 cars, or 8,800 tons, were dumped into lake boats at an average of 596 carloads a day. This was during ideal weather, with plenty of boats on hand. This volume was 14.3 per cent, or nearly one-seventh, of the entire shipments of coal dumped into vessels at Lake Erie ports during that week, which approximated 1,453,684 tons. This figure does not include coal dumped by the Toledo & Ohio Central, which, if added in, would bring the New York Central Lines quota on the lake transfer shipments to approximately 25 per cent. The maximum single day's loading at Ashtabula occurred on September 19, when 740 cars were dumped, a total of 37,000 tons.

Record in Loading Established for the Central

Coal handled at Ashtabula, however, is only approximately 10 per cent of the total tonnage handled by the New York Central Lines. A new record in coal loading on the Central's lines was established on October 20, when there was loaded 3,978 cars. The best previous record was made on September 25, when a total of 3,670 cars were loaded. Annually at points on the New York Central system between 500,000 and 800,000 cars are loaded with bituminous coal. Averaging 50 tons to a car, this would show an originating total tonnage of from 25,000,000 to 40,000,000 tons, or about 10 per cent of the nation's annual bituminous coal supply. These figures do not include coal traffic received from connecting carriers, which would bring the total figures much higher. During the same 32 working days (September 10 to October 18) for which figures for Ashtabula dock transfers have been given, 87,686 cars of bituminous coal were loaded on all roads of the New York Central system. This was a tonnage of 4,384,300 tons, an increase of 36.7 per cent over the same period of 1921, the figure for which was 64,122 cars, or 3,206,100 tons. At the Toledo docks of the Toledo & Ohio Central during these 32 days 7,763 carloads, or 388,150 tons, were transferred to lake vessels. New York Central officers on the Franklin division estimate that in the limited operat-

ing period of this year a tonnage far greater than that of the entire season of 1921 will be handled. All indications point to a complete neutralization of the shortage in the northwest by the time navigation closes on the lakes.

Coal and Ore Handling Equipment

Ashtabula harbor is situated north of the main line of the New York Central at Ashtabula and at the northerly end of the Franklin division, the branches of which extend from there into the Oil City and Clearfield districts of Pennsylvania and down to Youngstown, where connection is made with the Pittsburgh & Lake Erie and through it to other coal-carrying roads.

The yard, which is devoted exclusively to coal and ore handling, contains from 60 to 70 miles of track. It is divided into three large sections, *i. e.*, the bridge yard, the East system and the West system. The bridge yard forms a storage space for loaded coal cars which are fed to the car dumpers at the docks. The East system is a switch yard, through which the loaded coal cars are sent to the dumpers and transfer made of the empty cars to the ore docks and to other points. The West system is used for the receipt of empties from the East system and for the loading of ore exclusively. A large part of the yard work in connection with coal transferring consists of grouping the coal cars into the pools. The coal-loading equipment consists of two car dumpers, each of which may care for a vessel at a time.

Ore is unloaded from vessels at what are known as Docks No. 1 and No. 2. These docks can accommodate four of the largest lake vessels at a time and the unloading machinery handles two vessels at the same time. Ore is handled in much larger quantities than coal at Ashtabula, the unloading equipment and storage space being one of the largest in the country. The New York Central handles approximately 25 per cent of all the ore transferred from vessels to railroad at lake ports for rail haul to the furnaces.

Ore Traffic Shows Substantial Increase Over 1921

Traffic in ore declined in the year 1921, due to the business depression which first was felt in the fall of 1920, but the Central has, however, carried this year up to September 30 almost twice as much ore from Ashtabula Harbor docks to the furnaces as was carried last year. This year to September 30, 61,434 carloads, totalling 3,512,345 tons, have been handled, whereas the total figure for 1921 was only 38,693 carloads, or 1,997,514 tons. The record-breaking ore tonnage for the New York Central through the Ashtabula yards occurred during 1918, when 7,945,555 tons, or 158,898 carloads, were sent south from the port. The 1918 tonnage was followed closely by that of 1920, the figures for which show a total ore haul of 143,937 carloads, or 7,473,594 tons.

The most involved part of the task of transferring ore from steamer to cars is the grouping of suitable equipment from which the furnaces may unload. The unloading equipment at the furnaces governs almost entirely the class of equipment which may be loaded at the docks. The ore arriving in steamers is consigned to the furnaces, according to grade then required or to be needed in the near future. There are more than 32 grades of ore received at the docks. On arrival of vessels, yardmasters are given instructions as to the class of equipment wanted for a particular consignment and grade of ore to be loaded. The equipment suitable to the needs of the consignee is then fed into the system for loading.

The ore operation is an all-year around one, inasmuch as a large tonnage of ore is accumulated in the storage space on the docks for the winter supply of the steel furnaces. The storage capacity of the docks is 2,500,000 tons. At the present time there are about 1,500,000 tons on the docks awaiting draft of the furnaces this winter.

Two carloads a minute is the rate at which the ore unloading machinery operates. It consists of two batteries of four each or eight Hulett 15- to 20-ton ore unloaders. Four of these are located on either side of the dock space and are operated independently of one another.

Each battery of unloaders spans four tracks, upon which the cars are spotted for loading.

When furnaces are supplied and all current orders for ore consignments are cared for, the cargoes arriving at Ashtabula are stored. Further handling is carried out by means of two large electric traveling cranes, or ore bridges, one for each dock. Each bridge has a span of 625 ft., is 75 ft. high and handles 15 to 20 tons at a time. The ore bridges can unload 100 cars in ten hours with average capacity of 5,000 tons in ten hours.

Pennsylvania Contemplates Extensive Improvements at Norfolk

The Pennsylvania contemplates the expenditure of approximately $3,000,000 in the development of a rail-water terminal at Little creek, near Norfolk, Va. This information was made public in an address delivered by Elisha Lee, vice-president of the Eastern Region of the Pennsylvania, before a joint meeting of the Chamber of Commerce and the Board of Trade of Norfolk, Va., on October 30.

The Pennsylvania, at the present time, reaches Norfolk by car ferry from Cape Charles, Va., a distance of 36 miles. The development of Little creek, for which the company has already acquired about 1,000 acres of land, will shorten the water haul to 25 miles and will necessitate a new terminal, some new track and the acquisition trackage rights over other lines. Definite arrangements for these trackage rights have not been made as yet, but negotiations are under way and it is thought that they will be carried to a successful conclusion. A new freight warehouse will be built at Norfolk.

Aside from the long water haul, the incentive for the improvement is the congestion of traffic in Elizabeth river, Norfolk, through which all the company's traffic must now pass. In addition, there has been a great increase in traffic between Norfolk and Cape Charles. In 1910 this totaled 125,000 loaded freight cars and 146,000 passengers. During the height of the war activity, freight traffic rose to 190,000 cars and passenger traffic exceeded 500,000. Since that time, there has been some falling off in traffic because of the closing down of many of the war activities in the vicinity of Hampton Roads. Nevertheless, traffic is holding up far above pre-war levels and gives every promise of continuance and a steady growth.

Mr. Lee concluded his address by calling attention to the importance to business men of such improvements as the Pennsylvania is planning for Norfolk and to the fact that these cannot be carried out without money. He urged that business men give their support in helping the roads to maintain their credit in such fashion that extensions and improvements can be made as needed.

Three Hundred Dollars Damages for getting in the way of a moving locomotive, was the verdict won by the Central Railroad of New Jersey at Freehold, N. J., on October 24, in a suit against the Colonial Ice Cream Company of Philadelphia, based on the cost of repairs to one of the railroad's locomotives which, on April 8, last, struck a truck of the ice cream company at Larrabee's Crossing, between Lakeview and Farmingdale. The judgment was recorded by Judge Richard Doherty in the Circuit Court. Two employees of the ice cream company were killed and the truck was virtually demolished, but the evidence showed that the employees were to blame for the collision

Development of Concrete in Railway Construction*

Application of This Material to Other Than Bridges—Discussion of Importance of Waterproofing

By M. Hirschthal
Concrete Engineer, Delaware, Lackawanna & Western

THE DETAILS in connection with the design of reinforced concrete viaducts that are of the utmost importance are those of expansion joints and waterproofing and in connection with the latter, drainage. A concrete viaduct where the waterproofing is defective or where expansion has not been properly provided for, defeats the object of its selection, requiring a considerable expenditure for maintenance

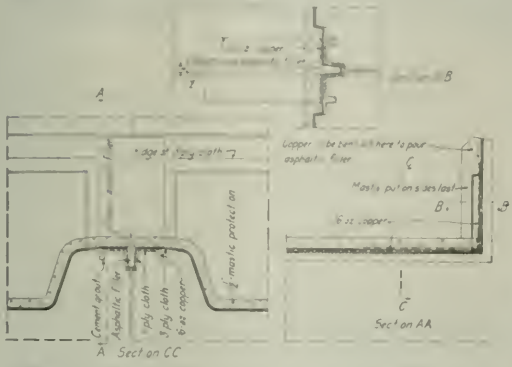


Fig. 33—Waterproofing Details for an Expansion Joint

because of the dangerous conditions resulting from leaks due to failure of either of the above details. It is for these reasons that particular attention was given to the subject of waterproofing and expansion joints and after exhaustive investigation the types described below were selected.

The waterproofing for the Tunkhannock and Martin's Creek viaducts consists of a membrane of 3-ply asphalt

Fig. 34—Pleasing Application of Concrete Construction to the Passenger Station at Far Hills

saturated, cotton fabric laid in asphalt and a protection coat of two ¾ in. thicknesses of asphalt mastic laid completely across the floor system and up the sides of the parapets and expansion joint dykes. To eliminate any possibility of the accumulation of water at any point along the viaduct a system of drainage was devised; cast-iron drain pipes sur-

Fig. 35—Reinforced Concrete in a Large Building, a Coal Breaker

mounted by cast-iron screened drain boxes were placed at the center of each cross wall supporting the floor arches,

Fig. 36—An Admirable Application of Concrete to a Signal Tower at Montclair

*This is the third of three articles, the first of which appeared in the *Railway Age* of October 14, page 705, and the second in the *Railway Age* of October 28, page 791.

except at expansion joints and located at the center between tracks, the bridge floor being pitched toward these drain pipes, forming a hip at the crown of the floor arches.

The expansion joints of the Tunkhannock viaduct are located at approximately the one-quarter points of the main

shop and office and storage building, are entirely of concrete and most of the members of the other buildings are also of concrete.

A splendid example of a concrete station of which there are a number along the line is that at Far Hills, Fig. 34,

THREE DESIGNS OF PLATFORM CANOPIES

Fig. 37—Concrete Canopy with Curved Outline at Watsessing

Fig. 38—Concrete Canopy Conforming to Straight Lines at Bloomfield

Fig. 39—Canopy with Steel Ribs, Giving Much the Same Appearance as Concrete

arch spans and on either side of each pier and consist of a ¼-in. opening starting from the haunch of the floor arches normal to the soffit, running vertically upwards through the center line of the wall with a dyke on each side of the opening extending nine inches or one foot above the floor

and it shows the adaptability of concrete to the architectural treatment required by this type of structure.

A class of buildings offering many different problems in design, are coal breakers, an example of which is shown in Fig. 35. Signal towers, of which Fig. 36 is a typical ex-

Fig. 40—Example of Concrete Construction as Applied to Pier Sheds

to form a dam and the floor adjacent thereto is pitched toward the next walls to shed water. The joints were provided with both sheet copper and saturated cloth as well as mastic protection after the opening had been filled with asphalt compound. The maximum distance between expansion joints is 83 ft. 9 in. Similar provisions have been made for the other viaducts and bridges, both arched and flat. These provisions have proved effective and have dispensed with any maintenance thus far. Fig. 33.

While bridges are the principal and most important structures pertaining to railroad work, there are structures other than bridges and reinforced concrete has been represented in the construction of these as well:

As has already been mentioned, in the erection of the Kingsland and Keyser Valley shops concrete was used for foundations, floors and subways. In the Scranton locomotive shops, however, some of the buildings, notably the pattern

ample, have excited the admiration of many railroad men. An automatic signal sub-station was recently erected of concrete at Harrison, N. J. The building was so designed that

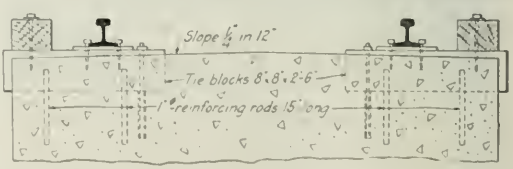


Fig. 41—Track Construction in the Bergen-Hill Tunnel

should it be required to change its location, it can be lifted from its foundations and transported to the new site chosen for it.

While station canopies are in fact facilities in connection with station buildings, they often provide interesting problems which make them independent studies. The Watsessing station is located at the street level while the tracks and

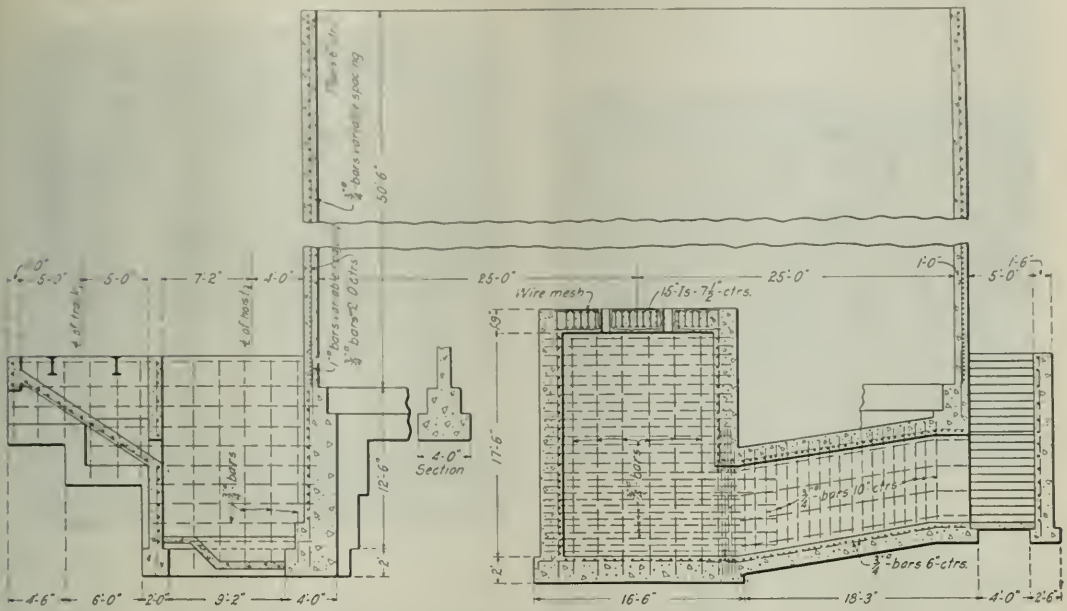


Fig. 42—A Large Concrete Sand Storage Bin

platforms are in a depression. The foundations of the station were formed to an elliptical arch and the underside of the canopy beams conforms to the curve of the intrados of the arch with the results shown in Fig. 37. The Bloomfield station, on the other hand, is on a fill so that the problem is somewhat simplified. The effectiveness of the reinforced con-

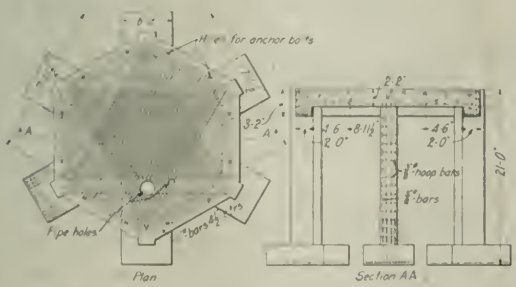


Fig. 43—A Concrete Foundation for a Water Tank

crete canopies is shown by Fig. 38. In the case of the station at Madison, the canopy construction consists of concrete columns and roof slab, while the cantilever beams and purlins are of structural steel, Fig. 39.

To obviate the necessity of frequent repair and renewal incident to timber construction a novel type of construction was resorted to in the design of the Hoboken piers. The piles were cut off at low water and completely decked with timber; a heavy concrete bulkhead wall was constructed, the first of which is a one-story structure, the other two stories in height, Fig. 40.

Concrete has been used for tunnel linings and shafts at various places along the line, notably in both the old and the new Bergen Hill tunnels at Jersey City, N. J. The difficulty in all tunnels is to resist the effects of water on the linings and due to its deleterious effects in the Bergen Hill tunnel, it was decided to substitute vitrified brick for the arches and sidewalls in the latest tunnel work at Factory-

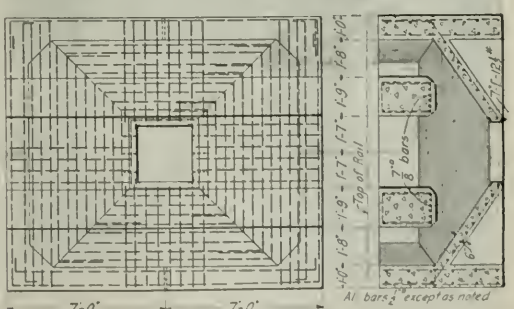


Fig. 44—Example of a Track Hopper for a Coaling Station

ville, Pa., using concrete for the shafts, backing and ditches. In the construction of the Bergen Hill tunnel a concrete roadbed was installed, a feature that has been amply described in detail heretofore in articles and which is shown in Fig. 41.

Among the structures which are classed as miscellaneous

the largest is the sand storage and dryer tank constructed of reinforced concrete at Scranton, Pa., with a capacity of 90 carloads of sand; the details of which are shown in Fig. 42.

Up to recently, water tank foundations, when not of steel or timber were made of solid concrete with a chamber to house the pipes. Figure 43 however, shows one of reinforced concrete at Black Rock, N. Y. to supplant the one of solid concrete heretofore used to support steel tanks. Track hoppers for a coaling station at Buffalo, N. Y., were designed to meet the special case there existing in connection with the coal conveyor, Fig. 44. Cinder pits have been constructed of concrete at various points, but the one for the power house at Hoboken, N. J., presents unusual difficulties because of the conditions surrounding it. The necessity of employing divers in the tidal waters for construction caused modifications in the design to the extent that entirely unusual combinations were required, Fig. 45. Among the minor uses of concrete are in the construction of pipes, piles, box culverts, ducts, manholes, storage battery wells, fence posts, etc.

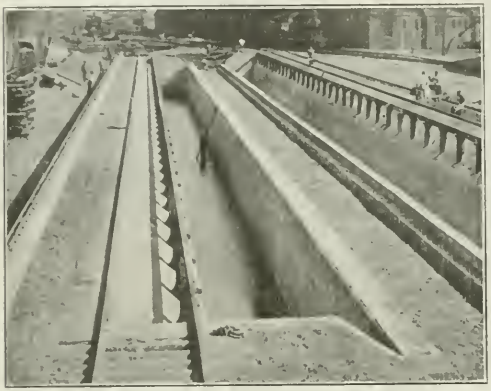


Fig. 45—Reinforced Concrete Cinder Pits at Scranton, Pa.

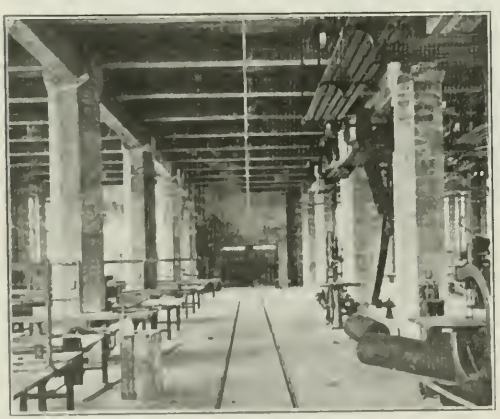


Fig. 46—Reinforced Concrete Building Construction for a Pattern Shop

While it has not been the object of this article to claim that concrete plain or reinforced is a panacea for all structural ills, the writer has attempted to point out the adaptability of this material for a multitude of uses and conditions and its actual adaptation to railroad construction as illustrated by its use on the Lackawanna.

The first chief engineer to countenance the use of concrete for engineering structures on the Delaware, Lackawanna & Western was W. K. McFarlin. Messrs. Lincoln Bush and G. J. Ray who followed him have been instrumental in expanding the uses of concrete to the great development it has now attained. B. H. Davis was the first engineer in charge of concrete design, followed by A. B. Cohen and the writer who is the present incumbent.

Fig. 47—Reinforced Concrete Smoke Jacks in a Roundhouse at Scranton, Pa.

Price Fixing and Competitive Bidding on Railroad Securities Opposed

WASHINGTON, D. C.

THE INTERSTATE Commerce Commission was strongly advised at a hearing before Division 4 at Washington on October 26 against embarking upon a plan of fixing the prices at which railroad securities should be sold or requiring competitive bidding in the sale of securities in connection with its orders granting or withholding authorization and approval for the issuance of securities. The hearing was called to give an opportunity for the expression of views on questions which have been considered by Division 4 as to whether and to what extent the commission should determine, limit or restrict the price at which, or the manner in which securities are to be sold; the cost to the carriers of the marketing of securities, and whether it is within the province of the commission to require competitive bidding and whether competitive bidding should be required. Division 4 consists of Commissioners Meyer, Daniels, Eastman and Potter, but Commissioners McChord and Hall also sat with them during the hearing. The commission was told that if the time comes when it considers it necessary to set up its own judgment against that of the railroads and the bankers as to proper prices for railroad securities, it should take the responsibility for the financing of the railroads out of the hands of private management, but that except in cases where there appears a direct conflict with public interest the com-

mission should allow a free hand to those who have the financial responsibility.

Robert S. Lovett, chairman of the Union Pacific, appeared as chairman of a special committee of the railroad executives and expressed the opinion that the commission should not change its present methods of supervision, under which, in giving approval to an issue, it has usually stipulated that the securities should be sold for not less than a given price, but the price has usually been that at which the railroad had stated it expected to be able to sell, if, indeed, it had not made definite arrangements in advance. He said that Kuhn, Loeb & Co. will pay just as much as the securities are worth and just as much as any other banking house could pay for them and that it is of great value for a railroad to have established connections with such an institution. He also referred to the importance of prompt action in placing securities, saying that while the present method of the commission, entailing from four to six weeks before a decision is announced upon a company's application, has not caused a serious delay in the last 18 months, while there was a rising bond market, even that amount of delay might become of more importance should the market condition be reversed so that prices would be liable to fall between the time that applications are filed and authority granted. Judge Lovett said it is not within the power of the commission to require that securities be sold to the highest bidder.

Otto H. Kahn, of Kuhn, Loeb & Co., also expressed opposition to the plan of requiring competitive bidding. He said the services of a banking house are of great value to railroads and that if securities were put up for sale to the highest bidder without the necessary preparatory work, the bankers naturally would pick and choose among issues offered and many railroads would run risks of finding themselves faced with failure to get securities taken. He also described to some extent the competition which exists among banking houses under present conditions.

F. J. Lisman, of F. J. Lisman & Co., said it is frequently easy to say afterward that a certain price was too low, but that some one must have the courage of his conviction to decide what is a fair price at which securities can be marketed. He also pointed out that competition exists even though railroads do not request competitive bids. If the large banking houses were to show an unwillingness to pay fair prices companies would promptly be formed to compete with them and they would lose their hold on the business. A plan of competitive bidding that might work in a rising market, he said, would not be successful in a falling market and in the long run would do much harm to railroad credit by interfering with the free play of human judgment. Bankers are not going to concern themselves with what the price of a security is going to be 60 days hence, because it cannot be determined any more than one can say where the thermometer will be on a given day.

W. A. Colston, vice-president of the New York, Chicago & St. Louis, said he proceeded on the assumption that the commission's power is plenary and exclusive, but that the commission should determine, limit or restrict the price at which, and the manner in which a security shall be sold and the cost to the carrier only when necessary in order to bring the transaction within the public interest as prescribed by the statute. However, it should impose no restriction on the action of the carriers which is not necessary to bring it within the public interest. The government has not undertaken to assume the responsibility for the financial management of the railroads and the authority should go with the responsibility. The commission is not the financial manager of the railroads, he said, just as the Supreme Court has said that the government is not the general manager of the railroads.

Mr. Colston said that in 1920 the commission in effect did limit the prices of railroad securities in connection with the administration of the loan fund. Whereas the carriers had been paying 7½ per cent on equipment trust certificates, the commission made a requirement that in case part of the funds were supplied from the loan fund, the balance should bear no more than seven per cent. It was said that this could not be done, but it was done and was in the public interest, but he said a great southeastern carrier came in and offered to pay over seven per cent for a large issue of securities rather than take a government loan at six per cent, in order to establish its own credit without government aid, and the commission wisely permitted it to do so. The commission should not attempt to issue rigid rules to cover all cases. If it were possible to do so, Congress would have prescribed the rule in the law instead of placing discretion with the commission. Mr. Colston said that there are some cases in which competitive bidding should be required, but it would not be proper for the commission to require competitive bidding if it were also to require that the lowest bid must be accepted because the lowest bid is not always the one most in the public interest.

Dwight W. Morrow, of J. P. Morgan & Co., testified along similar lines. He said that in the eight years of his connection with the company he had never known of any advantage to accrue to a banking house from having a representative on the board of directors of a railroad, from the standpoint of getting business from that railroad. Such representation is rather a responsibility, he said. Commissioner Hall asked Mr. Morrow if there is any reason why a prosperous railroad company should not attempt to sell its own securities through its own offices. Mr. Morrow said he did not see why this could not be brought about, but he pointed out some objections. In many states, he said, the amount of the local investment funds is probably bid for at much higher rates than a railroad could pay as the low rates for money prevail in older regions where there is an accumulating investment fund. He pointed out that the American Telephone & Telegraph Company is selling a large percentage of its stock to its own subscribers and employees all over the United States, but at nine per cent. In reply to a question by Commissioner Potter, he said the Northern Pacific and Great Northern refunding issue of $230,000,000 last year could not possibly have been handled "across the counter"; that the services of a large distributing organization were necessary. Mr. Morrow said it might be desirable for railroads to undertake to sell more of their own securities themselves, but that it is doubtful if any railroad could create an organization to handle its own securities as cheaply as it could be done by an organization whose sole business it is and which handles a large volume of business over which the overhead can be distributed. A. H. Harris, vice-president of the New York Central, said that the New York Central had undertaken a campaign to sell its stock to employees, but that in a year the subscriptions amounted to something less than 5,000 shares. The company thought that it is highly desirable to interest the employees in the ownership of the company, but that such a plan could not be depended upon to furnish capital in any substantial amounts. Mr. Morrow said he had never known bankers to interfere with matters of railroad operation, as such matters were outside their especial sphere, but they frequently give advice regarding financial policies such as matters pertaining to the payment of dividends.

Jackson E. Reynolds, president of the First National Bank of New York, said that it is a matter of indifference to his company whether the commission decides that railroad bonds shall be sold on competitive bids. It would not hurt the bankers, he said. "The only people you would hurt would be the railroads."

John E. Oldham, of Merrill, Oldham & Co., Boston, said that the banker would be taking considerable risk if required to make a bid and wait for some time before knowing whether it is to be acted upon. He said there were no insuperable

obstacles to finding what is a fair price for a security and if the object of competitive bidding is to furnish information, there are better ways of getting at it. Commissioner Potter asked what the commission should do supposing President Rea of the Pennsylvania should sell an issue of bonds at 93 and tell the commission that that was the best he could do, but the commission's Bureau of Finance should report that it thought he ought to have got 93½ or 94. "Shall we kick over the whole transaction?" asked Commissioner Potter.

"I think you had better take Mr. Rea's judgment," replied Mr. Oldham. "When you cannot do that, the government had better take over the railroads."

He said he thought the purpose of Congress was to prevent fraud rather than to substitute the judgment of the commission for that of the railroads and the bankers as to the exact prices at which securities should be marketed. Commissioner Eastman asked what the commission should do in case its own investigation showed that the price for the security mentioned by Mr. Potter should be as high as 102. Mr. Oldham said that in a case of such a wide discrepancy the commission should look into it.

Alfred P. Thom, counsel for the Association of Railway Executives, and Forney Johnston, counsel for the National Association of Owners of Railroad Securities, were given permission to file written memoranda on the subject.

Brief for Association of Railway Executives

Mr. Thom said in part in his brief:

The powers vested in the commission by this Section were conferred for the purpose of enabling the commission to protect the public interests and not for the purpose of making it the guardian of the private interests of the carriers.

At times it may be difficult to determine just where the public interest ends and purely private interest begins; but, when this point is once determined, the difficulty of the problem disappears, it being clear that the power of governmental regulation cannot extend further than the protection of the public interests.

This follows both from the constitutional limitations on the power of government and from the terms of Section 20a of the Transportation Act.

The ownership of property carries with it the right of occupancy and management, and should a statute deprive the owner of the right of management, except as such management may prejudice or affect some right of the public, it would undermine his right of private property and be contrary to the fifth amendment to the Constitution.

Congress had these limitations on its power well in mind when it made Section 20a a part of the Transportation Act, for in that section the power of the commission is to be exercised only if the transaction is "compatible with the public interests," is "necessary or appropriate for or consistent with the proper performance by the carrier of service to the public as a common carrier," "will not impair its ability to perform that service," and "is reasonably necessary or appropriate for such purpose."

No inference can be deduced from these carefully considered provisions of a purpose to go beyond the public interest and invade the field of private management.

If the power to require competitive bidding is conferred by the statute, it would not be wise for the commission to make the requirement. The present method, which is the outgrowth of years of experience, is unquestionably the best and is, in fact, the only practicable method.

There is doubtless a popular misapprehension of what the present method is. It may be popularly supposed that when a railroad deals with its banker in respect to the placing of securities, the banker seeks to drive as hard a bargain as he can and to obtain for himself the maximum possible advantage in the transaction. Nothing can be further from the fact.

The placing of securities through a regular banker is accomplished by one of two methods:

First, by the method of underwriting, in which case the banker undertakes, for a fixed commission or compensation, to ascertain for his railroad client the best terms that can be obtained for the issue and to give the railroad the full benefit of these terms, being interested only in the agreed compensation, and

Second, by the method of purchase. In this case also, where there is a sustained relationship between the railroad and its banker, the banker likewise undertakes to ascertain for the railroad the best terms at which he believes the issue of purchased securities may be placed and makes his price the figure that will give him fair compensation for selling the securities, but, at the same time, will conserve the interests of the railroad company, for which, by reason of his relationship, he feels a moral responsibility, and will likewise be fair to the investing public whose good-will he desires to retain. In this second case also, the fiduciary relationship of the regular banker exists and is enhanced by the moral responsibility he has to the purchasers of previous issues, this responsibility influencing him to regard not merely his own selfish interests in the single transaction but to make terms which will accommodate the present issue to a well conceived financial structure for the railroad.

In both cases, the relationship between the railroad and its regular banker is fiduciary in character and, in a measure, is such as exists between a lawyer and his client, in which the banker becomes a representative of its railroad client's interest and is paid for the service.

The service consists in the study of financial conditions, the forming of an expert judgment as to whether the time is opportune for placing securities, as to what class of securities, and the conditions and terms the market will accept, and a guarantee that the issue will succeed.

To do this successfully, it is necessary in most cases to have a country-wide financial organization, consisting of persons who will help float the issue and a group that will itself take any part of the securities that the investing public fails to absorb.

If an issue is offered which fails, it is a matter of general recognition that the consequences to the credit of the railroads are most disastrous. When the public fails to take an offering, it is an unmistakable announcement that the credit of the railroad is not sufficient to support it. If an issue, necessary for the financial purposes of a strong railroad is offered by it over its own counter or through any other agency, and only a part of it is taken, the part which remains untaken is discredited along with that which has been taken which, owing to the failure of the part, will then be in the hands of discontented holders.

A fundamental principle of sound financing for a railroad is that it shall not make an issue of securities until it is assured that the issue will succeed. No method of giving this assurance has yet been devised except the existing method of having the whole issue underwritten or the whole issue purchased by responsible bankers.

The question is what in any case constitutes fair compensation for the banker's service. There can be no doubt of its value nor that it is essential to successful financing. There may be cases where an issue may be disposed of without it, but these cases are most exceptional and furnish no justification for the abandonment of the orderly and scientific method. The amount of this compensation is, under the existing practice of the commission, subject to its supervision.

Competent bankers know whether the time is ripe for an offering of securities. Railroads and their counsel have no such knowledge, and if, without the aid and enlightenment of competent financial advice, an issue is offered and fails, the effect on the credit of the railroad would, as heretofore stated, be most disastrous. Competent bankers also know the character of securities which the public is ready to take.

Railroads and their counsel do not know, and yet it is of the utmost importance to be competently advised as to what class of security may be most advantageously issued.

They must have some one with scientific knowledge of finance and of markets to advise them and some one pledged to give them advice from the standpoint of the railroads' interest and not from the standpoint of trying to impose on the railroads the harshest terms that independent self-interest may make possible.

Moreover, the financial structure of most of the roads is very intricate and the terms of their mortgages are complex and involved. Whenever a new issue is proposed, there is a substantial value in having a financial adviser fully conversant with the financial structure and history of the company and able to suggest terms and conditions for new securities in harmony with a financial policy deliberately adopted and properly adjusted to the consistent development of the property, and not to have new, variant and perhaps inconsistent conditions imposed on each new issue as compared with those imposed by other bankers and their counsel in existing issues.

This continuity of financial policy cannot be attained without the aid of bankers fully advised in respect to it and actuated by a feeling of responsibility for and committed to its success. The advantage of consistent financial advice and guidance in building up and developing a sound financial structure is equally as great, if not greater, than consistent legal advice given by a single head conversant with the history, purposes and policies of the management, the needs and possibilities of the property, its intricate and interwoven corporate relationships, its charter obligations and the responsibilities it is under to persons, municipalities, state and other governmental authorities; and yet no one engaged in any large industrial enterprise would advocate doing its law business by competitive bidding or calling in a new lawyer every time legal

advice and guidance is needed. The asset of intelligent, informed, consistent and interested—interested from the standpoint of the company in the establishment and development of a sound financial policy—is too great to the public to be abandoned.

It is inseparable from the relationship existing under the present system that the company's bankers feel a special responsibility and a moral obligation to help in times of financial stress and difficulty, which is most valuable and at times essential to the company and which has frequently averted from the public, as well as from the company, financial disaster.

If a system of competitive bidding is resorted to, the rules of the commission would naturally provide either that the best bid should be accepted or, if none of the bids were satisfactory, that all should be rejected and another public offering made.

If the first alternative be adopted, the commission would find itself without power to pass finally on the price and thus would be sacrificing that very important power over the result in the effort to control the method.

If the second alternative is resorted to and all bids rejected, then there would be a manifest difficulty in persuading bidders to make a second bid.

If the system is not competitive in its strictest sense, but consists only of reporting to the commission the outcome of negotiations with more than one or with several responsible bankers, the result would likewise be unsatisfactory and hurtful to the financial interests of the railroads; for the reason that deliberate study and valuable advice cannot be obtained from bankers where the results of it may be enjoyed by others, for if the business is offered to several, there would be no assurance that the banker who studies the problem, devises the plan and assists in perfecting it, will secure the business. The consequence would be that one of the most valuable functions and services of a banker would be lost to the railroad. The railroad would, as a matter of fact, have lost its banker.

It may be that competitive bidding would in an individual instance or a special case produce better financial results for the railroad, but the slight and exceptional advantage thus temporarily obtained would not justify a system which would be injurious and disastrous in its general operation.

The interests of the public are amply protected by the supervision of the terms proposed for the issue of securities before they can be lawfully accepted and made operative.

Traveling Engineers Hold Thirtieth Convention

W. O. Thompson, Secretary, Since the Association Was Organized, Honored at the Opening Session

A REMARKABLE TRIBUTE to his constant service in behalf of the Traveling Engineers' Association throughout the 30 years since the organization had its inception, was paid by the members and friends of the association to W. O. Thompson, the secretary and only living charter member, at the opening session of the 1922 convention, held at the Hotel Sherman, Chicago, October 31 to November 3, inclusive. A three-quarter length portrait of Mr. Thompson, in oil, was presented to the association. In accepting, the association voted to have the portrait hung in the convention hall at all future meetings. The presentation was a complete surprise to Mr. Thompson.

W. O. Thompson

The convention was called to order by the president, J. H. De Salis (N. Y. C.), who, after the invocation addressed the association in part as follows:

President De Salis' Address

"The greater part of our members serve as instructors of locomotive engine crews, and personally observe the performance of the locomotives and the crews operating them. Their responsibilities cover all parts of the locomotive and its proper operation, both from a mechanical and transportation standpoint. The traveling engineer is required to be a specialist on the many devices that go to make up the successful and economical operation of a train.

"Education for the men holding these positions is necessary. Their duties place them in a position where mistakes cannot be corrected; they must act right the first time. If the train is not started in the proper manner the mistake means broken draft rigging or broken cars. If the train is not stopped properly it may mean derailment or collision, and if a train is not properly operated when running it may not make the schedule time or will cause a loss of fuel. At these conventions are brought out the best methods of educating engine crews. In the proceedings is found the best practice for the successful operation of trains, and a book published by this association entitled 'Standard Form of Examination for Firemen' is being used by many railroads for the examination of new men and of candidates for promotion."

Following Mr. De Salis' address, a brief resumé of the early history of the association, prepared at the request of the executive committee, was presented by Mr. Thompson, of which the following is an abstract.

Early History of the Association

A short time after the adjournment of the Master Mechanics' and Master Car Builders' convention in 1892, a road foreman of engines of one of the lines running into Chicago listened to a conversation between his master mechanic and a representative of the Westinghouse Air Brake Company relative to the good work accomplished at the convention and how beneficial it was for a man in railroad business to meet other men in the same business from all parts of the country for the purpose of exchanging views and experiences.

The conversation led the listener to think that if the Master Mechanics' Association was of such inestimable value, why would not an association of traveling engineers be of even more importance, not only to the traveling engineers, but to all departments of the railroad.

Acting on the thought, he started out to find traveling engineers enough to form an association, and, strange as it may seem with our membership of over 1,500 in the United States, Canada and Mexico, he was over three months in getting the names of 14 traveling engineers who were in favor of the idea.

After the 14 traveling engineers had been heard from, a meeting was held at Chicago, November 14, 1892. The result of that meeting was the forming of a temporary organization. During the meeting an invitation was received from Sinclair and Hill, of Railway & Locomotive Engineering, to meet in their office in New York City to perfect a permanent organ-

ization. This meeting was held on January 9, 1893, and 53 members were enrolled.

During the first few years of the association's existence its condition was rather precarious. At that time the newly created position of traveling engineer was not looked upon as an actual necessity by the managements of many railroads. In the panic of 1894 and 1895 approximately 70 per cent of our membership was set back to running engines and had it not been for the hard, painstaking work of a number of our members, the almost immediate popularity of reports and researches of our committees, the loyalty of a few of the higher railroad officials, the press and a few of the railway supply firms, the association would have died in its infancy.

The benefits to the traveling engineer have also been great. Thirty years ago he was considered nothing more than an engine-tamer and trouble-doctor, but today he is considered an indispensable adjunct of any well-organized railroad.

The association has grown from a membership of 53 to 1,536. During its life 575 members have been selected to fill higher positions on railroads or in other businesses. In all of the 30 years there has never been a decrease in membership. Nearly all of the members who have been promoted to higher positions continue their membership, thus giving the association their moral and financial support. Considering these facts, the pride which the traveling engineers feel in their association is pardonable.

Portrait of Secretary Thompson Presented

At the close of the paper, D. L. Eubank (Galena Signal Oil Company) unveiled and presented Mr. Thompson's portrait to the association. In his remarks leading up to the presentation he brought out the fact not mentioned by Mr. Thompson in his paper that the author was in large measure responsible for the organization of the association and for its healthy growth during the early years of its existence.

On behalf of the members, tributes were paid to Mr. Thompson's service to the association by L. D. Gillett (Dominion Railway Commission of Canada) and D. R. McBain. Members of the Traveling Engineers' Association, of the Railway Equipment Manufacturers' Association, and the Hotel Sherman participated in providing the portrait.

A report of the later sessions of the convention will appear in a later issue.

Equipment Manufacturer's Exhibits

The following companies, members of the Railway Equipment Manufacturers' Association, exhibited at the thirtieth annual convention of the Traveling Engineers' Association, held at Hotel Sherman, Chicago, October 31 and November 1, 2 and 3:

American Arch Co., New York.—Literature.—Represented by F. G. Boomer, G. M. Bean, A. W. Clokey, R. J. Himmelright, J. T. Anthony, Major W. L. Allison and W. E. Salisbury.

American Locomotive Co., New York.—Reverse gear, flexible and rigid staybolts.—Represented by G. P. Robinson, W. E. Corrigan, A. Haller and George G. Jones.

Baldwin Locomotive Works, The, Philadelphia, Pa.—Literature and photographs.—Represented by C. R. Riddell, N. E. Baxter, C. H. Gaskill and F. A. Neely.

Barco Manufacturing Co., Chicago.—Power reverse gear; crosshead and shoes; automatic smoke box blower fittings; metallic tender connections for air, steam, oil and water; joints to air reservoir, air pumps, distributing valves, headlight generators, etc., roundhouse blower and blowoff; coach yard and station steam heat and air connections; metal steam heat connections for passenger coaches.—Represented by F. N. Bard, C. L. Mellor, F. A. Stiles, W. J. Behlke and C. O. Jenista.

Bird Archer Co., New York.—Boiler compound, polarized mercury, anti-foaming and anti-leaking compounds.—Represented by L. F. Wilson, J. L. Callahan and G. J. McGurn.

Boss Nut Company, Chicago.—Nuts, bolts and rivets. Represented by J. W. Fogg, A. W. MacLean, W. G. Willcoxon and George A. MacLean.

Bradford Draft Gear Co., New York.—Boltless truck column; twin journal box nut; three spring draft gear; rocker type draft gear, and locomotive throttle.—Represented by Horace Parker, F. K. Mays, E. L. Nusz, J. C. Keene, W. W. Bosser, W. H. McWhorther and E. J. Barnett.

Morris B. Brewster, Inc., Chicago.—Metallic piston rod; valve stem and air pump packing; pressure breaker piston rod packing. Represented by Morris B. Brewster and Frank A. Orland.

Crane Company, Chicago.—Valves and pipe fittings. Represented by Fred Venton.

Dearborn Chemical Company, Chicago.—Represented by Nelson F. Dunn, O. H. Rehmeyer, I. H. Bowen, Ira Beebe, Joseph Arn, L. P. Bowen, George R. Carr and J. D. Purcell.

Detroit Lubricator Company, Detroit, Mich.—Locomotive lubricators; automatic locomotive exhaust nozzle cover; automatic flange oilers. Represented by A. G. Machesney.

The Duff Manufacturing Company, Pittsburgh, Pa.—Jacks for locomotive and car work. Represented by C. N. Thulin and E. E. Thulin.

The Edna Brass Mfg. Co., Cincinnati, O.—Lubricators, injectors, boiler checks, water gages, cold water sprinklers and fire extinguishers.—Represented by H. A. Glenn and F. S. Wilcoxen.

Elvin Mechanical Stoker Co., New York.—Photographs and literature.—Represented by A. G. Elvin and E. W. Englebright.

Flannery Bolt Co., Pittsburgh, Pa.—Grease plugs; flexible stay bolts.—Represented by W. M. Wilson.

Franklin Railway Supply Co., New York.—Radial buffer and unit safety bar; precision power reverse gear; pneumatic fire door; lateral motion driving box; automatic driving wedge; driving box lubricator and spreader; flexible conduit, and reverse gear.—Represented by W. N. Coyle, J. L. Randolph, H. M. Evans, C. W. F. Coffin, J. L. Bacon, T. L. Reed, S. D. Rosenfelt, W. T. Lane, P. Weiler, P. Willis, H. M. Clawson, F. H. Cunningham and C. J. Burkholder.

Galena Signal Oil Co., Franklin, Pa.—Represented by Robert McVicar, W. J. Walsh, P. H. Stack, D. L. Eubank, W. O. Taylor, W. F. Walsh, G. W. Buckpitt, W. L. Trout, L. H. Palmer, J. W. Bunn, B. P. Corey, J. A. Roosevelt, J. F. Ferguson, A. J. Poole, G. E. McVicar, F. B. Smith, J. F. Wilsey, R. J. McQuade, I. T. Birney, J. A. Graham and J. S. Brown.

Garlock Packing Company, Palmyra, N. Y.—General line of locomotive and power house packings. Represented by C. W. Sullivan and Stanley MacDole.

Grip Nut Co., Chicago.—Locomotive and pump piston rod nuts; unit nuts.—Represented by W. R. Richards and R. B. Radcliffe.

Hulson Grate Company, Keokuk, Iowa.—Full size locomotive grate showing rocking dump grate. Represented by A. W. Hulson, J. W. Hulson and A. E. Wentworth.

Hunt Spiller Manufacturing Corp., Boston, Mass.—Cylinder and valve packing rings; valve chamber bushing; piston and valve bull rings; crosshead shoes, side rod knuckle pin bushing.—Represented by J. G. Platt, V. W. Ellet, E. J. Fuller, C. Galloway and Fred Hartman.

International Correspondence Schools, Scranton, Pa.—Literature.—Represented by Ed. M. Sawyer and F. S. Powell.

Jenkins Bros., New York.—Valve and sheet packing.—Represented by George Royal.

The Leslie Company, Lyndhurst, N. J.—Steam heat pressure regulators and reducing valves. Represented by S. I. Leslie and J. J. Cizek.

Locomotive Lubricator Co., Chicago.—System of locomotive force feed lubrication.—Represented by W. J. Schlacks and C. W. Rudolph.

Locomotive Stoker Company, Pittsburgh, Pa.—Mechanical stoker, one-third size working model. Represented by A. C. Deverell, A. N. Wiltse, E. Prouty, V. B. Emerick, J. B. Ball, H. C. Woodbridge and H. C. Kelly.

Madison-Kipp Corp., Madison, Wis.—Force feed locomotive lubricator.—Represented by A. H. Flanagan, J. M. Borrowdale and S. W. Midgley.

Manning, Maxwell & Moore, Inc., New York.—Injectors; consolidated safety valves.—Represented by C. L. Brown, J. S. Smith and C. Corning.

W. H. Miner, Chicago.—Friction draft gears; friction buffers for passenger equipment; spring draft gear; side bearings; coupler centering device for passenger and locomotive equipment; bolster locking center pin for passenger equipment. Represented by Bradley S. Johnson and Charles F. McCuen.

Nathan Manufacturing Co., New York.—Injectors; bulls eye and force feed type lubricators; boiler checks; boiler washer and tester, fire extinguisher; water columns, and whistles.—Represented by F. C. Davern, William Brumble and J. Brandt.

National Boiler Washing Co., Chicago.—Literature.—Represented by F. W. Gale, F. S. Wichman and C. C. Lance.

National Malleable Casting Co., Cleveland, Ohio.—

National Railway Devices Company, Chicago.—Vertical fire door; Radial fire door. Represented by Jay G. Robinson and E. J. Gunnison.

National Tube Company, Pittsburgh, Pa.—Superheater tubes

applied in tube sheet, small 2-in. and 2½-in tubes—Represented by George N. Riley, J. T. Goodwin, J. W. Kelly and P. J. Conrath.

New York Air Brake Co., New York

Ohio Injector Co., Chicago.—Injectors, flange oiler, lubricator; low water alarm, water glass protector, and drifting valve.—Represented by A. C. Beckwith, F. W. Edwards, R. M. Harber and F. B. Farnsworth.

Okadee Co., Chicago.—Blow-off valve; front end hinge; automatic cylinder cock, and tank hose coupler.—Represented by A. G. Hollingshead, G. S. Turner, J. S. Lemley, J. M. Monroe, W. H. Heckman, and F. G. Zimmerman.

Parkesburg Iron Company, Parkesburg, Pa.—Sections of charcoal iron tubes. Represented by L. P. Mercer and J. F. Wiese.

Pilot Packing Co., Sea Cliff, N. Y.—Packing.—Represented by Joseph Sinkler.

Pyle-National Company, Chicago.—Model of Young valve gear; turbo headlight generators; cast metal, cast aluminum and cast iron headlight cases with glass reflector; cast aluminum flood light cases; back-up lamps. Represented by C. P. McGinnis, T. P. McGinnis, W. T. Bretherton, R. L. Kilker, George Haas, J. L. Reese, O. W. Young, William Miller and J. Will Johnson.

Railway Review, Chicago.—Represented by H. A. Smith, A. E. Hooven and J. E. Gougeon.

Sargent Company, Chicago.—Water column; water glass cocks; two seat gauge cock; iron clad protectors; gauges; blower valve and gaskets. Represented by George H. Sargent and L. L. Schultz.

Simmons-Boardman Publishing Co., New York.—*Railway Age*, Railway Mechanical Engineer, Locomotive Cyclopedia and Car Builders' Cyclopedia.—Represented by L. B. Sherman, C. B. Peck, B. J. Wilson, J. M. Rutherford and Homer Beach.

The Smith Automatic Adjustable Hub Plate Company, Chicago.—Locomotive adjustable hub plate. Represented by A. J. Sams.

Standard Steel Works Co., Philadelphia, Pa.—Literature and photographs.—Represented by C. R. Riddell, N. E. Baxter, C. H. Gaskill and F. A. Neely.

Sunbeam Electric Manufacturing Co., Evansville, Ind.—Airtight headlight.—Represented by H. A. Varney, J. Henry Schroeder and W. T. Manogue.

Superheater Co., New York.—Exhaust steam injector; feed water heater, and method of repairing superheater.—Represented by F. A. Schaff, R. M. Ostermann, G. E. Ryder, R. R. Porterfield, Bard Browne, W. A. Buckbee and all district representatives.

Talmage Manufacturing Co., Cleveland, Ohio.—Low water alarm; steam chest lubricating drifting valves; blow-off valves; hammer feed grease cup, and ratchet band brake.—Represented by F. M. Roby, H. B. Thurston and L. Sprague.

The U. S. Metallic Packing Company, Philadelphia, Pa.—Piston, valve stem and air pump packing; sanders and bell ringer; shaker bar and oil cup. Represented by R. A. Light, J. T. Luscombe and H. E. Hyslop.

Vapor Car Heating Co., Chicago.—Steam heat pressure valve; steam heat stop valves.—Represented by E. C. Post and N. F. Burns.

Harry Vissering & Co., Chicago.—Sander; bell ringer; metallic piston rod and valve steam packing.—Represented by Harry Vissering, G. S. Turner, Charles R. Long, Jr., W. H. Heckman, J. S. Lemley, J. M. Monroe and F. G. Zimmerman.

Westinghouse Air Brake Company, Pittsburgh, Pa.—Air cylinder oil cup; brake cylinder packing cup; compressor air strainer; brake cylinder gaskets. Represented by S. G. Downs, J. B. Wright, C. J. Ohmstead, J. S. Y. Fralich, F. H. Parke, L. Wilcox, F. B. Farmer, C. D. Foltze, V. Villette, F. B. Johnson, H. H. Burns, W. M. Sleet, A. G. Houston, A. L. Berghane, L. M. Carlton and E. R. Fitch.

Worthington Pump & Machinery Corp., New York.—Sectional model of locomotive feed water heater.—Represented by D. R. Coleman and J. M. Lammedee.

Over a Million Cars Loaded

WASHINGTON, D. C.

THE NUMBER of cars loaded with revenue freight crossed the million mark in the week ended October 21 for the first time since October, 1920. The total was 1,003,759, as compared with 964,811 in the corresponding week of last year and 1,008,818 in the corresponding week of 1920. The increase as compared with the preceding week was 20,280. The loading was still, however, below the record set in the peak week of October, 1920, when 1,018,539 cars were loaded. Although coal shipments are still being given priority, the large increase in loading as compared with last year is due to the heavy movement of other commodities. All classes of commodities show increases as compared with the corresponding week of 1921 except coal, the loading of which was nearly 19,000 cars less than last year, and merchandise, the loading of which was over 6,000 cars less than last year. Increases as compared with 1920 were shown in

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, OCTOBER 21, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	10,407	3,689	60,682	1,947	6,074	5,530	64,739	99,244	252,312	.....	.....
	1921	11,318	3,822	57,565	2,180	4,563	2,484	64,962	93,576	.....	240,470	254,238
Allegheny	1922	3,734	3,681	54,081	5,290	3,412	8,432	48,144	78,737	205,511	.....	.....
	1921	2,661	3,516	60,237	2,523	3,317	5,936	48,309	64,702	.....	191,201	209,948
Pocahontas	1922	218	597	18,505	352	1,523	37	5,725	3,697	30,654	.....	.....
	1921	233	457	25,590	202	1,207	.....	5,743	4,166	.....	37,598	37,291
Southern	1922	4,129	2,790	24,010	1,095	20,004	1,207	38,867	45,903	138,005	.....	.....
	1921	3,563	2,351	28,511	617	17,148	460	40,810	41,323	.....	134,783	131,733
Northwestern	1922	17,268	9,165	10,830	1,428	15,021	27,501	27,891	42,513	151,917	.....	.....
	1921	15,099	10,381	12,576	717	11,857	12,509	29,057	41,780	.....	133,976	164,101
Central Western	1922	12,218	16,615	21,513	355	7,506	2,213	31,173	61,418	153,011	.....	.....
	1921	13,023	15,772	25,090	216	7,526	739	32,537	59,106	.....	154,009	141,057
Southwestern	1922	5,706	3,936	7,150	164	6,804	248	15,258	33,083	72,349	.....	.....
	1921	4,546	3,548	5,926	165	8,037	461	16,602	33,489	.....	72,774	70,450
Total Western districts	1922	35,192	29,716	39,493	1,947	29,331	30,262	74,322	137,014	377,277	.....	.....
	1921	32,668	29,701	43,592	1,098	27,420	13,709	78,196	134,375	.....	360,759	375,608
Total, all roads	1922	53,680	40,473	196,771	10,631	60,344	45,468	231,797	364,595	1,003,759	.....	.....
	1921	50,443	39,847	215,495	6,620	53,655	22,589	238,020	338,142	.....	964,811	.....
	1920	39,480	35,187	225,950	15,587	59,754	73,022	210,354	349,484	.....	.....	1,008,818
Increase compared	1921	3,237	626	.....	4,011	6,689	22,879	.....	26,453	38,948	.....	.....
Decrease compared	1921	.....	.....	18,724	.....	.....	.....	6,223	.....	.....	.....	.....
Increase compared	1920	14,200	5,286	.....	.....	590	.....	21,443	15,111	.....	.....	.....
Decrease compared	1920	.....	.....	29,179	4,956	.....	27,554	.....	.....	5,059	.....	.....
October 21	1922	53,680	40,473	196,771	10,631	60,344	45,468	231,797	364,595	1,003,759	964,811	1,008,818
October 14	1922	52,492	39,141	196,926	10,208	59,727	46,362	226,123	352,491	983,479	910,529	1,018,539
October 7	1922	50,553	39,359	189,317	9,880	57,894	47,439	228,515	345,267	968,169	899,681	1,011,666
September 30	1922	52,129	39,830	184,349	9,456	58,742	49,777	234,517	354,581	988,381	904,831	992,283
September 23	1922	52,379	36,896	187,896	8,671	58,853	49,587	234,371	344,638	973,291	873,641	1,008,109

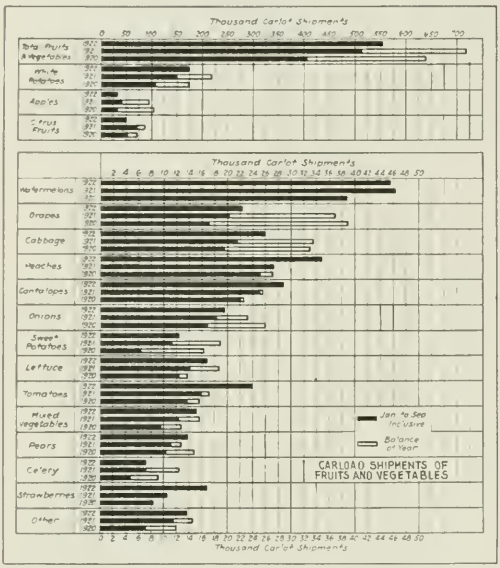
Compiled by Car Service Division, American Railway Association.

all classes of commodities except coal and coke, while there were increases as compared with the previous week in all classes except coal and ore. In the Southern, Central Western and Southwestern districts the loading exceeded that of 1920.

Fewer freight cars are now in need of repair than at any time since March 15, 1921, according to reports compiled by the Car Service Division. On October 15, the latest date available, 270,045 freight cars, or 11.9 per cent of the cars on line, were in need of repairs. This was a decrease of 21,609 cars compared with the total on October 1, at which time there were 291,654, or 12.8 per cent. This also was 54,538 fewer than on July 1, the date on which the strike of railway shopmen began. On October 15, 1921, there were 354,996 freight cars, or 15.5 per cent, in need of repairs.

Freight cars requiring light repairs numbered 55,123 cars on October 15 last, a decrease of 5,966 compared with the total on October 1. Cars in need of heavy repairs totaled 214,922, or a decrease of 15,643 within the same period. Every district on October 15 showed a decrease compared with the total not only on October 1, but also on July 1.

The freight car shortage increased from 156,309 for the week ended October 15 to 166,349 for the period from October 15-23.



Shipments of Fruits and Vegetables; 1922 Compared with Previous Years

Chart compiled by Car Service Division from statistics collected by the Bureau of Agricultural Economics of the Department of Agriculture.

The solid black lines show total loading to date in 1922 compared with the equivalent period for each of the two previous years. Where the 1921 and 1920 lines are extended in outline form, it represents the extent of the subsequent movement of these commodities for the remaining three months of the year. Comparing the length of the black area with that of the outline it can be seen just what proportion of the year's movement was completed by the end of September.

It will be noted that the total movement to date this year has exceeded last year by approximately 40,000 cars, and 1920 by 140,000. Almost without exception individual commodities show a greater movement this year than for the corresponding period of the two previous years.

This chart gives a graphic picture of the extent to which traffic in fruits and vegetables is increasing year by year.

Coal Situation Fairly Satisfactory

WASHINGTON, D. C.

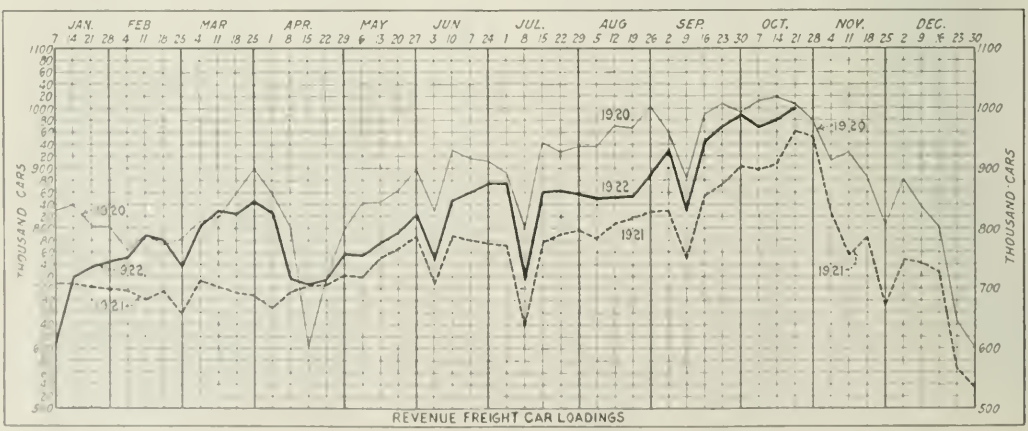
"INDUSTRIAL USERS of coal are beginning to accumulate some reserves, and the general steam coal situation may now be regarded as fairly satisfactory," said Federal Fuel Distributor C. E. Spens in a statement summarizing the present coal outlook. For the past few weeks the average spot price for all grades of bituminous coal has steadily declined, while production figures have mounted. Mr. Spens' statement is, in part, as follows:

A canvass of the situation, now being made by this office, indicates that storage of coal by industry is increasing, although industrial buyers have been urged to purchase only sufficient coal for current requirements, in order that no consumer might be distressed, and particularly that production and transportation of coal for domestic needs might not be jeopardized. The present greatly increased production of bituminous coal is, however, possibly sufficient to permit of some reserves even under the prosperous conditions of industry prevailing today.

The act creating the office of federal fuel distributor became effective September 22. Production of bituminous coal since that time has been as follows:

	Tons
For the week ended September 30	9,822,000
For the week ended October 7	9,736,000
For the week ended October 14	10,021,000
For the week ended October 21	10,350,000
For the week ended October 28	10,500,000

The situation to-day so far as steam, or industrial, coal is concerned, is fairly satisfactory. There are, of course, individual cases where, due to lack of transportation, more or less difficulty is encountered in securing sufficient supplies with regularity and "spot" coal purchases have to some extent been necessary, but,



generally speaking, the present steam [illegible] is not a matter of grave concern.

In the greater part of the country [illegible] as to domestic bituminous coals are quite comfortable though there are still some sections where available supplies would quickly vanish in the event of inclement weather, and with [illegible] curtailment in transportation. The northwest territory, for instance, served largely by lake transportation, will need for all purposes approximately four million additional tons before the close of navigation, in addition to all rail movement from Illinois, Indiana, etc., to care for its requirements until April 1. Barring unexpected difficulties, with dumpings at Lake Erie ports averaging at least one million tons per week, it is anticipated that these requirements will be accomplished.

In Illinois the available supply on hand is low, due largely to the fact that a very considerable proportion of the coal mined within the state and adjoining territories has been, and is, moving all-rail to the northwest to supplement the Lake allotment from eastern fields. It is important that far distant communities be served at this time, nearby communities can, of course, be taken care of with little delay.

In the matter of prices of bituminous coals, the following figures will give an idea of the present trend. For the week ended September 23, the average spot price of all grades of coal was $5.00 per ton.

	Per ton
For the week ended Septe[illegible]	$4.89
For the week ended October 7	4.60
For the week ended October 14	4.45
For the week ended October 21	4.26

During the past few weeks the above average prices have been held up by the comparatively higher prices received for domestic coals, the margin between "run-of-mine" and "lump" coals having in some instances been abnormally large.

The anthracite situation differs from the bituminous. The production today is practically at the peak and due to the strike, the production this season which ends with March 31, 1923, will probably not greatly exceed 60 per cent of that of last season. The plan for distribution of this season's production contemplates a pro rata distribution among last year's trade. This season's production cannot possibly, therefore, equal the demand, and necessarily other fuels must to some extent be substituted.

The most serious territorial situation as to anthracite domestic coal is, like the bituminous, in the northwestern states served by the lakes. The anthracite lake program calls for approximately two million tons, and up to date approximately only five hundred and fifty thousand tons have been shipped, in addition, there has been some movement all-rail, although this amount has not as yet reached an appreciable proportion. If normal lake conditions obtain, it is expected that shipment by lake will continue until at least the first of December, and since it will not be possible during this remaining period to complete the allotted proportion for shipment by lake, operators have been urged to supplement the lake movement by immediate commencement of all-rail shipments with due regard, of course, to necessary distribution to other sections of the country accustomed to the use of anthracite.

The average daily loading of anthracite during the last 18 days of September, 1922, (after the termination of the miners' strike), was 5,007 cars. The average daily loading in October this year up to and including the 26th instant, was 6,254 cars, as compared with 5,853 in October, 1921, and 5,910 in October, 1920. This indicates intense application by all interests.

The necessary distribution of coals is dependent principally upon two factors at the present time: climatic conditions and transportation. The latter factor is to a large extent dependent upon the former, although it should also be remembered in this connection that the transportation lines of this country have not yet fully recovered from the ravages of the recent railway strike, and that in addition, the offerings of tonnage of all character are almost at the peak in the history of the carriers.

Automatic Train Control—a Signal Engineer's View*

Lucid Analysis by a Veteran Signal Engineer—Possibility of Saving Expense of Wayside Signals

By Thomas S. Stevens
Signal Engineer, Atchison, Topeka & Santa Fe System

If wayside signals are to be used and the only purpose of automatic train control is to check the performance of the signals and the actions of the enginemen, those intermittent devices which have only two positive indications, with a speed control which is only local and momentary, may work up into first-class devices. By positive indications I mean those which are not dependent on time element devices or on the speed of the train.

If, however, we propose to make automatic train control pay by developing it into a complete signaling scheme, something more than is provided by these devices will probably be necessary. It would appear that at least three indications or controls are required—stop and proceed, of course, with the addition of a low-speed control of some character which should be continuous in its effect until replaced by a proceed indication.

Whether wayside signals are used or not, it is reasonable to suppose that train control will undoubtedly be the governing factor eventually. Because of the necessities it seems safe to assume that the ultimate development will tend to leave the control of the train in the hands of the enginemen, rather than that the actual brake application for the different indications will be made automatically. The probable function of the automatic train control will be to check the engineman by stopping the train if proper procedure is not taken. If this is finally proved to be true, it seems essential that information should be provided in the cab so that the engineman may be advised of the condition of the automatic train control apparatus and so be able to control the speed of the train properly in order to avoid being checked. This information may be given through the medium of a signal, whistle, or indicator of some kind; but any of these will, in effect, be a repeater of the wayside signal. Except for the fear of failures during the first few days of development, there seems to be no justification for the duplication of indications which will result if wayside signals are used as well as the necessary cab indications which would appear to be necessary in any case whether wayside signals are installed or not.

Developing Train Control

It would seem advisable for a number of railroads to approach this subject with the idea of developing something which would take the place of wayside signals as well as provide an automatic check on the actions of the engineman. This treatment is attractive from many standpoints:

(1) It would, of course, be far cheaper to install without wayside signals than with them.
(2) The cost of operating will be less because the necessity for holding signals clear during 24 hours regardless of whether the protection is needed or not will be eliminated and only the necessary power to protect a train properly which is actually operating over the railroad will be used.
(3) The question of a background for the signal indication will be solved, because the indication will be given in the cab.
(4) Signaling against traffic on double or multiple track rail-

*Paper read before the Society of Engineers at Chicago, October 23. Other papers read at that time were reported in the *Railway Age* of October 28, page 805.

roads can be undertaken with far less cost because the clearance problem is eliminated.

Advantages of Train Control

Railroading generally will not be as flexible with automatic train control because the speed of operation will be prescribed, but this prescription will be of the same extent regardless of whether wayside signals are used or not. Granting that automatic train control is successful, there seem to be many advantages which can be obtained from its use. If proper analysis is made of the effect of signal indications given by automatic signals, it will be found that the only indication which protects the rear end of a train is that which prescribes some form of low speed after stopping at an automatic signal. The stop in itself has never been of any use. Operating officers have been afraid to eliminate the stop because of the fear that a proper low speed would not be maintained without the stop. Probably the fear was justified, but with a controlling device which definitely takes care of the proper rate of speed it would seem that all stops for automatic signals could be eliminated.

In completely signaled territory rear flagging has been retained due to the same fear with reference to the action of the engineman, even after passing an automatic signal at stop in the proper way, and this fear is natural because of accidents which have happened after a train has actually stopped at a signal or picked up a flag. Under automatic train control it would seem possible to eliminate rear flagging or at least to shorten the distance, because the speed of the train will be taken care of definitely and positively by the automatic control.

Problems Involved in Installations

From an engineering standpoint the problems involved are many and varied. Considerable experience has been obtained from some of the installations already made with reference to the possibilities of mounting certain classes of devices properly on engines. The experiments, however, have not covered a sufficient length of time, nor have they been of a sufficiently diversified character to allow of definite suggestions as to the solution of the engineering difficulties involved.

Ramp devices seem to present the least difficulty in connection with the methods necessary to provide the requisite indications and controls. A simple change of polarity is all that is needed to bring about the different speed controls. The electrical problems involved can easily be understood by any signalman who has maintained automatic signals. The problem in connection with this type of device seems to be the integrity of contact during inclement weather and the proper construction and installation of the ramps so that impact shocks will be taken care of properly and the ramps securely protected against possible damage by dragging equipment.

The questions of clearances and interferences with the safety of employees seem to present subjects for study.

With the inductive devices which provide full clearance there is the problem of insulation which has always been a difficult one to take care of with apparatus which is practically underground. Most of the inductive devices involve principles which will require additional education of employees. With all of the ramps and intermittent inductive devices there will be a big problem with reference to the maintenance of track because all of these devices interfere more or less with the present scheme of taking care of the roadway structure.

The installation of this type of device will have to be made very carefully because no really good way seems at present to have been devised to take care of derangement of the apparatus. By somewhat complicated methods the actual removal of a ramp or intermittent inductive device can be protected against, but at the present time it seems possible for sufficient derangement to occur to render the device inoperative without any check being made.

With the continuous control devices which use central energy, the big problem seems to be the integrity of the power supply. This problem exists at the present time in connection with all installations of signals controlled from a central point, but failures of this character where wayside signals are involved can be taken care of by orders and, therefore, business can be moved more readily than will be possible, perhaps, under automatic control. In at least one of the devices an amplifier is necessary, which is a more or less delicate instrument. The installation of such a device on an engine will require careful study to protect it against the shocks which are bound to occur.

Air Brake Control Is the Big Problem

After all is said and done about the transfer of an impulse from the track to the engine, the big problem appears to be the proper control of the air brake apparatus. Whether the air brake control can be actually made automatic or whether it must always be a check on the actions of the enginemen, is the one phase of automatic train control which will require the most study during the period of development. If we endeavor to replace the flexibility of human action by something which is automatic it will necessitate the same brake application regardless of the length of the train, grades, curves, or the condition of the weather and the rail. It would seem probable that the final development would be to provide proper indications as to the allowable speed, with the requirement that the engineman should keep within certain limits under certain conditions to prevent the automatic train control having any actual effect on the air brakes themselves. Another serious problem is the release of the air brakes. Some of the questions on train control about which there is a vast difference of opinion are as follows:

Whether intermittent or continuous control will prove more efficient and flexible.

Whether the control points of intermittent devices should be located at the signal or at braking distance from the signal.

Whether the actual stopping of the train should cause the air brake control to be set to a prescribed low speed and thus a positive proceed indication be required.

Whether an indication should be provided on side tracks which would inform the engineman regarding the occupancy of the main line.

Whether simple apparatus with overlaps is preferable to slightly more complicated devices which would either decrease the overlaps or eliminate their necessity.

Whether it is desirable to introduce the necessary complications to insure that the indications of the signal should be properly checked by the automatic train control, and those of the automatic train control in turn checked by the signals.

Automatic train control will probably be subject to the same extent of mechanical failures as is experienced with other automatic devices. Man failures will be transferred from the human beings operating trains or signals to other human beings who are responsible for its manufacture, installation and maintenance. Whether train control will prove more effective than past schemes will be dependent on the care and study which is accorded its manufacture, installation, maintenance and operation.

Discussion

H. R. Safford (vice-pres., C. B. & Q.): Probably no device relating to safety and operation in railroading has been approached with as much caution as train control. It was hard at first for railroad men to realize that a substitute should be provided to operate when the human mind fails. We don't want to think that a mechanical substitute should be provided to replace human intelligence. The problem is to get a device that is durable and reliable with the organization available for its maintenance. It is my thought that the highest type of construction and highest type of care will be required to obtain a device to operate successfully.

C. A. Durham (sig. engr., G. N.): What is required in train control today is a device to bridge the gap between the automatic block signal system and the air brake device on a moving train. There is a great difference between speed control and the simple automatic stop. Some roads, no doubt, have traffic and speeds which warrant the adoption of a speed control device. However, this does not prove that such conditions prevail on all of the 49 roads listed in the commission's order and that all of these carriers should be required to install a system of this kind.

F. J. Sprague (Sprague Safety Control and Signal Corporation): Train control will offer a greater track capacity on one or two tracks with or without signals, normal clear or normal danger, with steam or electric propulsion. Track capacity will also be increased by operating trains either way on both tracks. The big problem of train control is the maintenance of the apparatus. It is our hope that the train control apparatus will not be required to operate except at infrequent intervals; normally the engineman can control the train with a nicety of manipulation and judgment of train length, air supply, etc., that cannot be duplicated by a mechanical device. Train control, if properly engineered, may tend to increase rather than decrease track capacity. The system should be a friendly mentor and guide for the engineman, aiding, not unnecessarily opposing, him, and a thoroughly reliable but unobtrusive partner in the operation of his engine, which, while interposing an effective shield between him and disaster, will leave, within all proper limits, the handling of the train subject to his judgment.

A. G. Shaver (Regan Safety Device Company): Installations of automatic train control have been in service on railroads under practicable operating conditions sufficiently long to demonstrate their usefulness and reliability. The fact that a train can be safely stopped automatically or can have its speed efficiently controlled automatically is not debatable in view of the records for such performances extending over a period of several years under the variety of operating conditions existing on the usual railroad. That I may not be misunderstood, I would define the essentials of automatic control to be: Means for automatically stopping a train; means to permit it to proceed after being stopped, and means to restrict its speed under certain conditions.

In its application and use automatic train control involves two different engineering departments of the railroad, neither of which usually has any particular interest or part in the business of the other. It has not been necessary for a motive power man to know how to signal a railroad in order to build and maintain a locomotive, nor has it been necessary for a signal man to know much about a locomotive in order to equip a railway line with a signal system. With automatic train control it is different, both the motive power and the signal departments are concerned, and the lack of a full appreciation of this fact, perhaps, has been quite a drawback in train control progress.

Any successful system of automatic train control must be simple in design and well constructed. The use of fragile and delicate apparatus and equipment, the life of which is not accurately known, is to be avoided. The careful railroad will use a system of demonstrated practicability; one comprising equipment which the existing skilled forces of the railroad can readily install and maintain. It should be borne in mind that those systems which will make the engineman unnecessary and which will do everything but talk are a long way from realization.

It has been shown that for systems already installed and in regular operation the locomotive equipment can be looked after by the regular roundhouse forces, and there is nothing about the track appliances which a good maintainer's helper cannot do. To get good service it is, of course, necessary to understand the working of the apparatus and its diseases in operation, but a knowledge of these is soon acquired, since the maintaining forces are already familiar with railroad equipment of a similar sort.

The major part and the important part of the train control system is the equipment on the locomotive. It is essential that it be properly applied and that it be given the same high order of inspection and maintenance as that now given by most railroads to their signal systems.

Although, generally speaking, that part of the train control system located on the track is simple and easily installed and maintained, there is the problem of its proper application to best serve the operating and traffic conditions of the railroad. No matter how good and efficient a train control system may be, it will not best serve a railroad if improperly applied. The important function of a train control system is to keep trains moving safely, and already there are systems which will do this. What railroad would be content to have its trains automatically stopped in such impossible places as on bad curves, steep up-grades, or on important street crossings, or to have them subjected to such interruptions as might occur from the signalman testing his circuits, the trackman trying his switches and the like?

A. J. Brookins (Burdette-Brookins Train Control System): In my opinion the transmission of the controlling impulse from the roadway to the locomotive is far less important than the actual operation of the device used to control the air brake equipment. There should be more latitude in the selection of equipment. Those desiring to use the simple stop should be allowed to do so; if others wish the speed control, let them try it. The audible signal also should be installed for an extensive trial. In this way a varied experience would be offered and a middle ground of development established. By such a program of trials and experiments a multitude of difficulties in the progress of train control would be eliminated.

The Chicago, Milwaukee & St. Paul has named the dining car on its "Pioneer Limited," which is operated between Chicago and Milwaukee, "Dan Healey," in honor of its popular dining car conductor who served on this run for many years and who died last month.

Kadel & Herbert, N. Y.

Hanging Rock at Clifton, Alaska

Thomas DeWitt Cuyler

Death of T. DeWitt Cuyler, Executives' Chairman

Chairman of Association of Railway Executives Found Dead in Business Car on Return from Trip

THOMAS DEWITT CUYLER, chairman of the Association of Railway Executives, was found dead in his stateroom in the business car of President Rea of the Pennsylvania Railroad, at Philadelphia on the morning of Thursday, November 2. Mr Cuyler was 68 years old. He had been chairman of the Association of Railway Executives since May 1, 1918, a director of the Pennsylvania Railroad since May 10, 1869, and was also a director in a number of other railroads and other companies.

Mr Cuyler had just returned from Rochester, N. Y. He was in that city on Wednesday and made an address before the Chamber of Commerce on the subject of "A Constructive Public Policy Toward Our Railroads."

By the death of Mr. Cuyler not only the railways but the entire nation sustains a heavy loss. He succeeded Frank Trumbull as chairman of the Association of Railway Executives at a crisis in the transportation affairs of the country. The railways were under government control and were incurring large deficits. Public sentiment favored their return to private operation. The very difficult problem was presented of formulating and securing the adoption of legislation under which they could be returned to private operation on conditions which would make possible restoration of their earning capacity. It was essential that the railways should secure the support of business interests, public men and the public for a reform of federal railroad laws. The railroads for some years in educating public sentiment and advocating plans for constructive railway legislation had had the statesmanlike leadership of Frank Trumbull, but he was no longer available.

It was a rare piece of good fortune that Mr. Cuyler was available to take up the work that Mr. Trumbull had begun and that he was found willing to do so. He was a man of large fortune. As a director for years of the Pennsylvania and the Atchison, Topeka & Santa Fe he was familiar with the railroad situation in both the East and the West. He had diplomatic gifts of the highest order which enabled him to win a hearing and sympathy for his views from important and influential people in all walks of life. He was not only a man of unusual ability but also a successful lawyer and therefore knew how to present the railways' case on all occasions logically and effectively. He was a natural leader of men, and these qualities of leadership enabled him to hold the railway executives together to get them to harmonize their views and present almost a united front even when there were very wide differences of opinion among them regarding questions of railway management and railway regulation. He was a superb presiding officer and he had to exercise great skill and firmness as a presiding officer at many meetings of the Association of Railway Executives when decisions regarding important matters had to be reached in spite of wide differences between different groups of executives.

While Mr. Cuyler was chairman of the Association of Railway Executives, the Transportation Act was passed; the railways were returned to private operation; the large advance in rates of 1920 was made; the struggle of the railways with the labor unions over the question of national agreements occurred; the railways passed through the historic crisis due to traffic congestion in 1920 and through the more serious financial crisis due to the great decline in their business in 1921 and, finally, they fought out the reduced rates case before the Interstate Commerce Commission and the reduced wage cases before the Railroad Labor Board. The Association of Railway Executives determined the policy of the railways in respect to all these matters and there were times when the differences of opinion between railway executives were so great that it looked as if it would be impossible for them to agree upon policies. That in most cases they finally did agree and that usually the policies adopted were sound were largely due to Mr. Cuyler's qualities of leadership and to the confidence inspired by his unfailing judicial fairness and his statesmanlike presentation of the various problems to be disposed of.

There has been a strong tendency recently among railway executives to believe that the Association of Railway Executives has been playing too large a part in railway affairs and in consequence many functions previously delegated to it have been transferred to other organizations. Before this process had begun, however, Mr. Cuyler had done a great constructive work for the railways for which he will always be held in grateful memory by all the railway executives of the present generation.

No reference to his work would be complete which did not mention the fact that as chairman of the Association of Railway Executives he never received a dollar of compensation. As a man of large business interests and especially as a large owner of railway securities, he was very anxious to help solve the railroad problem, but nobody who knew him will question that in the main his work for the railways was a labor of love performed by him because he believed it to be his duty as an American citizen.

Personally, he was one of the most approachable and charming of gentlemen. He had a powerful will, a dominating mind and tireless energy but in other respects he was the exact opposite of those men having similar qualities who are sometimes called "rough diamonds." He was indeed one of the gentlest and kindest of men as well as a very able lawyer, business man and leader of men.

Samuel Rea, president of the Pennsylvania, said the following Thursday concerning the death of Mr. Cuyler:

"Mr. Cuyler's sudden death is a terrible shock. Knowing him so intimately as I have for many years, I had the warmest affection for him. His legal training, his intimate knowledge of railroad affairs and finance and his keen powers of observation gained through years of service and contact with men of affairs all over the world qualified him as a business man of the ripest experience. His death is a great loss not only to the Pennsylvania Railroad Company, in which he was a director, but to all the railroads in the country, because of his position as chairman of the Association of Railway Executives and his able and impartial supervision of their affairs in the most difficult period in their history.

"No personal sacrifice was ever too great for him to make to advance the interests of the railroads. Among his own friends in the suburbs of Philadelphia, where he lived, his delightful personality and generosity and personal service to the community will be greatly missed."

Thomas DeWitt Cuyler was born in Philadelphia, September 28, 1854. He was the son of Theodore Cuyler, who at the time of his death on April 5, 1876, was general counsel of the Pennsylvania Railroad. He received his preliminary education in the schools of Philadelphia and graduated from Yale in 1874 with the B.A. degree. He was admitted to the bar at Philadelphia in 1876, following which he engaged in the general practice of law, later making corporation law a specialty. He served as counsel for a number of large corporations.

In the earlier years of his business career much of his

work was in the West, taking him to Texas, California, New Mexico and other states. He was counsel for a number of Scottish and English development companies that had brought settlers to the West to open up new territories. This brought him in direct touch with railroad building, and he became acquainted with many of the problems of construction and financing.

From these connections he went directly into railroad work, and was elected a director of the Pennsylvania Railroad on May 10, 1899. He was a director in several railroads embraced in the Pennsylvania System, as well as of the Atchison, Topeka & Santa Fe; the New York, New Haven & Hartford; the Rutland; the New York, Ontario & Western; the Maine Central; the Long Island, and many others.

He was also a director of the Interborough Rapid Transit Company; the Equitable Life Assurance Society; the Bankers Trust Company; the Western Union Telegraph Company; the Guaranty Trust Company; the Metropolitan Trust Company; the United States Mortgage & Trust Company, and others.

He was counsel in the reorganization of the Asphalt Company of America, and engaged in many of the most complicated and important railroad reorganization plans in the last 25 years. He was also a trustee of Yale University.

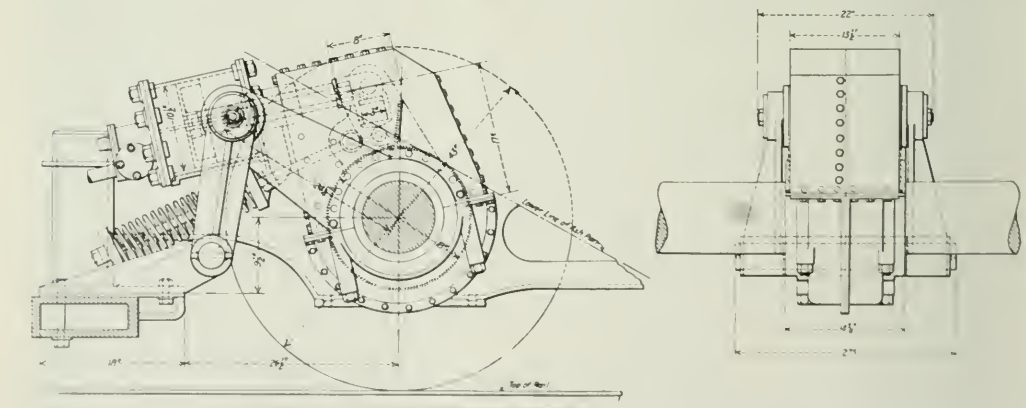
Mr. Cuyler became chairman of the Association of Railway Executives on May 1, 1918, succeeding Frank Trumbull, chairman of the board of the Chesapeake & Ohio.

Mr. Cuyler's home was at Haverford, Pa. His favorite diversion was the raising of blooded cattle at his stock farm at Paoli, Pa., known as the White House Farm, where he had one of the largest pure blooded Jersey dairy herds in the country. Mr. Cuyler was a member of the Rittenhouse Club in Philadelphia, of the Society of the Cincinnati, and of the Century, University, Union, Recess and Bankers clubs of New York.

Construction of the Street Locomotive Starter

Device Designed for Application to Trailer or Tender Trucks to Give Increased Power at Starting

In the past numerous efforts have been made to utilize the auxiliary carrying wheels of the locomotive as well as the driving wheels as a source of tractive force. Recently this practice has become more general with the adoption of boosters acting either on the trailing wheels or on the tender truck. The most recent development in appliances of this type is the Street locomotive starter, originated by Clement F. Street, Greenwich, Conn., which was briefly described in the *Railway Age* of June 22, 1922, page 1710. The function of the starter is somewhat different from that of the booster as it is intended to assist the locomotive only when starting and is designed for use only at very low speeds. The method of application and details of construction of this device are clearly shown in the drawing.



Side and End Views of Starter as Applied to Locomotive Trailing Axle

The starter consists essentially of a heavy cast steel ratchet wheel pressed and keyed on an axle and driven by a steam cylinder. The piston of this cylinder is driven through its working or forward movement by steam pressure and through its return or backward movement by a spring. The piston rod has a crosshead on its outer end which engages a wrist pin carried by a pair of lever arms, which on their lower ends surround and are carried by a pair of collars formed on the ratchet wheel. A ratchet which engages the ratchet wheel is carried by and pivoted in the lever arms.

When the machine is idle and during the return stroke of the piston this ratchet is held out of contact with the ratchet wheel by a pair of springs attached to the lever arms. When steam pressure is admitted to the cylinder it passes through the hollow piston rod and through a hole in the crosshead to a small cylinder formed in the crosshead and forces the ratchet down into contact with the ratchet wheel and holds it there as long as the pressure exerted by the steam is greater than that of the springs which hold the ratchet up. The area of this small piston and the strength of the two small springs as well as that of the main spring are so proportioned as to result in the ratchet being forced down before there is any forward movement of the main piston and lifted before it begins its return movement. This

arrangement eliminates any dragging of the ratchet over the ratchet wheel and the unnecessary wear and noise which would result if this were permitted.

Steam is admitted to and exhausted from the main cylinder through a piston valve embodied in the rear cylinder head and controlled by a small slide pilot valve which is operated by a stop on the piston rod. This construction has been in use for many years in air brake compressors.

The weight of the forward end of the starter is carried by the axle through the lever arms and the weight of the rear end by the truck frame through a pair of cylinder supporting arms. The lower ends of these arms are carried by a pivot pin secured to the truck frame and their upper ends surround a pair of trunnions cast on the cylinder. These trunnions are tied to the axle through a housing which surrounds the entire front end of the machine. This method of supporting and tying eliminates any possibility of a spreading action between the truck frame and the axle and results in all strain transmitted to the truck frame by the starter being in almost a direct downward direction. As the only connection between the truck frame and the starter is pivotal it can move vertically in relation to the axle without hindrance or limit. Lateral movement of the axle is cared for by clearance between the hubs of the ratchet wheel and the lever arms. The casing is water and dust proof and carries lubricant for the bearing between the ratchet wheel and lever arms.

The face or bearing surface of the ratchet and ratchet wheel at the point of contact is four inches in width, the ratchet teeth are ¼ in. in depth and five in number.

The maximum pressure coming on these teeth is 32,000 lb. and while five teeth are provided, any single tooth has ample strength to withstand any strain which must be transmitted through this point.

The control mechanism has been reduced to the most simple form and consists of a one inch steam line leading from the dome of the locomotive to the cylinder of the starter with a throttle at the dome and a flexible joint at the cylinder. The throttle is opened and closed through the medium of a ¼ in. copper pipe leading from the throttle to a push button in the cab. When the push button is held down the machine will run and when it is released it will stop. This button can be operated by either the foot or the hand of the engineer.

A machine of this character must respond instantly when action is demanded and there is no time to wait for water to run out of pipes and cylinders. Therefore the throttle must be placed near the dome or source of steam supply and the cylinder and all steam passage must be free of water when the machine is not working. The Street starter has an automatic drain valve at the lowest point of the cylinder which remains open at all times when there is a pressure of less than about 10 lb. in the cylinder and closes automatically under any greater pressure. There are no pockets in the piping and when the throttle is opened the steam has an unobstructed passage to the piston. The throttle is of the double seated balanced type and is fully opened as soon as the button in the cab is pressed.

The starter exerts its greatest force when standing when it is needed most. It has no dead points and the tractive force exerted at the rim of the wheel is practically constant and the maximum permissible at all times when the machine is working.

The machine shown in the drawing is designed for application to a locomotive trailing truck having wheels 43 in. in diameter and carrying a weight of 52,500 lb. The tractive force exerted at the rim of the wheel with a 10½ in. cylinder and 200 lb. boiler pressure would be 12,900 lb. When making applications to trucks requiring more or less power than this the cylinder and piston are made of different diameter but all other parts of the machine remain the same.

The machine illustrated is called the Type A; another smaller and less powerful, called Type B, is built for application to tender trucks. The starter is intended for moving a locomotive in one direction only, and if it is wanted for backing a second machine can easily be applied.

The device is primarily a locomotive starter and is cut out as soon as the train is well under way. In passenger service it will eliminate starting shocks resulting from taking slack. In freight service it will eliminate the need for taking slack in order to get a train under way and in so doing reduce break-in-twos, and draft gear and coupler failures.

The Problem of Highway Crossing Protection

L. S. Brach, president of the L. S. Brach Manufacturing Company, Newark, N. J., has published a brief essay on this subject, in which he calls for decisive action to do away with the confusion now existing in this feature of railroad operation. He says, in part:

The vast increase in the number of motor vehicles on public highways in all parts of the country has led the general public to become deeply concerned regarding methods of safeguarding grade crossings. One of the great difficulties in arriving at a decision as to what is the best method of protecting crossings by an automatic device is occasioned by the very large number and varied types of devices that are on the market. These different arrangements are so puzzling to the average automobile driver that the need for some standardized form of indication is pressing. To attract attention under all conditions of light and weather, the signal should be different from all other signs or scenery along the highway. It should compel attention in most impressive terms by arresting the eye. It must deliver its message that will be understood in all languages "STOP! A TRAIN IS COMING." It should not merely excite curiosity but it should tell instantly to the subconscious mind of the driver the message that will cause him to bring his car to an instant stop.

It is now possible by taking a trip of not many miles, to pass flashing light signals at road intersections and curves and by traveling further along the highway to meet the same type or similar signal at railroad crossings. Still further along, we find swinging banners, swinging lights, stationary lights and stationary banners, arm type signals, or flashing signs. This condition is further complicated by the use of one of these types of signal for advertising purposes. On close investigation one finds a sign demonstrating the merits of some popular cigarette, or advertising the advantage of a certain bank. At another point the same general scheme may be used for the protection of a railroad crossing.

This condition demands immediate action. It demands unselfish action. It may be necessary for some of us either as manufacturers or as railroad men to abandon our pet ideas.

There is a great opportunity ahead. All signals should be impartially judged by competent engineers without connections or influence, neither having their own or friendly signal interests in view. The writer has been a pioneer in the development of a certain type of crossing signal but he feels that there is more to be gained in a standardization of the best signal by impartial judges whether that signal be manufactured by his company or by another company. Certainly, standardization should not be left to the choice of any individual interested in any type of crossing signals or methods of indication. The general public is entitled to more consideration than any manufacturer or individual and if the apparatus is given the opportunity of impartial choice, the public will be more likely to receive the benefit of a type of signal that will be seen, and when seen will be respected.

General News Department

The Delaware, Lackawanna & Western has reached an agreement as to wages and working conditions with all its mechanical department employees, represented by a new association known as the Lackawanna Association of Mechanics, Helpers and Coach Cleaners.

The Canadian Board of Conciliation in a majority report has ruled against reductions in wages for employees of the Canadian Pacific represented by the International Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees. A minority report, however, supports the position of the company. The company has announced its rejection of the findings of the majority report.

Twenty Million Loaded Cars

More cars were loaded with merchandise and miscellaneous freight during the first 40 weeks this year than ever before in the history of the railroads, according to a statement issued by the American Railway Association. In this period (nine months and seven days) 20,649,237 cars were loaded, an increase of 4.02 per cent over the corresponding period in 1920, and 13.87 per cent over the same period in 1921. Total loading of l. c. l. freight this year was 9,218,484 cars and of other freight 11,430,753 cars.

Freight Claims Adjusted More Promptly

The length of time required to adjust the average freight claim is not as long as some people would have the general public believe. According to the freight claim division of the American Railway Association great progress is being made in expediting the settlement of all claims, with conditions improving steadily. In 1921, about 54 per cent of all claims were adjusted within 30 days, and 77.5 per cent in 90 days, while for the first six months of 1922, records show that 64.7 per cent of all claims were settled within 30 days, 21.2 per cent in 30 to 90 days, and only 14.1 per cent of the total required more than 90 days to be settled.

P. R. R. Improvements at Pitcairn

The Pennsylvania has just completed and placed in service at Pitcairn, Pa., a modern 34-stall enginehouse with turntable at a cost of $1,385,000. This terminal is located on the main line of the Central Region and is one of the key positions of the system in expediting the movement of through trains. Nearly 200 engines are handled daily. In addition to preparing the engines for service the heaviest of running repairs will be made at Pitcairn. Among the important facilities at the new enginehouse is the turntable, 110 ft. long and electrically operated. Each stall is 140 ft. long and so constructed that it can be completely enclosed. The structure is steam heated.

National Personnel Association Convention

The National Personnel Association will hold its annual convention at the William Penn Hotel, Pittsburgh, November 8-10. Several of the sessions will be of interest to railroad officers who are interested in improving the relations between the men and the managements. On Wednesday morning, November 8, there will be sessions on employment and labor turnover, trade apprenticeship progress and psychological tests and rating scales in relation to training; on that afternoon, sessions on economics for employees and health education. On Thursday morning there will be sessions on pension plans, shop training, job analysis and developing men for executive positions. The general session on Thursday afternoon will include a discussion of our immigration policy and its social and economic effects, and also on nation-wide co-operation in personnel work. On Friday morning, November 10, there will be sessions on industrial motion pictures, foreman training methods, personnel problems of small offices and employee publications. Friday afternoon will be given over to the consideration of local personnel groups and activities. On Friday evening there will be sessions on relations with engineering colleges and with industrial and public schools.

The address of the National Personnel Association is 20 Vesey street, New York.

Tennessee Central Shops Destroyed by Fire

The machine, blacksmith, tin and woodworking shops of the Tennessee Central at Nashville, Tenn., were destroyed by fire on October 27, with an estimated loss of $80,000. Six freight cars were also burned and four locomotives damaged. The company intends to replace immediately both the shop buildings and the machinery which was destroyed within.

Iowa Wins Tax Battle

The Iowa state executive council won its tax valuation case against the Chicago Great Western and the Chicago, Rock Island & Pacific, when the United States Circuit Court, at a hearing held in Des Moines, Iowa, on October 30, refused the plea of the railroads for the issuance of an injunction preventing the state from collecting taxes based on the 1922 valuations.

The railroads had protested the per mile valuation set by the state executive council at a meeting in July. At that time the Chicago, Rock Island & Pacific was valued at $30,400 per mile, a reduction of $600 from the 1921 valuation, and the Chicago Great Western, at $29,000 per mile, a reduction of $1,000. The railroads claimed that the valuations were too high in comparison with the tax valuation set by the council upon Iowa farm lands.

Tentative Valuations

The Interstate Commerce Commission has issued tentative valuation reports in which it finds the final value of owned and used property as follows:

	Owned	Used
Sierra, 1916	$2,072,890	$2,077,276
South San Francisco Belt, 1916	69,498	84,425
Denison & Pacific Suburban, 1916	180,000	184,560
Nacogdoches & Southeastern, 1918	210,999	198,999
Cooperstown & Charlotte, 1916	260,000	531,427
Cumberland, 1917	386,203	404,203
Fairchild & Northeastern, 1916	884,746	.....
Birmingham & Northwestern, 1917	722,847	.....
Indiana Northern, 1916	29,310	55,250
Verde Tunnel & Smelter, 1917	571,101	.....
Carrollton & Worthville, 1917	100,000	.....
Eureka Nevada, 1917	35,762	599,762
Yreka, 1917	103,142	.....
Washington, Idaho & Montana, 1917	2,581,294	2,582,836
Keeseville, Ausable Chasm & Lake Champlain, 1916	113,619	.....

Railroad Topics at A. S. M. E. Annual Meeting

L. F. Loree, president of the Delaware & Hudson, will be one of the speakers at the Economic Forum to be held in connection with the annual meeting of the American Society of Mechanical Engineers in New York December 4-7. Other speakers at the forum will include F. M. Herr, president of the Westinghouse Electric & Manufacturing Company, whose topic will be The Human Problem in Industry; Doctor W. C. Mitchell and Professor H. R. Seager of Columbia University, and Dean Dexter S. Kimball of Cornell University, president of the society.

Notable among the reports to be presented will be that by the Committee on Training for the Industries, covering recent advances in correspondence work in extension schools, industrial training schools, and training in the works. Among the professional sessions will be one held by the Railroad Division, which will be presided over by the new chairman of the division, James Partington, of the American Locomotive Company.

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings

AIR BRAKE ASSOCIATION.—F. M. Nellis, 165 Broadway, New York City. Next convention, May 14, 1923, Denver. Exhibits by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—J. F. Cotton, The Ashton Valve Company, 318 Washington St., Chicago. Meeting with Air Brake Association.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontius, Supervisor of Demurrage and Storage, C. & N. W. Ry., Chicago.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—L. A. Stone, C. & E. I. Ry., Chicago.

AMERICAN ASSOCIATION OF ENGINEERS.—C. E. Drayer, 63 E. Adams St., Chicago.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—J. Rathbun, Room 400 Union Station, St. Louis, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—J. W. Welsh, 8 W. 40th St., New York.

AMERICAN RAILROAD MASTER TINNERS', COPPER SMITHS' AND PIPE FITTERS' ASSOCIATION.—C. Borchardt, 202 North Hoyne Ave., Chicago, Ill.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbank, General Secretary, 75 Church St., New York, N. Y. Annual convention postponed.

Division I—Operating.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Freight Station Section (including former activities of the American Association of Freight Agents).—R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.

Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York, N. Y.

Protective Section (including former activities of the American Railway Chief Special Agents and Chief Police Association).—J. C. Caviston, 30 Vesey St., New York, N. Y.

Safety Section.—J. C. Caviston, 30 Vesey St., New York.

Telegraph and Telephone Section (including former activities of the Association of Railway Telegraph Superintendents).—W. A. Fairbanks, 30 Vesey St., New York, N. Y. Annual meeting has been indefinitely postponed.

Division II—Transportation (including former activities of the Association of Transportation and Car Account ng Officers).—G. W. Covert, 431 South Dearborn St., Chicago, Ill.

Division III—Traffic.—J. Gottschalk, 143 Liberty St., New York.

Division IV—Engineering.—E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Exhibit by National Railway Appliances Association.

Construction and Maintenance Section.—E. H. Fritch.

Electrical Section.—E. H. Fritch.

Signal Section (including former activities of the Railway Signal Association).—H. S. Balliet, 30 Vesey St., New York, N. Y. Next meeting November 21 and 22, Hotel McAlpin, New York.

Division V—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Exhibit by Railway Supply Manufacturers' Association.

Equipment Painting Section (including former activities of the Master Car and Loc motive Painters' Association).—V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill.

Division VI—Purchases and Stores (including former activities of the Railway Storekeepers' Association).—W. J. Farrell, 30 Vesey St., New York, N. Y.

Division VII—Freight Claims (including former activities of the Freight Claim Association).—Lewis Pilcher, 431 South Dearborn St., Chicago, Ill.

Car Service Division.—C. A. Buch, 718 18th St., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 S. Waller Ave., Chicago. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—A. Leckie, Industrial Agent, Kansas City Southern Ry., Kansas City, Mo.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—(Works in co-operation with the American Railway Association, Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Exhibit by National Railway Appliance Association.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—(See American Railway Association, Division V.)

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—R. D. Fletcher, 1145 East Marquette Road, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.

AMERICAN SHORT LINE RAILWAY ASSOCIATION.—T. F. Whittelsey, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY FOR STEEL TREATING.—W. H. Eiseman, 1600 Prospect Ave., Cleveland, Ohio.

AMERICAN SOCIETY FOR TESTING MATERIALS.—C. L. Warwick, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Prof. J. H. Dunlap, University of Iowa, Iowa City, Ia. Regular meeting 1st and 3d Wednesdays in month, except July and August, 33 W. 39th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

Railroad Division.—V. E. Stuebing, Manager Editor, Railway Mechanical Engineer, Woolworth Bldg., New York.

AMERICAN TRAIN DISPATCHER'S ASSOCIATION.—C. L. Darling, 1310-1311 Mallers Bldg., Chicago, Ill. Next convention, June 18, 1923, Chicago.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—S. D. Cooper, A. T. & S. Fe R. R., Topeka, Kan. Next meeting, January 23, 1923, New Orleans, La.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, Northern Pacific R. R., St. Paul, Minn.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andrenccetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Thomas De Witt Cuyler (chairman), 61 Broadway, New York, N. Y.

ASSOCIATION OF RAILWAY SUPPLY MEN.—A. W. Clokey, 1658 McCormick Bldg., Chicago. Meeting with International Railway General Foremen's Association.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—(See American Railway Association, Division I.)

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railway Association, Division II.)

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—John Nelson, Joseph E. Nelson & Sons, 1-4 South Michigan Ave., Chicago. Meeting with convention of American Railway Bridge and Building Ass'n.

CANADIAN RAILWAY CLUB.—W. A. Booth, 53 Rushbrook St., Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—Thomas B. Koeneke, 604 Federal Reserve Bank Bldg., St. Louis, Mo. Meetings, first Tuesday in month at the American Hotel Annex, St. Louis.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 126 Cortlandt St., New York. Regular meetings, 2d Tuesday in January, March, May, September and November, Hotel Iroquois, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. P. Elliott, Terminal Railroad Association of St. Louis, East St. Louis, Ill. Annual convention, November 6-8, Hotel Sherman, Chicago.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—D. B. Wright, 34th St. and Artesian Ave., Chicago, Ill. Meeting with Chief Interchange Car Inspectors' and Car Foremen's Association.

CINCINNATI RAILROAD CLUB.—W. C. Cooder, Union Central Bldg., Cincinnati, Ohio. Meetings, 2d Tuesday in February, May, September and November.

EASTERN RAILROAD ASSOCIATION.—E. N. Hessling, 614 F St., N. W., Washington, D. C.

FREIGHT CLAIM ASSOCIATION.—(See American Railway Association, Division VII.)

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—C. H. Trencheil, Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Friday in month, Room 1414, Manhattan Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—George P. White, 747 Railway Exchange, Chicago. Meeting with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, 762 E. 51st St., Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabash Ave., Winona, Minn.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—C. W. Sullivan, Garlock Packing Co., 326 W. Madison St., Chicago. Meeting with International Railway Fuel Association.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Division V.)

MASTER CAR BUILDERS ASSOCIATION.—(See A. R. A., Division V.)

NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—Warren C. Nixon, Western Tie & Timber Co., 905 Syndicate Trust Bldg., St. Louis, Mo.

NATIONAL ASSOCIATION OF RAILWAY AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York. Annual convention, November 14th, Hotel Tuller, Detroit, Mich.

NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, People's Gas Bldg., Chicago. Annual exhibition at convention of American Railway Engineering Association.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Next meeting, November 14.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 3d Friday in month, except June, July and August, at 29 W. 39th St., New York.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 600 Liberty Bldg., Broad and Chestnut Sts., Philadelphia, Pa. Annual meeting and dinner, November 9, Hotel Commodore, New York.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, General Electric Co., Chicago. Annual meeting with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—R. J. Himmelright, 17 East 42nd St., New York. Meeting with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, C. & O. Ry., Richmond, Va.

RAILWAY SIGNAL ASSOCIATION.—(See A. R. A. Division IV, Signal Section.)

RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A., Division VI.)

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meeting with A. R. A., Division V.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W. Ry., Sterling, Ill. Annual convention, November 21-23, 1922, Hotel Statler, Cleveland, Ohio. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—W. K. Edmunds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—V. J. Merrill, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. L. Carrier, Car Serv. Agt., Tenn. Cent. Ry., 319 Seventh Ave., South Nashville, Tenn.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—H. S. White, 9 N. Jefferson St., Chicago.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—Bruce V. Crandall, 14 E. Jackson Boulevard, Chicago. Regular meetings, 3d Monday each month except June, July and August.

Traffic News

The New York Central Lines on Monday, October 23, reported shippers as loading a total of 3,978 cars of coal, 308 more than ever were loaded before on these lines in a single day.

The Southern Railway announces the opening of freight offices at San Francisco and Los Angeles, California. H. S. Knapp is the representative at San Francisco, and H. V. Gardner at Los Angeles.

A bulletin issued by the Superintendent of the Rocky Mountain National Park, Colorado, says that during the 1922 season (July 1 to September 10) there were 108,472 visitors to the park, while during July alone, 51,114 people entered, making an average for that month of 1,648 persons a day.

Grain, to the amount of 150 cars a day, is now going east from Port Arthur, Ont., by rail, this movement having been started because of a blockade at Buffalo making it impossible to send grain forward by vessel. Because of lack of cars at Buffalo, the elevators at that city are full, and at the end of last week it was said that 5,000,000 bushels of grain were afloat waiting to be unloaded.

Eastern Box Cars Ordered Returned

The Car Service Division of the American Railway Association, in orders issued on October 26 instructed railroad companies in the Northwestern, Centralwestern and Southwestern districts to return at once box cars on their lines which belong to Eastern roads. These cars are to be loaded and sent east as rapidly as possible.

The order follows a similar one issued the day before by which railroads east of Chicago, Peoria and St. Louis were instructed to send west immediately all box cars belonging to western roads in order to enable the roads in the western agricultural states to meet the box car shortage that exists in that part of the country, the box cars of western roads being built especially to transport grain.

Under this latest order the western carriers are told to discontinue using locally, in station-to-station service, box cars belonging to eastern roads.

Through this series of orders the railroads in both the eastern and western districts will more nearly be able to supply the class of cars required to meet the demands of shippers in their particular sections.

Increase in Express Rates Asked

The Interstate Commerce Commission on October 26 made public a petition filed with it by the American Railway Express Company on behalf of itself and the railroads over whose lines it operates for authority to make increases in its rates and certain changes in classification and ratings. At the same time the commission issued an amendment to its order calling for a general investigation of interstate express rates, which had been set for hearing at Washington on November 20 to include within the investigation the reasonableness and propriety of the proposed revised rates. In the petition the company mentioned no specific amount of increase, but presented evidence to show that the present rates are inadequate. The company conducted its business without profit from July 1, 1918, to September 1, 1920, the government bearing the loss of approximately $70,000,000. In 1921 there was a deficit in the conduct of the express business by the railroads and the company of $39,171,191 and the deficit for 1922 is estimated at $13,000,000, not allowing anything for a return on the investment of the express company or those of the railroad companies.

Both the express and railroad companies, the petition said, have conducted their business on the most economical basis consistent with good service. While the costs of operation have been declining, due to a gradual return to normal of all operating expenses and general conditions, the petitioner believes that the ratio of operation expense will continue practically the same in the future so that there will be at least the same deficit in 1922 and 1923 and future years unless an increase in express rates is granted. It is also stated that the net operating income of the Class I railroads for the first six months of 1922 was only 4.4 per cent on their total valuation, plus additions and betterments to September 30, 1921. The company says that an increase in rates is necessary to pay operating expenses, taxes and a fair return on the property devoted to that service and it is also desirable that certain changes be made in classification and ratings which will be proposed in detail at the hearing.

Coal Production

Preliminary returns on coal production in the fourth week of October indicate a total of 12,500,000 net tons, of which about 10,400,000 tons is bituminous coal and 2,100,000 is anthracite, according to the weekly bulletin of the Geological Survey. Revised estimates for the third week show 10,365,000 tons of bituminous and 2,003,000 tons of anthracite. The gain in the rate of production during the past two weeks reflects some improvement in the transportation situation which, however, remains the principal factor limiting output. The rate of output is approaching adequacy but does not yet assure sufficient coal to meet current needs.

The outstanding feature of the mine reports for the week of October 14 was the gradual improvement in car supply. Districts in which working time increased because of better railroad service were Illinois, Northern Ohio, Westmoreland, Central Pennsylvania, Pocahontas, Tug River, Kenova-Thacker, Northeastern Kentucky, and the Southwest interstate region. In the Pittsburgh district in Northern West Virginia, Alabama, and the Rocky Mountain States, however, losses of working time ascribed to transportation disability increased.

Even in the Pocahontas field where some improvement was noted operators alleged the loss of 55.8 per cent because of railroad disability. In the Winding Gulf, Logan, Hazard and Harlan fields the loss exceeded 70 per cent.

Labor as a factor limiting mine working time is now important only in the Cumberland-Piedmont, Kanawha, and Connellsville regions. In addition, however, many mines are working shorthanded in the Somerset, Westmoreland and Connellsville district of Pennsylvania.

Reports of declining prices at the mines have yet to be reflected in mine idleness through no market, except in the Trans-Mississippi States. East of that river only two mines reported loss of time through lack of orders. West of the river, however, indications of no market were received from Iowa, Missouri, Kansas, Oklahoma, Texas, Colorado and Washington.

Although the tonnage of soft coal dumped into vessels at Lake Erie ports has declined steadily during the past month, and in the week of Oct. 16-22 was at the rate of about 1,000,000 tons, the tonnage remains much larger than at the same date a year ago. Anthracite shipments from Buffalo during the week ended October 17 were 113,300 net tons and in the week ended October were 119,100 tons.

According to the Ore and Coal Exchange the total soft coal handled at Lake Erie piers during the week ended October 24 was 1,004,094 net tons as compared with 1,090,599 tons in the week preceding. In comparison with the corresponding week a year ago this was an increase of 69 per cent.

During the present season to October 22, inclusive, 12,855,130 tons of cargo coal (bituminous) have been dumped into vessels at Lake Erie piers.

According to reports received by the Car Service Division of the American Railway Association, the total loading of bituminous coal in the week ending October 28 was 190,276 cars. This exceeded the week before by 3,981 cars which up to that time had marked the peak. Loading of anthracite coal totaled 32,927 cars which was a decrease of 4,189 cars compared with the week before. During the first five days last week loading averaged 6,508 cars daily, but on Saturday, because of the holiday (Mitchell Day) only 385 cars were loaded.

More cars were loaded with bituminous coal on Monday than on any day in approximately three years, with the exception of one in 1920, according to reports received by the Car Service Division of the American Railway Association. The total was 45,298 cars. This was only exceeded in the three-year period on November 22, 1920, when the total was 45,457 cars or only 159 cars greater. The records of the Car Service Division do not go back prior to 1920.

Commission and Court News

Interstate Commerce Commission

The commission has issued a decision finding proposed increases in rates on iron and steel articles rated as special iron in Southern classification from Ohio river points, St. Louis and points taking the same rates to points in Carolina territory, Augusta, Ga., and South Atlantic ports and points taking the same rates, to have been justified in part. The suspended schedules were ordered cancelled without prejudice to the establishment of rates in conformity with the commission's findings.

State Commissions

The Railroad Commission of Tennessee has ordered 12 railroads to appear on November 9 and show cause why they should not furnish cars for the transportation of gravel and other material for use in highway construction. The commission believes that the railroads have been furnishing open top cars for use in carrying classes of freight not authorized by orders which require such cars to be used for coal, food and other commodities classed as essentials.

Service on M., D. & G. Ordered Restored

The Arkansas Railroad Commission has ordered that operations on that portion of the defunct Memphis, Dallas & Gulf, between Hot Springs, Ark., and Glenwood, must be resumed within 90 days. At present the new owners are operating the M., D. & G. only between Ashdown, Ark., and Shawmut, under the name of the Graysonia, Nashville & Shawmut. The Commission, however, has held that the entire line between Hot Springs and Ashdown is owned by one interest and must be operated throughout.

Court News

Necessity for Evidence of Value of Damaged Shipment

In a suit for damages to a shipment of celery and cucumbers while delayed in transit, there was evidence that the goods were of some value after being damaged, but no evidence as to this value at the time they were offered by the carrier to the consignee. The Georgia Court of Appeals holds that a verdict for the plaintiff was without evidence to sustain it. Evidence of the selling price on the day following was insufficient, the goods being subject to rapid deterioration.—American Ry. Express Co. v. Dubois Bros. (Ga. App.) 111 S. E. 70.

Violation of Commission's Order as to Use of Ladders on Cars

The federal district court for the Western District of Michigan holds that the Interstate Commerce Commission's order that all cars having sides more than 36 inches high must be equipped with side ladders is final and not subject to review or change by the courts. Where interstate ore cars, no longer required for carrying ore, were reconstructed to carry limestone by adding a superstructure over 36 inches high, which would be so used as long as the limestone traffic continued, the superstructure was held not temporary, and its use without ladders was a violation of the order subjecting the railroad to the penalty therefor.—United States v. Duluth S. S. & Atlantic, 281 Fed. 347.

What Is a Secure Sill Step?

The Circuit Court of Appeals, Fourth Circuit, holds that the requirement of the Safety Appliance Act of "secure sill steps" means "steps which furnish secure footing for employees having to use them," and it was a question for the jury whether slickness of an engine sill step rendered it not a secure one within the act. Knapp, Circuit Judge, dissented, on the ground that thus to hold was to bind the railroad to keep the step continually new, which would be practically impossible, "and is effect to hold that in the matter of safety appliances the railroad company is an insurer, which is not the law." It should be said that the court regarded the case as a close one on the question as to whether it should go to the jury.—Davis v. Reynolds, 280 Fed. 363.

United States Supreme Court

No Reparation to Shippers for Loading Services

The Supreme Court of the United States has reversed the judgment of the Court of Appeals of the District of Columbia (277 Fed. 538) directing the issue of mandamus requiring the Interstate Commerce Commission to take jurisdiction of the claims of the Waste Merchants' Association of New York for allowances, under section 15 of the Act to Regulate Commerce, for loading services in respect of paper stock shipped in carload lots from New York harbor, which services had been imposed upon the shippers, members of the association, by the carriers' failure to perform that duty, and to allow damages and fix the amount thereof. The Supreme Court finds that the commission did not dismiss the complaint for lack of jurisdiction, but heard the case fully, and dismissed the demand for allowances because it held the shippers were not entitled to relief. It found that "the rates charged were not unreasonable or discriminatory (in violation of the Commerce Act) nor unreasonable for the service actually performed (in violation of the Federal Control Act). It found that the conditions complained of were an incident of the World War; that the arrangement for loading was a voluntary one beneficial to shipper; that there was no provision in the tariffs for allowance to shippers who load cars; and that, therefore, such allowance could not legally be made by the carriers."

Petitioners sought in the proceeding to set aside the adverse decision of the Commission on the merits and to compel a decision in their favor. The Court of Appeals granted the writ. This was error. Mandamus cannot be had to compel a particular exercise of judgment or discretion, Riverside Oil Co. v. Hitchcock, 190 U. S. 316; Ness v. Fisher, 223 U. S. 683; Hall v. Payne, 254 U. S. 343; or be used as a writ of error, Commissioner of Patents v. Whitely, 4 Wall. 522.

Whether a judicial review of the Commission's decision could be had by some other form of proceeding the Supreme Court considered it unnecessary to enquire.

The original complaint of the association, filed March 11, 1919, was directed against the Director General of Railroads and 184 transportation companies. Reparation was sought to the extent of "a reasonable allowance per ton or per car for lighterage services performed, and which are presumed to be performed by defendants," and "liquidated damages for violation of said act to regulate commerce and said federal control act." The allegation as to disregard of the tariff provisions in respect to lighterage was abandoned. The proceedings before the Interstate Commerce Commission showed that either the carriers or the shippers suggested that the movement of paper stock would be facilitated if the shippers were willing to load their paper stock into empty cars for outbound movement. The evidence was somewhat conflicting as to the origin of this suggestion. However, from the evidence as whole, there was little doubt that an agreement, tacit or expressed, was arrived at between the carriers and shippers of paper stock by which the latter undertook to do their own loading of the cars, if they were permitted to drive their trucks on to the carriers' piers, having but short periods of waiting. The complainant's members were thus enabled to withdraw their trucks from the long lines of vehicles containing miscellaneous commodities and to form lines consisting exclusively of paper stock, obviating great delays and the consequent additional trucking expense. The Commission held (57 I. C. C. 686) that such a mutual arrangement was unquestionably for the benefit of both parties under war-time conditions. Nothing in the act requires that a shipper must be reimbursed for transportation service that he may elect to perform primarily for his own convenience. Section 15, the Commission held, was intended merely to provide against excessive allowances to owners of shipments for services connected with transportation. The other findings of the Commission are stated in the above quotation from the Supreme Court's opinion. Interstate Commerce Commission v. United States ex rel. Waste Merchants' Association of New York. Decided October 23, 1922. Opinion by Mr. Justice Brandeis.

Foreign Railway News

Performance of British Railways in 1921

The Ministry of Transport of Great Britain has issued a volume of statistics covering the operation of British railways in 1921. The average return to capital for the year's operations was 4.28 per cent. This return was possible only with government compensation, the roads having operated at a deficit amounting to £5,892,000.

1,000 Employees of English Road Are Attending Classes in Transportation

The North Eastern Railway, England, has in operation a very comprehensive program for the training of clerical employees.

Most entrants into the service come in between the ages of 15 and 17. They are required to pass an examination in regard to physical fitness and a written examination in English composition, arithmetic, geography and other elementary subjects. A high standard is maintained and only about 25 per cent of the applicants succeed in gaining employment. The successful ones are then placed on probation for a period of not less than a year. Every clerk is expected to become proficient in shorthand within a reasonable time after entering the service and, after a year's probation, he is called upon to pass an examination in that subject. At the age of 17½, a junior clerk is eligible for a qualifying test in shorthand and typewriting, telegraphy, or some kindred subject and if he passes this examination, he is advanced to the position of fifth class clerk at the age of 18. These tests are compulsory.

In addition to these there are voluntary examinations on the following subjects:

A. Train Signaling; Train Operation by Telegraph Block; General Rules and Regulations.
B. 1. Freight Station Work and Accounts, or
2. Passenger Station Work and Accounts, or
3. Locomotive and Car Accounts and Statistics, or
4. Engineering Accounts and Office Work.
C. Railway Operation.
D. Railway Economics.
E. Railway Law.
F. Railway and Commercial Geography of the United Kingdom.
H. An examination on any other cognate subject.

Preparation for these examinations in subjects A to F, as given above, is offered in classes held during the winter months at various terminals along the railway. Three classes of certificates are issued for passing marks in any of the subjects and a final certificate is granted to any employee who qualifies in five of the subjects, which must include subjects A and B and at least two from C to F inclusive. For success in passing any subject from C to F, money prizes are given as follows:

	£	s.
Class 1 Certificate	5	5
Class 2 Certificate	2	2
Class 3 Certificate	1	1

In addition, a prize of £5 5s. is given to each student who obtains a final certificate within a period of five years.

Instruction in some of the branches in which employees are examined is given in conjunction with the Universities of Durham and Leeds and lectures are given by competent and learned instructors. Each course consists of 20 lectures. The classes are popular and nearly 1,000 students have enrolled for work during the winter months.

Above this program of instruction is the "traffic apprenticeship." The company has about 30 traffic apprentices who are appointed as the result of competitive examinations in the following subjects:

1 Accounts, Block Operation, General Rules and Regulations.
2 Railway Operation.
3 Railway Economics.
4 A General Paper.
5 An Essay.

These examinations are conducted by the University of Leeds and Armstrong College, Newcastle. The company appoints the five candidates who make the highest marks as traffic apprentices and it may also select any other student who has done particularly well. The traffic apprentice goes through a strenuous course of training lasting three years. He serves in many departments and his progress is constantly watched by the officers of the company. A limited number of traffic apprentices have been appointed from outside the service, notably from graduates of colleges and universities.

The *Railway Age* is indebted to the Railway Gazette (London) for the above information.

Control of Chinese Eastern Relinquished

Secretary Hughes of the State Department has addressed a note to the Chinese government announcing that, following the withdrawal of allied troops from Siberia, the United States Government has followed the action of Great Britain, France, Italy and Japan in relinquishing its participation in the inter-allied control of the Chinese Eastern Railway. The control was established by an agreement in connection with the dispatch of American and allied troops to Siberia in 1918. The representatives of the United States on the inter-allied committee at Vladivostok and the technical board at Harbin have been instructed to proceed to the winding up of the affairs of each organization and the termination of further activity as of October 30.

"The government of the United States takes this occasion," Secretary Hughes said, "also to reaffirm its concern in the preservation of the Chinese Eastern Railway with a view to its ultimate return to those in interest without the impairing of any existing rights, as well as its continued interest in the efficient operation of the railway and its maintenance as a free avenue of commerce open to the citizens of all countries without favor or discrimination.

"Having regard to its concern in these matters, and to the important contributions which it has made to the maintenance and operation of the railway during the last four years, both materially and through the services of the distinguished American engineer, Mr. John F. Stevens, and his assistants, the government of the United States will not fail to continue to observe carefully the administration and operation of the railway and the manner in which the government of China discharges the obligations it has assumed.

"At the same time the government of the United States desires to assure the Chinese government of its friendly interest and goodwill and its readiness to assist or co-operate with the government of China and the other powers concerned at any time in any practicable way with a view to conserving the railway and assuring its efficient operation in the interest of all concerned."

Photo Courtesy, Campbell, Gray, Ltd., London

Planning for Heavy Passenger Traffic at British Empire Exhibition at Wembley, Near London, in 1924

Railway Officers Inspect Site of Exhibition to Make Preliminary Plans—From Left to Right, Back Row: Col. Stone, in Charge of Exhibition, and Mr. Derry of the London & South Western—Middle Row: Messrs. Hamlin (Great Northern), Oddy (G. N.), Smith (Great Central), Crabtree (Great Western)—Front Row: Messrs. Daniels (G. N.), Dennis (London, Brighton & South Coast), and Milton (L. & S. W.)

Equipment and Supplies

Locomotives

THE PHILADELPHIA & READING is arranging to build 5 Pacific type locomotives in its Reading shops.

THE GREAT NORTHERN denies a current rumor that it expects to come into the market soon for a number of locomotives.

THE TENNESSEE CENTRAL, reported in the *Railway Age* of October 28 as contemplating the purchase of 4 Mountain type locomotives, has deferred buying for the present.

THE SEABOARD AIR LINE has ordered one locomotive from the American Locomotive Company. It has also ordered one locomotive from the Baldwin Locomotive Works and one from the Lima Locomotive Works.

THE SOUTHERN PACIFIC, TEXAS LINES, reported in the *Railway Age* of October 14 as inquiring for 9 Pacific type locomotives, has ordered this equipment from the Baldwin Locomotive Works.

THE CHESAPEAKE & OHIO, reported in the *Railway Age* of September 30 as inquiring for 2 Mountain type and 6 Pacific type locomotives, has ordered this equipment from the American Locomotive Company.

THE CENTRAL OF NEW JERSEY, reported in the *Railway Age* of October 14 as inquiring for 10 Mikado type locomotives, has ordered this equipment from the American Locomotive Company. This company is now asking for 4 Pacific type locomotives.

THE ILLINOIS CENTRAL reported in the *Railway Age* of October 28 as inquiring for about 75 locomotives, has ordered 85 Mikado type locomotives from the Lima Locomotive Works. It is expected that this road will place an order soon for 40 additional locomotives.

THE TOLEDO TERMINAL, reported in the *Railway Age* of October 21 as contemplating the purchase of three switching locomotives, has placed an order with the American Locomotive Company for one six-wheel switching locomotive and two Consolidation type locomotives.

Freight Cars

THE MISSISSIPPI CENTRAL is inquiring for from 100 to 200 flat cars.

THE CORNWALL RAILROAD is inquiring for 40 ore cars of 50 tons' capacity.

THE GENERAL ELECTRIC COMPANY is inquiring for 2 tank cars of 10,000 gal. capacity.

THE CHARLESTON & WESTERN CAROLINA has ordered 100 single sheathed box cars of 40 tons' capacity from the Standard Tank Car Company.

THE BEACON OIL COMPANY, Boston, Mass., has ordered 50 tank cars of 8,000 gal. capacity from the American Car & Foundry Company.

THE PENNSYLVANIA SALT MANUFACTURING COMPANY, Philadelphia, Pa., has placed an order with the General American Car Company for 3 flat cars of 30 tons' capacity.

THE MINNEAPOLIS, ST PAUL & SALT STE. MARIE has ordered 500 box cars and 250 gondola cars from the Pullman Company and 500 box cars from the American Car & Foundry Co.

THE ST. LOUIS SOUTH WESTERN is inquiring for 500 double sheathed box cars of 40 tons' capacity, 500 automobile cars of 40 tons' capacity. The company is also inquiring for 200 ballast cars of 50 tons' capacity.

THE CHICAGO & NORTH WESTERN, reported in the *Railway Age* of October 14 as inquiring for 800 steel ore cars of 50 tons' capacity, has ordered this equipment from the Pullman Company.

THE WESTERN PACIFIC, reported in the *Railway Age* of October 28 as inquiring for 800 general service gondola cars and 500 stock cars, is inquiring for 500 to 1,000 of the latter. Some reports state that this equipment is to be used by the Denver & Rio Grande Western.

Iron and Steel

THE NORTHERN PACIFIC is reported to have divided an order for 35,000 tons of rail.

THE CHICAGO & NORTH WESTERN has ordered 40,000 tons of rail from the Illinois Steel Company.

THE MISSOURI PACIFIC has ordered 118 tons of structural steel from the Virginia Bridge & Iron Company.

THE ILLINOIS CENTRAL is reported to have divided an order for 30,000 tons of rail of which the Inland Steel Company received 10,000 tons.

THE VIRGINIAN RAILWAY has ordered from the Bethlehem Steel Bridge Corporation 5,700 tons of steel for a coal pier at Sewalls Point, Norfolk, Va.

THE GREAT NORTHERN has closed bids for one steel oil tank of 65,000 gal. capacity, including all steel work fabricated for erection.

THE GRAND TRUNK has placed an order with the British Empire Steel Corporation for 25,000 tons of 100-lb. rails. The rails will be rolled at the Sydney, N. S., plant of the Dominion Steel Corporation.

THE SOUTHERN PACIFIC has ordered 43,400 tons of rail from the Tennessee Coal Iron & Railroad Company and 1,600 tons from the Lorain Steel Company. This is in addition to 76,000 tons previously placed by this company for delivery in 1923, as already reported in the *Railway Age*.

Track Specialties

THE MICHIGAN CENTRAL is inquiring for about 11,000 kegs of spikes.

THE NEW YORK CENTRAL is reported to have divided about 25,000 kegs of bolts and 15,000 kegs of spikes between the Oliver Iron & Steel Company, the United States Steel Corporation, the Inland Steel Company and the Buffalo Bolt Company.

Machinery and Tools

THE NEW YORK CENTRAL is inquiring for one crank planer.

THE CHICAGO, ROCK ISLAND & PACIFIC has placed an order with the Whiting Corporation for a 200-ton transfer table.

THE ST. LOUIS SOUTHWESTERN is inquiring for two boring mills, a centering machine, a cutter, a reamer grinder and two emery stands.

THE CANADIAN NATIONAL is inquiring for one 32-in. by 32-in. crank planing machine, one 18-in. by 8-ft. lathe and one close quarter pneumatic drill.

THE CHICAGO & NORTH WESTERN is inquiring for six lathes, three grinding emery wheel stands, three power hack saws, two drill presses, two crank planers, one spot welding machine, one centering machine and one power hammer.

Signaling

THE ANN ARBOR has placed an order with the General Railway Signal Company for a 72-lever electric interlocking machine to be installed at Boulevard (Toledo), Ohio. The order also includes an illuminated track diagram, relays, position-light signals and replacement of storage batteries and charging outfit.

Supply Trade News

John G. Turpie has been appointed assistant to the president and B. W. Lockwood to consulting engineer of the Standard Tank Car Company, Sharon, Pa.

H. P. Hevenor has joined the staff of Dwight P. Robinson & Company, Incorporated, New York, as consulting engineer. He was until recently a member of the firm of Engel & Hevenor, Incorporated, where he specialized in track construction.

Dwight P. Robinson & Company, Incorporated, New York, is now at work on the design and construction of an extension to the plant of the American Rolling Mill Company at Ashland, Ky. The extension will include a jobbing and sheet mill and a galvanizing plant.

J. T. Mullaney, signal supervisor of the Chicago, Milwaukee & St. Paul, with headquarters at Deer Lodge, Mont., has left to enter the service of the Union Signal Construction Company, and will take charge of the installation of an interlocking plant for the new Chicago Union station.

G. P. Atkinson, for several years connected with the sales department of the Weston Electrical Instrument Company, Newark, N. J., has established an office at Atlanta, Ga., to represent that company in Georgia, South Carolina and northern Alabama. In addition to Weston instruments, Mr. Atkinson will represent several other electrical equipment companies.

Joseph T. Ryerson & Son Celebrates Eightieth Anniversary

One of the oldest companies in the railway supply business in this country is Joseph T. Ryerson & Son, which this month celebrates its eightieth anniversary. The history of the company and the earlier connection of the Ryerson family with the iron industry in this country are fascinating chapters in the development of industry and transportation in America.

Shortly after New Jersey was granted to Lord Berkeley,

Old Warehouse on South Water Street, Chicago, Occupied by Joseph T. Ryerson from 1852 to 1872

George Ryerson and a syndicate purchased 6,000 acres of land in the northern part of the state. In 1695 the development of this tract for agricultural purposes was begun. Later ore fields were discovered and developed so that Mr. Ryerson and his associates were among the first to work the iron mines in this region. His son, Marten Ryerson, further developed iron production and quite an amount of pig iron was made as early as 1740. The Ringwood and Wynokie mines in this region supplied the colonial army with great quantities of munitions material and equipment during the Revolutionary War.

About 1790 Marten's son, Thomas Ryerson, moved to Philadelphia and started business as a wholesale dealer in finished iron and steel products. Joseph, the son of Thomas Ryerson, continued in the same business. Hearing the call of the west, he started for Chicago in 1842, as the agent of Wood, Edwards & McKnight of Pittsburgh.

Some idea of the development of the country at this time can be gained from the transportation facilities. On his trip he went by railroad from Philadelphia to Columbia, Pa., then by stage coach to Pittsburgh and Cleveland; by boat to Detroit; by railroad to Jackson, Mich.; by stage to St. Joseph, Mich., and by boat to Chicago. The journey took eight days and he arrived November 1, 1842.

The rent for Mr. Ryerson's first store near Clark and Water streets, was $200 a year. From this small beginning has developed the present company. As business expanded, Mr. Ryerson moved first to Lake street and then to South Water street where the warehouse was located for many years.

Joseph T. Ryerson died in 1883 and his son, Edward L. Ryerson, succeeded him at the head of the business. The company was incorporated as Joseph T. Ryerson & Son in 1888. In 1908 the first buildings of the present Chicago plant were erected. They have been gradually expanded since until they now occupy over 19 acres. Other plants were establishd in St. Louis in 1914; in New York in 1915; in Detroit in 1917, and in Buffalo in 1919. The five plants now cover 40 acres, having a combined floor space of nearly 1,500,000 sq. ft.

Obituary

E. A. Hurlbut, formerly western railway sales representative of the Crouse-Hinds Company, with headquarters at Chicago, died in Evanston, Ill., on October 9.

William Blake Wood, president of Gifford-Wood Co., Hudson, N. Y., died on October 28 at the Albany City Hospital, after a two weeks' illness. Mr. Wood was born in Arlington, Mass., on July 15, 1869. He became a member of the firm of William T. Wood & Co., of Arlington, upon the death of his father, Cyrus, in 1896 and continued as a partner with William E. Wood, and later as a member of Gifford-Wood Co. when it was incorporated in 1905. He moved with his family to Hudson in 1911 and succeeded Malcolm Gifford as president upon the latter's death in 1919.

Trade Publications

Fireproof Construction for Small Coaling Stations.—The Roberts & Schaefer Company, Chicago, has issued a folder illustrating and describing one of the most recent developments in coaling station construction, namely, the application of reinforced concrete, permanent construction to coaling stations of 100 tons storage capacity, serving either one or two tracks. The descriptive matter shows how a permanent and reliable plant can be obtained for a moderate outlay.

Steel Structures.—The McClintic-Marshall Company, Pittsburgh, Pa., has recently issued a leather bound, 70-page book containing illustrations of structures erected by this company. A short introduction states that the pictures is the simplest and most direct method of transferring ideas and that this book is a form of picture writing. Other than this and the titles under the illustrations, there is no printed text. Sixty-four pages are devoted to full-page illustrations of a large number of steel structures covering power houses, enginehouses, erecting shops, warehouses, freight houses, office buildings, pier sheds, and other types.

The Wabash Railroad, by a notice issued by J. E. Taussig, president, has offered a reward of $1,000 for information leading to the arrest and conviction of the person or persons guilty of derailing train No. 2 on October 19, near Williamsport, Ind. The derailment resulted in the deaths of three members of the crew and some injuries to passengers.

Railway Construction

BANGOR & AROOSTOOK.—This company has awarded a contract to the Howlett Construction Company, Moline, Ill., for a coaling station with 50 tons' ground storage and a 25 tons' overhead storage, using automatic machinery, at Squa Pan, Me.

LOUISVILLE & NASHVILLE.—This company has awarded a contract to the H. K. Ferguson Company, Cleveland, Ohio, for the construction of a freight house 60 by 600 ft. with a second story at one end for offices, at Knoxville, Tenn., to cost approximately $150,000.

MISSOURI PACIFIC.—This company has awarded a contract to T. S. Leake & Company, Chicago, for the construction of a frame engine house 90 by 200 ft. with a composition roof at Pueblo, Col.

PENNSYLVANIA.—This company has just completed and placed in service at Pitcairn, Pa., a modern 34-stall enginehouse with turntable at a cost of $1,385,000. The turntable is 110 ft. long and electrically operated. Each stall is 140 ft. long and so constructed that it can be completely enclosed. The building is steam heated.

PENNSYLVANIA.—This company is asking for bids for the completion of the substructure for the Cherry street undergrade bridge, Erie, Pa. The approximate quantities are as follows: 600 cu. yds. foundation excavation; 400 cu. yds. concrete foundation masonry; and 770 cu. yds. concrete abutment masonry. The use of slag concrete will be permitted. The work will be in charge of George Nauman, assistant to the chief engineer, Pittsburgh, Pa.

PENNSYLVANIA.—This company has undertaken improvements and extensions to cost $900,000 at its Enola Yard on its low grade freight line three miles west of Harrisburg, Pa. The purpose of the improvement is to facilitate the movement of through freight and to provide enlarged facilities for the handling of through preference shipments and scheduled freight trains, in all directions and from all points, east, west, north and south. The work includes the erection of a new steel freight car repair shop, 100 ft. by 620 ft., the building of which has already been begun.

PENNSYLVANIA.—This company is asking for bids for all the work necessary to complete the strengthening of the bulkhead of the American Agricultural Chemical Company's warehouse at Baltimore, Canton, Md. The approximate quantities are as follows: 4,300 tons stone (1 and 2 men) furnished and placed; 9,600 sq. ft. four-inch concrete flooring; 300 cu. yd. back fill and excavation; and 25 piles, 40 ft. long, 14 in. butts, in place. The work is in charge of J. W. Craig, assistant engineer, Baltimore, Md.

PENNSYLVANIA.—This company proposes the installation of extensive waterfront facilities at Little Creek, near Norfolk, Va., where it has purchased about 1,000 acres of land together with water rights. At present the road enters Norfolk direct by car ferry from Cape Charles. In the proposed development car ferry service will terminate at Little Creek and entrance to Norfolk will be effected by trackage rights over other roads. The improvement includes the construction of a modern freight warehouse at St. Julian avenue, Norfolk. At Little Creek a complete rail-water terminal will be constructed. This work will involve the expenditure of some $3,000,000.

TENNESSEE CENTRAL.—This company will replace the machine shop, blacksmith shop, tin shop and woodworking plant at Nashville, Tenn., destroyed by fire on October 27.

VIRGINIAN.—This company will build a new steel coal pier at Sewell's Point, Norfolk, Va., to cost approximately $3,000,000. The new pier, it is reported, will be 1,073 ft. long, 86 ft. wide and 74½ ft. high. It will be completely equipped with modern coal dumping machinery and, it is reported, will have a dumping capacity of about 6,000 tons an hour and will double the company's coal dumping capacity at Sewalls Point.

Railway Financial News

ATCHISON, TOPEKA & SANTA FE.—*To Redeem Equipment Notes.*—In addition to the $4,000,000, series C, 6 per cent equipment trust notes maturing on January 15, 1923, this company will retire the remaining $5,884,800 of its 6 per cent equipment notes, at 103, on that date. The total issue of these 6 per cent equipment notes was $7,356,000, and they were issued in 15 series, maturing on the 15th of January from 1921 to 1935.

BOSTON & MAINE.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $4,000,000 of 6 per cent bonds to be issued for refunding purposes. Merrill, Oldham & Co. have offered 87.89 for $3,000,000 of the bonds with an option on $1,000,000 additional at the same figure.

CAROLINA & YADKIN RIVER.—*Asks Authority to Abandon Line.*—This company has applied to the Interstate Commerce Commission for a certificate authorizing the abandonment of its line from High Point to High Rock, N. C., 35 miles.

CENTRAL INDIANA.—*Receivership.*—William P. Herod, of Indianapolis, was appointed receiver for this road on October 31 by Federal Judge A. B. Anderson on the petition of the Union Trust Company, of New York.

The Central Indiana operates between Muncie, Ind., and Brazil, 127 miles.

CENTRAL VERMONT.—*Equipment Notes Offered.*—Plympton, Gardiner & Co. and Paine, Webber & Co. are offering $754,000 6 per cent equipment trust notes, series E, at prices to yield from 5 per cent to 5.75 per cent, according to maturity. The notes are dated May 1, 1922, and mature $49,000 semi-annually from November 1, 1922, to May 1, 1927, and $44,000 semi-annually from November 1, 1927, to May 1, 1930. The first semi-annual instalment of $49,000 was paid on November 1. The notes are issued to provide part payment for 500 30-ton rebuilt box cars and 200 50-ton rebuilt coal cars, purchased at a contract cost of $1,107,571.

CHICAGO & EASTERN ILLINOIS.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $989,000 of 5½ per cent prior lien bonds for the purpose of partially reimbursing the treasury for cash payments for cars and locomotives. It is proposed to sell the bonds to Kuhn, Loeb & Co., at 95.

CHICAGO GREAT WESTERN.—*Asks Authority for Equipment Notes.*—This company has applied to the Interstate Commerce Commission for authority to issue 40 notes aggregating $906,573 at 5½ per cent, maturing quarterly from June 15, 1923, to March 15, 1933 to the Pullman Company in payment of 75 per cent of the cost of 500 box cars at $1,850 each.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*New Directors.*—Albert H. Harris and Warren S. Hayden have been elected directors to succeed A. T. Hardin and William Rockefeller, deceased. Bertram Cutler has also been elected a director.

DENVER & RIO GRANDE.—*Deposit Date Extended.*—The Sutro committee has extended the time for the deposit of bonds with the American Exchange National Bank to December 4, 1922. A statement issued by the committee said in part:

"The constructive efforts of our committee are being and have been thoroughly examined into by numerous important independent and impartial sources, resulting in each case in recommendations that bonds be deposited with the committee."

DETROIT & MACKINAC.—*Asks Authority to Abandon Line.*—This company has applied to the Interstate Commerce Commission for a certificate authorizing the abandonment of its Hurst branch, from La Rocque to Hurst, Mich., 5.08 miles.

GRAND TRUNK PACIFIC.—*To Pay Interest.*—J. P. Morgan & Co. announce that the Bank of Montreal has been ordered by the

Dominion of Canada to pay the coupons due in November on the Alberta bonds.

INTERNATIONAL-GREAT NORTHERN.—*To Buy Bonds.*—J. & W. Seligman & Co. and Speyer & Co., reorganization managers, have arranged to purchase the first mortgage 6 per cent (extended to 7 per cent) bonds of the International & Great Northern, due November 1, not heretofore deposited under the plan. The bonds should be presented on that date to the Equitable Trust Company, where they will be purchased at par. When the new International-Great Northern securities are issued, as it is expected they will be later in the year, the old first mortgage bonds will be cancelled and the mortgage discharged. Interest due November 1 will be paid by the receiver upon the surrender of the coupon.

NORFOLK & WESTERN.—*To Redeem Equipment Notes.*—Holders of the following equipment gold notes issued under the agreement dated January 15, 1920, are requested to present them for payment on or after January 15, 1923, at the Guaranty Trust Company of New York: Notes maturing from January 15, 1924 to January 15, 1935, inclusive, and bearing numbers 1378 to 1835, 1837 to 2294, 2296 to 2753, 2755 to 3212, 3214 to 6885, all inclusive, for $1,000, each, and D1 to D10, E1 to E10, F1 to F10 and G1 to G10, all inclusive, for $100, each, at 103 per cent of par, and accrued interest.

TEXAS & PACIFIC.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $810,000 of 5 per cent certificates to be issued by the Commercial Trust Company of Philadelphia and to be sold at not less than 97½.

WESTERN MARYLAND.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to issue $450,000 of 5 per cent equipment trust certificates to be issued by the Commercial Trust Company of Philadelphia.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out to or received from the several roads the following amounts:

Charleston & Western Carolina Railway Company	$1,450,000
Georgia Southern & Florida Railway Company	50,000
Delaware & Hudson Company paid Director General	1,500,000
Beaumont Wharf & Terminal Company paid Director General	19,935

Dividends Declared

Central of New Jersey—$2.00, quarterly, payable November 15 to holders of record November 10.

Cleveland & Pittsburgh—Guaranteed, 87½ cents, quarterly; special guaranteed, 50 cents, quarterly; both payable December 1 to holders of record November 10.

Trend of Railway Stock and Bond Prices

	Oct 31	Last Week	Last Year
Average price of 20 representative railway stocks	69.50	72.40	56.00
Average price of 20 representative railway bonds	86.40	87.13	77.35

THE STATE OF UTAH, through Attorney General H. H. Cluff, has petitioned the Interstate Commerce Commission to be allowed to intervene in the proceedings of the Southern Pacific for permission to acquire control of the Central Pacific. The state intends to support the contention of the Southern Pacific and to oppose the application of the Union Pacific, which objects to the granting of the Southern Pacific application.

THE ST. LOUIS-SOUTHWESTERN has filed a petition in the Supreme Court of the District of Columbia for a writ of mandamus compelling the Interstate Commerce Commission to permit representatives of the railroads to inspect records of the Bureau of Valuation relating to the valuation of its property. The commission had denied the request of certain carriers to be permitted to examine and make copies of various detailed notes in possession of the bureau, unless and until such notes should be offered in evidence in a valuation hearing or in a court.

Railway Officers

Executive

John J. Mantell, manager of the New York region of the Erie, has been appointed vice-president of the New York region, with headquarters at New York City. Mr. Mantell was born at Elmira, New York, and was educated in the public schools of that city and at Elmira Academy. He began railway work in June, 1899, as a clerk and stenographer in the superintendent's office of the Erie. Later he served consecutively as yard clerk, chief yard clerk, yard master and general yard master at Croxton and Jersey City, N. J., and Susquehanna, Pa. He then became special agent in the office of the general superintendent at New York and afterwards served consecutively as trainmaster of the Delaware and Jefferson divisions, terminal trainmaster at Jersey City and superintendent of the Wyoming division. In 1915 he was appointed superintendent of terminals at Jersey City and in May, 1917, became general superintendent, Lines East. During federal control, he was terminal manager at Jersey City for the Eastern and Alleghany regions and at the termination of federal control was appointed manager of the New York region.

J. J. Mantell

W. E. McGraw, whose promotion to vice-president of the St. Louis Southwestern of Texas, and general superintendent of the St. Louis Southwestern lines, with headquarters at Tyler, Texas, was reported in the *Railway Age* of October 14, was born in 1875, at Fond du Lac, Wis. He entered railway service as a fireman on the Chicago, Milwaukee & St. Paul in 1893. From 1898 to 1900 he was a brakeman and conductor on the Wisconsin Central, and for the next six years he was superintendent of terminals of the Denver & Rio Grande and the Colorado & Southern at Denver, Colo. In 1906 he became superintendent of terminals for the Grand Trunk, and from 1907 to 1910 he was a trainmaster on the El Paso & Southwestern, with headquarters at El Paso, Texas. In 1910 he was promoted to superintendent of the lines in Mexico, which position he held until 1916, when he entered the employ of the St. Louis Southwestern as supervisor of terminal service of the entire line. He was promoted to superintendent of the Northern division in 1920, which position he held until his recent promotion.

W. E. McGraw

Franklin G. Robbins, vice-president of the Chicago & Erie, has been appointed vice-president in charge of the Chicago

region of the Erie Railroad. Mr. [illegible] became vice-president of the Chicago & Erie in May, 1922, and a photograph and a brief biographical sketch of him appeared in the *Railway Age* of June 3.

R. S. Parsons, vice-president in charge of operation of the Erie, has been appointed vice-president of the Ohio region with headquarters at Youngstown, Ohio.

W. A. Baldwin, manager of the Ohio region of the Erie with headquarters at Youngstown, Ohio, has been promoted to vice-president in charge of operation with headquarters at New York. Mr. Baldwin was born at Elmira, N. Y., on July 26, 1876, and was graduated from Cornell University in 1896. He began railway work the same year as a chainman for the Erie. In May, 1899, he was promoted to rodman and some time later to assistant engineer. From March, 1902, until September, 1903, he served as trainmaster. He was then appointed division engineer and retained that position until 1909, from which time until December, 1910, he again served as trainmaster. He was promoted to superintendent of the Chicago and Lima divisions in 1910 and was transferred to the Jefferson and Delaware divisions in May, 1912, after which he was promoted to general superintendent, Lines East of Salamanca, and in 1917 was transferred to the Lines West with headquarters at Youngstown. He was appointed transportation assistant in June, 1918, and a month later was appointed general manager, in which position he served until April, 1920, when he was appointed manager of the Ohio region. In this position he was serving at the time of his recent advancement.

W. A. Baldwin

Financial, Legal and Accounting

J. N. Davis, whose promotion to commerce counsel of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, was reported in the *Railway Age* of October 28, page 824, was born on February 27, 1880, at Clermont, Mo. After graduating from Grand Island College in 1906, he entered the employ of the Fidelity & Casualty Company of New York, in the Chicago office, where he was assistant trial attorney. He remained in this capacity until May 1, 1911, when he entered railway service as assistant general solicitor of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, which position he was holding at the time of his promotion to commerce counsel.

J. N. Davis

L. L. Atwood, whose promotion to contract attorney of the Missouri Pacific, with headquarters at St. Louis, Mo., was reported in the *Railway Age* of October 21, was born on July 1, 1872, at Bridgeton, Mo. He was graduated from Washington University, St. Louis, Mo., in 1893, and entered railway service as assistant claims attorney of the Missouri Pacific, with headquarters at St. Louis, Mo. He held this position until his recent promotion.

J. M. Salter, treasurer of the Texarkana & Fort Smith, has been appointed assistant treasurer of the Kansas City Southern. **H. H. Hoar** succeeds Mr. Salter on the Texarkana & Fort Smith.

A. K. Atkinson has been appointed assistant auditor of the Wabash with headquarters at St. Louis, Mo. Mr. Atkinson is 30 years of age. He entered railway service as an office boy in the office of the general auditor of the Denver & Rio Grande in October, 1909. He held various clerical positions in the office of the auditor of disbursements and, after serving as traveling accountant for several years, was appointed special accountant. On April 1, 1919, he entered the service of the Railroad Administration as field accountant and in July, 1921, was advanced to the position of supervising accountant. In March, 1922, he was appointed assistant to the comptroller and held this position until the time of his recent appointment.

I. C. McGee has been appointed treasurer of the Kansas City Southern, succeeding H. Visscher, deceased. Mr. McGee was born at Holt, Missouri, in December, 1873. He began his railroad career with the Chicago, Burlington & Quincy (Hannibal & St. Joseph) as a telegraph operator in 1887 and served in various capacities including that of bridge train dispatcher at Kansas City, which position he resigned on November 1, 1898, to engage in business. He returned to railroad service in September, 1900, as clerk in the auditing department of the Kansas City Southern and in April, 1903, was elected treasurer of the Texarkana & Fort Smith with headquarters at Texarkana, Texas. He remained in that capacity until January, 1915, when he was elected assistant treasurer of the Kansas City Southern with headquarters at Kansas City, Mo., and held the latter position at the time of his appointment as treasurer.

I. C. McGee

Traffic

T. A. Ward, chief clerk in the freight claim department of the New York Central at Buffalo, N. Y., has been promoted to district freight claim agent, with headquarters at Chicago, succeeding C. J. Lindemann, deceased.

G. E. Schnitzer, assistant general freight agent of the Chicago, Rock Island & Pacific, with headquarters at Little Rock, Ark., has been promoted to general freight agent. He is succeeded by **H. E. Rilley,** chief clerk to the vice-president and freight traffic manager, with headquarters at Chicago.

W. L. Nichol, assistant general freight agent of the Nashville, Chattanooga & St. Louis, with headquarters at Nashville, Tenn., has been promoted to general freight agent succeeding **C. Barham,** resigned to accept the position of chairman of the Southern Freight Association, with headquarters at Atlanta, Ga. Mr. Nichol was born on January 5, 1872, at Nashville, Tenn., and entered railway service as a delivery and bill clerk in the local office of the Nashville, Chattanooga & St. Louis at Atlanta, Ga., in 1891. In 1892, he became a claim and rate clerk in the general freight office at Nashville, Tenn., which position he held until 1897, when he was promoted to assistant local agent at the Tennessee Exposition, with the same headquarters. A year later he was promoted

to soliciting freight agent with the same headquarters, which position he held until 1899, when he was promoted to commercial agent with headquarters at Chicago. In 1901, he was transferred to Nashville, Tenn., where he remained until December 1, 1912, when he was promoted to assistant general freight agent, with the same headquarters, which position he was holding at the time of his recent appointment.

Operating

G. E. Donnatin has been appointed assistant trainmaster of the Los Angeles division of the Southern Pacific with headquarters at Indio, Cal.

E. J. Sturdevant has been appointed superintendent of transportation of the Minneapolis & St. Louis and the position of superintendent of car service has been abolished.

C. E. Green, trainmaster of the Chicago, Rock Island & Pacific, with headquarters at Cedar Rapids, Ia., has been promoted to superintendent of the Des Moines Valley division, with headquarters at Des Moines, Ia., succeeding C. T. Ames, deceased. He will be succeeded by **C. F. Redans**, trainmaster, with headquarters at El Reno, Okla. **C. G. Adams**, chief clerk to the vice-president and general manager has been promoted to trainmaster of the Chicago Terminal division with headquarters at Chicago.

G. L. Whipple, whose promotion to general superintendent of transportation of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, was announced in the *Railway Age* of October 28, was born on January 30, 1872, at Keithsburg, Ill. He entered railway service in 1888 as a telegraph operator on the Chicago, Milwaukee & St. Paul and held this position until 1894, when he was promoted to train dispatcher, which position he held until 1900. On the latter date he was promoted to chief dispatcher and held this position for the next six years. His next promotion was to trainmaster, which position he held from 1906 to 1910, when he was promoted to assistant superintendent of transportation. Two years later he was promoted to superintendent of transportation and has held this position until the time of his recent promotion.

G. L. Whipple

Mechanical

E. W. Smith, whose promotion to general superintendent of motive power of the Southwestern region of the Pennsylvania, with headquarters at St. Louis, Mo., was reported in the *Railway Age* of October 21, page 776, was born on September 21, 1885, at Clarksburg, W. Va. He was graduated from the Virginia Polytechnic Institute at Blacksburg, Va., in 1905 and entered railway service as a shop hand in the Wilmington shop of the Pennsylvania on June 5, of that year. On August 1, 1906, he was promoted to special apprentice in the Altoona machine shop. On July 26, 1909, he was promoted to inspector in the office of the assistant to the general manager and on March 12, 1913, to foreman in the office of the general superintendent of motive power. On October 15, 1913, he was promoted to assistant master mechanic at the Wilmington shop, which position he held until April 19, 1915, when he was transferred to the Altoona machine shop. He was promoted to assistant engineer of motive power in the office of the general superintendent of motive power on July 1, 1916, and to master mechanic of the Harrisburg shops on the Philadelphia division on October 10, 1917. On May 26, 1918, he was promoted to superintendent of motive power of the Central Pennsylvania grand division, with headquarters at Harrisburg, Pa., which position he held until December 1, 1919, when he was transferred to the Eastern Pennsylvania grand division, with headquarters at Altoona, Pa. On March 1, 1920, he was promoted to engineer of transportation in the office of the vice-president in charge of operation, which position he was holding at the time of his recent promotion.

Engineering, Maintenance of Way and Signaling

J. W. Stone, assistant valuation engineer of the Pennsylvania System, has been appointed valuation engineer with headquarters at Philadelphia, effective October 1, succeeding C. A. Preston, retired. Mr. Stone was born in Philadelphia and educated at Treemont Seminary, Norristown, Pa. He began his railroad career as a rodman in the engineering department of the Pennsylvania when he was but seventeen years of age. After four and one-half years in the engineering department he was transferred to the operating department where he served successively as transitman, assistant supervisor, supervisor and division engineer at various points on the lines east of Pittsburgh and Erie. On May 15, 1915, Mr. Stone was appointed assistant valuation engineer of the Pennsylvania Railroad, Lines East, and served in that capacity until his present appointment as valuation engineer of the Pennsylvania System.

J. W. Stone

P. Aagaard, president of the T. S. Leake Construction Company, Chicago, and formerly superintendent of buildings on the Illinois Central, has returned to that road as general building inspector, with headquarters at Chicago.

F. F. Seeburger, signal inspector on the Chicago, Milwaukee & St. Paul, with headquarters at Tacoma, Wash., has been promoted to signal supervisor, with headquarters at Deer Lodge, Mont., succeeding J. T. Mullaney, resigned.

Obituary

H. B. Green, general agent of the Baltimore & Ohio, with headquarters at Cleveland, Ohio, formerly division superintendent of the Cleveland division until its consolidation with the Newcastle division on April 1, died on October 30 at Cleveland from paralysis.

H. J. Simmons, formerly general manager of the El Paso & Southwestern, with headquarters at El Paso, Texas, died on October 16, at El Paso, Tex. He was born on July 17, 1869, at Adairville, Ky., and entered railway service as a rodman on the Huntsville & Monte Sano in April, 1888. From 1889 to 1893 he engaged in the private practice of civil engineering and from August, 1893, to August, 1895, he was civil engineer for the railroad commission of Texas. During the next seven years he was engineer and superintendent of the Galveston, La Porte & Houston and the Arizona & New Mexico, respectively. He entered the employ of the El Paso & Southwestern as chief engineer in April, 1902, and later held the positions of general superintendent and of general manager from which latter position he resigned on September 1, 1915. In March, 1920, he was appointed general agent and representative of the company in its dealings with the Federal Railroad Administration. At the time of his death he was general agent, with headquarters at El Paso, Tex., and was also in charge of valuation matters.

EDITORIAL
Railway Age

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What Will the Mechanical Section Do?

[Editor's Note—The following editorial was written and in type when news was received that the General Committee of the Mechanical Section had decided this week not to hold a convention next year, although a business meeting will be held. This decision does not in the least alter the facts as to what kind of convention OUGHT to be held next year, and therefore the editorial is published exactly as originally written. We shall publish further discussion of the situation presented in later issues.]

IT IS FIVE MONTHS since the last convention of the Mechanical Section of the American Railway Association was held. Almost ever since then the mechanical department officers have been engaged in fighting the shop employees' strike or trying to remedy its effects. Therefore, little progress has been made in doing the preliminary work of making the program and preparing the reports for the 1923 convention.

It is not too late, and it certainly is not too early, to emphasize that the convention next year can and should be made the most important and constructive in the history of the mechanical associations. Whether this will be done, however, will depend on whether the mechanical department officers, with the assent and encouragement of their executives, take advantage of the opportunities and live up to the demands of the situation which exists now and will exist for months to come. If the papers, reports and discussions at the next convention are not extraordinarily valuable and constructive it will be because they will fail to deal with the subjects with which they ought to deal, and with the frankness, intelligence and courage with which they ought to deal with them.

The year 1922 has thus far been one of the most important in the history of American railroads, and especially of the mechanical departments. A number of locomotives of new and remarkable design and construction have been put into service. The policy of running locomotives over more than one division without turning them, in order to increase the useful service of locomotives, has been tried on several railways and within the months immediately ahead will be tried on many more. The railways have gone through the first nation-wide strike in their history, and it has been a strike in the shops. When this strike began there was an almost unprecedented amount of bad order equipment, and the strike rendered it impossible for months materially to improve this condition. Some railways have settled the strike, but many more have not, and in spite of this the railways are now handling almost as large a volume of freight as they ever did in history. Cold and stormy weather will come within a few weeks, finding many locomotives in bad condition, and the mechanical departments during the winter will be put to one of the severest tests they have ever known.

We are mentioning these things because they suggest the most important subjects with which next year's convention should deal. What does—or ought—the Mechanical Section exist for? Obviously, to help promote economy and efficiency in railroad operation. How can it best do this? By serving as a clearing house for the experience and ideas of those who are especially charged with responsibility for the design, maintenance and operation of locomotives and cars. These men have technical questions, and they also have human problems. The two kinds of problems are interlocked. Neither kind can be solved unless the other is solved. A railway may buy the best designed and constructed locomotive ever turned out, but unless it is repaired, maintained and operated by men who do their work skillfully it may get very little better results for the company than would a poorer locomotive.

What has been the experience of mechanical department officers with the locomotives of new and even novel types which recently have been put in service? What are the arguments for running locomotives over more than one division, what new problems does this practice give the mechanical departments, and how may they best be solved? What new methods have been used to expedite reduction of the amount of bad order equipment, and what have been the results? Why did most of the shop employees, and even the foremen, on some roads strike, while on others only part of them struck, and what lessons does the experience teach? How have the roads that settled with the labor unions got along, as compared with those that have not, and why? What methods have been and are being used to train the big army of new employees that many roads have in their shops as a result of the strike? What improvements in shop equipment does the necessity of recruiting and training this army of new men suggest are needed? The railways for months com-

plained loudly about the working rules of the national agreements with the shop crafts. What changes have been made in these rules on railways which have not settled with the shop crafts and what have been the results? What have these railways done to increase efficiency not only by changing working rules, but also by effecting more intelligent differentiation between the pay of unskilled and skilled employees, and what have been the results? What new methods for dealing with employees have been adopted and with what results? These are the kind of questions which ought to be considered at the convention, and adequate consideration of which would make it a great convention. They afford opportunities for papers, reports and discussions which would be most interesting and most valuable if frankness, intelligence and courage prevailed in them.

Is this opportunity going to be missed and the convention allowed to consist of mere perfunctory threshing over of old straw, or is the opportunity going to be grasped and the convention made one which will be of really great value to mechanical department officers and the railroads? This will not depend entirely upon the mechanical department officers. It will depend largely on the railway executives. It will depend upon whether the executives tell their mechanical department officers that matters such as those which have been mentioned are too sacred and delicate to be frankly talked about at a convention, or tell them that the more squarely these problems are faced and the more fully and freely they are discussed the sooner their solution will be effected.

One of the most foolish and harmful superstitions in the railroad business is the widely prevalent superstition that it is all right for railway officers to get together and publicly discuss the technical problems of the industry, but that it is dangerous for them to get together and talk publicly about the great economic and human problems of the industry. One of the principal causes of the troubles the railways have been having for years is that their officers have not thoroughly studied and frankly and fully discussed the economic and human problems of the business and the methods for solving them. Does the existing labor situation in the railroad industry indicate that the prevalent past policy of dealing with it has been a success? Is there any industry in the United States today which has relatively more men in it who constantly resist efforts to increase its efficiency or who gladly listen to every misrepresentation of its management that is spread abroad and actively participate in propaganda against its management?

The officers of the Mechanical Section, with the sanction and approval of their superior officers, should begin at once to prepare to make next year's mechanical convention the most valuable ever held. They should recognize from the very start, however, that they will not do this unless they decide to discuss frankly and fully the important and vital problems of the mechanical department, including its labor problem. There have been too many mechanical conventions within recent years at which 90 per cent of the time has been consumed in the consideration of problems to which mechanical department officers do not devote 10 per cent of their time when they are in their own offices or out on their own lines.

Let the mechanical department officers decide to devote 90 per cent of the sessions of the next convention to the problems to which they devote 90 per cent of their thought and energies at home, and the convention will be most important and valuable to the railways of the country—and it will not be unless this is done.

The Farmer and Freight Rates

NOTHING IN THE FUTURE is more certain than that within the next year there is going to be a great struggle over freight rates on farm products. In the western states many candidates for the national House of Representatives and Senate devoted most of their campaign speeches to attacks upon the Transportation Act and the present freight rates, which they attribute to it, and most of the candidates who did this have been elected. Some of the western state railway commissions already have started proceedings for further reductions of freight rates. The farmers have been told that most of their present troubles are due to freight rates, and they believe it.

There is no doubt that the farmers generally are suffering severely from present economic conditions. The situation in which they find themselves and the transportation situation are the two conditions which afford the strongest arguments to those who express doubt whether the period of prosperity the country is entering will last long. If, however, the farmers would investigate the facts for themselves, instead of believing the gross misrepresentations of men such as Senator LaFollette of Wisconsin, and Messrs. Brookhart and Howell, who have just been elected to the United States Senate from Iowa and Nebraska, they would soon find that they are laboring under a remarkable hallucination when they attribute most of their troubles to freight rates.

Freight rates are higher compared with the prices of farm products than they were immediately before the war. *But it is also true that the prices of almost all the things the farmer has to buy are higher compared with the prices of farm products than they were before the war.* The railway rates and prices of the year 1913 are usually selected for comparison with present railway rates and prices. The average rate per ton per mile in 1913 was 0.729 cents and in 1921 it was 1.275 cents, an increase of 68 per cent. As a result of the 10 per cent reduction made this year, the average rate is now 57 per cent higher than in 1913. Wholesale prices of all commodities are reported monthly by the Bureau of Labor Statistics of the Department of Labor. These statistics show that in July, 1922, the average price of farm products was 35 per cent higher than in 1913. What do the statistics of the Bureau of Labor show regarding the average wholesale prices of other commodities? They show that in July, 1922, the average price of cloths and clothing was 80 per cent higher than in 1913; the average cost of

fuel and lighting, 154 per cent higher, the average price of lumber and building materials, 70 per cent higher, and the average price of house furnishings, 78 per cent higher. The average wholesale price of all commodities, except farm products and foods, was 62 per cent higher than in 1913. It will be seen that the increase over 1913 in the prices of almost all other things the farmer buys was greater than the increase in average freight rates.

But why compare the statistics of 1913 with those of 1922? Railway rates had descended to almost the lowest level ever reached in 1913. On the other hand, the prices of farm products and other commodities had been increasing for some years before that. The average railway rate is now only 50 per cent higher than the average railway rate of the 10-year period, 1900 to 1910. As compared with the average prices of 1900-1910, the average price of farm products showed an increase in July, 1922, of 74 per cent; of cloths and clothing, 99 per cent; fuel and lighting, 176 per cent; metals and implements, 40 per cent; lumber and building materials, 70 per cent; house furnishings, 82 per cent. The average increase in the wholesale prices of all commodities was 79 per cent as compared with an average increase in freight rates of only 50 per cent.

These statistics show conclusively that the increase which has occurred in the average freight rate, as compared with the increases which have occurred in the prices of commodities, is being enormously exaggerated.

Furthermore, the farmer makes only a comparatively small part of his total expenditures for freight transportation. James R. Howard, president of the American Farm Bureau Federation, is authority for the following estimate of expenditures made by the farmers in a year: For purchases at wholesale prices, $7,018,340,000; for interest, at least $1,000,000,000; for taxes, $663,000,000; for railway transportation, freight and passenger, $1,103,000,000. These figures make a total of $9,784,000,000 for expenditures made by the farmers. If this estimate is correct, the farmer's expenditure for railroad transportation is only 11 per cent of his total expenditure; his expenditure for freight transportation is not more than $800,000,000. Therefore, of his total outlay not more than 8 per cent is made for freight transportation.

Upon what theory of economics can it be claimed that the farmer is being ruined because there has been an increase in the cost of something for which he makes only about 8 per cent of his total expenditures?

According to Mr. Howard's estimate the farmer is paying about a billion dollars a year in interest. This is more than he is paying for freight transportation. The total mortgage indebtedness on the farms of the country increased 132 per cent between 1910 and 1920. The average rate of interest also increased, so that what the farmer pays in interest has increased much more than what he pays for transportation.

Nothing could be plainer than that the real cause of the farmer's troubles is the disparity which exists between the prices of his products and *the cost of all things for which he has to pay*, and that only a relatively small fraction of his present troubles is due to freight rates. Why, then, do men such as Senator Capper of Kansas, Senator LaFollette and Messrs. Brookhart and Howell tell him that most of his troubles are due to freight rates? Why do they not tell him the truth—viz., that no reduction of freight rates which there is the slightest possibility of his getting would help him much, and that if the situation in which he finds himself is really to be improved, he must secure a more satisfactory relationship between the prices of the things he has to sell and the costs of all the things for which he must pay? The reason why they do not is that they are demagogues who attack the railways and their rates because they believe that by doing this they can best promote their own political interests. Senator Capper is a wealthy publisher of many farm papers. Is it entirely unreasonable to suspect that the reason why he so persistently attacks railway rates and ignores the relatively high cost of other things besides transportation that the farmer has to buy is that the people who sell these other things to the farmers advertise in his farm papers?

The fact is that the farmer can less afford to have reductions made in his freight rates than in the cost of anything else he buys. The farmer is today suffering heavy losses because the railways are unable to furnish enough transportation to move farm products satisfactorily to market. This condition can never be remedied except by an increase of railway facilities. A sufficient increase in railway facilities can never be secured unless the railways are allowed to earn net returns large enough to enable them to raise large amounts of new capital. To reduce railway rates under present conditions would inevitably be to keep the net return earned by the railways inadequate. The railways as a whole could not financially stand any further reduction of their rates unless it was accompanied by further reductions of wages and the prices of the fuel and materials they have to buy. But under present conditions it would be impracticable for the railways to secure further reductions of wages. There is no perceptible tendency of the prices of materials to decline. The cost of coal has been increased as a result of the coal strike.

Under these conditions an order, whether made by the Interstate Commerce Commission or any other government body, including even Congress itself, for a reduction of railway rates would be confiscatory, and therefore unconstitutional and void.

In the course of years further reductions of railway rates may become practicable. They will not become practicable, however, until corresponding reductions in the prices of commodities, in rates of interest and in the wages of labor have been or can be brought about. The railways cannot reduce their rates as long as the wages of labor and the prices of commodities remain so much higher than they were before the war, because the railways have to pay these high wages and high prices themselves. They never can make pre-war rates until they can get labor, materials and fuel at pre-war costs. To force a further reduction of railway rates under present conditions would do little toward bringing about the needed general readjustment, and it would be ruinous to the railways and make it impossible for them to provide the increased transportation service that the farmers and all the other producers of the country imperatively need. Demagogues may go on lying to the farmer and misleading him as long as they like, but these are the irrefutable facts.

Old Rules Not Outlawed By Ignoring Them

Twenty-seven passengers injured and a damage bill of perhaps $15,000 constituted the net result of a crossing collision at Houston, Tex., as described in one of the latest investigations made by the Interstate Commerce Commission, reported in another column. This collision was due to open-eyed and evidently deliberate violation of two rules which have been well-known for years; first, the rule to stop before crossing another railroad unless interlocked signals are provided—a rule which, in essence, is at least 60 years old—and, second, the rule to use air brakes on long freight trains, which is of many years' standing. Let us not entertain the superficial idea that automatic train control is the only problem in the prevention of collisions. Had either of these unlawful practices been eliminated, says the report, "this accident undoubtedly would have been prevented."

Improving Employee Relations

Two unique contributions on improving the relations with the employees appear elsewhere in this issue. They present some interesting facts and both of them are written by neutrals—one a Y. M. C. A. secretary and the other a college student who has spent a couple of summers in railroad service. Both of these, in different ways, stress the necessity of a "get together" spirit on the railroads which will eliminate the gulf between the employees and the executives and allow them to meet in a friendly way on a common platform. There are many ways in which this better relationship can be cultivated. Although many progressive industries have been promoting employee representation for a number of years, the term has been little used and is hardly understood on railroads. The inauguration of such a plan on the Pennsylvania Railroad, which permits the groups of officers and employees at a local point, on a division, or in a region, or on the system as a whole, to meet around a table to discuss their common problems, has worked wonders in getting each side to recognize the good points and claims of the other side and humanize their relations. It is remarkable how misunderstandings and grievances have melted away and have been replaced by a spirit of co-operation.

Quality Rather Than Quantity

One unfortunate effect of the shop strike was its interference with the work of the various associations of railway officers. Although this did not militate against the success of any of the conventions held this fall, it caused a general postponement of the American Railway Engineering Association's committee meetings durings the summer months, when the bulk of the subcommittee work is usually carried on. However, judging from the number of committee meetings which have been held by this organization during the past three weeks, this delay is now being largely overcome. There is every reason to believe that these committees will exercise scrupulous care to avoid the inclusion of any ill-considered or superficial work in the reports that are submitted for publication. But in the effort to expedite the progress of the committee work, there is danger that some defective material may creep into the published conclusions. It is well, therefore, that each committee keep definitely in mind the periodic admonishments of the association's officers, that reports be presented only on those assignments that have stood the test of mature thought. There has been a growing tendency in recent years to increase the length of the committee reports. This fact, together with the enlarged membership of the association, makes it increasingly difficult to undertake a detailed consideration of all of the reports at the annual conventions. The result is that most of the committee reports are accepted as the word of the association with little or no change from the form in which they were presented. This imposes a responsibility on the committees which must not be borne too lightly. The aim should be for quality rather than quantity.

Delays to Freight Cars

In periods of car shortage a special effort is usually made by the railroads to secure quick loading and unloading. This means of reducing the idle time of cars should not be neglected at present, but there are other features of car movement that deserve as much, or more attention. One of the most important is delays in yards. In making an average trip of 475 miles, a freight car passes through about four division terminals. It is very easy for dead freight to lose two or three days in yards and empty cars especially are likely to be delayed when yard tracks are crowded. The time lost between movements is usually much greater than the time wasted during loading and unloading and for that reason speeding up yard operation probably offers one of the greatest fields for saving cars. Providing a few tracks on which trains can be set after they are made up is a simple method of relieving congestion and avoiding delays that is applicable at many of the smaller terminals. Running trains through intermediate terminals without switching is another means of eliminating idle time which should be carefully considered.

Institute a Signaling Investigation

When confronted with the necessity of increasing the track capacity of single track lines no road can afford to overlook the possibility of solving the problem by an installation of automatic block signals. Obviously, this would require an extensive investigation by competent officers. In many cases the management and the operating officers have considered signaling as a dubious quantity; in fact some roads in the absence of convincing data or due to a lack of study of train operations on roads equipped with signals, have actually constructed second track when an expenditure of only approximately $4,500 a mile for signaling would have permitted the traffic to be handled on single track for years to come. For example, a certain road that had adopted a large program of second tracking, had failed up to 1917, to close up a few stretches of from 10 to 75 miles of double track on a 300 mile division. In 1919 an operating officer, in co-operation with the signal officers, instituted a traffic study that evolved a signaling system for the stretches of single track so as to increase the track capacity of the entire division to the extent that the completion of the original double tracking program can be deferred for years to come. On this same road there is a low grade single track division 165 miles long, connecting two trunk stems. For years, at certain seasons, this line has been congested with freight requiring rerouting over other divisions. On account of the many curves and rock cuts the expense of constructing a second track is excessive, and as a result little has been done to relieve the situation. However, this road has just awakened to the fact that an installation of automatic signals would relieve the congestion and obviate the necessity for second tracking for years. No doubt there are many other roads that, through a lack of co-operation between the operating, engineering and signaling departments, have missed opportunities for enormous savings. Therefore, on roads where certain single track divisions are known to be "bottle necks" in the system, it would seem advisable to require the signal engineer, in co-operation with the operating officers, to make an investigation and report on what can be expected from an installation of automatic block signals.

Protecting Records from Fire

One of the interesting topics discussed at the Baltimore meeting of the Railway Fire Protection Association (*Railway Age*, October 25, page 799) was the recent burning of the Burlington office building at Chicago and one of the most significant utterances in the discussion was that of B. S. Mace, of the Baltimore & Ohio, who emphasized the importance of maintaining fireproof vaults on every division of a large railroad. A single one at headquarters is not enough. In almost every railway office are records and papers the loss of which would entail much inconvenience and loss of time and money. Some of them could not be replaced at any price. It is true that no railroad is so well provided with funds that it can install all the equipment it needs. When funds are available there must be a selection among various possible expenditures in accordance with their relative merits. In the ordinary course of business, however, it is the new machine or other improvement which promises direct and immediate savings to which attention is most easily directed. Ordinarily it is only after a disastrous fire has occurred that the installation of fireproof vaults and filing cases for the protection of important records receives the attention it deserves. This condition is unfortunate, for it is much more profitable to lock the stable with the horse within than to barricade the door after the animal has been stolen. Similarly the protection of records which can be replaced only at great expense or not at all should be considered on a par with improvements which promise a direct money return. The safeguarding of valuable possessions already in hand is quite as important as the acquisition of new things—be they bridges, machines, buildings or records and documents which represent the expenditure of money and effort in their compilation.

A Figure of Leading Importance

"Net railway operating income," the term which the *Railway Age* has recently been discussing in these columns, is given an official or legal definition in that much discussed section of the Transportation Act—namely Section 15-a. The definition is contained in paragraph 1 and reads as follows: ". . . and the term 'net railway operating income' means railway operating income, including in the computation thereof debits and credits arising from equipment rents and joint facility rents." In last week's issue, page 830, there was given a list of the items in the form on which the carriers report their monthly earnings to the Interstate Commerce Commission and an explanation was given showing how the figure of net railway operating income was worked out. Quotation of the definition as given in Section 15-a adds nothing to the definition as given in the description of the monthly report form. The point in introducing it here at this time is to emphasize the importance of the figure and in so doing to make clear the value of a proper understanding of what it means. It may be worth while at this time to refer to the fact that it is net railway operating income which for all the roads in a rate-making group is supposed to equal 5¾ per cent on the property used in the service of transportation. For federal control it was the basis of standard return. It seems hardly necessary also to add that net railway operating income is in the case of the individual road the figure upon which is based the computations for the recapture of half the earnings over 6 per cent. All in all, therefore, the figure of net railway operating income is a very significant and important one. In the monthly reports of the carriers as individuals or in total, it serves as an index available 12 times in the year for use by the commission, by railroad men, by investors and the public generally. In its annual form it supplements and supplants the monthly figures, and in addition stands as one of the basic indices in railway regulation. The figure in whatever form it may appear has had a deservedly increasing popularity. It is unfortunate, however, that there still remains considerable hesitancy about using it and some inconsistency, embodied chiefly in the difficulty of comparing or reconciling the figures shown in the monthly reports with those covering the year as a whole.

Consolidation by Amalgamation

The wholesale railway consolidations under way in Great Britain are being effected by the exchange of securities in the new companies for those of the existent companies, rather than by the acquisition of control of smaller companies by purchase of stock or lease by the larger companies. These exchanges of securities are arranged, insofar as possible, to provide new stocks and bonds of the same earning power and relative security as those of the old companies. Under the terms of the Railways Act of 1921, all British railways must be consolidated into four non-competing systems. The companies are required to submit plans for consolidation to the Amalgamation Tribunal, a body created by the Railways Act, before January 1, 1923. If satisfactory plans are not filed by that date the tribunal is authorized to prescribe provisions of its own formulation. The directors and security holders of the railways have, however, been active in their negotiations to arrive at equitable and acceptable plans of amalgamation and their efforts have, generally speaking, been quite successful, considering the great variety of interests which they have had to reconcile. The provisions for railway consolidations in the railway law of this country are voluntary. The carriers are not compelled to consolidate, although there is some agitation in Congress to make the consolidation provisions of the Transportation Act obligatory on the railroads. At any rate, however, there will probably be many consolidations of railways in this country during the years to come, even if they are not forced upon the roads. The British method of amalgamation by an exchange of securities has certain advantages over acquisition by lease or purchase of stock and a study of British practice might be of value to railway officers in this country who are interested in the subject of consolidation.

Receiving Representatives of the Press

Railway managements as a whole are giving far more attention to publicity than they have in the past. They are fast learning the desirability of improving the relations with both the public and their own employees by educating them as to the problems with which the managements are confronted and by giving them facts relating to railway operation and finance. Much more, however, can be done in this direction. One way in which some roads can greatly improve matters is to show more appreciation to the representatives of the newspapers. Government officers at Washington, including the President and prominent members of his Cabinet and Administration, make it a practice to set aside a certain hour once a week, or oftener, to receive press representatives and to talk with them frankly as to their problems and answer questions. This is in addition to the regular news releases from their offices in typewritten or printed form. It is understood that these officers will not be quoted direct, unless specific permission is given so to do. Members of the press, however, are given a view back-stage, as it were. This makes it possible for them to anticipate certain important developments and more correctly to interpret the situation to their readers. This practice not only conserves

the time of both the Government officers and the representatives of the press, but it is invaluable to both parties in directing public thought along the right lines. It would be impossible to overestimate the value of these informal meetings with representatives of the press in recent years. Why cannot railway officers adopt the same policy to advantage? Newspaper men complain that they find great difficulty in getting to some of the prominent railroad officers; railway officers say that too much time is often required in receiving representatives of the press. An important point of contact is therefore being largely neglected and lost. Why not set aside definite times each week to receive representatives of the press, talk to them of the road's problems and answer questions as far as it is possible to do so? It would help to break down a most undesirable wall which now exists between some railway officers and the press. It would eliminate a lot of misunderstanding and be exceedingly helpful to the railroads in improving the relations with both the public and their employees.

D., T. & I. Again Experiences Deficits

Although Henry Ford and his son continue to give advice to the railroads, it is noted that they have been less inclined recently than they were for a time to base their discussions on the "remarkable" results experienced on their own railroad, the Detroit, Toledo & Ironton. After the Fords had bought this road and given it a large volume of new traffic, the results were much more satisfactory for a time than those obtained by the former management, but the improvement has by no means been kept up, as expenditures for maintenance and for hire of equipment have increased with the increase in traffic. For the first six months in 1922, the road's reports to the Interstate Commerce Commission disclose, it had a net operating income of $705,518, as compared with $190,082 for the similar period of last year. However, for the month of July there was a deficit of $16,367, for August of $300,404 and for September of $383,097, with the result that for nine months of the calendar year the net operating railway income has been reduced to $5,650. Operating revenues for that period were $6,687,749, an increase of $1,906,539, while the expenses were $5,577,756, an increase of only $1,779,842. However, there was also an increase of $463,855 in the debit balance of equipment rents. The September revenues also showed an increase over September of last year, but the increase in expenses was still greater.

Equipment Orders in October

Locomotive orders in October totaled 184, freight car orders 14,498, and passenger car orders 116. For the ten months period the totals for domestic orders have now reached 1,856 locomotives, 125,658 freight cars and 1,553 passenger cars. The total of 184 locomotives in October was not bad; it was, however, not as good as the totals reported for the four preceding months. Why there should have been a falling off it is difficult to say. The disappointing railway net reported by most roads for August and September was possibly a deterrent to purchasing. A more important reason may have been that many roads that have already placed their orders are having difficulty securing deliveries. Some sizable inquiries, however, are in the market, so the prospects for November look to be far from disappointing. The orders for freight cars in October were much better than those for locomotives. The October freight car total—14,498—was double those for August and September combined. It was exceeded, however, by narrow margins by the totals for July, May and February, but it was only half the total for 1922's biggest month to date—April—when the New York Central's business brought the total up to over 30,000. Interest in these car and locomotive figures now has two values—one embodied in the use of the figures as an index to the volume of railway purchasing and the other as an indication of the success the railways are having in meeting deferred equipment requirements. Car loadings of over a million cars for the week ended October 21 and the present severe car shortage are a measure of the deferred requirement. The railways are making fair progress towards meeting this particular problem; the volume of orders for new equipment is, on the whole, quite satisfactory. The present transportation situation, however, is plain evidence that still further progress is needed. The experts say that business in general should be extremely satisfactory in 1923. If they are correct, a continuation of the present volume of equipment purchasing and possibly an increased volume as well, are quite properly to be expected.

CAR AND LOCOMOTIVE ORDERS

	Locomotives	Freight cars	Passenger cars
January	5	7,960	235
February	8	14,721	160
March	76	5,550	23
April	272	30,507	540
May	99	18,337	235
June	22	11,097	37
July	353	15,675	120
August	220	576	22
September	617	6,737	63
October	184	14,498	116
Total, 10 months	1,856	125,658	1,553

A Word of Warning

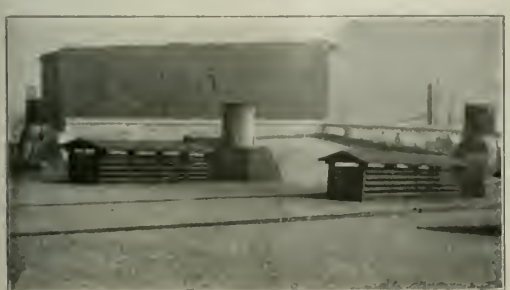
The unfortunate controversy between the Pennsylvania Railroad and the Labor Board over the question of employee representation has given the public at large a wrong impression of this whole question. It is even claimed by some that the real object of this new development was to destroy the Railroad Labor Board and the Transportation Act. Now that the full facts about the scheme are becoming known and understood, the real significance of this remarkable advance is becoming more widely recognized. The time was when railway officers assumed that questions of wages and working conditions were matters to be settled by the management only; the employee could take them or leave them. Unfortunately, some managements still do not recognize the advisability and necessity of giving the employees a voice in these matters. The employees on the Pennsylvania, as was shown in the article in the *Railway Age* of October 14, page 691, now have a voice in these questions and the machinery has been set up for the prompt hearing and adjustment of all grievances or criticisms relating to them. The results in increased loyalty and better production are truly remarkable. Other roads seeing these results are anxious to adopt similar measures. A word of warning is necessary. It must be recognized that this development on the Pennsylvania was not brought about in a few days, a few months, or even a few years. It began some years ago. The foundations have been well laid. The request for the present arrangement first came from the train service employees and it was finally worked out by them in co-operation with the officers. Other roads wishing to adopt similar measures must recognize this, and as indicated in the editorial on page 828 of last week's issue, must not attempt to hand down a ready-made plan, but must develop it with the co-operation of the employees. After all, the machinery of the plan is unimportant as compared to the spirit of a square deal which must dominate it. This same thing holds true of all personnel work.

From the Turntable Side

Erie Builds New Enginehouse at Jersey City, N. J

An Old Structure Destroyed by Fire Is Replaced Without Interference With Locomotive Operations

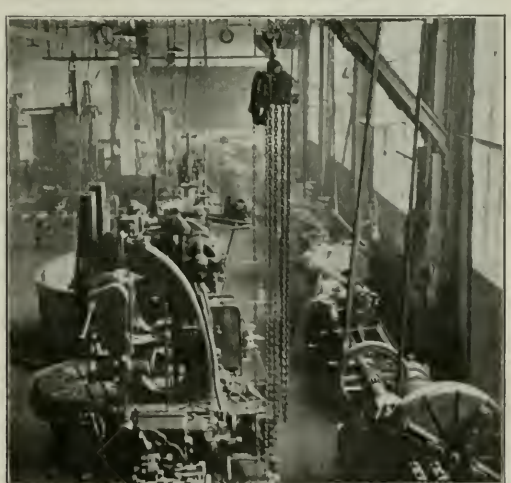
The Erie Railroad has recently completed a new engine terminal at Jersey City, N. J., which includes a 21-stall enginehouse, machine shop and other facilities, the construction of which was carried on "under traffic." It replaces an old layout which was destroyed by fire and was built on the old site without interference with operation, the old turntable and radial tracks being kept in use for the turning and servicing of both passenger and yard locomotives. Because of the restriction as to location and space and the necessity for non-interference with the motive power movements, the design and construction are both novel and interesting. The new building is a combination of a radial type 105-ft. enginehouse and a rectangular building.



Alternate Installations of Two Types of Smokejacks

The old enginehouse was of timber construction with 21 stalls served by an 80-ft. turntable and adjoined Pavonia avenue, a heavy trucking thoroughfare ending at the ferries. The back wall of the structure was parallel to the street line, a plan that was followed in the construction of the new enginehouse. In conjunction with the 21 stalls in the enginehouse, there was a repair bay containing 8 tracks which connected with 6 radial tracks at one end, and with a transfer table at the other. This transfer table is located between and serves the repair bay and a rectangular enginehouse of 12 tracks known as the "long" house. The fire destroyed the main part of the layout, leaving only the transfer table and the "long" house. Most of the engine pits, which were of timber, were badly damaged.

Jersey City is the eastern terminal of the Erie and, as a result, a large freight and passenger business is handled at this point. In addition there is a heavy commuter traffic. The freight engines and through line passenger engines as well as a large number of switching and yard locomotives



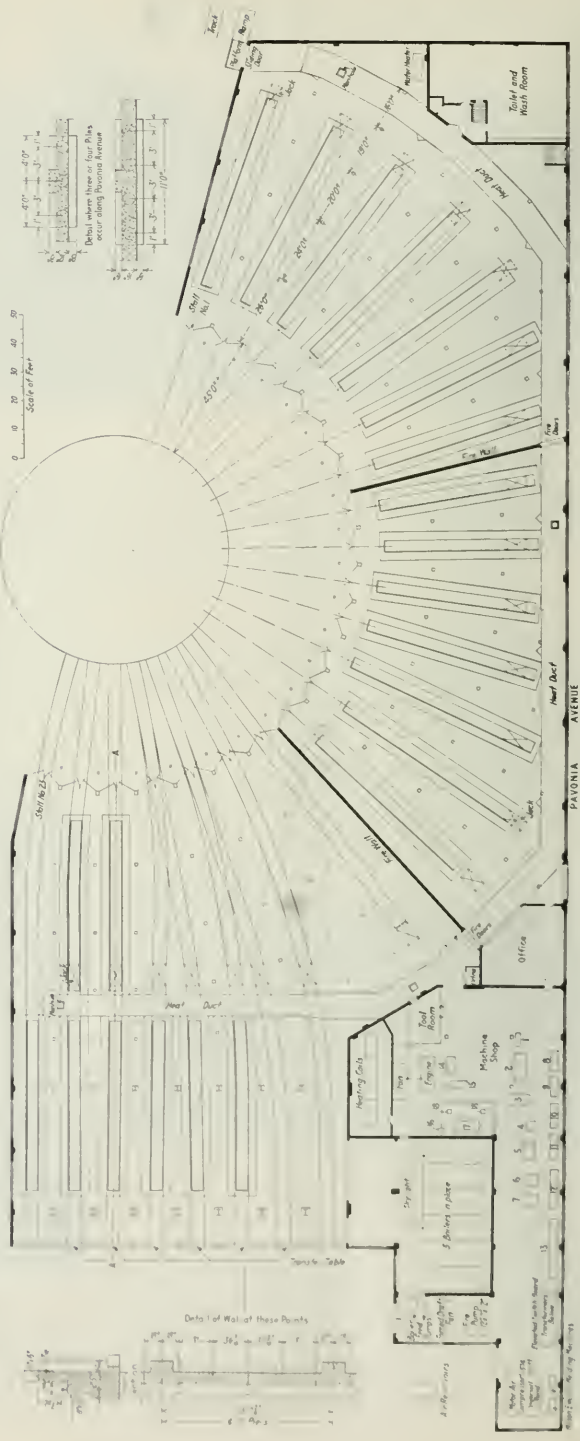
General Arrangement of the Machine Shop

are turned at the Secaucas engine terminal in the Hackensack meadows. The Jersey City enginehouse is primarily for the servicing of the commuter engines although all of the New York division passenger locomotives and a few yard locomotives are also handled there. About 200 engines are turned daily at Jersey City which, in connection with the congested layout, presented a problem that was easily rendered serious by the loss of the enginehouse. It became imperative that the utmost speed be developed in erecting another structure with a minimum of interference to engine movements and motive power repair requirements since under the circumstances the old tracks had to be continued in use. At the same time it was desired to use this opportunity to modernize the layout. The result was that construction and design proceeded almost simultaneously and both were largely prescribed by the existing conditions, predominant among which was the location of the turntable.

The new layout is a rectangular shaped building, having straight walls on three sides and the customary inner circle of doors facing the turntable. It is of brick and concrete construction with a timber superstructure of the shed roof type modified to fit the rectangular shape at the corners and where joining into the machine shop and the repair bay monitor. There are 21 stalls, divided into three sections of seven stalls each, one section adjoining and actually being a part of the eight-track repair bay of the monitor type. In one corner of the rectangular house beyond the radial section is located a large machine shop, the boiler and engine room, forges, air compressors and pumps, hot air heating equipment and the offices. A similar corner, although smaller, at the other end has been utilized for the washroom, shower baths, and lavatories and above this, in a small second floor, are located the lockers. A lean-to adjoining the north wall of the repair bay houses the pumps, tanks and other machinery for a complete boiler washing system.

The rectangular shape of the building resulting from the location of the center of the 80-ft. turntable only 159′-3 1/8″ from the street line, the existing radial tracks and the necessity for complete utilization of all available space, produced a non-uniform spacing of pilasters in the street wall. Thus the distance between each pilaster increased gradually at either side of the turntable center line perpendicular to the street, tending to become too wide for economical construction beyond the points where the street line intersected the outer circle of the standard 105-ft section. Between these points, that is, along the chord, single pilasters of heavy construction were used while in the remainder of the wall, intermediate pilasters were used to permit of the easy installation of standard size sash.

Much of the foundation is supported on piling, the site of the enginehouse being filled ground near tidal waters, the piling being driven in clusters of from two to four under the pilasters. Four piles were driven under each of the single pilasters in the chord section.

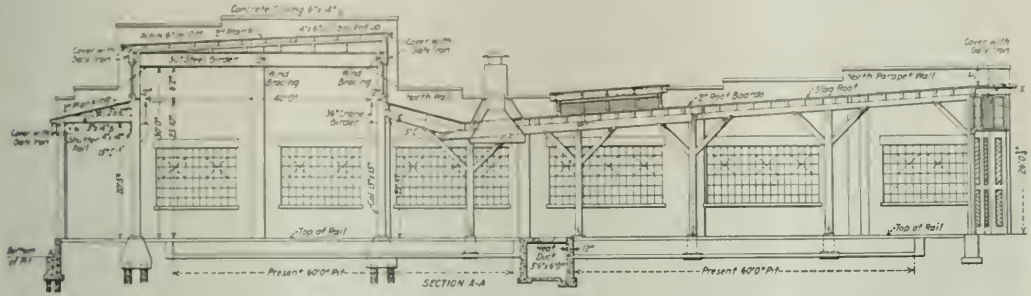


General Plan of the Erie Enginehouse Layout

three under each of the other main pilasters and two under the intermediate ones. This, as well as the location and number of piles in the other sections of the building are shown clearly in the illustrations. Piles were driven and cut off at an elevation of 1 ft. 6 in. above mean low water. These were capped or surmounted with concrete footings, 3 ft. wide, 20 in. thick, and from 7 ft. to 13 ft. long depending upon the number of piles and the location. These footings carry piers from 5 to 11 ft. long, 13 in. thick and 4 ft. high with an 8-in. by 24-in. pilaster poured integrally with it on the inner side. The street wall proper is carried on a continuous reinforced concrete girder, resting on these piers and running the full length of the wall. It is 13 in. thick and 7 ft. 4 in. high with an 8-in. by 24-in. pilaster poured integrally with it to correspond with the pilaster section poured with the piers. The remainder of the street wall with the exception of the lintel, which is another reinforced concrete beam running continuously, is of brick and steel sash. The foundation adjoining the transfer table is a gravity wall stepped to carry one of the transfer table rails.

The engine stalls are designed on the basis of a standard 105 ft. house with five bays spaced from inner to outer wall at distances of 26 ft., 24 ft., 20 ft., 19 ft. and 16 ft. The limiting factor of the distance from the center of the turntable to the street line made it necessary to continue the old with 6-ft. by 6-ft. footings carrying a 2-ft. 4-in. square pier 8 ft. 9 in. deep.

The repair bay is of the monitor type with a steel superstructure fabricated from floor beams, chords, etc., taken from an old steel bridge across the Susquehanna river. This work was done by company forces, the erection being handled by the bridge gangs. A 15-ton electric traveling crane will be installed in this section of the building, provision having been made in the design and construction for this purpose. The crane bay is 42 ft. 7½ in. wide from center to center of posts and runs the full length of this section. A Whiting hoist of 200-ton capacity has also been installed in this section in conjunction with four new concrete pits. Other crane and hoisting facilities consist of a series of six post cranes of 16-ft. radius installed at convenient points throughout the house.



A Cross Section Through the Enginehouse and Repair Bay

Within the circle there are three stalls without engine pits, five with old wooden pits, four of which have been extended with concrete, and 13 new concrete pits with inside lengths varying from 52 ft. to 89 ft. The seven-stall section at the east end of the house has been floored with 6 in. of concrete poured with depressed drains on each outer side of the pit rails. These drains connect with the engine pits and carry off quickly any water which may accumulate on the floor during boiler washing, this section being used chiefly for

The Engine Terminal Occupies an Extremely Congested Location

angle between tracks of about 8 deg. 12 min., 49 sec. in order to secure sufficient clearance at the doors; instead of the usual standard of the Erie for this length of stall of about 7 deg. The roof structure is of timber overlaid with Barrett roofing and is supported upon wooden posts spaced as described above. These in turn are carried on and anchored to heavy concrete piers and footings with a bearing surface of 6 ft. by 6 ft. The lower footing is 18 in. thick, the upper is 3½ ft. by 3½ ft. and 12 in. thick and the pier is 1 ft. 6 in. square. The repair bay, having been designed for an electric traveling crane, required heavier foundations. Four piles were driven under each column and surmounted with 6-ft. by 6-ft. footings carrying a 2-ft. 4-in. square pier 8 ft. 9 in. deep.

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The structure is heated by a modern installation of heating coils and blower discharging into a concrete air duct situated below the floor and around the outer circle. This

duct is tapped between each two stalls by lines of vitrified clay pipe which carry the heated air to the engine pits. Wherever the enginehouse tracks cross the duct, the upper slab has been reinforced and in addition, the running rails are carried in a double rail trussed construction.

Electrically Equipped for Economical Operation

The power used in the enginehouse for machine shop and other uses, is purchased from an outside source supplying two-phase energy at 2,300 volts, and 60 cycles which is stepped down to 220 and 110 volts according to needs. A unique method has been utilized to prevent the destructive action of gases on wiring installed in conduits above the gas line. From the switchboard at one end of the enginehouse, the conduit is led out through the street wall and along and over the exterior of the building. At points where it was necessary to run wiring above the gas line, it was accomplished by mounting the wire on glass petticoated insulators supported on the rafters.

On the inside of the street wall, two 100-watt lighting units are installed between stalls and so arranged that the light beams from each will cross each other, both also being inclined downward to an angle of about 15 deg. from the horizontal. A single unit of this type is mounted on the door posts. The circuits for this latter installation are brought over the roof of the enginehouse and down on the outside of the door posts. Three flood lights mounted on the roof, keep the turntable well lighted at night. Facilities for arc welding are furnished by two Wilson two-man sets delivering sufficient current for four welders through cables tapped at each stall and terminating in a 150-ampere charging receptacle. The welder simply plugs in his welding lead at the proper receptacle, removing it when he has completed his work.

The majority of the machine tools are belt-driven from an overhead line shaft operated by a 50-hp., 220-volt, two-phase motor with a 30-hp. motor in reserve which can be substituted immediately by throwing on a belt. Two large turret lathes, a blower fan, and a large Ingersoll-Rand air compressor unit have individual motor drives. The latter unit is of the duplex, two-stage, constant speed type with a capacity of 1,574 cu. ft., the regulation of the supply being accomplished by a five-step clearance control which loads or unloads the compressor in five successive steps, according to needs. The motor is a 260-hp. synchronous motor operating on 2,300 volts. The plant supplies air at 100-lb. pressure for use in the electro-pneumatic interlocking plant, for charging train lines and for various shop and enginehouse requirements.

The air line to the enginehouse stalls is carried on brackets with other pipe lines suspended from the rafters and following around the building 30 ft. inside of the doors. There are five distinct lines, aside from the steam line, consisting respectively of a 3-in. air, a 4-in. cold water, a 4-in. filling, a 4-in. washout and a 5-in. blow-off line. Each pit has individual connections.

The Machine Shop Equipment

The machine shop is well arranged and well equipped for the work to be performed, which consists entirely of light running repairs. Should heavier repairs be required, a locomotive is sent to the North Shop on the other side of the tracks. At the entrance from the enginehouse to the shop there is a toolroom which serves all the men whether working in the shop or on locomotives. Adjoining this on the same side is a double blacksmith forge with a blower, two anvils and a trip hammer. A 3½-in. bolt threader is also placed on the same side of the room in a convenient position.

Six engine lathes are arranged in line along the street side of the shop. These range in size from 14 in. by 6 ft. to 36 in. by 20 ft. In front of the lathes is a 60-ton rod press, a double-end emery wheel grinder, a 42-in. drill press, a 4½-ft. radial drill, a 28-in. shaper, a 24-in. vertical turret lathe, and a 42-in. vertical boring mill.

The Street Wall of the Enginehouse on Pavonia Avenue

List of Shop Tools and Equipment

The location of the various machine tools is shown on the general plan by numbers given in the following table:

1—60-ton rod press.
2—4½-ft. Mueller radial drill press.
3—28-in. Smith & Mills shaper.
4—20-in. by 3-in. double-end emery wheel grinder
5—42-in. drill press.
6—24-in. Bullard vertical turret lathe.
7—42-in. Colburn vertical boring mill.
8—14-in. by 6-ft. Cisco engine lathe.
9—17-in. by 8-ft. National engine lathe.
10—18 in. by 8 ft. National engine lathe.
11—18-in. by 8-ft. National engine lathe.
12—28-in. by 12½-ft. Boye & Emmes engine lathe
13—36-in. by 20-ft. New Haven engine lathe
14—3½-in. Adams bolt threader
15—Trip hammer.
16—Buffalo forge blower.
17—Double blacksmith's forge.
18—Two anvils

Protection Against Future Fires

Ample precautions have been taken for proper fire protection in addition to the fire walls between each of the seven stall sections and between the machine shop and the engine-

house proper. A fire pump situated in the machine shop connects with the main intake water supply by a system of valves which are normally set so that the water is by-passed around the pump. Each valve is plainly numbered while a large chart shows clearly what valves should be turned to deliver water to any section of the building or the yard. Fire hose connections have been installed between every two pits within the building, as well as on the roof structure, there being five in the latter instance alone. In addition numerous other hydrants are installed in and around the remainder of the building.

Methods Necessitated Close Co-operation

The construction of the Erie house necessitated close co-operation between the engineering, motive power and operating departments. The broad plan adopted was for the construction forces to be allowed three tracks at a time, free from interference while the operating department would deliver each 24 hours the designated cars of material before the starting of work each morning. The engineer in charge of construction was given authority to move engines in the roundhouse not under repair from stall to stall according to the needs of the occasion. This factor in itself eliminated much waste motion since it was possible to return one or more tracks to the motive power department and take possession of others promptly, thus keeping the construction forces and equipment steadily at work. Another factor of consequence was the assurance of ready material by keeping it "in load." On account of lack of storage space wherever possible all material purchased was loaded into Erie cars and when this was not possible it was transferred on the job as soon as such cars were available. These cars were held in one of the outer freight yards subject to the orders of the engineering department. Each afternoon a list of the cars containing the materials wanted for the next day's work was forwarded to the operating department, which moved them to the roundhouse after rush hours, the ones designated being set in on the enginehouse tracks before morning.

Construction itself was prosecuted from as many different points as possible. Both track drivers and land drivers were used for the piling, working in the case of the former from the radial tracks and extensions to them laid along the line of the outer wall. As soon as each cluster of piles was in place, work was started on the concrete piers. The supports for the roof posts were built in a progressive manner from one end of the house to the other, the excavating, sheeting and shoring where necessary, being handled by one gang, and the forms by another, after which followed the concreting, removing of forms and backfilling.

The erection of the superstructure was handled in a somewhat similar manner, the work in this case being divided and carried out progressively from one end wall in each of the three sections. The posts, roof beams and rafters were framed in a car placed on the track next to the wall after which the timbers were erected with the aid of a locomotive crane. Material for additional stalls was then hoisted on top of the roof and the remainder of the roofing structure framed and erected from the top with the exception of the posts. The posts were distributed well in advance of the roof construction and as needed were erected by a locomotive crane operating on engine stall tracks. This method insured the use of a minimum amount of ground work and a consequently greatly lessened interference with locomotive work.

Boiler Washout Section, Showing Depressed Drains, Post Cranes, Etc.

The new enginehouse was designed by the engineering department of the Erie, R. C. Falconer, assistant to the president and chief engineer, C. H. Splitstone, superintendent of construction and surveys; F. A. Howard, engineer of structures and O. V. Derr, resident engineer, in active charge of construction in the field. The Austin Company, Cleveland, Ohio, was the contractor for the superstructure and Frank D. Brown of Jersey City, N. J., for the substructure.

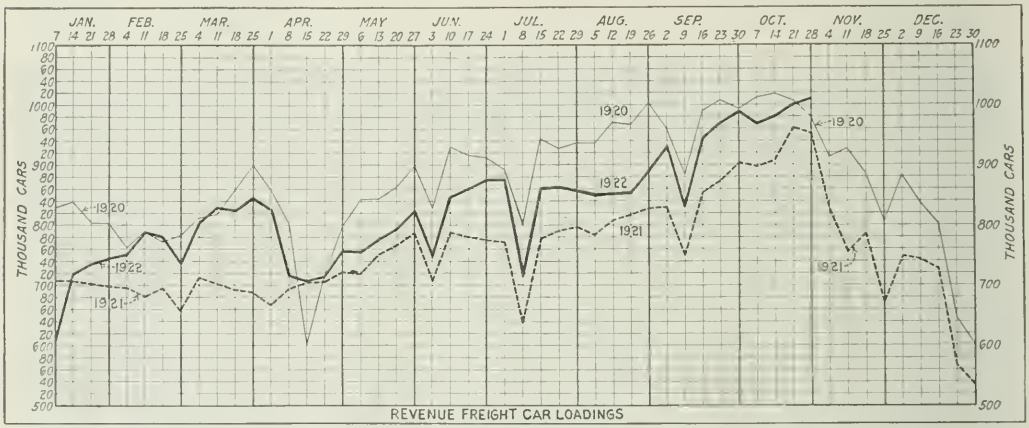
Non-observance of Rule 6 of the code of per diem rules, requiring subscribers to the car service and per diem agreement to make settlements for car hire with non-subscriber connections at the established per diem rate without any free time and without reclaim, has been complained of to the Board of Directors of the American Railway Association, and an appeal has been issued, calling upon the railroads to see that the provisions of Rule 6 are uniformly enforced. Non-observance results in discrimination as between non-subscriber railroads and in constant efforts of non-subscriber roads to obtain as favorable arrangements as may have been made with the few, all of which has a tendency to break down the entire per diem structure.

Freight Car Loading Shows Further Gain

WASHINGTON, D. C.

REVENUE FREIGHT car loading continued to increase during the week ended on October 28 and was over the million mark for the second time this year. The total, 1,014,480, was also only 4,059 cars less than the record for a week established in October, 1920, and in all districts except the Pocahontas and the North Western, the loading was in excess of that for the corresponding week of 1920. The loading for the three western districts combined was also in excess of that for 1920. The total loading for the week was 10,721 in excess of that for the previous week, 63,096 greater than that for the corresponding week of last year, and 33,238 greater than that for the corresponding week of 1920. The peak of car loading this year is later than it was in 1920 or 1921, but it is now regarded as probable that the next week's loading will show some reduction. The loading of grain and grain products was less than it was the week before although all other classes of commodities showed an increase and all but coal and merchandise l.c.l. showed increases as compared with last year. All except coal, coke and ore also showed increases as compared with 1920. The summary as compiled by the Car Service Division of the American Railway Association is given in the accompanying table.

The number of locomotives out of service for repairs showed a further decrease during the first half of October to 15,935, or 24.7 per cent, for repairs requiring over 24 hours, and 3,296, or 5.1 per cent, for repairs requiring less than 24 hours. The number of locomotives turned out of shop during the period was 11,404. However, the number of serviceable locomotives stored had been reduced to 950.



REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, OCTOBER 28, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	10,152	4,035	57,170	2,050	5,963	5,228	64,838	99,468	248,904	.....	.....
	1921	12,310	3,640	56,603	2,690	5,324	4,321	66,005	96,095	.....	246,988	238,442
Allegheny	1922	3,561	3,896	58,624	5,814	3,233	8,759	50,382	80,481	214,750	.....	.....
	1921	2,791	3,321	58,928	2,611	3,166	5,122	50,417	68,071	.....	194,367	210,427
Pocahontas	1922	212	369	18,881	370	1,681	48	5,464	3,779	30,804	.....	.....
	1921	276	441	25,000	212	1,432	2	5,881	4,029	.....	37,273	37,469
Southern	1922	4,041	2,654	22,830	1,206	20,992	1,342	39,065	46,357	.....	.....	.....
	1921	3,378	2,307	26,790	580	16,937	568	39,541	40,833	.....	130,934	129,367
Northwestern	1922	15,594	10,214	11,299	1,480	14,697	30,187	27,092	42,709	153,272	.....	.....
	1921	13,129	10,139	12,586	872	12,776	6,463	29,318	39,964	.....	125,247	158,440
Central Western	1922	12,404	17,370	22,582	322	7,028	2,044	31,362	62,621	155,733	.....	.....
	1921	12,413	13,915	24,585	196	7,316	763	32,477	55,953	.....	147,618	140,817
Southwestern	1922	5,949	4,106	6,542	146	6,990	397	15,477	32,923	72,530	.....	.....
	1921	3,913	3,066	6,138	235	7,479	857	15,932	31,337	.....	68,957	66,280
Total Western districts	1922	33,947	31,690	40,423	1,948	28,715	32,628	73,931	138,253	381,535	.....	.....
	1921	29,455	27,120	43,309	1,303	27,571	8,083	77,727	127,254	.....	341,822	365,537
Total, all roads	1922	51,913	42,644	197,928	11,388	60,584	48,005	233,680	368,338	1,014,480	.....	.....
	1921	48,210	36,829	210,630	7,396	54,430	18,096	239,571	336,122	.....	951,384	.....
	1920	37,496	32,867	224,986	16,492	59,456	68,039	213,440	330,456	.....	.....	981,242
Increase compared	1921	3,703	5,815	.....	3,992	6,154	29,909	.....	32,116	63,096	.....	.....
Decrease compared	1921	.....	.....	12,702	.....	.....	.....	5,891	.....	.....	.....	.....
Increase compared	1920	14,417	9,777	.....	.....	1,118	.....	20,240	37,882	33,238	.....	.....
Decrease compared	1920	.....	.....	25,058	5,104	.....	20,034	.....	.....	.....	.....	.....
October 28	1922	51,913	42,644	197,928	11,388	60,584	48,005	233,680	368,338	1,014,480	951,384	981,242
October 21	1922	53,680	40,473	196,771	10,631	60,344	45,468	231,797	364,595	1,003,759	964,811	1,008,818
October 14	1922	52,492	39,141	190,926	10,208	59,727	46,362	226,123	352,491	983,470	910,529	1,018,539
October 7	1922	50,553	39,389	189,312	9,880	57,841	47,439	228,515	345,267	968,169	899,681	1,011,666
September 30	1922	52,139	39,830	189,349	9,456	58,742	49,777	234,517	351,581	988,381	904,831	992,283

Railway Development Lags Behind Traffic Increase

C. H. Markham Tells Railway Business Association How Inadequate Facilities Menace Prosperity

THAT THE INCREASE in railway facilities during the past decade and more has been entirely inadequate to meet growing traffic requirements and that this check to railway development has resulted from restrictive legislation was the theme of the address of Charles H. Markham, president of the Illinois Central, delivered at the annual dinner of the Railway Business Association on Thursday evening. Other speakers were Senator George Wharton Pepper of Pennsylvania and James A. Emery, counsel of the National Association of Manufacturers.

Mr. Markham presented some interesting statistics to show the extent of the decline in railway development in recent years. For example: during the five-year period ended in 1921 the increase in the combined tractive effort of all locomotives was 60 per cent less than for the five-year period ended 1907; similarly, the increase in tonnage capacity of all freight cars was 85 per cent less for the period ended 1921 than for that of 1907. Mr. Markham also laid emphasis upon the significant fact that the present acute shortage of transportation is being felt at the beginning of a period of industrial revival and not, as has always been the case heretofore, at the peak of business activity. Mr. Emery, in his address, advocated an end to government interference in labor disputes unless there is imminent danger of an interruption in transportation. The addresses of Mr. Markham and Mr. Emery follow in part:

Mr. Markham's Address

We have witnessed this year a remarkable change in conditions in the United States. The country recently was passing through one of the most profound business depressions in its history. It has emerged from this depression, and has entered a period of tcaivity in production and commerce such as those which always have followed its panics and depressions in the past. Foreign conditions affecting our export business are very unsatisfactory, and it is impossible to measure the influence they will exert. But our domestic commerce always has been many times as important as our foreign commerce, and in our own land almost every condition seems favorable to another era of expansion and prosperity.

At the very threshold of this new era, however, we are confronted with a shortage of railroad transportation. The farmers have produced bumper crops. The railways have moved more grain this year than ever before in history. Nevertheless, the farmers complain that, although their big crop has not all been harvested, they cannot get enough cars for even the grain that is ready for shipment. Lumber manufacturers find themselves unable to ship the lumber they have produced and for which there is a demand. The coal mine operators cannot get anywhere near as many cars as they order. Manufacturers of iron and steel show that their output is being restricted because the railways cannot deliver them enough fuel and raw materials. Road building and other construction concerns complain that their business is interfered with by the priority in the use of open top cars being given to coal under an order of the Interstate Commerce Commission. Growers of fruit and vegetables say they are suffering large losses because they cannot get enough refrigerator cars.

Some of these complaints are exaggerated. Some are without justification. But they reflect a nationwide condition, the existence of which cannot be questioned.

Transportation Shortage, Heretofore Felt Only at Peak Times, Now Comes at Beginning

There have been other times when the service the railways could render has been unequal to the demands. This was the case, for example, in 1906 and 1907, and in the war years. But in every past time when there was a shortage of transportation it was felt only after the revival and increase of business had been going on for some time and had carried production and commerce to higher levels than ever before. What we call "car shortages" always have represented inadequacy of all railroad facilities. The "car shortages" of 1906 and 1907 did not come until toward the close of a ten-year period of industrial and commercial expansion during which the railways had increased by 2½ times the volume of freight carried by them. The car shortages of the war years did not begin until when, in 1916, the railways were handling 20 per cent more freight than in the previous year.

The outstanding fact regarding the present shortage of transportation, the significant fact which challenges our attention, is that it has been met at the very beginning of a period of business revival. In this respect it creates a situation unprecedented in the history of the United States—a situation which should cause every farmer and business man, every railway regulating official, every public man, every wage worker, to pause and reflect seriously.

Adequate Transportation Necessary for Prosperity to Any Class

It is plain to every man who thinks that the wage labor can be paid, the income the farmer can get, the profits that can be derived from business, depend in the long run upon the total amount of production and commerce that can be carried on. If the necessities, comforts and luxuries each of our people have is to be increased, we must increase our total production and commerce more rapidly than our population. We have always done this in America. But nothing could be more obvious than that the increase in production and commerce which is vital to the welfare of all cannot be secured without a corresponding increase in transport.

It is a historic fact that in this country within the last one hundred years production and commerce and the material welfare of the people have increased faster than they ever have in any other country in the world. It is also true, as every student knows, that this wonderful material progress has been made possible by the fact that until recently our railroads always were developed ahead of, and prepared the way for, the growth of population and industry. The conditions which now exist, therefore, mark a revolution in our affairs. Nothing less than a revolution has occurred when our railroads, whose surplus capacity has always in past periods of business made possible the vast increases which have occurred in our production and commerce, are found threatening to prove unequal, or actually proving unequal, to the demands made upon them at the very beginning of a period of business revival.

The railways are now moving about as much freight

weekly as in 1920, when the highest record was made. In spite of this the "car shortage" recently reported has been the largest ever known, and the demands of shippers continue to increase. In past periods of business revival the increase in freight business has gone on until it has reached a point 35 to 150 per cent higher than ever before. We may well ask ourselves whether, with the railways finding it difficult to surpass the freight carrying record of 1920, they can be expected within a few months or years to handle such an increase in tonnage as past experience shows would be only normal in a period of general revival of commerce and industry.

Inadequate Transportation Costs Farmers $400,000,000

Who can measure the losses which may be sustained by the country's people if the railways prove unable to increase anywhere near as much as they have in past periods the amount of freight handled? Mr. Julius H. Barnes, president of the Chamber of Commerce of the United States, was head of the government's grain corporation during the war, and has been in the grain exporting business for 30 years. In a recent address Mr. Barnes showed how inadequacy of transportation has so restricted the flow of grain from our farms to Europe that, in his opinion as an expert, the difference between the prices of grain on our farms and in foreign markets average 10 cents a bushel more than it would if transportation conditions in this country enabled the grain to flow normally to market. He estimated that if similar transportation conditions continued throughout the crop year the loss due to them suffered by farmers on grain alone would be $400,000,000. He attributed the inadequacy of transportation to "an over-rigid system of government regulation over our railroads, which has extended over ten or twelve years." Apply similar reasoning to all the rest of the industry of the country, and you will get some idea as to why Secretary Hoover recently estimated that every period of shortage of transportation costs the country at least a billion dollars.

Why are we suffering from this shortage of transportation at the very beginning of a business revival? The correct answer must be given to this question, and the public must be convinced that it is correct. Without an informed public opinion the situation cannot be remedied.

The situation is partly due to the coal strike and the shop employees' strike. The long coal strike has imposed upon the railways a demand for the movement during the fall and winter months of a vast tonnage of coal which should have been moved in the spring and summer. The shop employees' strike has delayed repairs to a large amount of equipment which was in bad order when it began and which would have been made ready for service if the strike had not occurred.

Development of Industry Continues— Railroad Development Lags

But it would be a serious mistake to assume that these strikes have caused the present shortage of transportation and that it will disappear when their effects have been removed. The causes of the present shortage of transportation and the still greater shortage there is reason for fearing go much deeper and farther back. During the last 15 years the production and commerce of the country, in spite of occasional reverses, have grown as rapidly in proportion as in previous years. The increases in the freight offered the railways conclusively prove this. But during this time the development of the facilities of the railways has steadily and rapidly declined. The time has come at last when not only has the surplus capacity of the railways been exhausted, but when their development has fallen far behind that of other industries. These are the real causes of the present situation.

Decline in Tractive Power Increase 60 Per Cent, Car Capacity 85 Per Cent

In the 5 years ending with June 30, 1907, the number of locomotives in service on the railways of the United States increased 18,160. The end of this period coincided with the beginning of the period of restrictive regulation. Compare this with the increases that have occurred since then. In the 5 years ending with June 30, 1912, the increase in the number of locomotives in service was only 8,447; in the 4½ years ending with December 31, 1916, it was only 4,558; and in the 5 years ending with 1921 the number of locomotives in service actually *decreased* 664. The locomotives retired were constantly being replaced with more powerful engines, and the increase in the total tractive power, or total pulling capacity of the locomotives in service in the first 5 years of this period was 640 million pounds. In the next 5 years it was only 338 million pounds; in the next 4½ years 367 million pounds; and in the 5 years ended with 1921 only 262 million pounds.

Now, take freight cars. In the 5 years ending with June 30, 1907, the number in service increased over 480,000. In the next 5 years it increased less than 230,000; in the 4½ years ended December 31, 1916, it increased only 114,000; and in the 5 years ended with 1921 the number of freight cars in service actually *declined* 13,521. The cars retired were constantly replaced with cars of larger capacity, and the increases in the total capacity of the freight cars in service were as follows: 5 years ended with 1907, 23 million tons; 5 years ended with 1921, 16 million tons; 4½ years ended with 1916, 12 million tons; 5 years ended with 1921, 3½ million tons.

Comparison of the figures for the two 5-year periods farthest apart show that the increase in the total tractive power of locomotives was almost 60 per cent less, and the increase in the total capacity of freight cars 85 per cent less in the 5 years ended with 1921 than in the 5 years ended with 1907. Probably these statistics afford as good a measure as could be given of the decline in the expansion of the railways which has occurred.

Decline in Increase of Other Facilities

The decline in the amount and capacity of the equipment provided has been accompanied by a corresponding decline in other facilities provided. Construction of new lines, which formerly averaged about 5,000 miles a year, has dwindled until during the last 5 years more mileage has been abandoned than built. The enlargement of terminals, the construction of second and other additional main tracks, the improvement of stations, have been for years coming nearer and nearer to a standstill.

The fact that a decline in the expansion of the railroads has been occurring has been frequently stated and is generally known. I have given these statistics not so much to show there has been a decline as to make clear how much greater it has been than most people realize.

Railways Can Increase Facilities if Capital Is Forthcoming

It should be evident to every well informed person that the country must have a revival of the expansion of its means of transportation, or its production, commerce, wealth and the well being of its people will never be able to increase again as in the past. Some advocate the development of other means of transportation, such as inland waterways, upon the theory that needed transportation can be obtained more economically by other means than by railroad development, or that adequate development of the railroads has become impossible. In my opinion, it is easily demonstrable that the additional transportation needed can be secured more economically by increasing the capacity of the railways

than in any other way. Furthermore I say merely what every experienced railway officer will endorse when I add that if a reasonable amount of new capital can be raised by them the capacity of our railroads can be increased just as easily and rapidly in future as it formerly was.

The Cause of the Present Situation

What is it that has caused this great and menacing decline in railroad development? What must be done to revive their expansion? From time to time it is suggested that regulation should be abolished and the managements of the railroads given the same freedom of action as those of other concerns. I believe the railroads, because of their character and fundamental importance to all other business, should be operated under the supervision of agencies controlled by the public. But while I am a firm believer in the principle of regulation, I also believe that government regulation as it has been practiced for 15 years is almost wholly responsible for the decline of railroad development and for the existing shortage of transportation. For 10 years before the war, regulation kept down the rates and reduced the net return of the railroads, although wages, prices and the returns earned in other lines of business were increasing. The policy of regulation was dictated chiefly by those who charged that the railways were enormously over-capitalized and who argued that because they render an essential public service the net return they are allowed to earn should be especially restricted. Persons who had money to invest more and more avoided the railroads. The market value of their securities declined, and with it the capital they could raise to expand their facilities. After the country entered the war they were unable satisfactorily to meet the demands. When the government after operating them 2 years returned them to their owners, without having substantially enlarged their facilities, their expenses had been increased so much more than their rates and earnings that they were incurring a large deficit, and the prices of their securities had sunk to new low levels.

Congress provided in the Transportation Act that the Interstate Commerce Commission should have authority to set aside rates made by state authorities which were discriminatory against interstate commerce or unreasonably unremunerative; that it should make a tentative valuation of the railroads and so fix the rates on this valuation as to enable the carriers, under economical and efficient management, to provide adequate transportation; and that for two years it should take 5½ per cent upon the valuation as its measure of a fair return and might in its discretion allow ½ of 1 per cent more to be earned.

The Commission in 1920 granted advances in rates which it believed would be sufficient to cover the increases in operating expenses which had occurred and to enable the railways to earn a return of 6 per cent upon the tentative valuation of $18,900,000,000 made by it. But the country was just entering a period of business recession and depression. Railway traffic declined to the lowest level since 1915. In spite of the most drastic retrenchments, instead of 6 per cent the railways earned and received in 1921 only 3⅓ per cent—an amount barely equal to their fixed charges. Although a large part of the railways were threatened with bankruptcy, there was raised throughout the country a demand for a general reduction of freight rates. Farmers, business men, politicians, all joined in it. Reductions of rates being manifestly impossible without reductions of wages, and the cost of living and wages in other industries having declined, the railways applied to the Railroad Labor Board for general reductions of wages.

Reductions of rates were advocated on the ground that they were essential to a revival of general business. Without now arguing the question whether they were desirable or not, it is notable that general business began to revive before any reductions of rates were made. Within the last 6 months the freight business handled by the railways has increased 30 per cent, and the net return earned by the carriers as a whole this year has been somewhat larger than last year, having averaged 4 per cent upon their valuation. Owing to this, to the relatively large advance which has occurred in the market prices of railway securities and to the prospective demands of a still heavier traffic, the railways thus far this year have ordered more cars and locomotives and begun more improvements of other kinds to enable them to handle more business than they have for several years. To the middle of October orders for locomotives this year has totaled 1,792, for freight cars 122,053 and for passenger cars 1,467.

Adequate Revenues the Only Solution of Railroad Problem

Clearly it is essential to the welfare of the country that the railways should as rapidly as practicable put their existing facilities in good condition, and that they should for some years rapidly improve and expand their properties. What is necessary to insure that this will be done? Those charged with the responsibility of managing railways can make but one answer. The one thing, and the only thing, which ever will enable and cause the railways to carry out a sufficient program of expansion will be to let them earn sufficient net return to raise the new capital required for that purpose. The question is not what interest and dividends railways *ought* to pay. It is what they *must* pay to get capital.

The Interstate Commerce Commission having, after 2 years more of investigation, again held reasonable the valuation placed by it upon the railways in 1920, has held it would be fair and in the public interest for them to earn in future an average annual net return of 5¾ per cent on this valuation. In view of past experience in the railroad business and of present economic conditions it is impossible to comprehend how any reasoning mind could conclude that the earning power by the railways of any smaller average return than 5¾ per cent over a period of years would enable them to raise the large amounts of new capital which, in the interest of the entire producing, commercial and consuming public, they should raise and invest.

It is a fact, however, which we must not minimize or disregard that a strong and widespread propaganda is being carried on to secure legislation to reduce the net return of the railways to a much lower basis than that which the Commission has held reasonable. It has been proposed in bills introduced in Congress to restore to the states the same authority to regulate rates that they had before the Transportation Act was passed. This would remand the railways again to the rule of 49 masters. It would result in the states again making state rates lower than the corresponding interstate rates. It would destroy the ability of the Interstate Commerce Commission to so regulate rates as to enable the railways to earn net returns adequate to attract a sufficient amount of new capital.

In addition, the valuation made by the Interstate Commerce Commission is being attacked by certain labor and political leaders on the ground that it is from $5,000,000,000 to $7,000,000,000 too large.

The passage of the Valuation Act under whose provisions the Interstate Commerce Commission collected and compiled the information upon which the valuation was based, was secured 9 years ago chiefly by men who claimed that the railways as a whole were grossly over-capitalized. Basing its estimate mainly upon the wages and prices of materials which prevailed in 1914 the Commission, after 8 years' work in carrying out the valuation law, has found that the value of the railways as a whole, while less than the investment shown by their books, is more than $2,000,000,000 greater

than the amount of their securities actually outstanding in the hands of the public.

Attacks on Rate Making Provisions of Transportation Act

It would be unwise to ignore the fact that many people, especially railway employees, and farmers in the middle west who are suffering from adverse conditions, are believing and being influenced by propaganda against the railways. Its avowed purpose is to bring about changes in federal regulation by which the valuation would be scaled down billions of dollars and the net return of the railways correspondingly restricted. The attack is directed chiefly against the rate-making provisions of the Esch-Cummins Act. The most important of these provisions now in effect is that which directs the Interstate Commerce Commission in fixing rates to consider the need of the country for adequate transportation. Therefore, the principal thing Congress would do by repealing the rate-making provisions would be to say in effect to the Commission that it should not in future consider the need of the country for adequate transportation.

The principal lesson taught by the outlaw switchmen's strike two years ago and the recent shopmen's strike seem plain enough. Both, after doing much harm, proved failures. They plainly indicate that, having established an impartial tribunal to pass on labor controversies, the public will always be so strongly against railway employees who strike that most strikes will in future be foredoomed to failure from the start. The public and the railroads long since decided it would be best for all concerned for differences between the railways and their employees which could not be settled by direct negotiations to be settled by arbitration. Labor leaders have been hostile to arbitration. There are indications, however, that railway labor leaders who are not infected with radical hostility to the entire present industrial and social system, but who are simply striving to promote the best interests of members of their unions under the present industrial system, are losing confidence in strikes, and especially in strikes on a huge scale, as means for promoting the welfare of labor.

With respect to the valuation law and the rate-making provisions of the Transportation Act, there seems real danger that they will be changed for the worse unless the public can be given a better understanding of the railroad situation, and of what must be done to improve it if it is not to be allowed to restrict the growth of production and commerce until it brings a great disaster upon the nation. That disaster must be avoided; and therefore adoption of the policy that would cause it must be prevented.

Duty of Executives to Educate Employees and Public

In concluding my remarks I wish to emphasize as strongly as I can the duty that those responsible for the management of the railroads owe to their security owners and to the nation to make much greater efforts than they ever have to give railway employees and the public a better understanding of railroad management, of the railroad situation and of the railroad problem. Most of the troubles of mankind are due to lack of understanding or to misunderstanding. A very large majority of the employees of the railways are good citizens who do their duty as they see it, and who desire to contribute their share toward their country's progress and prosperity. I have an abiding faith, based upon long experience as a railway officer, that if the managements of the railroads will not only treat the employees fairly, but will also get to them the facts about the railroad business which they are entitled to know, and appeal to and rely upon their intelligence and good sense, a large majority of railway employees will respond in what they say and do in the same spirit.

I have, besides, an abiding faith in the fairness and good sense of the American public. We should never have had the unfair and harmful policy of regulation we have had for fifteen years if there had not been abuses in the railroad business which the managements themselves ought to have corrected. Furthermore, we should not have seen this policy persisted in year after year if the railroad managements had not failed to use legitimate means which were available for presenting to the public the simple facts which demonstrate that, in spite of some abuses, the railways of this country have been as honestly, as economically and as public spiritedly developed and managed as any large industry.

The duty—the selfish duty, if you please—of helping create an intelligent public sentiment regarding regulation of railroads rests upon our agricultural leaders, our business leaders, our public men and our newspapers as much as upon railway managers; and all will suffer in the disaster that will result if such a public sentiment is not created.

Mr. Emery's Address

If it is no longer necessary for a railway business man like John Stevens to convince a Livingstone that a locomotive may operate upon a track with the speed and safety of a canal boat, or persuade a complacent turnpike company that it is feasible to substitute steam for a Conestoga wagon, you are still confronted with conceptions of public railway control that fit only "the Toonerville trolley that meets all the trains." I view with apprehension that misguided belief that would divide the control of national transportation among 48 principalities or fatuously insists that we may starve our distributive service and insure its growth. The lessening consuming power of the transportation giant already reacts upon a thousand activities that fed its diminished appetite. If economic necessity drives from its exclusive service the great specialists who have ministered to its needs and multiplied its powers, it is the American people who will suffer.

From the shipper's viewpoint, what problem is more vital than an effective means to prevent the continually threatened interruption of interstate commerce through disputes between carriers and their employees? Within 35 years, four notable legislative experiments are represented in the Acts of 1888, 1898, 1913, and the Labor Board provisions of 1920. Standing in the shadow of the most serious effort to paralyze transportation since 1894, may we not inquire whether the nature and operation of the present method indicates that its theory and practical administration are best calculated to secure the object sought?

Two things are prerequisities of any plan. The one, an enlarged acceptance of social responsibility so indispensable to the security of our interdependent social life; the other, a resolute and effective enforcement of existing law against any and every combination that crosses the deadline of public safety.

Approaching the present plan, I criticise neither the personnel of the Labor Board nor its administration. I am concerned with a far more fundamental aspect of the matter, the principle of operation and the tendencies it is plainly developing. What is it that is sought? A practical means of protecting the paramount public interest in uninterrupted transportation, efficiently performed at reasonable rates. The method employed is arbitration through representative groups, compelling inquiry and delivering an opinion without penalty. This is not adjustment through a commission representing the public exclusively, but arbitration through groups representing the parties at interest in which the public element

is a minority. The Board is unrelated to the Interstate Commerce Commission. The primary determination of income and outgo is therefore the separated function of unrelated public bodies. The price of transportation is necessarily fixed by its cost, but the body fixing the price is not a participant in determining the cost.

These structural defects may be cured by amendment if it is practicable to establish a liaison between the Labor Board and the Commission. But a still graver difficulty lies in the nature of the plan and will become more aggravated with its continuing operation. The public is not concerned in every difference between management and men incidental to the employment relation, but only such as threaten a substantial interruption of commerce. The present Board, in 2½ years, has received 11,000 disputes, which means that in practical operation it deals not with irreconcilable differences of gravity but becomes a detailed and meticulous supervisor of every circumstance of working conditions, necessarily substituting the judgment of a public body for the discretionary authority of experienced management in contract, individually or collectively, with free men. If this means anything at all, it is practical substitution of government for private control under circumstances that do not make for economic operation. But, furthermore, the establishment of that morale, once the proud boast of every road, demands an intimate relation between management and men in accordance with their mutual agreement. But right employment relations cannot be manufactured by government and imposed from without. The experience of all industry teaches that they are a human growth that springs up only from within.

The issue then is, are we, as a matter of national policy, to permanently approve the meticulous regulation of the relation of railroad managers and employees, or urge government intervention only when their natural disagreements, arising out of their differing conception of private interest and public obligation, threaten the suspension of indispensable service. One method leads to a detailed governmental control characterized by all the essential aspects of ownership. The other gives free play to the origination and establishment of employment relations in accordance with the circumstances of each road as an independent unit of self-interest and transportation production and stops the assertion of group interest only when it approaches the deadline of public safety. It rests upon continuing enforcement by public authority, of public order, under every circumstance and upon every occasion and with all the weapons possessed by government under the long standing, clearly recognized limitations upon combined aggression.

Are we then left to the ultimate of compelled arbitration if the dispute reaches its crisis? Compulsory arbitration is the last resort of social self-defense. Why, therefore, not experiment within safe limits, with the protective sanction of an aroused and informed and therefore invincible public opinion? Suppose the President of the United States, whenever in his judgment, a dispute between a carrier and its employees threatens the movement of the mails, the free flow of commerce between the states, or the distribution of supplies essential to the Army and Navy for the national defense, halted the controversy and appointed, for the express purpose, a commission of not to exceed five impartial and qualified persons to investigate the causes and circumstances of the controversy and report their findings to him, to be made by him public. To preserve the subject matter of controversy and insure uninterrupted operation, it may be made unlawful for the parties to the dispute to strike or lockout until a reasonable time after the publication of the report of the President's commission. Thereupon, if the determination to concertedly but peacefully withdraw from the service of the carrier remains, it may be exercised after the taking of a secret ballot, under the supervision of a public officer, by the parties in association.

Ultimate intervention in the public interest may thus be secured under circumstances which, while protecting transportation from obstruction or stoppage, insures an inquiry into any dispute of substantial importance under circumstances which, riveting public attention upon the event, assure for the commission's finding attentive consideration and the establishment of an informed opinion. The period of delay intervening for permitted action assures a deliberate exercise of judgment under circumstances which excite the recognition of a condition demanding correction or the public condemnation of the withdrawal in terms so certain that it cannot endure.

I. C. C. Declines To Take Charge of Car Distribution

WASHINGTON, D. C.

THE Interstate Commerce Commission has declined formally to take charge of car distribution under Paragraph 15 of Section 1 of the Interstate Commerce Law, as it was requested to do by the Washington Department of Public Works and others who have presented demands of the shippers of the Northwest for an increased car supply, on the ground that the commission deems such a step unwise and prefers, under the circumstances, to work in co-operation with the Car Service Division of the American Railway Association. The Car Service Division has recently taken steps to relieve the situation in the Northwest by issuing orders for the return by the eastern roads of cars of western line ownership, but in spite of this fact the commission has been urged, particularly by O. O. Calderhead, traffic expert of the Washington commission, and also by Senator Poindexter, to exert its emergency powers. On November 3 the Washington commission advised Mr. Calderhead, who has been in Washington in connection with the matter for several weeks, in effect to demand that the commission take direct charge. This was followed by a message to the commission on the subject from Senator Poindexter, to which the commission replied as follows:

"The commission deems it unwise formally to take charge of cars under sub-section 15. The effect might be to relieve carriers from responsibility and the commission is without the elaborate organization necessary to handle the subject in detail, and the time required to build up such an organization renders it practically impossible. The fact of the matter is there are not enough cars and motive power to go around and it is physically impossible wholly to relieve the situation. The directions of the Car Service Division of the American Railway Association are made after the fullest conferences with our representatives and we have the personal assurances of the executives of the affected carriers that orders will be observed. In fact our check shows car distribution is being made so far and fast as physical conditions permit. The demand made on carriers now is the greatest in history at this time of the year, with motive power only two-thirds in service as a result of the strikes."

The Car Service Division reports that the orders issued October 25 have been made effective on all lines and that the movement of empty western route cars to home lines is well under way. Although reports were not yet available from all lines, such as have been received indicate substantial progress in this direction. For instance, up to and including October 30, three New England lines delivered 371 western cars to connections for home, while six of the smaller lines east of Chicago report delivering 598. Two Kansas City lines report delivering 512 while six western lines delivered 1,618. In addition to the above an informal report from one of the larger eastern lines says that up to

the evening of the first it expected to have completed delivery at western junctions of 400 cars with approximately 200 more en route to be delivered within 48 hours.

Western lines have also received orders to expedite the return of cars belonging to eastern lines, by eliminating their use in local service and by loading either to home lines or terminal markets where there will be eastern loading to take the cars home.

The above orders have received rather wide publicity and the reaction to it has been very favorable in all sections of the country and at Washington. The entire movement is being closely watched by the Car Service Division with the view of obtaining the maximum performance.

Reports show an excessive number of open tops in New England, Michigan and the Northwest, and the Car Service Division is actively after the return of these cars. The heavy loading of coal is taking the cars into this territory in abnormal amounts.

Division Five of the Interstate Commerce Commission has approved the recommendation of the Federal Fuel Administrator that the use of open top cars be permitted for loading coke when consigned to public utilities or for domestic use.

P. J. Coleman, formerly assistant general superintendent of transportation of the Northern Pacific, has been appointed district manager of the Car Service Division of the American Railway Association with headquarters at Minneapolis, Minn. Mr. Coleman will have the authority of the Car Service Division in the territory to which he is assigned, which includes the terminals at St. Paul and Minneapolis, states of Minnesota, North and South Dakota, northern part of Wisconsin, and the state of Montana east of the Rocky Mountains.

Valuation Questions Argued Before I. C. C.

WASHINGTON, D. C.

THE Interstate Commerce Commission devoted three days last week, November 1, 2 and 3, to hearing oral argument on questions as to various fundamental principles of its valuation work raised by the protests of the carriers to the tentative valuations served by the Bureau of Valuation in approximately a dozen cases. One of the chief points discussed was involved in the insistence of the carriers that the commission state the methods or process by which it arrives at the figures stated as representing the "final value" and particularly as to whether it should state only a value for rate making purposes or a figure which would represent the commercial value. Counsel for the railroads urged a valuation representing the latter type, while representatives of the bureau of valuation and of the state commissions urged the use of a "rate base" as representing the principal purpose of the valuation work, although some of them also expressed the opinion that the commission should state what considerations it had given weight to and what kind of a value it means in stating the final value. In the tentative valuations the question is avoided and the figure given is stated to represent value in accordance with the meaning of that term as used in the interstate commerce act. Several of the commissioners dissented from the opinion in the Evansville & Indianapolis case because it contained no analysis of the method by which the final value was arrived at.

W. G. Brantley, speaking for the Winston-Salem Southbound, asked of what avail it is when the commission has said that the value is so much and the company says it is so much more, if nothing is known as to the process by which the commission arrived at its conclusion. Leslie Craven, representing the railroad valuation committee, said that the greatest danger is that there will be no exact definition of what the commission has done, that these points have been argued before the commission for years and no decision has been reached yet on one of the greatest economic problems before the country. The railroad lawyers took the position that the question of the value of a railroad property is a judicial and not an administrative one and that without a statement of the methods, which they said the act contemplated, the results published by the commission would be of little value. P. J. Farrell, chief counsel of the commission, although he opposed the railroads on other points, said that the time has come when the commission must say what it is doing and that if it is going to make no distinction between value for rate-making purposes and commercial value it will create a valuation that can't be used for any purpose. Mr. Brantley also pointed out that even if the valuation act when passed had contemplated a valuation for rate-making purposes the transportation act provided for several additional uses for the valuation. He also asked where is the constitutional protection if the commission has centered in it the two powers of making rates as its judgment dictates and determining values in the same way. If this is so, he said, the carriers are remitted for a remedy "back to politics, back to efforts, if you please, to bring about the appointment of a new commission, and things of that kind."

Edgar E. Clark, former chairman of the commission, appeared for the Tonopah & Tidewater and expressed views in general similar to those of Mr. Brantley regarding the finding of a single sum value.

J. M. Souby said that the bureau is proceeding in a circle in contending that there is a value for rate purposes lower than the commercial value of the same property, because, if so, the other value would be reduced. He argued that cost cannot be made the basis of a reasonable rate for the conveyance of passengers or freight.

While several roads have taken the position that their earning power should be treated as at least an important element of value, some of the roads represented at the hearing that have had frequent deficits took the position that their potential earning power should be considered or that they were at least entitled to the cost of reproduction of their property. Mr. Brantley said that if a road had earning power it should be given weight, but that at least its physical value should be considered.

Attorney Matthews of the Western Pacific said that in a valuation for rate making purposes an argument based on earning power begs the question and that to take a new and undeveloped carrier and assume that its immediate earning power is a measure of its ultimate earning power would do it great injustice. He contended that the cost of reproduction is the essential criterion and he pointed out that the commission would not fix rates in relation to the valuation of the Western Pacific except as its valuation entered into the valuation of the roads as a whole used as the base for figuring a 5¾ per cent return. The purpose of the valuation, he said, is to afford a check on rate making, not an absolute basis for it.

In reply to this type of argument, Mr. Farrell said that when a railroad has a low earning power its valuation is not cut down on the basis of the earning power but on the ground of improvident investment.

Walker D. Hines, formerly director general of railroads, appeared on behalf of the Western Union Telegraph Company in opposition to the inclusion in the railroad inventory of contributions made by the telegraph company to the property of the railroad along its right of way.

Arguments were also presented by Sanford Robinson, for the valuation committee, C. W. Needham, P. J. Doherty and H. H. Hartman for the bureau of valuation and John E. Benton, general solicitor of the National Association of Railway and Utilities Commissioners.

Latest type of dining car for the Pennsylvania System

Pennsylvania System Dining Cars Built at Altoona

Attractive Interior Finish, Kitchen Equipment, and Cast-Steel Truck Side Frames Features of Design

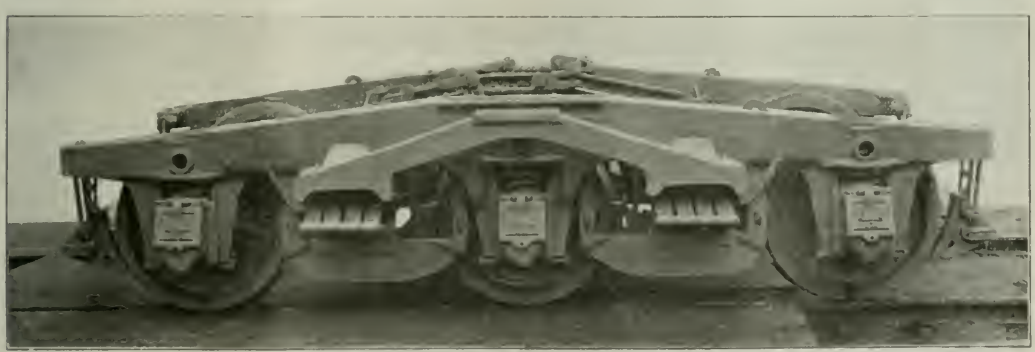
TWENTY NEW STEEL dining cars for the Pennsylvania System have just been completed in the car shops at the company's Altoona works. Structurally, these cars are the same as others now in service, having a strong built-up center sill with a cross-sectional area of 50 sq. in., and four cantilevers, two attached to each side of the center sills, spaced 18 ft. 9 in. from the transverse center line of the car, supporting the superstructure. No bolsters are used in this construction.

The sides below the window sills are designed to act as trusses and transfer the load to the cantilever supports, which in turn carry it to the center sill. The side posts, of the cantilever type, are made of ⅛-in. pressed steel and extend from the bottom of the side to the deck plate, the lower onals between corner and door posts. Standard diaphragms are attached to the I-beams.

The general dimensions are as follows:

Length over buffers	82 ft. 3⅛ in.
Distance between centers of trucks	56 ft. 3 in.
Distance between centers of cross cars	37 ft. 6 in.
Width over sides	9 ft. 10⅛ in.
Width over roof	9 ft. 11½ in.
Width over upper deck	7 ft. 7 in.
Height from rail to center line of coupler	34½ in.
Height from rail to top of platform	50 in.
Height from rail to car floor	52 in.
Height from rail to eaves lower deck	11 ft. 2⅝ in.
Height from rail to eaves, upper deck	13 ft. 3½ in.
Height from rail to top of roof	14 ft. ½ in.
Seating capacity	36 persons
Weight when fully equipped with ice, coal, water and supplies	160,000 lb.

The air brake is the Westinghouse type UC-1812, without



Cast Steel Side Frames Reduce the Weight of the Truck and Decrease the Number of Parts

deck roof sheets, 1/16 in. thick, being riveted directly to the posts. The deck plate is ⅛ in. thick and the upper deck roof sheets are 3/32 in. thick. The roof sheet joints are welded.

Vestibules have been omitted since passengers enter the dining cars only from adjoining cars. End protection against collapse is of the same strong construction used in all Pennsylvania System steel passenger equipment cars, which for non-vestibule cars consists of one 12-in. I-beam on each side of the doorway and two Z-bars, one 4 in. by 8.2 lb. and one 3 in. by 6.7 lb., at each corner, with pressed steel diagthe electro-pneumatic attachments, although this feature can be readily applied as the wiring has been installed.

The cars are heated with vapor, having a thermostatic control and may also be operated manually, the thermostat being located at the center of the car between windows.

The lighting effect is very satisfactory, semi-indirect lights being used, one over each pair of tables. Each fixture contains a 100-watt lamp, which makes a very efficient light. Between each pair of lamps is an electric fan with an air deflector or distributor, which produces a movement of air at intervals of about 20 times per minute. This feature of in-

termittent breeze eliminates the steady gust of air common to many types of electric fans.

The draft gear is of the Westinghouse type N-11 with attachments for cheek castings at least 25 per cent stronger than the A. R. A. requirements for freight cars. The tail yoke is cast steel with quadruple shear attachment to stem, which has the latest A. R. A. type D head.

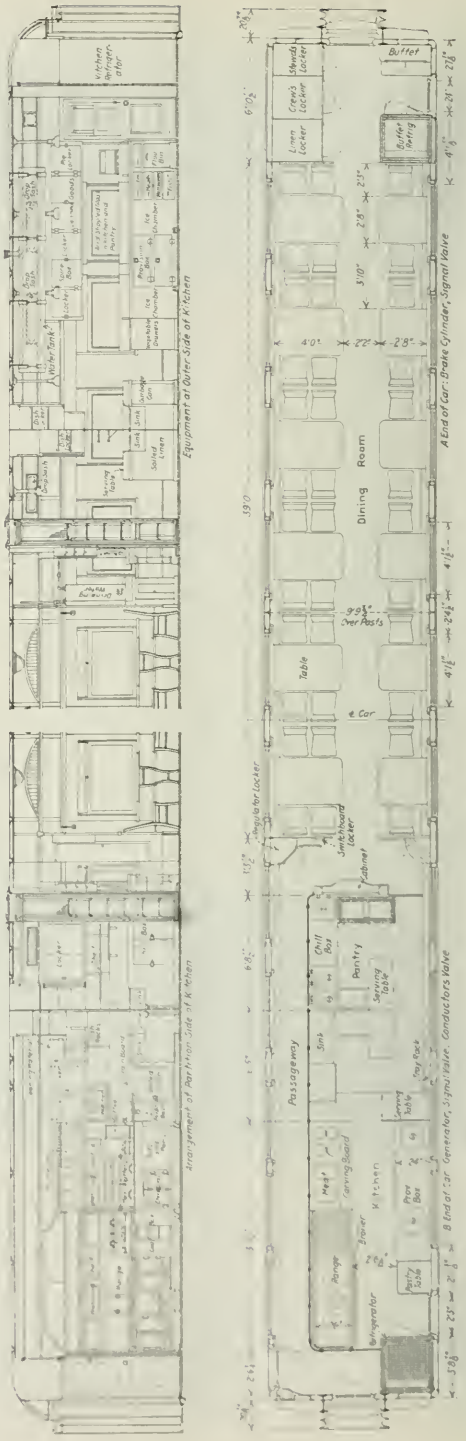
The trucks are of the six-wheel clasp brake type and have a wheel-base of 11 ft. 0 in. The axles are of the special Pennsylvania System type with 5½-in. by 11-in. journals, and the wheels are rolled steel, 36 in. in diameter. The general scheme of the trucks is the same as used on all former Pennsylvania System cars, the bolster being of riveted plate construction, which has been exceedingly satisfactory on previous cars. It was designed to flex readily in a horizontal plane, but is rigid against transverse and longitudinal strains.

The bolster is supported on sets of quadruple elliptic

The Interior Is Finished in Olive Green

springs, one set under each end of each spring beam. The equalizers supporting the elliptic springs have one end hung from the truck frame, the other being attached to an inverted U-shaped equalizer and hanger combined, which rests on the helical spring located over the center journal box. The helical springs are supported directly on the journal boxes which in turn are guided as usual in pedestals. It will be noted that this arrangement results in having the least possible non-spring-supported weight and, therefore, the least possible kinetic effect on rails. The principal feature which differs from the old trucks is the side frame.

The older trucks had side frames built up of channels, cast steel pedestals, spacing pieces, cross-braces, etc. In the new truck all of these parts are combined into two cast steel frames, one on each side, connected flexibly by only two 2-in. transverse rods, located respectively between the center and each end axle. Each frame can, therefore, readily adjust itself, independently of the other frame, to meet track irregularities. Also, since the bolster is flexible in a horizontal plane, it in turn can adjust itself to the various positions taken by the side frames and, being rigid longitudinally,



Plan of Pennsylvania Diner and Elevations, Showing Kitchen Arrangement

holds the side frames in correct transverse alinement. The cast-steel side frames were designed to be interchangeable with the old built-up side frames so that when repairs are necessary to old trucks the cast-steel frames, which weigh less than the built-up frames, can be substituted. The total weight of each truck is 23,000 lb.

The interior of these dining cars is arranged so that there is a large dining room, seating 56 persons. They are finished in plain mission style of architecture, the walls being painted a medium shade of olive green with striping of a darker shade of green edged with gold. The ceiling is cream color striped with dark green. The carpet and curtains are of a green shade. The color of the side walls is unique and has been the subject of many complimentary remarks from passengers.

At one end of the dining room are located the linen lockers, crew's lockers and steward's lockers, while on the opposite side of the passage-way is a large refrigerator with a humidor used by the steward for mineral waters, etc. There is also at this end of the car a buffet for the use of the steward.

At the other end of the dining room the pantry and kitchen are located. These are arranged especially for quick service, the kitchen and pantry being in one without a partition between them as is usually the case; this permits the waiters to enter the kitchen and allows more freedom for the men.

The kitchen and pantry have a number of special features, such as a water filter for filtering all water used on the tables, and separate coolers for milk, cheese, butter, meats and fish.

Hearing on Disposition of Central Pacific

WASHINGTON, D. C.

ORAL ARGUMENTS were held by the Interstate Commerce Commission at Washington on November 4 on the petition filed by the Union Pacific asking the commission to dismiss for want of jurisdiction the application of the Southern Pacific, which had been set for hearing on November 21, for authority to retain control of the Central Pacific by stock ownership and by lease pending the completion of the commission's plan of consolidation. In a general way, counsel for the Union Pacific based their arguments on the contention that the jurisdiction of the case is with the United States court for the district of Utah, which was directed by the Supreme Court to prepare a decree for the separation of the Central Pacific and the Southern Pacific and that the Supreme Court has decided that control by the Southern Pacific is contrary to public interest. On the other hand, the contention of the Southern Pacific was that the court had not attempted to deal with the situation created by the transportation act because it lies within the administrative functions of the Interstate Commerce Commission, and that the commission, therefore, has jurisdiction over its application and should certainly allow a hearing on it. The Union Pacific's argument was presented by H. A. Scandrett, commerce counsel; N. H. Loomis, general solicitor; C. C. Dorsey, general attorney, and Edgar E. Clark, formerly chairman of the Interstate Commerce Commission, while the Southern Pacific was represented by Fred H. Wood, commerce counsel; J. P. Blair, general counsel, and Max Thelen, who was formerly chairman of the California Railroad Commission.

Mr. Scandrett began the argument for the Union Pacific by reading from the Supreme Court decision, which held that the Central Pacific and the Southern Pacific were competing lines and directed the lower court to prepare a decree severing the control by the Southern Pacific. Commissioner Potter asked if it was his claim that the commission may not ultimately award the Central Pacific to the Southern Pacific in a consolidation plan. Mr. Scandrett said that it was not necessary to argue that point now, although, in his opinion, the commission may not do so, as the Supreme Court has held that the control by the Southern Pacific is contrary to the public interest. Commissioner Meyer asked if the commission might not at least hear the application of the Southern Pacific, to which Mr. Scandrett replied that if it appears that the commission would have no authority in law to grant the application time would be wasted in holding a hearing. He said the commission is asked to exercise an extraordinary power—to nullify a decree of the Supreme Court. If that power is conferred by the law it must be done only in express terms. Unless the commission can say at this time that the inclusion of the Central Pacific in the Southern Pacific system will be in accord with its final consolidation plan, he said, it cannot entertain the application now. In reply to a question as to whether the commission could not afford the temporary relief asked by the Southern Pacific, Mr. Scandrett said that the relief asked is not temporary and that the commission cannot say what will be the best plan of consolidation until it reviews the entire field. Commissioner Hall pointed out that the court acted under the Sherman law, while the commission is to act under the new law. Mr. Scandrett said the court was presumed to know of the transportation act and, in fact, the consolidation provisions were called to its attention in argument, so that if it had wanted to it could have referred to the situation created by the new law in its decision. Mr. Scandrett contended that the control proposed by the Southern Pacific is in effect a consolidation, although authority to approve a consolidation in advance of the final plan is expressly withheld from the commission in paragraph 2 of section 5. The roads are now consolidated into a single system for ownership and operation and only the further step of conveying the property to the Southern Pacific could make the consolidation more complete. The Southern Pacific, he said, is asking the commission to perpetuate a control which the Supreme Court has said now constitutes a practical identity of the properties.

When Commissioner Potter asked if the Supreme Court has foreclosed the question of the public interest, Mr. Scandrett said that the jurisdiction of the district court is exclusive until the decree is carried into effect and it is the duty of the district court in preparing a decree to make arrangements for joint use of terminal properties, etc., which would require a long time. Unless the commission finds that the Central Pacific should be included in the Southern Pacific system, the court proceedings must go on. When Commissioner Hall asked what effect an order of the commission could have on the court, Mr. Scandrett said that he was not in the confidence of the Southern Pacific, but he guessed it would show the order to the court and ask it to stay its hand. He argued, however, that until the court proceeding has reached a finality, the commission should not interfere with the subject matter; otherwise there would be an unseemly conflict of jurisdiction resulting from a court order directing a separation and an order of the commission allowing control by the Southern Pacific. Commissioner Meyer asked how the commission can find what is in the public interest until it hears the evidence. Mr. Scandrett replied that that is *res adjudicata*. Even if the Supreme Court decision is not conclusive, Mr. Scandrett said, it precludes a finding of the commission in advance of its final consolidation plan that such a consolidation would be in the public interest and until there is a separation in accordance with the decree there is no way in which the Central Pacific can have a voice in the matter because its directors are selected by the Southern Pacific. When Mr. Scandrett asked if briefs would be allowed to be filed, Mr. Wood, on behalf of the Southern Pacific, entered a vigorous protest, saying that the whole purpose of the Union Pacific was to

cause delay, but the commission ruled that briefs might be filed within seven days.

Mr. Loomis discussed the bearing on the case of the Pacific railroad acts, which contemplated a continuous through line from the Missouri river to the Pacific coast, although the line was built by two separate companies. The law provided, he said, that neither company should discriminate against the other in the handling of through traffic and, therefore, the Union Pacific is barred from building or acquiring a line of its own to San Francisco to handle freight which would otherwise go by the Central Pacific. But, he said, the Central Pacific cannot possibly treat its partner, the Union Pacific, fairly, because it is under the domination of the Southern Pacific. The Pacific railroad acts constitute a three-party contract between the government, Central Pacific and Union Pacific, which cannot be impaired. He did not claim that the Central Pacific should be given to the Union Pacific, but merely that it cannot be given to the Southern Pacific because the Southern Pacific would be "bound to operate it in its own interest."

Mr. Clark said that the consolidation provisions of the transportation act, except the clause relating to the express company, speak for the future and give no power to the commission to approve an existing consolidation. The commission's approval of the Southern Pacific application, he said, would be based only on a tentative finding of the public interest and would involve a breach of comity toward the Supreme Court. Commissioner Aitchison asked if the commission does not have a mandate from Congress to carry out the provisions of the transportation act, to which Mr. Clark replied that the law gave it power only to deal with a control not then in existence. When Commissioner Hall referred to the case in which the Pennsylvania was allowed to lease the Panhandle, Mr. Clark said that different facts and circumstances existed, but Mr. Hall asked how the commission was to get at the facts without a hearing. Mr. Clark also pointed out that the commission has no power to require a consolidation and that the Central Pacific could refuse to consent to any plan of consolidating it with any other company, and under Southern Pacific domination, he said, it could not give any independent assent to any plan. He also made the point that the Southern Pacific is not in lawful possession of the stock which it has voted to assent to control of the road by the Southern Pacific.

Mr. Wood said that counsel for the Union Pacific had presented the kind of arguments that would naturally follow the presentation of evidence on the merits instead of on a motion to dismiss. The sole issue, he said, is the question of public interest, and for the purpose of the present argument the allegations of the Southern Pacific petition as to the harm that would result if the roads were to be separated must be taken as true. He pointed out that motions to intervene on behalf of the Southern Pacific have been filed by the state authorities of Utah and Nevada and by a statewide committee representing commercial organizations of California, all of which say that the granting of the Southern Pacific petition will be in the public interest.

Mr. Wood also contended that the Southern Pacific does not seek the continuation of the existing status. It seeks control of the Central Pacific by a valid lease and a lawful stock ownership, whereas, according to the opinion of the Supreme Court, it has never been in lawful control of the Southern Pacific. As to the effect of the Pacific railroad acts, he said that the unreversed decision of the district court that the provisions of those acts could be carried on by the Southern Pacific as lessee of the Central Pacific, as well as by the Central Pacific itself, stands as the law of this case and that the control of the Southern Pacific is in no way violative of the Pacific railroad acts. The Supreme Court, Mr. Wood said, did not pass on any issue arising under the transportation act, because there was none before it and could not be until the commission exercises its administrative jurisdiction and the court has something to review. The commission and the commission alone is empowered by the act to bring about a relation between railroads in harmony with the new policy of Congress. When Commissioner Potter asked what would happen if the commission should award the Central Pacific to the Union Pacific in a consolidation plan and the Southern Pacific should prevent such a consolidation by asking $500 a share for the stock, Mr. Wood replied in that case the commission could terminate its lease.

The Southern Pacific's belief, he said, is that if the properties are separated the quality of public service will be impaired and harm done both to the public and to the Southern Pacific, but he realizes that the commission should not now authorize a form of control that would be any barrier to the consummation of the commission's final plan. He said the Union Pacific probably hopes that if the commission shall refuse jurisdiction and the district court requires a sale, the Central Pacific will fall into the hands of people who will never sell it back to the Southern Pacific at any price that would be approved by the commission. On the other hand, if the commission should grant the Southern Pacific's petition, the disposition will be in its hands. If the separation were to take place and the commission should subsequently grant authority to the Southern Pacific to acquire the road, it would have to pay much more for it than it would get for it at a forced sale. He also contended that the form of control proposed by the Southern Pacific does not constitute a consolidation any more than other cases where the commission has authorized leasing of roads which are already controlled by stock ownership.

Mr. Blair said that Congress had not attempted to tie the Union Pacific and the Central Pacific together any closer than by the requirement of physical connection and nondiscriminatory treatment. As long as there is a thorough, unhindered transportation route, the public is not concerned with where one road begins and the other ends. He said that the sending of more freight over the Southern Pacific by the El Paso gateway is not a discrimination prohibited by the Pacific railroad acts. When Commissioner Potter referred to the Union Pacific-Southern Pacific dissolution plan which provided for the sale of the Central Pacific to the Union Pacific, Mr. Blair said that that was a plan which the Southern Pacific had had to consent to at a time when "a club was being held over its head in one hand and a bribe was held in the other."

Mr. Thalen denied that the doctrine of comity prevails as between the judicial and legislative branches of the government and said that the commission is a representative of Congress. The case before the commission, he said, does not have a similarity of purpose, subject matter or relief to that before the court because the public will be represented before the commission but not before the court. The only remedy available to the court, he said, is to tear apart; the commission may keep the properties together. If the commission is in doubt, he said, it should decide in such a way that the representatives of the public may have a chance to be heard and he referred to the petitions filed by the state authorities and commercial organizations of California, Nevada and Utah.

H. W. Prickett spoke briefly on behalf of the state of Utah and the chambers of commerce of Salt Lake City and Provo, asking that the commission give an opportunity to be heard on the Southern Pacific's petition, and the concluding argument for the Union Pacific was made by C. C. Dorsey, who said that if the Supreme Court had expected the Interstate Commerce Commission to interfere with the separation it had ordered it would have made some provision for it in its mandate.

Two Points of View on Employees' Relations

Officers and Employees Should Be on More Friendly Basis—The Value of System Athletics

THE *Railway Age* drive on the necessity for improving relations between the managements and the employees has brought many expressions of interest and commendation to the Editor's desk. Two of these, incorporated in this article, are of special interest—both are based on actual experiences and both are thought-provoking and constructive.

The contribution from Ward W. Adair focuses out into clear relief one of the fundamental reasons for the misunderstandings which are the rule rather than the exception on many roads. The mere fact that this condition is allowed to continue to exist is because its very existence is, or has been, largely overlooked; at least its great importance has not been recognized. Mr. Adair, by the way, is a keen student of human nature. He is one of the most successful of the Railroad Y. M. C. A. secretaries and has had special opportunities—as a neutral—for studying the relationships between managements and men on American railroads. Incidentally, he knows how to express himself in writing and make his point clear.

The second contribution—that from Leander H. Poor—is equally striking. Mr. Poor is a student at the Massachusetts Institute of Technology and has spent two summers in the service of the Pennsylvania Railroad. The article was originally written in connection with his college work after his first summer on that road; it was revised this fall on the basis of his more extended experience and observation. While it relates largely to the value of a system athletic program, reading between the lines it goes far deeper into the big and complicated problem of employees' relations on the railroad.

An Incident and a Suggestion

By Ward W. Adair
Executive Secretary, Railroad Branch Young Men's Christian Association of the City of New York

The vice-president of an Eastern railroad sat at his desk wrestling with the great transportation problems that occupied each waking hour, when the clerk laid a letter of introduction on his desk. He read it, then reread it, and pondered. The thing that gave him pause and pain was that an outsider was introducing him to one of his own men.

"Show him in," he said to the clerk.

The man entered and was cordially greeted by his superior officer, who listened patiently and sympathetically to the story of a personal injustice of several years' standing, which had greatly worried the employee, but which in the presence of his kindly disposed superior was straightened out in five minutes. Happy over the outcome, the railroader rose to go, and as he did so, the vice-president held out his hand and bade him goodbye.

Letters of Introduction Not Needed

"And now," said the official, "let me urge upon you that if you ever have another such incident in your life, you will come to me without any letter of introduction. We both belong to the same great railroad family, and you have as free access to me as to any other man in our employ. It makes me feel a little badly to think that one of our own men should go to an outsider to get a letter of introduction to me, and I want our men to feel that no such ceremony as that is necessary. Whenever anything is wrong, feel perfectly free to come to me and we will talk it out together."

This story is not a figment of the imagination, for it actually happened within the past year, and it is highly interpretative of a regrettable situation that has grown up within the last decade. A gradually developing feeling of estrangement between officialdom and the men of the rank and file has been observed and deplored by many thinking people who are at once friends of the railroad companies and of the men who work for them.

To a certain extent, the condition is the result of rapid growth, and it frequently is the penalty that is paid for quick development. In the organization served by the writer, where the membership has grown from 1,500 to 5,000 within a comparatively short time, it is altogether possible that a member might seek a letter of introduction to the executive, for the very reason that the larger family is more unwieldy and more difficult to know than the smaller one. In such an organization as the railroad company, however, the lack of personal acquaintance breeds grave misunderstandings and misapprehension. The "stove pipers" are much given to derogatory conversation. Many of them are accomplished knockers, and it is a well known fact that a knocker needs neither mental capacity nor training in order to become an expert. When a group of this kind get together, and none of them have any personal acquaintance with their superior officers, they are great breeders of dissension and distrust. If they knew some of the men at the top, and knew how thoroughly human the most of them are, such knowledge would greatly temper their conversation, but they draw on their imagination for qualities that really do not exist, and they have no scruples about doing the man an injustice.

Humanize the Railroad

Now, the antidote to this whole situation is in the get-together idea. The human element in railroading is first of all human. Wives and little ones of the section hands are just as dear to them as the wives and little ones of the president and general manager are to them. There should be mutual understanding, mutual sympathy, mutual acquaintance. The humanizing of the whole railroad situation is one of its most crying needs.

A big machine looks terribly heartless at times to the fellows down at the bottom. If they are not careful they will find themselves conjuring up visions of high salaried and unfeeling men who care nothing for their struggles and problems. As a rule, nothing is farther from the truth, but in order to dispel these erroneous ideas, officials should be ready and eager to avail themselves of opportunities to meet their men in social fellowship, man to man.

In the writer's 30 years in a branch of the railroad service that provides a common meeting ground for the men and the officials, he has had a varied experience. Certain railroad officials stand out in memory as those who always had "a previous engagement" when an opportunity was given them for an evening with their men. Certain others, and these I am thankful to say have been in the majority, have shown an appreciation of such opportunities, and have cancelled engagements, and inconvenienced themselves in order that they might seize upon opportunities to further friendly acquaintance with the employees. The vice-president above cited is a conspicuous and refreshing example of this latter class, although even he was in danger of being misunderstood by one of his own men.

It was my lot to listen not long ago to an address on the

subject, "The Human Element in Railroading." The speaker had not talked five minutes before it was patent to any thinking man that he had overlooked the pivotal fact that the human element in railroading is, first of all, intensely human. It is the appreciation of that fact that will engender good feeling on the railroad, and it is the ignoring of it that will work infinite and irreparable harm. The employees of any railroad should be one big, happy family, with plenty of "family reunions," where everybody would get to know everybody else in a great human way. We are constantly progressing toward it, and only the slow of heart lag behind the procession.

Place of Athletics on the Railroad

By Leander H. Poor

"What's all the shootin' for?" With these words the stable man in George Cohan's stage success "The Tavern" introduced himself. "What's all the shootin' for?" seems to neatly express the public's attitude in our ever recurring industrial disputes. The "shootin'" is all because the two factions, labor and capital, cannot agree. That much is evident. But why can't they agree? Each side mistrusts the other. Neither party wishes to retrench. Such has been the general attitude in the past. But today, industries, individually, are awaking to the fact that both capital and labor are indispensable to successful operation. And coincident with this awakening comes the further realization that a closer co-operation between these two necessary factors will net both of them greater returns. But that this principle has been successfully applied to one of the largest railroad systems in the country may come as a surprise. Indeed, taking the public at large, the much too general impression of a railroad is a complex organization which conveys one at its convenience from starting point to destination. The conductor who takes one's commutation ticket is carelessly looked on as being scarcely more human than the machine which gurglingly swallows nickels and dimes in the subway; the engineer and fireman, as only necessary adjuncts to that complicated, wheezing giant out front, which somehow gets one home at night; the shopman, as a bolshevist in disguise, and the official as the cartooned plutocrat, who sits back in a plush chair and snarls at his cringing subordinates. But the realization, by railroad officials and the public, as well, that the railroad organization is made up of individuals every bit as interested as the rest of us is coming.

Railroad Organization Made Up of Individuals

The officials of the Pennsylvania System have long since come to this realization. The results from it were brought home to me today as I watched the Eastern Pennsylvania Division elimination contests in track, field and swimming events, as well as in tennis, trapshooting, quoits, tug-of-war, golf and baseball. In a most beautiful setting in the mountains of central Pennsylvania are the Pennsylvania Railroad athletic grounds at Tyrone. As I sat looking across the greensward of the baseball field, the cinder track and the tennis courts to the swimming pool, and the golf links beyond, I asked myself, as you would have, what has a man rightfully to complain of when he has all this given to him to use as he so desires?

And my mind turned back to a day late in September, 1921. The scene was in eastern Ohio—"The Twin Cities" they called themselves—Dennison and Ulrichsville—and they had been chosen as the scene of the Second Annual Pennsylvania System Field Day. Almost before daylight I had been awakened by an unusual commotion. In the station the first "Special" had arrived with its load of enthusiastic rooters from Philadelphia. Before it had pulled out into the yards another pulled in from St Louis, then one from New York, then one from Cleveland, and so on, until, by the middle of the morning, the little towns were fairly swarming with ruddy faced variously tagged but unanimously zealous supporters. All morning long a cheerful mob drifted toward the green field and white bleachers at the foot of the street. Meanwhile the preliminary and elimination contests were being run off in the green carpeted arena, accompanied by the intermittent barking of shotguns, as the trapshooters pulled away on the blue clay pigeons in the meadow behind the east stands.

By noon, the sun in a spotless blue sky, shining through an atmosphere such as exists only after a recent rain, lent its warmth to the enclosure, while its rays were reflected from the gigantic red keystone on yonder hill with its P. A. C. (Panhandle Athletic Club) emblazoned in gold letters. By this time the movement to the field had become general, and there was a steady stream of delegations marching on to the field, each led by its band. At one o'clock the stands were jammed and the field was well cleared of all but contestants and field day officials. Bands kept the air aquiver with blatant notes of popular songs. Good humored jibes floated back and forth between stands and field, while events were run off with a dispatch and precision that might well be copied in collegiate competition.

The sun was setting as the last inning decided the West victor over the East in the first of the three-game "Railroad World Series." And then the rush for the waiting trains began. In the rapidly advancing dusk the medals were awarded, by the manager of the Central Region, Vice-President J. A. McRea. And finally with the perfect order with which we like to characterize good railroad operation, the 20 trainloads of employees and officials, 25,000 in number, were cleared of the Dennison station, while the individual passengers sought what rest they could get as the clickety-click of wheels on rails stepped off the miles toward home.

How the Work Is Organized

This field day at Tyrone today was the first of two elimination meets in preparation for the Third System Field Day. These elimination contests are based on the geographical divisions of the system. Each superintendent's division has a team which is picked by the divisional chairman of athletics, his choice being based on the showing of the individual candidates in practice, time for which is granted by the company. These teams compete in the grand division meet, one of which was the meet at Tyrone today. The qualifiers, the first four in each event, or the winning team, in these meets represent the grand division in the regional meets, where in a similar manner the regional representatives for the system meet are qualified. This plan is satisfactory in every respect; there are thus about five teams competing each field day. The general plan had its birth in 1916 on the then Pennsylvania Lines East (lines east of Pittsburgh), with the expectation of extending the scheme over the entire system if it proved popular. The war and government control interfered with the immediate expansion, but competition was continued through 1918 and 1919 on the lines east, or as it had come to be known, the Eastern Region. In 1920, with the return to private control, the First Annual Pennsylvania System Field Day was held on the Cricket Club grounds (P. R. R.) at Altoona, Pa. It proved beyond a doubt the success of the plan and the added interest shown in the Second Annual Field Day, held at Dennison, Ohio, last fall insures its continuance as a leading feature in the welfare program in years to come.

This success has been possible only through the generous help of the management in establishing first-class athletic grounds and equipment at important division points, such as Philadelphia, Tyrone, Altoona and Columbus in connection with its already excellent Y. M. C. A.'s. Athletic directors were placed in charge of the well equipped gym-

nasiums, use of which was encouraged among the employees. The organization, once decided upon, was placed in the hands of competent workers. It is based like the competition, on the geographical and traffic divisions of the system. At the head there is the chairman of the system athletic committee, who is directly responsible to the management. Responsible to him are the regional chairman, under whom are respectively the grand divisional chairman, and the superintendent's divisional chairmen. Too much cannot be said in praise of these chairmen. Their enthusiasm is an example to college coaches and their confidence in the future success of athletics on the Pennsylvania is an explanation of the extraordinary development of the plan in the past. "The biggest athletic meet in history" is their slogan for the System Field Day at Altoona* this fall.

Is It Worth While?

After the difficulties and expenses experienced in procuring extra service, arranging for conventions, etc., one may well ask, "Is this all worth while?" The most direct and conclusive answer is that if it were not, the Pennsylvania System would not be doing it. As a matter of fact, the cost to the railroad is comparatively small, consisting only of the extra transportation facilities, and the time lost away from the job. That the scheme is actually worth the expense is apparent in the general attitude of the employees. The immediate effect is the same that athletics have on college life, a wholesome diversion from the monotonous routine of daily affairs.

A day or so away from the old grind and each man comes back to his job on Monday morning refreshed and with something to talk about besides reduced wages and the faults of the management.

Particularly among the younger men is the effect beneficial. The young men have entered the railroad service in answer to the appeal that railroading still holds for many of us. In their daily work they come to feel infinitely remote from the guiding forces at the head of the organization. The labor union organizers work on these young men with their usual collection of arguments, tending to instill the principle of the union first, the railroad afterward. The eventual result of such persistent hammering on the youthful mind can lead to but one result: the detriment of the man's effectiveness. But see how the field days arrest the intent of this poison. Here is the railroad willing to give the man time off to play, not idle play, but play by which he can get his name or picture in the local paper, by which he can become known among his fellows. So the railroad is trying to flatten out his pay envelope, is it? Well, at least, he is getting a good time out of it, rather better all around than his school chum who is selling neckties in the haberdasher's shop. Then on the field he meets the general manager or a vice-president, or a superintendent, or even his own boss, who comes up to him, grabs him by the hand, and calling him by name, compliments him on his performance. Are these the niggardly tightwads the union agitator has described? He should say not! At least, not so he can notice it! That friendly recognition is going to be remembered, every word of it. And it has not hurt the official. It is a man's frank recognition of another man's honest work. For the time being, he can forget his office and be a man among men. Yes, that handshake is worth the man's wages to the management, for it means a step toward permanency in the working force.

Then perhaps to a lesser extent, there is the feeling of sectional rivalry which springs up out of this field day. These fellows the competitor meets are good sports and all that, but they aren't like the home bunch. Or it may be—see their roadbed, not much as it is on his division—or the engines, not quite like the baby he and Jim were pulling down yesterday, and so it goes. The effect on the spectators is much the same. "Good stuff these fellows have here but they can't travel fast enough to beat our bunch," or "The luck was with them this year, but we'll show 'em next year and you can bet I'll be on hand to see 'em do it."

Cultivates Good Will

So much for the immediate effects of the field day, but what about the ultimate result of the continuance of the plan? It looks to me like a solution to much of the unrest in the labor situation of today. I firmly believe it builds for a better understanding between the management and the employee, because it is founded on good-will. If not a cure-all, it is a potent combatant of the disastrous effects of radical labor agitation. If anything will build for democracy in the industry, certainly here is a means—effective because of its universal scope on the system. The fireman, the mechanic, the apprentice, the draftsman, the clerk, the conductor, the office boy, and the official are mingled for a day in equal footing. If collective bargaining, or any kind of wage agreements, can be made between labor and management without outside interference, here is a way for both parties to discover to themselves their respective places in the industry.

Across the conference table, as on the field, they can meet as man to man, no longer as lord and slave, each mistrusting the moves of the other.

Organization is not perfect by any means; very few human creations are. Grumbling and discontent cannot be stifled; they are bound to exist. Discontent with conditions as they were has brought civilization ahead as far as we have come. But discontent and grumbling to the extent of hindering progress is disastrous and I believe the ultimate result of the System Field Day will be to reduce these necessary evils to their proper status. It is coming, I feel sure. The employee is a true man at heart, and as soon as he has recovered from the Arabian Nights dream he enjoyed under the Railroad Administration, he must, and will see that field days, trades picnics, welfare lectures, employee ownership of company stock, and the employee benefit associations fostered by the railroad are not tools for prying more work out of him for a smaller wage, but are methods of showing the management's interest in making the man worth more to himself as well as to the company. What can result but an increasing loyalty to the industry and a desire in the man to show his appreciation, by increasing the returns from his own labor?

Such are my conceptions of the possibilities in the results of field day. I find the whole idea aptly summarized in an editorial referring to the system meet of 1921 by Cullen Cain, sports editor of the Philadelphia "Public Ledger" in its issue of September 30, 1921. I quote in part: "Athletic and competitive sports are best of all to promote better and friendlier feelings and to create a pride in the firm or institution in the hearts of employees. It might be said now that the sports idea among great business and industrial institutions is universal. But this system meet of the Pennsylvania, the second annual affair of its kind, by the way, is a sports promotion on a tremendous scale. To furnish a gym for the workers is very fine, and to lease a baseball grounds and even go 40 miles from town to play a rival is fine also. *But when the conservative old Pennsy system assembles its children from the Atlantic seaboard to the Mississippi shore by the thousands in an Ohio town for a competitive meet on such a scale as this Dennison affair, then it is time to scratch all piker entries, enlarge the grandstand, build some more bleachers and issue a new catalogue embellished with the royal seal. It is also time to think.*

"What do sports mean to workers and their children? Some day the answer to this question may amaze the world."

In the foregoing I have attempted to outline my conception of the field for athletics in one industry.

* See *Railway Age*, September 30, 1922, pages 597 and 607

Signaling Busy Terminals

By T. Holt

Signal Engineer, Chicago Union Station Company, Chicago

Train speed in congested terminal territory must of necessity be retarded. The current of traffic is in both directions on all tracks, with train movements deflected over crossovers and turnouts which are arranged for a multiplicity of routes. There is little need of high speed signals, but a great need for a system of signaling which will permit train movements at the maximum authorized terminal speed when the route set up is unoccupied. Such a system should also provide an indication for retarding train movements to a speed which allows them to follow each other with safety to occupied tracks.

Two general schemes of signaling have been used on the important terminals in this country, one a dwarf signal scheme with dwarfs operating in three indications; the other a two-arm high signal scheme using four indications, usually known as special terminal signaling.

With the dwarf signal clear, information is conveyed to the engineman to proceed at maximum authorized terminal speed, that the track is clear to the next signal, which is either at clear or caution. The dwarf signal at caution indicates that the next signal is at stop and the track between the caution and the stop signal may or may not be occupied. The stop indication gives information that the route is not set. These three indications are considered by some operating officers as giving sufficient information for the proper governing of traffic on a busy terminal. However, other operating officers feel that information should be given as to whether the track ahead is occupied when a caution signal is displayed. This has led to the adoption of special terminal signaling on some important terminals.

The top arm of the two-arm high signal in special terminal signaling has three indications and is used to govern to all routes, showing clear when the track is clear and the next signal at caution or clear; showing caution when the track is clear and the next signal at stop and showing stop when the route is not set. The bottom arm has but two indications, one in a proceed indication in combination with the top arm at stop which shows that the switches are set for a route which is occupied. The other is a stop indication in combination with the top arm at stop which shows that the switches are set for a route which is occupied. The other is a stop indication in combination with the top arm at stop, which indicates that the route is not set.

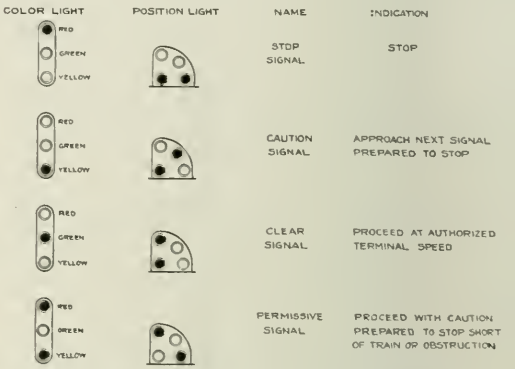
The unusual use of the top arm to govern to all routes is based on the assumption that the maximum authorized speed in the terminal territory is the safe speed for all turnout and crossover movements. This same assumption makes it possible to move trains at the maximum authorized terminal speed by dwarf signal indication.

The chief advantage derived from the use of special terminal signaling is the information as to the occupancy of the track ahead. This not only quickens the movement on a caution indication but makes follow-up moves safer. The information is clear and definite and no indication can have two meanings.

The chief disadvantage is the difficulty of placing signals at the proper points to allow the tracks to be used to full capacity, as the complicated track layouts with crowded clearances usually found on important terminals make it almost impossible to erect the overhead structures at actual fouling points for the support of high signals.

The dwarf signal has the advantage of being located at the proper point to permit trains to occupy tracks to full capacity, but as it is used today it cannot give the information as to the occupancy of the track ahead. The engineman running under a dwarf signal caution indication must determine for himself whether the track immediately ahead is occupied. His decision depends largely on his view of the track. The careful engineman will proceed with caution prepared to make a stop, watching the line-up of switches to determine whether he is to be deflected to an occupied track. The optimistic engineman will take a chance and proceed without reduction of speed, prepared to stop at the next signal, but he may have to make an emergency stop before he reaches it. The first man may slow up the terminal movement unnecessarily. The second man may make follow-up movements hazardous. The only factor of safety for him is to have the maximum speed permitted in the terminal slow.

Actual observations of the speed at which train movements are made through short slips and crossovers on some terminal layouts would indicate that the track engineer has allowed for a considerable factor of safety in his decision as to the



Four Position Dwarf Signal Indications

safe speed at which these deflecting moves should be made. Unless enginemen are constantly checked up the speeds are usually exceeded, but very rarely with disastrous results. This has an important bearing on the need in indicating definitely when the track ahead is occupied, as the speed of the optimistic engineman may be one that makes an emergency stop difficult. Having in mind the cautious and the confident engineman, it is seen that the addition of the fourth indication, which is gained by using two-arm high signals, will speed up the first man on the other indications and will retard the second man when he is moving to occupied track.

Considering the two schemes of signaling, we find that if the addition of one indication were made to the dwarf signal scheme it would have the advantage of special terminal signaling without its disadvantages, and the advent of the light signal makes this fourth indication possible without any change in the design of the signal as now used for three indications. This would seem to make the dwarf signal particularly adapted for the proper governing of traffic on a busy terminal, as it combines the advantages of the two systems as now used on our important terminals without their disadvantages and makes possible the operation of a busy terminal to its full capacity. The four indications are shown in the sketch.

Lumber Mills of British Columbia report that 90 per cent of their output is now being purchased by China and Japan. The Prairie Provinces were formerly the chief outlet for this province's lumber. So insistent is the demand from the Orient that most of the Coast mills are said to be sold out a month ahead.

Railway Electrical Engineers Meet in Chicago

Heavy Electric Traction, Power Trucks, and Axle Generator Pulleys Among Subjects Discussed

THE THIRTEENTH annual convention of the Association of Railway Electrical Engineers was held at Hotel La Salle, Chicago, October 31 to November 3. This was the first annual meeting that the electrical men have held since October, 1920, the usual fall gathering having been omitted in 1921 on account of the business depression which prevailed at that time. In spite of the labor difficulties of the past troublesome months, the convention was well attended and much interest was manifested in the proceedings. Considerably more than 100 railway electrical officers registered and the attendance included many others who did not register.

The first session of the convention was called to order by the president, L. C. Hensel, electrical engineer of the St. Louis-San Francisco Lines, at 10:30 a. m. on Tuesday, October 31. After a brief opening address by Mr. Hensel, the reports of the secretary and auditing committee were presented and accepted.

Crane Type Trucks Show Remarkable Economies

Presented as unfinished business was the question of affiliation with the American Railway Association. This subject was first broached to the Association of Railway Electrical Engineers at its annual convention in October, 1919, and has been held in abeyance ever since. Originally, it appeared that certain advantages might accrue to the members by becoming affiliated with the American Railway Association, but more recently these advantages do not appear so marked. Whatever may subsequently develop in the situation will be taken care of by a committee consisting of J. R. Sloan, chief electrician, Pennsylvania System; L. S. Billau, assistant electrical engineer, Baltimore & Ohio; J. A. Andreucetti, assistant electrical engineer, Chicago, Northwestern, and E. Wanamaker, electrical engineer, Rock Island Lines.

E. A. Lundy of the Railway Electrical Engineer, chairman of the committee on data and information, presented a report including tabulated information showing the extent to which electrical equipment is being used on the various railroads throughout the country. This report is the first of its kind that has been presented since 1918, and the figures given show a remarkable increase in the use of electrical apparatus. One field in which this increase is particularly noticeable is that of electric arc welding. It is plainly evident that the roads are coming to realize the economic advantages of electric welding and it is only a question of time when this work will be common practice on all roads.

A report on power trucks and tractors was presented by L. D. Moore of the Missouri Pacific. Inasmuch as trucks and tractors are not always electrically operated, the report includes gasoline operated equipment as well as those deriving power from storage batteries. The report outlines in general the different types of equipment for use under various conditions and locations. While it was believed for the most part that electrically operated trucks and tractors would satisfactorily meet all requirements, it was conceded that under some conditions gasoline equipment might be the best to use.

One particularly interesting development which was brought out in the discussion which followed the reading of the report was in regard to the crane type truck. John Carson of the New York Central Lines stated that his company was using three trucks of this type in enginehouse service and had found them to be one of the greatest labor-saving machines that had ever come into their hands. Locomotive air compressors, front ends, main rods, or any similar parts are handled with no trouble whatever. The machines are of the Elwell-Parker type, having a capacity of 3,000 lb. at a 6-ft. radius. The trucks are equipped with outrigging so that the danger of the machines tipping over is very remote. It has been found best to place one man on each shift in charge of this truck and not to allow it to be operated by anyone else.

To illustrate the economy effected with the crane type truck, Mr. Carson stated he knew of several instances where a crippled compressor had been removed and a new one applied by three men in 25 minutes. A front end can be handled in a proportionately short time. For use in yard work, unloading cars, or handling material such a truck with an operator and two men will accomplish 75 per cent more work than six men will do in the same length of time.

The Committee on Heavy Electric Traction presented a very extensive report, including much tabulated data on railroad electrification in both North and South America. This report was read by J. R. Sloan, chairman of the committee. In reply to a question by E. Marshall, electrical engineer of the Great Northern, as to what lies in the immediate future along the line of heavy electric traction, Mr. Taylor of the General Electric Company said: "It is rather a general subject as to just what is going on. Here in Chicago, the Illinois Central has just given out a report that it is going to electrify its suburban service, using 1,500 volt direct current. Of course, that is in the immediate future. There are several foreign jobs, one in Chile and another in Mexico. There seem to be more requests for reports on electrification just now than at any other time; more steam railroads seem to be interested in the possible electrification." In speaking on the same subject, Q. W. Hershey of the Westinghouse Electric and Manufacturing Company said in part: "During the war, of course, there was no money available to spend for electrification and all energies were exerted to provide transportation. Following that came a peak in traffic requirements and again everybody fell in to move the load. Then came the depression. Then following that another peak, which we are now in. The problem of the railroads has been taking care of details for the immediate necessities of the transportation requirements, so that in this country there has not been very much physical electrification work

done in the last four or five years. This condition exists—that in a very broad sense the railroad managements are looking forward to preparing for the time when money will be available to provide such electrification as they will find they need. It would seem your part of the electrical inquiries of the railways should be that of studying their problem rather than letting some outside people do it without their participation. I want to compliment the committee and also the Railway Electrical Engineer for the data which has been prepared. I believe this is the most complete statistical data that has been offered at any time since electrification has been thought of, and it will stand as a valuable reference work."

In touching upon the factor of regeneration by electric locomotive, it was brought out that the important feature was not the amount of power which could be returned to the trolley or power system but rather the control and restraint of trains traveling down grade.

One of the significant points in the report of the Committee on Electric Repair Shop Facilities and Equipment was brought out by E. H. Hagensick of the Union Pacific, who said: "During this last labor trouble on our road we have had a great deal of difficulty with motors burning out and we have got by simply because we had lots of spare motors." Spare motors are vitally essential if tie-ups are to be avoided, for without means to replace a burnt out machine most costly delays may easily develop. In order not to carry an excessive number of spare motors or parts, it is clearly advantageous to standardize on motors for different purposes.

Another factor which is destined to become an important adjunct to the already large scope of activities for the electrical men was presented in the form of a motion picture illustrating the Regan System of Automatic Train Control. This picture, together with a description of the equipment, was presented by Joseph Beaumont and B. F. Meisel of the Regan Safety Devices Company.

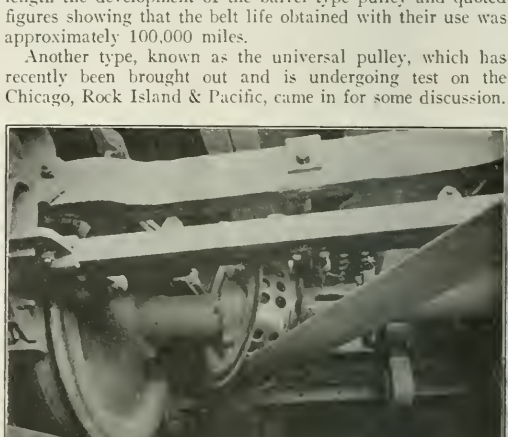
The report of the Committee on Illumination was presented by L. S. Billau, chairman of the committee. A number of changes has been made in the report since it was presented at the June meeting of the association in Atlantic City. The principal point of interest, however, is that of train lighting lamps now available and listed in commercial production. Stocks of lamps which are in general use by all railroads and are apt to be found everywhere in the country, ought to be reduced to a minimum. The committee recommmends that the 50-watt gas filled lamps should be brought out with the bowl enameled or frosted in order to prevent glare which results from the unprotected filament of such lamps. There has been an increasing demand during the past year for a locomotive cab lamp of smaller physical dimension than is possible to secure at present, and it is believed that a smaller 32-volt lamp can be developed that will give reasonably good life. It may also be said that in the effort to secure smaller lamps for locomotive cab use the Michigan Central and the New York Central Railroads have been experimenting with 6-volt lamps. In view of the fact that practically all railroads are using flashlights for inspection purposes throughout all departments, it was felt that some consideration should be given to the desirability of standardizing these miniature lamps.

Another point emphasized by the committee was the fact that illumination intensities are being used in other than railroad fields that are 100 per cent higher than was considered good practice three or four years ago. It is believed that an increase of lamp load, which means higher illumination intensities, would be justified by the advertising benefit derived even though it might increase the cost of operation and maintenance to some extent. The discussion developed the fact that a mill type tungsten filament lamp has been developed which many of the roads are using with entire satisfaction in all kinds of portable service in shops.

The report of the Committee on Motor Specifications presented by E. Wanamaker did not provoke a great deal of discussion, but the committee has obviously taken a step in the right direction by preparing a standard specification for motors used in railroad service. Such motors are of necessity frequently required to perform work that is particularly arduous. By preparing a set of specifications with the cooperation of representatives of the motor manufacturers, motors more suitable for the exacting requirements of railroad service may be developed.

The discussion of the report of the Committee on Train Lighting Equipment and Practice centered largely upon the subject of axle pulleys, particularly the barrel type pulley as used by the Pullman Company. E. Lunn, chief electrician of the Pullman Company, explained at considerable length the development of the barrel type pulley and quoted figures showing that the belt life obtained with their use was approximately 100,000 miles.

Another type, known as the universal pulley, which has recently been brought out and is undergoing test on the Chicago, Rock Island & Pacific, came in for some discussion.



New Axle Pulley Built on the Universal Joint Principle

This pulley, which is designed on the universal joint principle, aims to keep the axle pulley in line with the generator pulley regardless of whether the car be on curve or tangent track.

The report of the Committee on Electric Welding consisted of a tentative specification for the rating of welding machines. The little discussion that followed was confined largely to the merits of alternating current welding equipment and the extent of its application, a subject upon which opinions seem to differ.

The electric headlight report was substantially the same as the progress report presented in June, with a few minor changes. L. C. Muelheim of the Baltimore & Ohio, chairman of the committee, read the report. The discussion which followed touched briefly on the subject of regrinding ball bearings and rebushing and reboring the turbo-generator machine cases to fit the ball bearing properly, after having been worn down in service. Both of these practices are entirely feasible and practical.

The final paper of the convention was the report of the Sponsor Committee on Insulated Wires and Cables of the American Engineering Standards Committee. The report was accepted and no discussion followed. An interesting feature of the final convention session was the presentation of a motion picture showing the various stages in the manufacture of rubber covered wire by the Okonite Company, Passaic, N. J.

Election of Officers

The officers elected for the coming year are as follows: E. S. McNab, Canadian Pacific, president; Ernest Lunn, Pullman Company, first vice president; E. J. Hill, Michigan Central, second vice president. Two new members of the executive committee were selected as follows: E. H. Hagensick, Union Pacific, and George W. Bebout, C. & O.

Railway Electrical Supply Manufacturers' Association Exhibit

The exhibit of the Railway Electrical Supply Manufacturers' Association, which is always held in conjunction with the convention of the electrical engineers, was highly successful. There was a number of new exhibitors. All of the exhibition space was taken up, and if the number of exhibitors increases further either larger quarters will have to be secured or some of the larger companies will be obliged to give up part of their space.

The officers of the manufacturers' association elected for the coming year are as follows: Daniel Woodhead, Daniel Woodhead Company, Chicago, president; R. L. McClelland, Westinghouse Electric and Manufacturing Company, New York, senior vice president; George H. Scott, Safety Car Heating and Lighting Company, Chicago, junior vice president; Edward Wray, Railway Purchases and Stores, Chicago, treasurer; J. Scribner, General Electric Company, Chicago, secretary.

The Financial Starvation of the Railways*

Industry and Commerce Strangled by Shortage in Transportation Facilities

By Herbert Hoover
Secretary of Commerce

OUR TRANSPORTATION facilities have lagged far behind the necessities of the country. Progress has been made in their restoration from the demoralization of war, but our rolling stock, our trackage, and many of our terminals are unequal to our needs. Some increases in equipment have been made during the past year; yet they are entirely insufficient as the result of long-continued financial starvation. The deficiency in transportation finds its visible expression in car shortage; and while the recent strike has temporarily aggravated the situation, the trouble is far more deep-seated. Except during periods of business depression or strikes there has to some degree been continuous car shortage for the last six years. Furthermore, car shortage reaches its most acute stage during the four or five months of peak load in the fall and early winter.

Railway cars are the red blood corpuscles of commerce, and we suffer from commercial anaemia every year, because they are starved. The losses through short transportation are a tax upon the community greater than the cost of our government, because such a shortage not only stifles the progress of production and introduces speculation into distribution, but it also seriously affects price levels. No better instance exists than the lift in the price of coal by over 300 per cent in 1920 when there was no strike, and over 60 per cent in 1922, after production following the strike had been resumed. In both cases the mines could have produced 30 per cent more coal, and if the railways could have transported even 20 per cent more, then prices would have been normal. Furthermore, this very shortage is one of the most deep-seated causes of the instability in the bituminous industry and its recurrent strikes. The car shortage also directly affects our farmers, because in every car-shortage period a price differential on grain below the Liverpool price (and yet in excess of the railway rates and handling costs) sets in of from 5 to 15 cents per bushel. The losses to livestock growers are very great because of the necessity to feed stock beyond the fattened stage. And there are regularly great losses in fruit and vegetables because of the lack of refrigerator cars.

The management of our principal railways to-day, by all the tests of administration, of load factors, of mechanical efficiency, etc., is the most efficient transportation machine in the world in so far as it is not limited by causes beyond the managers' control.

A Cumulation of Experiments

The situation has been contributed to by the war, but also fundamentally by the cumulation of experiments in public relations to the railways, both national and state. We have tried uncontrolled operation; we have tried negative regulation in the prevention of discrimination; we have tried nationalization; we are now trying positive regulation. Nationalization would be a social and economic disasteer; free operation would reconstruct the vicious practices of 30 years ago. Regulation in some form is necessary, but constructive development of this regulation—to preserve the initiative and responsibility of our railway executives, to secure the fine values of private operation, and at the same time to secure public protection and assure adequate service—are absolutely vital and not necessarily incompatible. The present Transportation Act possesses many constructive features and some weakness. It was the result of compromises in many particulars, and these very compromises are some of its weakest points.

Disproof of Fiction That Earnings are Guaranteed

If the causes of financial starvation were solely a question of war and of hard times, we could afford to wait for a natural solution, but they are not. The Transportation Act of 1920 affirmatively declared that the rates should yield a fair return on the aggregate real value of the railway properties (as determined by the Interstate Commerce Commission) used in public service and operated under honest, efficient, and economical management. It provided that the fair return during the first two years should be at the rate of 5½ per cent on the railways as a whole, or in each of the major groups in which the country might be divided in the administration of the law, and that during this period there might be added ½ per cent for rehabilitation. At the expiration of this two-year period the Interstate Commerce Commission placed the fair return at the rate of 5¾ per cent per annum, or 6 per cent less ¼ per cent to cover income taxation. The law, however, further provided that any particular carrier which earns in excess of 6 per cent per annum shall hand over one-half of that excess into a contingent fund to be administered by the Interstate Commerce Commission "in fur-

*Extracts from the forthcoming annual report of the Secretary of Commerce for the fiscal year 1921-22.

therance of the public interest in railway transportation" either by loans to carriers or by the purchase of transportation equipment and facilities and the leasing of the same to the carriers. The carriers have never earned these amounts and the failure of earnings without charge on the government is complete disproof of the current fiction that earnings are "guaranteed."

Strong Railroads Cannot Provide Equipment for Weak Ones

Furthermore, the immediate effect of this recapture provision would be that whereas the strong and fortunately situated railways are able to earn in excess of 6 per cent, and are therefore able to secure finance for betterments, the very fact that they did earn in excess of the average would mean that the weaker roads were unable to earn up to the average. It may be accepted as a general proposition that carriers earning materially below the 5¾ per cent return are not in a position to command the confidence of investors which is necessary for expansion to meet the public demand. The contingent fund makes available money which such carriers may borrow, provided, however, that they are able to give the necessary security for repayment. It is easy to comprehend that such a contingent fund may serve the purpose of bridging carriers over temporary difficulties, but it is more difficult to understand how a carrier which, though it may be very essential to its part of the country, is financially a chronic weakling is to be made strong and capable by becoming more deeply involved. If there is any merit in this device, it seems not to extend to those anaemic carriers that are unable to give the government the color of assurance of repayment. This device also carries a certain liability to the government in that carriers that borrow from the fund and fail to pay are likely to become government railways through their financial difficulties. It would seem that the first of the two uses to which moneys of the contingent fund may be put holds out better promise of furtherance of the public welfare. However, the creation of such a national reserve of transportation equipment has not been seriously undertaken. It would seem that our dire distress in time of car shortage and, at times, motive-power shortage would strongly argue for the creation of such reserves. Rolling stock for limited use during 60 to 90 days is probably unprofitable to any railroad, and certainly the stronger railroads can not, and should not, be expected to provide it for the weaker ones.

The present act contemplated the solution of the problem of the weak roads through voluntary consolidation of the weaker and stronger roads into larger systems to be definitely indicated by the Interstate Commerce Commission. There is no doubt that such consolidation would be a large advance in solution to the whole problem. As the nation has resolved to control rates, and thus to depend no longer on competition as a means of rate regulation, it should secure the manifest advantages of larger systems. The economies in operation through standardization and better employment of rolling stock would be constructive themselves, but of vastly more importance would be the strengthening of the foundations for the financing of betterments and for more intelligent handling of rate regulation. The part of the act providing for consolidations has not been advanced very much so far, although a tentative plan for grouping has been issued to serve as a basis for investigation, and hearings have been begun. When the permissible consolidations are once enunciated it is possible that some railways can arrange terms amongst themselves for such consolidations.

How far such voluntary action would solve the problem is uncertain, but compulsory consolidation leads into many untenable premises. It might be that there could be invented some inducements to consolidate into the proposed systems, or to lease for consolidated operation, or some form of cooperative operation. If the recaptured profits principle is to be maintained and if it can be enforced by the Interstate Commerce Commission, the assured application of such recaptured profits within such enunciated groups in some form might at least be worth discussion as an inducement to consolidate.

The alternative of repealing the miscalled guaranty clauses of the act does not fundamentally assist the expansion of the weaker roads, for so long as rates are controlled by 49 different commissions, it is unlikely that the rates would or could be made discriminatory in favor of the weaker roads, and thus the basis for the financing of betterments by these roads would not be materially improved. The suggestion that all rate control should be repealed except control against discrimination or preference would not meet the situation of the weaker roads, because the restoration of competitive rates would enable the stronger roads to again drive the weaker roads nearer to the wall.

Rate Structure Needs Reorganization

Another vivid question in this connection is that of the rates themselves. In an era of wide disparity between farmers' income and that in and of industry, the transportation rates have proven to be a heavy burden on agriculture. On the other hand, under present conditions railway earnings are obviously not large enough to assure railway expansion. Some relief both to the railways and the farmer may be obtained by thorough reorganization of the rate structure. Some classes and areas of traffic are carried at actual loss; others are carried at lower rates than the relative value of the commodities warrant; and a series of scientific upward readjustments should be made in some cases in order to give the railways and the shippers of primary commodities and agricultural produce some relief. The recent reduction of 10 per cent in rates on luxuries as well as on primary goods contributed nothing to commerce and impoverished the railways just that much. The tangled skein of rates seems a mesh in which there is so persistent a resistance against every constructive proposal, that we are incapable of rescue except by some complete departure in courage.

Labor Regulation Unsatisfactory

Another phase of present regulation is the machinery of wage control and strike prevention, which are unsatisfactory. The legislation embraces the important principle of the public's right to secure continuity of service and it carries the obligation of the public to secure just wages to the employees. The Railway Labor Board has performed large services to the employees, to the railways, and to the public. The difficulties arise from the tripartite structure of the board under the act, from its detachment from the rate-making body, and especially from the fact that the act did not originally contemplate that the government would be a universal wage fixer. It was the assumption that the board would only function in case of a major threat of stoppage in service. The failure of the local adjustment boards for direct contact between employees and employers has thrust all disputes on the labor board; and in result we have practically governmental fixing of all wages and conditions of labor.

There can be no question that action in some direction is imperative, if industry and commerce are not to be further strangled by a shortage in transportation. Whatever may have been the sins of railway finance in the last generation, we are not only suffering from them, but we have maintained an attitude of bitterness in our public relationship to our railways for which we pay thrice over in prevention of their proper development.

We must have increased transportation, if we are to maintain our growing productivity. We must therefore find a way out of the cycle of systematic starvation of a large part of our mileage and the denudation of our railway managers of their responsibilities and initiative.

T. E. A. Displays Keen Interest in Long Engine Runs

Convention Discussed Utilization of Power and Operation of Stoker and Oil Fired Locomotives

A REPORT of the opening session of the thirtieth annual convention of the Traveling Engineers' Association, held at the Hotel Sherman, Chicago, October 31 to November 3, inclusive, appeared in last week's issue. The following are abstracts of the more important reports which were presented and discussed at the later sessions.

Distribution of Power: Its Effect on Operating Costs

At more or less frequently recurring periods, every railroad is confronted with a situation where its ability to earn revenue is controlled by its ability to move the traffic offered. Likewise periods occur when surplus equipment represents a large overhead investment producing no revenue. Any plans that will contribute toward improving these conditions will help greatly in reducing the general cost of operation.

A study of the power situation with a view to conserving tractive effort on the railroad system as a whole, without reference to particular conveniences or economies on a single division, is of paramount importance. Records of fuel and locomotive maintenance cost will show that, generally speaking, where the size of the train is limited, the smallest type of engine that will comfortably handle the train will give the lowest annual operating cost for fuel, wages and repairs, and in turn will release the heavier type of power for trains where the loading is controlled only by the tractive effort of the engine. Investigation has shown instances of comparatively heavy engines handling very light local passenger trains, with lighter engines handling tonnage freight trains on other divisions, perhaps for the reason that the engineman returned on a heavier run, or because that particular division inherited that particular class of power as a result of some changes in the power distribution on the district as a whole. Changes in power distribution or extending the run of locomotives over two divisions have in such cases brought about considerable saving in tractive effort and as a result decreased the cost of operation.

Locomotives having a large reserve of power for the trains they are required to handle, or more modern in design, can be in less than average good condition and yet make the time without failure. Furthermore, small types of more or less antiquated power are not popular at the general shops for overhauling, for the reason that the more modern types are usually in demand, and it is easier to figure on what they will require in repair parts. The motive power officer on the division has for his yardstick man hours per locomotive despatchment and engine failures, rather than the total cost of operation per 1,000 gross ton miles or per passenger car mile.

It has been stated by eminent authority that the loss to the farmers of the United States, through not being able to move their crops when markets are favorable, amounts to about $400,000,000 annually, and yet railroad officers find themselves at certain periods with considerable surplus of power. These considerations, together with the fact that the average miles per locomotive day for freight locomotives in 1920 was 59.3, gives to the subject of power utilization a compelling interest, any discussion of which will naturally resolve itself into consideration as to the merits of pooled vs. regular engines, of long runs vs. division runs, and many other things.

One feature to consider in engine assignment is that engines having a large reserve of power for the trains assigned to them do not call for the same refinement in the handling and firing that will obtain where it is necessary to have skillful handling in order to deliver the desired service. This absolutely works out in practice. The fuel used at terminals and in stand-by losses represents probably 30 to 35 per cent of the total and this expense increases with the larger power on light trains.

The cost of locomotive operation for a representative midwestern road for the year 1920, and which will be fairly representative of 1922 conditions, was as follows:

	Total cost for year	Cost per loco. owned per annum
Fuel	$28,789,756	$13,158
Repairs	26,462,086	12,094
Wages—enginemen, firemen and enginehouse employees	18,442,173	8,429
Lubricants	424,917	194
Other supplies	335,696	153
Total of selected items	$74,454,628	$34,029

This represents average costs applied to all locomotives owned. If this were shown only for the locomotives in actual service or for the heavy freight locomotives in service, the average cost would be much higher, but this will serve for illustration.

The St. L. S. F. has for some time made up a daily cost sheet for each freight train operated. This shows the cost per 1,000 G. T. M. for fuel and wages, including overtime. This information reaches all division operating officers, including the road foremen of engines, daily, and is very valuable in keeping individual fuel and wage costs before all concerned, including enginemen and trainmen.

On the majority of roads the operating or transportation department distributes the power, in conjunction with the motive power department, which usually approves of the individual engines to be assigned to divisions or runs, but this is not always the case in transfers of power between divisions or districts. A very close working arrangement is necessary if the best results are to be obtained. Transfers of power are sometimes, if not usually, made at times of rush business when new men are entering the service, both in the shops and on the road. A transportation officer without training in locomotive matters cannot fully appreciate all that is involved in introducing new types of locomotives into new territory. The experience of men with the training of the traveling engineer is very valuable in such times and should be utilized. The traveling engineer so advising should be thoroughly familiar with the operating conditions on the railroad as a whole and make his recommendations accordingly, without reference to division economies which disregard the general good to be accomplished. Compound engines or engines equipped with certain special devices, while giving excellent service where regularly used, may prove of negative benefit when thrown into a group of engines of similar tractive power perhaps, but unlike in design or equipment. This is especially true where there are many new men in engine service and shops not entirely familiar with the types of locomotives or devices.

A number of roads have increased the available power supply through lengthening locomotive runs. This will not apply equally on all roads, but has great possibilities under

certain conditions. This practice has been very much extended since our 1921 meeting, and the experience of the members is invited in the discussion to follow. Local conditions, as to train schedules, conveniences for taking coal and water, the grade of fuel used and facilities for caring for the fire and ash-pan enroute, must be considered. It is a fact that enginemen and firemen are assigned to runs rather than to engines and the difficulty in actually having regular crews on engines has increased, thus making it difficult to secure satisfactory mileage from regularly assigned engines to runs. It is safe to predict that where the character of the fuel used will permit, the tendency of operating departments of railroads will be to develop the fullest information as to the desirability of extending the length of runs for locomotives in passenger and fast freight service, but particularly in passenger service. The experience of the New York Central Lines, with which two members of your committee are connected, has been that to date the average monthly mileage of all passenger locomotives has not increased as a result of running certain engines over two divisions, although individual engines will make large mileage for a period. There is a saving in fuel due to decreased terminal consumption and the supervision given toward maintaining good condition of fires enroute to avoid delays for steam. We suggest the possibilities of extended runs for locomotives be made a subject for next year's convention.

Segregating certain types of engines to one district or division, instead of mixing up different classes in one territory, has its advantages. This may appear to impose a hardship at first if the engines are new to the district and somewhat more difficult to maintain and to operate than the engines regularly or previously used, but if done at a time when business is not too heavy and when experienced men are on both sides of the engine, and a high standard of inspection and repairs can be built up, it is a very paying proposition. It is the practice, also, on some roads to work fairly close on power at all times, the motive power officers themselves insisting on this, thus keeping the largest possible reserve of power laid up in good order for rush periods. It costs money to take engines out of storage, and it should not be done without knowing that they are actually needed.

The roads referred to also maintain pooled freight engines throughout the year rather than assigning regular crews to engines duing slack periods and then having to pool them when a rush comes on. The principle involved is that of maintaining a more rigid average year round system of inspection and repairs at terminals than would obtain with regularly assigned engines for certain seasons of slack business, and when we more or less depend on the engineer's report and personal interest to help maintain the power than when running pooled engines. However, when forced to return to pooling it is hardly possible to build up quickly the inspection and the method of caring for repairs or to keep the same degree of interest alive among the engine crews that obtains with regularly assigned engines or with a highly developed plan of pooled service. The advent of newly promoted enginemen and new firemen is an important point to consider and it is always to be remembered that the period of rush business is when the earning capacity of the locomotive is the greatest and when we should be able to get the best possible use from it.

The report is signed by Robert Collett (N. Y. C.), chairman; David Meadows (M. C.); W. R. Garber (K. & M.); J. E. Ingling (Erie), and C. A. Fisher (G. N.)

Discussion

The discussion of this report centered very largely around the subject of long engine runs, in which it is evident that the members of the association are taking a deep interest. Several cases of passenger runs of from 250 miles to over 600 miles were cited, and a number of cases were also cited where freight locomotives were running over two districts. It developed that in several cases the extension of the length of the locomotive run has required an increase in the size of the cylinder lubricator. The four-pint lubricator has been found too small for large passenger power and in some cases six pint lubricators are being installed. This matter has offered no real obstacle, however, as extra oil is placed on the engine for use in case the original filling does not carry the locomotive over the entire run.

On the New York Central passenger locomotives are being run through from Harmon, N. Y., to Syracuse. This has saved turning 40 locomotives a day at the Rensselaer terminal (Albany, N. Y.), at an average cost of from $6 to $9 each, with a corresponding reduction in the number of movements between the roundhouse and the station, a distance of one mile over a busy double track bridge. Car department employees fill the main pin grease cups and shovel the coal forward at the Albany station in an average of from five to seven minutes. The locomotives have a short layover at Syracuse and return to Harmon in less than 24 hours. This practice has not necessitated any increase in the engine house force either at Harmon or Syracuse. On the two divisions, trains which formerly required 21 locomotives to handle are now being taken care of with 16 locomotives. No case was cited in the discussion where the practice, once established, had been discontinued because of the inability to overcome any of the difficulties encountered, although the shopmen's strike has interfered with the development of the practice in some cases. Although numerous difficulties have been encountered, the consensus of opinion of those members of the association who have had experience with it, indicates that some increase in locomotive mileage may be expected, that train miles per locomotive failure need not be decreased by the longer runs and that engine house expense will be reduced. Definite opinions as to what effect the long runs will have on fuel consumption and locomotive maintenance was not brought out.

Is Mechanical Firing Reducing the Cost of Train Operation?

The outstanding features of stoker firing are the possible increase in tonnage or decrease in time between terminals, or both, together with the possibility of handling a fuel of a lower B. t. u. value and a corresponding lower cost.

As an offset against these considerations, which directly affects the cost of train operation, there has always been charged the increase in coal consumption per 1,000 gross ton miles, which has always been considered as going hand in hand with stoker operation. In the early development of the stoker the only successful machine was one having a relatively high point of delivery, and, consequently, when the locomotive was being forced to its maximum the lighter particles of coal were carried over the arch, where arches were used, thereby resulting in an excessive stack or spark loss. In recently conducted road tests it has been found that this condition no longer prevails. It was shown that where the same attention was given the stoker as in hand firing, the fuel consumption per 1,000 gross ton miles per hour was generally lower on the stoker-fired locomotive. This difference in fuel consumption was no doubt due to the higher average temperature obtainable in stoker firing, due to the elimination of the periodical inrush of cold air, and the more perfect combustion possible through carrying a lighter fire as well as the more regular and uniform fuel feed.

The data in the table was obtained as the result of a careful test conducted on a trunk line road to determine the difference between assigned and pool service

Fuel Performance of U. S. R. A. Light Mikado Type Locomotives Equipped With Stokers

	Assigned service	Pool service
February, 1922		
Engine No.	652	656
Engine miles	3,150	3,773
Gross ton miles	4,514,135	4,436,685
Pounds coal between terminals	476,271	515,530
Pounds per 1,000 G. T. M.	105.59	134.66
March, 1922		
Engine No.	652	656
Engine miles	3,150	6,144
Gross ton miles	5,189,449	7,723,177
Pounds coal between terminals	590,862	913,279
Pounds per 1,000 G. T. M.	113.24	118.25

The test extended over a period of 60 days. The two locomotives were identical in every respect, and operated in the same class of service, viz., fast freight. Locomotive No. 652 was operated by the same crew throughout the entire test, while locomotive No. 656 was handled by four crews alternating. Note that during the first 30 days the assigned locomotive made 18,150 more ton miles and 553 less engine miles than the pooled engine, and consumed 128,820 pounds less coal or a difference of 27.5 per cent calculated on a 1,000 gross ton mile basis.

At the end of the first month it was possible to make an immediate comparison which showed up the above difference in coal consumption. Steps were therefore taken to bring the performance of the pool crews to that of the assigned crew by teaching and getting the men interested, and the result of this action is reflected in the results for March.

While these results show an increase of 7.3 per cent in fuel for the assigned engine, this increase was due almost entirely to weather conditions. The table shows, however, that the active supervision over the pool crews, together with their co-operation, resulted in a decrease of 13.8 per cent. As the weather conditions affected both alike, it is reasonable to assume that had the pool crews been allowed to go on during the month of March as in February, the coal consumption for Engine No. 656 would have been affected the same as in the case of Engine No. 652, i. e., increased 7.3 per cent, which would have made it approximately 144.49 lb. per 1,000 gross ton miles instead of 118.25 lb.

This test proves, first, that the excess in fuel consumption of the pooled over the assigned engine was not due to the stoker or the locomotive, but altogether to the manner in which it was handled by the four crews; and, second, that intelligent supervision will bring the same results in case of stoker as in hand firing.

Economical train operation means the movement of the greatest possible tonnage over a division in the shortest possible time. The loading and time factors are the all-governing ones and must be carefully worked out by the operating department, as an error of 10 per cent either way, i. e., overloading or underloading, spells a material increase in operating expense. What has the stoker to do with correct loading? Everything. Where the coal consumption per hour approaches the physical limitations of the fireman, it is only through the application of the stoker that a uniform maximum steam pressure is possible at all times, and it is only through the maintenance of the maximum steam pressure that the desired speed can be sustained.

Opinions vary as to the size of the locomotive to which the application of stokers seems justified. This is because the conditions are not the same on all railroads or even on all divisions of the same railroad, and as men speak of things as they find them, it is but natural that there should be a difference of opinion.

A certain railroad in the Southwest, where temperature ranges are high, operated consolidation type locomotives of 45,000 lb. tractive effort, 49.5 sq. ft. grate area, over two divisions, one being 117 miles long of practically one per cent continuous grade, the other 124 miles long with one per cent broken grades, the longest continuous grade being 40 miles. The rating of the locomotives when worked to their capacity was 1,500 gross tons. Owing to the physical limitations of the firemen it was found necessary to reduce the tonnage over the first district to 1,150 gross tons and over the second to 1,250 tons in order to get the trains over the road within the sixteen-hour period. Stokers were afterward applied to these locomotives and the tonnage raised to the locomotive capacity; i.e., 1,500 gross, or an increase in the first instance of 30 per cent and in the second of 20 per cent. As the wages remained the same, this change resulted in a corresponding direct decrease in operating cost. In this instance it was not a question of the size of the locomotive so much as a question of climatic conditions and physical characteristics of the railroad.

We now cite a case where the locomotives were so large that when worked to their capacity the firemen were unable to supply the coal as fast as the engine could burn it. These were of the 2-10-2 type, 67,000 lb. tractive effort, 80 sq. ft. grate area, operated over a choppy division 100 miles long having short grades of 1½ per cent. The tonnage behind these engines when hand fired was 2,350 gross tons. Stokers were applied and the tonnage increased to 2,650 gross or 12.76 per cent. The wages and other costs remaining the same, this resulted in a decrease in cost of train operation of 12.76 per cent.

In some very exhaustive tests conducted in the Dominion of Canada during the months of May and June, 1921, with Mikado type locomotives, 53,000 lb. tractive effort and 56.5 sq. ft. of grate area, it was found that the maximum drawbar horsepower that could be developed hand firing on the maximum grade was 996, while the same type of locomotive stoker fired gave a drawbar horsepower output of 1,227, an increase of 22 per cent. An increase of 300 gross tons over the normal hand-fired rating was handled by the locomotive stoker-fired, maintaining the same average speed as was maintained by the hand-fired engines with the lighter tonnage.

On the road represented by the chairman, there is a seasonal fruit rush which calls into service every available man and locomotive to such an extent as to make it necessary to double the road (150-mile division) wherever the condition of the locomotive, the crew, and the hours of service make it possible. When this rush is on, we find no difficulty in getting the men to double back on stoker-fired locomotives even though they have a stoker-fired engine in but one direction. Therefore it is clear that if we did not have stoker-fired engines it would mean either more men, which would often result in the payment of the arbitrary held from home terminal, or in holding the engines for the crew's rest, or in an increase in the number of engines assigned to this service which would mean an increased number of idle engines during the slack period. An idle engine costs money even if standing dead behind the roundhouse, as it represents an investment on which the interest will run from $10 to $15 per day.

The above simply represents the definite decrease in cost of train operation as developed on different railroads through the application of stokers to locomotives of different dimensions.

There is, however, another decrease in cost of train operation which can be absolutely attributed to the application of the stoker, but which varies with the seasons and climatic conditions of the states traversed by the railroads. We refer now to the necessity of sending out relief firemen to take the place of others who on account of the extreme heat or through other causes have become physically exhausted. While this may appear as a small matter, records indicate that on some roads the loss chargeable to this one item amounts to considerable. The committee has records

of one railroad located in the Mississippi Valley having one division 156 miles long, operated by locomotives developing 39,000 lb. tractive effort and during the summer months it is necessary to have relief firemen stationed at intermediate points 50 miles apart, and as a rule one or more firemen are relieved daily. As under the schedule, 100 miles or less constitutes a day's work, it follows that in a case of this kind the labor cost insofar as firemen are concerned, is doubled. This in itself would not amount to so much, provided there is no attendant train delay, but where it is necessary to tie up a train at some intermediate station until a fireman has been deadheaded from a terminal, it results not only in an increased labor cost, but it upsets the dispatcher's entire schedule, delaying not only the train in question, but often other opposing trains.

Going back to the Canadian test previously referred to, it was found that the maximum speed on the grades possible with the hand-fired locomotives was 12.42 miles per hour, while with the stoker-fired engine handling the same tonnage a speed of 15.61 miles per hour was maintained, or an increase in speed which is equivalent to an increase in ton-miles per hour of 25 per cent.

It is on account of the speed factor not being considered that in many instances the mechanical stoker has been charged with an increase in fuel consumption over hand firing. Ton miles or train miles or locomotive miles is a mighty poor yardstick by which to measure train or locomotive operation. The time element should always be taken into consideration and where this factor is considered and coal consumption as well as other operating costs are based on the ton miles per hour, it will be found that the stoker can show economies over the best hand firing.

In the beginning of this paper we referred to one possible reduction in operating costs through the possibility of burning a cheaper grade of fuel. During the last months in 1921 slack coal, or what is termed screenings, became a drug on the market and could be purchased at $1.20 per ton less than the mine-run coal produced at the same mines. A saving of $1.20 per ton held out a very attractive proposition to the railroads, but it was found that in hand-firing practice it could only be handled successfully in switch engines, as in road service the firemen experienced considerable difficulty in maintaining full steam pressure at all times in either passenger or freight service. Tests were conducted to determine whether or not the coal could be successfully used in connection with mechanical stokers, and it was found that with some types of stokers practically the same locomotive horsepower output could be obtained per pound of screenings as per pound of mine-run, and therefore on such roads as were equipped to handle both mine-run and screenings at their coaling stations, screenings were used in the stoker-fired locomotives, resulting in a net saving in fuel cost of 7.6 cents per locomotive mile—more than enough to offset the wages of the fireman.

The report is signed by James Fahey (N. C. & St. L.), chairman; A. L. Bartz (E. P. & S. W.), Joseph Keller (L. V.), William Towney (G. N.), and F. P. Roesch (Standard Stoker Company).

Discussion

The trend of the discussion bore out the conclusions in the report that fuel consumption with stokers firing, when measured on a ton mile basis, is more economical than hand firing. Of course, the only direct comparisons which can be made are with locomotives of less than about 50,000 lb. tractive effort, since engines of greater capacity are beyond the limit of practicability for hand firing.

Considerable attention was given to the question of spark losses in the discussion and it is evident that while these losses were large with some of the early stokers, they are now no longer serious, even when slack coal is being burned. On the Baltimore & Ohio the steam from the stoker exhaust is being diverted into the stoker barrel, where it serves to moisten the coal slightly and to hold it in the firebox long enough for complete combustion to take place. It was suggested that eventually it will be impossible for the railroads to procure screened coal at the mine because of the difficulty of disposing of the screenings and that it will become necessary to purchase mine run coal. It was brought out that this is already the case in some districts. The railroads should, therefore be prepared to burn coal economically with any percentage of slack that may be produced at the mine.

The design of the grate is also receiving attention in connection with stoker firing. The Santa Fe is replacing finger grates with table grates having circular instead of slotted air openings in territory where Gallup coal is being burned. This has effected a reduction both in the spark losses and the loss of unburned fuel through the grate. The Pere Marquette is also applying the table grates on stoker fired locomotives. On the Wabash it was brought out that the standard finger grates are being replaced with Hulson grates. Stress was also laid on the need for high standards of stoker maintenance, particularly of the distributors, to insure that the fuel be uniformly distributed over the grate.

Very little was said about stoker failures. Although the members taking part in the discussion generally admitted that there are stoker failures, it is evident that they are of no more frequent occurrence than the failure of other parts of the locomotive and that they have not had any detrimental influence on the miles per engine failure.

[The reports on Operation and Maintenance of Oil Burning Locomotives and on Employing and Educating Engineers and Firemen will appear in an early issue of the *Railway Age*.—EDITOR.]

Other Papers

Reports were also presented on the following subjects: Flange Oilers; Radiolite for Illuminating Cab Gages, and Relation of Air Brake Defects to Traffic Delays and Fuel Consumption.

Election of Officers

The following officers were elected to serve for the year 1922-23: President, Frederick Kerby, (Baltimore & Ohio); first vice-president, T. F. Howley, (Erie); second vice-president, W. J. Fee, (Grand Trunk); third vice-president, J. N. Clark, (Southern Pacific); fourth vice-president, J. B. Hurley, (Wabash); fifth vice-president, J. D. Heyburn, (St. Louis-San Francisco), and treasurer, D. Meadows, (Michigan Central).

The membership of the executive committee for the coming year is as follows: B. J. Feeny, (Illinois Central); G. A. Kell, (Grand Trunk); James Fahey, (N. C. & St. L.); E. R. Boa, (New York Central); J. A. Cooper, (Erie), and J. H. DeSalis.

THE SOUTHERN PACIFIC will reduce freight rates on a number of commodities from eastern points to Oregon, the reductions ranging as high as 30 per cent and effective November 30.

TWO MILLION WORDS.—A number of words approximately equivalent to that in 26 novels was written by five court stenographers during the nine days of the government's injunction proceedings against striking railway employees; 2,100,000 words, said to be the biggest record in the federal court since the famous I. W. W. trial in 1918. The five stenographers in turn rushed back to their offices and dictated to a corps of 35 typists. In this way they turned out more than 750 pages of the record in a day, and certified copies of the proceedings were delivered to the court, the government attorneys and the attorneys for the defense by the next morning.

Fire Insurance on the Burlington

THE PAPER on fire prevention, by W. T. Krausch, engineer of buildings of the Chicago, Burlington & Quincy, which was read at Baltimore on October 18 and was noticed in the *Railway Age* of October 26, was supplemented by a sketch of the fire insurance and fire prevention activities of the officers of that road, which sketch is reprinted below. This was in the form of a letter to an insurance agent from the vice-president of the road who supervises this work, and was as follows:

"This work is in charge of W. H. Klinsick, who is assisted by H. L. DeCamp, E. Bignell, S. H. Shults and R. M. Parker. Mr. Shults devotes his time to making fire inspections at large shops and terminals and attending monthly meetings of the division fire prevention committees on Lines East. Mr. Bignell devotes a portion of his time to similar fire protection work on Lines West and has been concentrating on the locomotive spark hazard in the lignite territory. Mr. DeCamp and Mr. Parker make fire inspections of important terminals and shop property whenever we feel that such are necessary to check up conditions.

"The inspectors from this office inspect all terminals, coaling stations, elevators, water plants and other important property twice each year and send their report to this office and a copy to the division superintendent. All other points not mentioned above are inspected by our special agents' organization once each year, who send a copy of their report to the division superintendent and one to this office. Fire inspections of bridges are made by the bridge foreman when making monthly inspection and by the master carpenter when making his regular bridge inspection in the spring and fall. All coaling stations where lignite coal is used are cleaned and inspected twice each month, and stations where bituminous coal is used are cleaned and inspected once each month. These inspections are made by or under the supervision of the master carpenter.

"We have organized fire prevention committees on each division, composed of representatives of each department, who meet once each month and discuss matters pertaining to fire prevention. Members of these committees inspect the buildings on their respective divisions and correct any existing hazards. These meetings are held according to a prearranged schedule and on the same day on which the committees on safety and fuel economy meet, so that the work of fire prevention is extended to a large degree by the members of these other committees. At each terminal or shop plant a fire marshal has been appointed who has charge of the fire fighting apparatus and the drilling of fire companies. He also makes semi-monthly inspection of all structures and fire fighting apparatus at his terminal and holds two fire drills each month.

"When reports of inspections are received from the underwriters they are immediately taken up on the ground with the division people and all items are carefully considered. Those not requiring large expenditures of money or new practices, are taken care of immediately. Copies of these reports, showing action taken on each recommendation, are forwarded to the vice-president of operation, the general manager and all concerned.

"Messrs. Shults and Bignell for years prior to their work in fire prevention had been active in the official position of division superintendent. . . ."

The Burlington road has over 5,000 buildings, as follows:

General offices	7
Passenger stations and freight stations, approximately	1,800
Roundhouses, shops, store and oil houses, etc., approximately	720
Power plants (separate and distinct plants), approximately	40
Coal plants, approximately	200
Water plants, approximately	460
Grain elevators	6
Large stock yards	8
Miscellaneous buildings	2,000

Hooper on the "Living Wage"

THE RECENT RULING of the Railroad Labor Board on the question of the "living wage" for maintenance-of-way employees, described in the *Railway Age* of November 4, page 857, has brought forth a torrent of denunciation by the Hearst chain of newspapers particularly in Chicago where the board has its headquarters. This attack has been abetted by statements from Samuel Gompers, president of the American Federation of Labor; Edsel Ford of the Ford Motor Car Company and many labor leaders.

The issues raised by these interests were finally answered by Ben W. Hooper, chairman of the Labor Board, who said:

Mr. Edsel Ford breezily remarks that the railroads would probably suffer "deficits for a while" if the so-called living wage were established. Plunging all the railway systems of the nation into a deficit does not disturb the equanimity of Mr. Ford. He makes no reference to the inevitable consequence of such a deficit, namely, higher freight and passenger rates.

It is now a matter of quite general knowledge that the margin of profit in the manufacture of tin Lizzies is much greater than it is in the operation of railroads. It is also pertinent to note that the man who pays for the operation and upkeep of a Ford is in a better position to sympathize with the men who run railroads than is the manufacturer of the Ford.

Mr. Ford should be able to speak of railroad deficits as one having authority. The records now show that the Ford railroad, although it has the benefit of the diversion of the tonnage of the Ford Motor Company, an advantage it did not enjoy before he purchased it, has experienced deficits at the end of several months. The deficit in December, 1921, was $331,240; in July, 1922, $16,367, and in August, 1922, $300,404. It also goes without saying that the operation of this small railroad can not be taken as exemplary of the operation of the great railway systems of the country.

In so far as the opposition of Mr. Gompers to the Railroad Labor Board is concerned, it is sincere and understandable. He is opposed to anything that looks toward a limitation of the freedom of labor organizations to enforce their demands on the railroads and the public by strikes. The issue is clear between Mr. Gompers and those who believe that the public has a definite and positive right to efficient and uninterrupted transportation, which must not be destroyed by controversies between carriers and their employees. The latter view is not hostile to organized labor. No greater blessing can be conferred upon the employees of the railroads than to free them from the necessity of engaging in recurring industrial struggles at the cost of enormous loss and suffering to themselves and, at the same time, to guarantee to them just and reasonable wages and working conditions.

The attitude of the Hearst syndicate of papers is not quite so clear. The position of this syndicate of papers on the living wage bears many of the recognizable earmarks of political expediency, and this is an unsafe foundation for an economic policy.

The Board in its action on this question has not only served the best interests of the public in general, but has saved labor from the folly of some of those who pose as its friends. A wage award which would crush the railroads would ruin their employees. A wage award which would create an enormous deficit in every railway treasury would necessitate the imposition of higher freight rates on the farmers, producers and shippers of this country. Does this syndicate of papers advocate an increase in freight rates and the consequent increase of living costs to the masses? If not, from what source do they expect to obtain the 125 per cent increase which the so-called living wage would necessitate?

One of the expert economists who presented the matter to the Board for the employees stated that this would "throw a monkey wrench into the industrial machinery" and that the theoretical living wage should not be established all at once, but the minimum should be made 48 cents per hour.

In view of this situation does this syndicate of papers desire to throw the monkey wrench into the machinery? If not, why criticize the Board for refusing to do it. Let it be remembered that the Board contends that it has established "a living wage" for common labor—a wage, which, in an overwhelming majority of instances, is appreciably higher than the wage paid common labor in the same community in other industries.

A flat wage is as impractical as a flat dollar. Both have been tried out in Russia, where the laborer may get millions of roubles for an hour's work, but what will his flat wage and his flat rouble buy him?

The swelling tide of prosperity in our country can not be hastened by methods of this kind.

Subsequently, there has been a noticeable decrease in the space given to this controversy in the Hearst publications.

General News Department

The Missouri & North Arkansas announces that passenger and freight service will be extended to Joplin, Mo., on November 15, thus completing resumption of service over the entire line from Helena, Ark., to Joplin, Mo.

The Illinois Central has announced that all shop employees who lost their pension rights as a result of a strike in 1911, but who remained at their posts during the strike last summer, will have their lost pension rights restored.

The New England Railroad Club will meet on November 14 at the Copley Plaza Hotel, Boston, at 6:30 p. m. C. F. Shirley, purchasing agent of the Forbes Lithograph Manufacturing Company, will speak on New England Railroads from a Commercial Agent's standpoint.

Five hundred dollars fine and three months' imprisonment were imposed as penalties for contempt of court, in the Federal Court at Macon, Ga., on October 28, against two striking shopmen of the Central of Georgia who had violated the injunction against interfering with railroad employees. The two men were found guilty of attacking two workmen several weeks ago. A third man who was tried was found by the jury not guilty.

Two train-robbers killed and no property lost, is the result of an attempt to loot the mail car of Train 805 of the St. Louis-San Francisco near Wittenberg, Mo., on the night of November 2. One of the robbers was well known, having served 12 years in the Missouri penitentiary, and post-office inspectors, who had been watching him for several weeks, were on hand at the scene of the robbery, with railroad and local policemen. They stopped the robbers a short distance away from the train and on their refusal to halt shot them. They had pulled the mail car several miles away from the rest of the train, and after taking the registered letters ran, with the locomotive, still farther, finally jumping off, leaving the engine to run wild.

The Careful Crossing Campaign has had some effect in limiting the number of persons killed and injured, as indicated by preliminary compilations made by the Safety Section, A. R. A., which managed the campaign. The figures do not show any remarkable gain in safety and they are based on only 204,091 miles of road—four-fifths of the Class I mileage of the country—but they indicate a definite diminution in both fatal and nonfatal injuries. For the period of the campaign, June 1 to October 1, there was an increase of 9.7 per cent (as compared with the same period last year) in the volume of railroad business as indicated by the car loadings, and an increase in registration for the same period of 2,009,021 automobiles and trucks, or 21 per cent; but the number of accidents at highway crossings increased only 3.6 per cent; non-fatal injuries 2.4 per cent and fatal injuries 3.6 per cent. This is an average of 3 per cent increase for non-fatal and fatal injuries. The total of the accidents reported for the period was 4,411, an increase of 153; total non-fatal injuries 1,800, an increase of 42, and total fatal injuries 693, an increase of 24.

Commissioners Object to Cut in Valuation Appropriation

Chairman McChord and Commissioners Esch and Lewis of the Interstate Commerce Commission called on the President on November 4 to protest against a proposed reduction in the appropriation for the commission's railroad valuation work for the next fiscal year, which has been recommended by the Bureau of the Budget in its effort to reduce government expenses. The commission had asked an appropriation for this purpose of $1,300,000 and the budget bureau had recommended that the sum be reduced to $750,000. The President was told that if the appropriation requested is allowed the underlying work of valuation would be completed by July 1, 1924. He will discuss the matter further with the officers of the budget bureau.

Circus Train Wreck

Three persons were killed and four seriously injured when the westbound "Sunset Express" of the Southern Pacific crashed into the rear end of the Wartham Carnival Company's special show train near Adeline, La., on October 31. The dead and injured were all members of the theatrical company.

Tank Car Safety Valves

The Mechanical Division of the American Railway Association has issued a circular granting permission to companies having stocks of tank car safety valves of the 1920 design to place in service prior to July 1, 1923 any valves now on hand of that design. All patterns should be changed at once so that future castings will comply with the requirements shown in Supplement 1 to the Tank Car Specifications for 1920. Fig. 9-A and 10-A.

Interstate Commerce Commission Accident Report

Houston, Tex.; Crossing of the Southern Pacific and the International & Great Northern, September 13. At this crossing, where the tracks lie nearly at right angles, a yard freight of the International & Great Northern, with 44 cars, moving slowly, about 4:50 p. m., ran into the side of a passenger train of the Southern Pacific; 27 passengers and one employee injured. Three passenger cars overturned. The inspector finds that the air brakes of the freight train were not in use, a violation of law, and that the engineman did not bring his train to a stop before passing over the crossing, also a violation of law. There are no interlocked signals at the crossing. The investigation disclosed that the movement of yard freight trains without using air brakes and without coming to a stop at the crossing was a common practice, and the officers of the road are held to merit severe censure.

Air Brake Hearings Resumed

Hearings before Examiner Mullen of the Interstate Commerce Commission in connection with the commission's general air brake investigation were resumed at Washington on Wednesday, November 8. Witnesses representing the Automatic Straight Air Brake Company presented a number of voluminous exhibits covering air brake failures and the results of tests and were to be recalled later for cross-examination after the representatives of the roads had had an opportunity to check them. The first witness was a conductor for the Virginian who filed records of several hundred air brake failures on the Virginian and other roads. On being questioned as to whether he was able to testify to these records from his personal knowledge he said that about 75 of the failures occurred on his own train and that these cases had been checked in his exhibit and that the others could be identified by the notation "B. S." which he had used to indicate that the information was taken from the records of the Bureau of Statistics.

Katy Employees Organize Union

Employees in the motive power and car departments of the Missouri, Kansas & Texas lines have completed the organization of the M. K. & T. Association of Metal Craft and Car Department Employees, "to promote the welfare and protect the interests of its members, to promote good feeling and constructive co-operation between the members and the officers of the railway, and, by joint action, protect and promote the interest of the

public." The organization was completed at a meeting held recently in Parsons, Kan., attended by seventy delegates, representing employees at practically all terminal and shop points on the system.

A system adjustment board was created under the provisions of the Transportation Act, and the by-laws of the association provide that this board shall act as the official representative of the association. It is the duty of the adjustment board to place before the officers of the railway all matters submitted to it by local adjustment boards concerning grievances and it will deal with all matters relating to interpretations of rules, rates of pay and working conditions.

The by-laws further provide that any disputes which cannot be settled in conference between the system adjustment board and officers of the railway, shall then be handled in accordance with the provisions of the Transportation Act.

Mechanical Convention in 1923

The General Committee of the Mechanical Division of the American Railway Association decided at a meeting held in New York on November 8 not to hold in 1923 a convention of the kind ordinarily held in past years. It was decided to hold merely a business session of the Mechanical Section, at which reports dealing with interchange of cars, standard box cars and kindred matters will be received.

The explanation given for this action is that owing to the shop employees' strike no meetings of the committees of the section have been held to consider most of the regular reports, and that it will be impracticable to hold meetings of this kind during the rest of the present year. It was therefore decided that it would be impracticable to prepare the usual reports for the convention.

This decision, if left unchanged, means that the business session will be held at some place, possibly Chicago, instead of the convention being held at Atlantic City, as originally intended. It also means that no exhibit of equipment and supplies will be given and that the session to be held will last only two or three days.

Gray and Gormley Speak to Chicago Shippers

C. R. Gray, president of the Union Pacific, and M. J. Gormley, chairman of the car service division of the American Railway Association, were the principal speakers at the annual meeting of the Chicago Shippers' Conference Association which was held on November 7, at the Hotel LaSalle, Chicago. Mr. Gray discussed the Southern Pacific-Central Pacific "unmerger" case, contending that Chicago shippers should be concerned in seeing that the Central Pacific is kept separate from the Southern Pacific.

Mr. Gormley dwelt upon the present car shortage situation, "the greatest in railroad history." On September 9, a total 683,689 cars were moved, while on October 25, 876,657 cars were moved, or an increase of 192,968. He said that 11 per cent of all the cars in service today are awaiting repairs, but with conditions steadily improving. He explained the recent orders issued by the car service division and appealed to the shippers to see that the cars at their disposal are loaded to capacity.

The new officers elected by the C. S. C. A. are as follows: President, R. C. Ross, traffic manager of Joseph T. Ryerson & Son; vice-president, G. A. Blair, traffic manager of Wilson & Co.; treasurer, R. W. Campbell, traffic manager of the Butler Paper Company, and secretary, W. J. M. Lahl, traffic manager of the American Seating Company.

Revenues and Expenses for September

The Class I railroads in September had a net operating income of $58,428,000, according to reports filed with the Interstate Commerce Commission. This represented a return, on an annual basis, of only 2.88 per cent on their tentative valuation. In September last year it was at the annual rate of 4.32 per cent, while in August this year it was 2.65 per cent. The railroads failed by $58,000,000 of realizing a return of 5¼ per cent. September operating revenues were substantially increased but operating expenses increased 8.2 per cent. In September $120,000,000 for maintenance of equipment was expended, an increase of 15.7 per cent over the same month one year ago. The number of freight cars in need of repairs was reduced by 30,000 and of locomotives by 114. Expenditures for maintenance of way, however, were seven per cent under those of one year ago. Measured by net ton miles freight traffic in September this year increased more than 10 per cent.

During the first nine months this year, the railroads had a net operating income of $529,413,000, compared with $393,793,000 during the corresponding period last year. This is at the annual rate of return of 3.96 per cent, compared with 2.95 per cent. Carriers in the Eastern district in September earned net at the annual rate of only 1.98 per cent; those in the Southern district 4.66 per cent and those in the Western district 3.46 per cent.

Forty-four roads in September had operating deficits. Of this number, 23 were in the Eastern district, 4 in the Southern and 17 in the Western. In August, 49 had operating deficits.

New Officers of Railway Equipment Manufacturers' Association

At the annual meeting of the Railway Equipment Manufacturers' Association, held during the Traveling Engineers' Association convention at Chicago, on October 31, the following officers were elected for the coming year: F. W. Venton, (Crane Company), president; R. J. Himmelright, (American Arch Company), vice-president; J. W. Fogg, (Boss Nut Company), secretary, and George E. Haas, (Pyle National Company), treasurer.

The following members of the Association, not included in the list published last week, also had exhibits at the Hotel Sherman during the convention of the Traveling Engineers' Association:

American Steel Foundries, Chicago.—Models of brake beams, couplers, adjustable shelf coupler pocket, adjustable brake heads for passenger beams, vertical key yoke, and side frame and journal box.—Represented by W. G. Wallace, J. H. Tinker and W. C. Walsh.

Ashton Valve Company, Boston, Mass.—Locomotive steam and air gages, driving wheel quartering gage, safety valves, whistles, wheel press recording gage and gage testing devices.—Represented by J. F. Gettrust, H. O. Fettinger and E. W. Nordstrom.

Johns-Manville, Inc., New York—Insulations, packings and locomotive specialties.—Represented by J. E. Meek, J. C. Younglove, J. H. Trent, P. C. Jacobs, Charles E. Murphy, Harry Flannagan, L. S. Wilbur, P. R. Austin, H. J. Crowe and A. H. Purdom.

Sheafe Engineering Company, Chicago.—Locomotive cylinder and lubricator air pump steam cylinder lubricator.—Represented by J. S. Sheafe.

Standard Stoker Company, New York. Photographs and literature of mechanical stoker.—Represented by F. P. Roesch, H. N. Carmer and L. F. Sweeney.

White American Locomotive Sander Company, Roanoke, Va.—Locomotive track sander with new duplex operating valve.—Represented by James Frantz and W. L. Ransom.

The New Santa Fe Shop Employees' Association

Our attention has been called to the fact that the article appearing in the *Railway Age* of October 21, page 768, omits the Atchison, Topeka & Santa Fe as one of the first railroads on which associations of shop employees were formed independent of the American Federation of Labor. The list of roads named at that time emanated from the Railroad Labor Board, as stated, but unfortunately the Santa Fe was not included in the board's announcement.

When the strike began, 2,300 mechanics remained in the service of the Santa Fe, and by August 22, the number of employees in the mechanical department had reached a total of 13,702 or 71 per cent of the normal force. These employees had already formed company unions among themselves and had made a request on the management to negotiate new agreements. Consequently on August 22 new agreements were signed with the shop craft associations, i.e., machinists, boilermakers, blacksmiths, sheet metal workers, electricians and carmen and their helpers and apprentices. Agreements were also made with the stationary engineers, firemen and oilers. The date of this action, therefore,

places the Santa Fe as one of the first railroads in the country to reach a satisfactory settlement of the strike. On October 19, the force in the mechanical department had reached 100 per cent, the road having at the present time 18,972 employees in the mechanical department.

In discussing the effect of the strike on the Santa Fe, one of the officers of that road recently said, "Never in the history of the Santa Fe System Lines has it been offered and handled as heavy a business as it has since the latter part of August. We have no embargoes in effect; we have no serious congestion of any kind; our condition of motive power is normal. Our bad order freight car situation, as of October 25, showed only 4.69 per cent of all cars on our lines in need of repairs the lowest point of record since the return of the roads to private control. We have 2,000 new box cars soon to reach us and we have ordered for delivery in the first quarter of next year 59 locomotives, 1,000 box cars, 1,000 automobile cars, 2,000 refrigerator cars, 500 double-deck stock cars and 500 coal cars."

Decline in Number of Firms Manufacturing Cars

Census reports show the decrease in activities of establishments engaged in the manufacture of cars for use on steam and electric railways during 1921, as compared with the year 1919, according to the Department of Commerce.

In 1921 there were 105 establishments engaged in the manufacture of steam railroad cars and the total value of their products amounted to $314,394,867, as compared with 99 establishments for 1919 with a total value of products of $538,222,831. The decrease in the total value of products was $223,827,964, or 41.6 per cent.

During this same period there were 10 establishments engaged in the manufacture of electric railway cars and the total value of their products was $14,856,068 as compared with 7 establishments for 1919 with a total value of products of $18,441,976; showing a decrease in the value of products of $3,585,908, or 19.4 per cent.

The decrease in the value of products for both classes has been accompanied by decreases in the number of wage earners, in the total amount paid in salaries and wages during the year, and in the cost of materials used. In January, the month of maximum employment, 66,545 wage earners were reported, and in September, the month of minimum employment, 35,264—the minimum representing 53 per cent of the maximum employment. The average number of wage earners in 1921 was 46,863 as compared with 55,218 in 1919, a decrease of 15.2 per cent. A classification of the wage earners shows that 10,170, or 21.7 per cent of the total number were employed in establishments where the prevailing hours of labor per week were 48 and under; 20,295, or 43.3 per cent between 48 and 54; and 16,398, or 35 per cent, were employed in establishments where the prevailing hours of labor ranged from 54 to 60.

The number of cars manufactured during the year by both classes of establishments showed a decrease from 155,186 in 1919 valued at $387,447,866, to 51,894 in 1921, valued at $180,866,191. The decrease was chiefly in the manufacture of steam railroad cars. This class showed, in 1919, 153,288 cars made, valued at $373,945,213, as compared with 50,361 cars, valued at $170,325,626, for 1921. The decrease in the number and value of cars manufactured was 67.1 and 54.5 per cent, respectively.

These figures do not include the number and value of cars manufactured in repair shops of steam and electric railroad companies, or as secondary products by establishments classified in other industries. In 1919 establishments of this kind manufactured 6,345 cars valued at $16,217,044.

Brotherhoods Oppose Changes in Working Conditions

A controversy which labor leaders claim represents the inauguration of an attack on the eight-hour day, came before the Railroad Labor Board on November 2 when W. G. Bierd, receiver of the Chicago & Alton and other officers of that road appeared before the board in support of a petition asking for the elimination of time and one-half for overtime in road-freight transfer and hostler service, the extension of the present eight-hour rule to nine hours in short turn around passenger service and a modification of the working schedules in outlying switching yards on the road.

They asserted that time and a half in connection with the mileage basis for train and enginemen, is wrong; it pays for service never rendered; is a premium for not putting forth ordinary effort; and it prohibits the carriers from supervising train operation closely and economically. Enginemen and trainmen, it was argued, receive a rate of pay that is unfair to every other class of railroad employee. It was also contended that under present conditions the C. & A. is called upon to sacrifice the use of 12 to 20 engines a day and to put on two trains and crews to do what one train and crew had formerly done for many years.

The road also asked the board to grant a nine-hour rule for yard service in small outlying terminals where it has no continuous service. Under the eight-hour day the road cannot get full service from the crew at these small points.

A third question before the board is the double header rule, from which the C. & A. is asking to be released on its 300 miles of single track from Roodhouse, Ill., to Kansas City, Mo. Removing the double header restriction would increase the capacity of this 300-mile line.

In replying, representatives of the employees claim there is evidence tending to show that the punitive overtime rule has been beneficial by increasing the speed of trains, thereby saving in motive power, equipment, etc.

Referring to the road's contentions regarding the eight and nine-hour day, the employees reiterated the arguments on the right of workers to an eight-hour day, adding, "It does not make any difference whether the eight-hour day is in the control of the carrier or not; if a man works longer than eight hours he is drawing unreasonably upon his resources and he is therefore entitled to an increased rate of compensation."

Representatives of the men stated that the objection of the trainmen to double headers is a desire to reduce their hours of labor and that there is an added element of danger involved in handling trains with two engines.

The Condition of the C. P. & St. L.

A possible solution to the difficulties of the Chicago, Peoria & St. Louis is the contemplated merger of that road with a larger line having east and west connections. The hearing on a petition to abandon the road is scheduled for November 13. B. A. Worthington, president of the Cincinnati, Indianapolis & Western, denied that his road had decided by buy the defunct line, but admitted that he had inspected the property and that the inspection report is now in the hands of his directors. He further said: "Unofficially, I will say that the Chicago, Peoria & St. Louis is much too good a road to be scrapped. In the interest of the public good, as well as from the standpoint of the railroads, it should be absorbed with some road with east and west connections. The road has about 247 miles of track, 75 per cent of which is in passable shape. The rolling stock is somewhat out of repair, but it could be put in shape and used with profit. The road has about 1,800 freight cars, 38 coaches and 51 locomotives. Control of 25 per cent of the stock in the Peoria & Pekin Union Terminal stock is valuable, as are also the St. Louis terminals. The road serves a territory which will show great development under proper conditions.

"The fate of the road rests with the bondholders, who hold the prior lien on the property, amounting to about $2,000,000. If the road is scrapped, these people can get their money at once. If another railroad system were to take over the property, it would be necessary that these bondholders take stock in the new organization in place of their former holdings. It might mean a few years to wait, but the property would undoubtedly pay its way within a few years, and the stock would have a good value. The company taking over the Chicago, Peoria & St. Louis would have to put about $3,000,000 in improvements and repairs. With the $800,000 current debts which the road has, no big system will absorb it unless the present owners take part pay in stock in the new organization."

The bondholders are understood to be anxious that the property be abandoned and scrapped, as the scrap value will be ample to relieve the $2,000,000 bonded indebtedness now outstanding.

Traffic News

The San Francisco freight office of the Southern Railway is under the jurisdiction of J. L. Martin, Pacific Coast agent, 705 Monadnock Building.

The Chamber of Commerce of the United States has asked the federal coal commission to be allowed to present the views of organized business in the event the commission seriously considers any proposal looking to the nationalization of the coal industry.

The Illinois Central announces a new train, to go into operation on December 5, between Chicago and Jacksonville, Fla., to be known as the "Floridan." The train will leave Chicago Tuesdays, Thursdays and Saturdays about noon and will arrive at Jacksonville about 9 p. m. the following evening in time to make connections for other Florida points.

The Arkansas Railroad Commission has announced that it will oppose the Oklahoma Corporation Commission's petition to the Interstate Commerce Commission asking a readjustment of the freight rates for the entire southwest, declaring that the petition is directed toward practically the same ends as the "Memphis rate case." It claims that the purpose is to increase freight rates on all commodities moving into and through Arkansas.

The St. Clair River District Transportation Club was organized at Port Huron, Mich., on October 9. The following officers were elected: President, E. C. Miller, Mueller Metals Company, Port Huron; first vice-president, W. M. Markle, Diamond Crystal Salt Company, St. Clair, Mich.; second vice-president, W. W. Shingle, Pere Marquette Railroad, Port Huron; secretary, A. G. Thernstrom, assistant agent, Grand Trunk, Port Huron; treasurer, J. M. Barbee, Port Huron Chamber of Commerce.

Durant Motors, Inc., announces the personnel of its traffic department as follows: William J. Bailey, director of traffic, Long Island City, N. Y.; Fred L. Pomeroy, assistant director of traffic, Long Island City, N. Y.; Edward G. Rice, assistant to director of traffic, Long Island City, N. Y.; P. V. Demerest, traffic manager, Elizabeth, N. J.; Bert C. Sproul, traffic manager, Lansing, Mich.; Earl C. Allander traffic manager, Oakland, Cal.; Arthur C. Heath, traffic manager, Muncie, Ind.; Emmet F. Howley, traffic manager, Leaside, Ont.

The fuel situation has become stabilized to such an extent that the Chamber of Commerce of the United States has notified its members that surveys and reports are no longer necessary, as the program adopted in September to equalize coal distribution through co-operation among users in the period immediately following the strike has been successful. In a letter to business organizations Julius H. Barnes, president of the chamber, calls attention to the present adequate distribution of supplies and to the steady reduction of prices during the last few months.

Storage in transit is now allowed by the Canadian Pacific, on apples in carloads from British Columbia destined to Eastern Canada or to the Atlantic seaboard for export. Exporters are said to be arranging to establish big collecting warehouses in Winnipeg and other cities. The storage in transit privileges are allowed at Winnipeg, Regina, Moose Jaw, Lethbridge and Calgary. The shipper has the privilege of holding this produce in any of the cities named for a period of six months. The new regulations will, on and after November 17, apply on shipments to points in the United States.

The Atchison, Topeka & Santa Fe has announced that until December 31, 1922, one-half present tariff rates will apply on cottonseed cake, meal and hulls, corn and articles taking corn rate, hay and alfalfa from all points on that road in Texas, Oklahoma, Colorado and Kansas; also from Kansas City, St. Joseph, and Superior (Neb.) to Santa Fe points in New Mexico. Half rate basis will apply from Phoenix, Ariz., on cottonseed cake, meal, hulls and alfalfa. This emergency rate reduction is made for the relief of the drought stricken livestock industry in New Mexico. The El Paso & Southwestern and the Southern Pacific have made similar reductions.

The Alabama, Tennessee & Northern announces that additional gasoline motor cars will soon be put in service. On May 1 this road bought and put into service between York, Ala., and Silas, a gasoline motor car, later extending the service to Millry and Healing Springs. The car has proved popular and the same kind of service is to be established from York north, serving Reform, Carrollton, Aliceville, Cochrane, Dancy, Panola and intermediate points. The latest car purchased has improvements over the first one. President J. T. Cochrane says that he does not expect to take off any steam trains; the motor car service is to be in addition to all other trains now in operation.

John T. Cochrane, president of the Alabama, Tennessee & Northern in an interview in the Mobile (Ala.) Register calls for a general freight car pool. He says: "The transportation system of the United States as a whole is under obligation to take care of all shippers as near proportionately equal as practicable, and the only way to do this is to mobilize the cars of the various railroads of the United States under an effective and authoritative central management as can be done by the Interstate Commerce Commission. Cars can be handled through railroads just as the Federal Reserve system handles money through the banks. The A. T. & N. owns more than enough cars to take care of the large production on its railroad, but now its cars are scattered all over the country and we cannot get them back. We are contending that all the cars, including ours, be put into a pool and sent by those in authority to the points where needed most. Until this is done all our railroads are going to continue to have the same hard fight we are having from day to day to get empties."

The wealth of Kaolin in the ground along its lines is the chief topic of the latest newspaper discussion issued by the Central of Georgia. Georgia is generally regarded as an agricultural state, but its mineral products in 1920 were valued in excess of $13,000,000 and clay products (brick and tile) made up approximately 35 per cent of this amount. The development of the clay industry means more to a greater territory and to a larger number of people than any other mineral. The road has been co-operating with the government in a series of tests and states with full assurance that Georgia kaolins when properly prepared can compete with the English china clays in the filler trade and the manufacture of pottery, electric porcelain, floor tile, wall tile, and sanitary ware. An even more inviting field for development is afforded by the refractory clays which possess primary requisite for the manufacture of fire brick, for electric, chemical, metallurgical and industrial furnaces—the ability to withstand fusion at high temperature. There is enough clay in Georgia to supply the needs of the nation for generations to come. Pamphlets describing the clay resources, the tests and the preliminary results, may be had from J. M. Mallory, general industrial agent of the road, Savannah.

The Illinois Central's November Manifesto

The Illinois Central in its latest general newspaper advertisement assures the public that the officers are leaving nothing undone in their efforts to meet the situation. Since the October statement was published 75 large freight locomotives have been bought, making a total of 140 locomotives purchased this year. "However, we are handling the largest traffic in the history of this system, and our patrons doubtless will continue to be inconvenienced by the general shortage of transportation facilities.

"In the seven years ended with 1921 the number of locomotives in the United States increased only 275 a year, and the number of freight cars only 6,000 a year. The increase in the number of locomotives in the seven years ended with 1921 was only one-ninth as great as in the seven years ended with 1907, while the increase in the number of freight cars was only one-fifteenth as great. The decline in the amount and capacity of the equipment provided has been accompanied by a corresponding decline in other facilities. * * * When the confidence of investors in railway securities is fully restored, large expenditures for additions and betterments can be made, and the railroads will then be able to supply all necessary transportation. This is the 'railway question' in a nutshell. * * *"

Operating Statistics for August and Eight Months

The net ton miles of revenue and non-revenue freight handled by the railroads in the month of August totaled 30,452,000,000 as compared with 30,420,000,000 in August, 1921, according to the monthly bulletin of operating statistics issued by the Interstate Commerce Commission. The car miles per car day averaged 21.8 as compared with 22.7 last year, the net tons per loaded car 26.3 as compared with 27.4 and the net ton miles per car day 406 as compared with 400. For the eight months ended with August, the net ton miles totaled 227,739,000,000 as compared with 222,411,000,000 last year.

Southern Freight Association

The Southern Freight Association has recently been organized by the railroads operating in the territory south of the Ohio and Potomac Rivers and east of the Mississippi as a successor of the Southern Freight Rate Association, to have jurisdiction over rate adjustments in that territory. Charles Barham, heretofore general freight agent of the Nashville, Chattanooga & St. Louis, has been elected chairman of the association and also of its executive, general and standing rate committees. L. E. Chalenor, who was secretary of the old association, was elected secretary of the new one.

"Sell Recreation"

M. E. Westbrooke, director in charge of the National Travel and Out Door Life exposition, which will be held in Chicago May 7-12, inclusive, has asked the support of the railroads. At a meeting of traffic men held in Chicago on October 26 he said:

"Sell recreation and you will have sold travel. Recreation is a commodity and should be sold as other commodities. The scenery, highways, hunting and fishing grounds, golf links and polo fields constitute a commodity of which there is an unlimited supply awaiting purchasers. Sell the playgrounds of the United States and Canada and you have sold travel. Outdoor life is a commodity which in the past has been bought much as the farmer purchased his requirements from a mail order catalog, only to meet with disappointment.

"The National Travel and Out Door exposition in its exhibits will symbolize all the principal forms of outdoor recreation. The playgrounds of America and Canada will be visualized to give the purchaser of recreation a realistic picture of what the various sections afford."

Coal Production

Preliminary returns to the Geological Survey on coal production in the week ended November 4 indicate a total of 12,500 net tons, of which about 10,700,000 tons is bituminous coal and 1,800,000 tons is anthracite. Revised estimates for the fourth week of October show 10,681,000 tons of bituminous and 1,773,000 tons of anthracite. Thus a slight increase in the total coal raised is shown for last week as compared with the week before.

The increased rate of production during the past three weeks is said to be principally due to improvement in transportation. The rate of output of soft coal is now about equal to that of 1918 and higher than in 1921, but lower than in 1919 and 1920.

The production of anthracite in the fourth week of October is estimated at 1,773,000 net tons which is a decrease of 11 per cent as compared with the week preceding.

Reports for the week ended October 21 indicate continued improvement in transportation in most of the territory east of the Mississippi. The most notable exceptions were in Westmoreland County, Pennsylvania, and the Tug River district of West Virginia, where transportation losses increased to 49.4 and 72.8 per cent, respectively. In the trans-Mississippi states the rail situation grew steadily worse and losses charged to transportation disability ranged from 1.7 per cent in Iowa to 57.4 per cent in Utah.

The movement of bituminous coal across the Hudson River into eastern New York and New England decreased during the week ended October 28. The cumulative movement for this year to date now stands at 67,872 cars of anthracite and 85,184 cars of bituminous coal through the Hudson gateways, and 282 cars of anthracite and 1,963 cars of bituminous coal through Rouses Point.

The fourth week of October was the seventh successive week in which the tonnage of soft coal dumped into vessels at Lake Erie ports exceeded 1,000,000 tons. Anthracite shipments from Buffalo during the week ended October 31 were 94,200 net tons against 119,100 tons in the week before.

Shipments of bituminous coal through Hampton Roads in the week ended October 28 increased about 6 per cent as compared with shipments in the 2 weeks preceding. In the last week reported dumpings totaled 276,072 net tons as compared with 261,524 in the week preceding.

Reports received by the Car Service Division of the American Railway Association show that under the program agreed upon following the settlement of the miners' strike, the railroads have only 2,000,000 tons to deliver in order to fulfill their agreement. This means the delivery of approximately 666,700 tons a week.

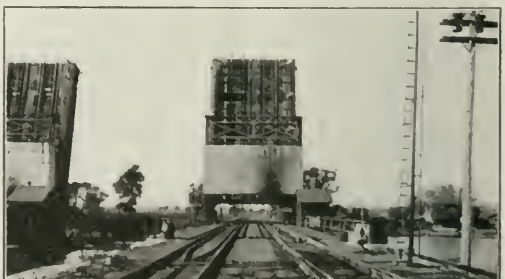
The Car Service Division reported on Nov. 7 a total coal loading for the week of 237,010 cars. This exceeded by 13,599 cars the week which ended on October 21, the previous high mark. Bituminous amounted to 193,103 cars, an increase of 2,827 over the week before, and a daily average of 32,184 cars. This was an increase of 1,139 over the daily average for October one year ago. Anthracite totaled 33,907 cars, an increase of 980 cars over the week before, when Mitchell Day was observed. The average of 5,651 cars daily exceeding the daily averages for both November, 1920 and 1921.

On Monday of this week 43,810 cars were loaded with bituminous coal. Except for the preceding Monday, when 45,298 cars were loaded, this was the largest number of cars loaded on any one day since December 13, 1920.

Commercial Coal Stocks

A canvass of commercial stocks of anthracite and bituminous coal undertaken by the Bureau of the Census and the Geological Survey, indicates that on October 1, commercial consumers had in storage approximately 28,000,000 tons of soft coal, according to an announcement by Fuel Distributor C. E. Spens. This figure compares with 27,000,000 tons on October 1, 1916, and with 28,000,000 tons on October 1, 1917. On September 1, stocks amounted to 22,000,000 tons. The trend of production has continued upward and it is estimated that the increase in storage from October 1 to November 1 will at least equal the increase from September 1 to October 1. The stocks on hand on November 1—approximating 35,000,000 tons—comprise the quantity in the hands of commercial consumers, and does not include coal in the cellars of domestic consumers nor steamship fuel.

"On January 1, 1922," said Mr. Spens, "commercial stocks amounted to 48,000,000 tons, and by April 1, when the strike began, to at least 63,000,000 tons. The average weekly production at present is approximately 10,500,000 tons or roughly, 2,000,000 tons in excess of current consumption.



The Reading's New Drawbridge Over Darby Creek, Chester, Pa.

Commission and Court News

Interstate Commerce Commission

Applications for Relief from the Fourth Section

In the interest of economy and expedition, it has been the practice of the commission to pass upon certain applications for relief from the provisions of the fourth section of the act without hearing. Applications based upon the circuitous character of the petitioner's route are so handled.

While no objections have come to the attention of the commission, some misunderstanding appears to have arisen concerning the status of orders granting relief in such cases. To clear up such misunderstanding the commission announces that where applications are passed upon without a hearing, the orders issued are not to be considered as final but are subject to modification upon complaint after notice and hearing; or without hearing if, because of changed conditions or other adequate reasons, such modification may seem necessary and proper.

In order to afford the public more information with respect to applications for relief under the fourth section, arrangements have been made to issue and place upon the press table in the secretary's office daily synopses of applications as received.

Leases of Property by Railroads to Shippers

The Interstate Commerce Commission has issued a report on its investigation instituted prior to federal control concerning the propriety of practices of carriers in leasing their facilities and other properties to shippers of freight over their lines. The commission holds that no justification exists for the leasing of railway lands to industries at a nominal rental charge. The commission held hearings at New York, Washington, Fresno, Calif., and Spokane, Wash., after which the intervention of federal control delayed action and the commission has since been advised that various changes have occurred as a result of the hearings so that the record does not in all respects accurately reflect the present situation. For the sake of brevity, the report deals only with the situation at Spokane as it was disclosed at the hearing. It is stated that this situation fairly illustrates the questions of law and of public policy involved and affords an adequate basis for the discussion of the questions. The commission goes no further in this report than to indicate some of the underlying principles which, in its opinion, should govern carriers in the leasing of lands to shippers and which are illustrated by the evidence which has already been summarized:

1. No justification exists for the leasing of railway lands to industries at a nominal rental charge. It is conceded that traffic considerations are the moving cause, in such cases, so far as the carriers are concerned. Where the traffic of the lessee is in part the consideration the transaction amounts to a concession to the shipper-lessee, in violation of the law.

2. A provision in a lease whereby a shipper agrees to route over the lines of the lessor or its connections all or any part of his traffic amounts to an acknowledgment that the consideration was in part the exchange of traffic for right to occupy the land.

3. The determination of the value of leased premises by mutual agreement of the shipper and carrier, and revaluation from time to time is an arrangement open to serious abuse.

4. Every effort should be made by carriers to obtain terms no less favorable than would be obtained were the land owned independently of the railroad.

The facts disclosed by this investigation strongly support the general conclusion that the above principles have not been sufficiently observed by the carriers, and that leases have often been a medium of unwarranted concessions to shippers. There is reason to believe that this investigation has led to improvements in the practices of carriers. Shippers and others who believe that they are subjected to undue prejudice and disadvantage can be of assistance by bringing such situations to our attention. The proceeding will be discontinued. No order is issued.

State Commissions

The Illinois Commerce Commission has approved an agreement between the Chicago, Aurora & Elgin and Alfred E. Pfahler, whereby the railroad company is to lease 20 passenger cars and one electric locomotive. The railroad is authorized to issue and deliver to Mr. Pfahler $470,000 in equipment trust certificates.

Railroads in Wisconsin Ordered to Repair Cars

Railroads operating in Wisconsin were ordered last week by the railroad commission of that state to take immediate steps to relieve the freight car shortage situation by repairing the cars now idle because of unfitness for service. The roads are called on to make daily reports on the results of their car repair work.

Illinois Commission Appeals to I. C. C.

The Illinois Commerce Commission has asked the Interstate Commerce Commission and the American Railway Association to modify the car service orders which have been put into effect. It is requested that eastern railroads be required to supply some of their own cars for use in the west, especially for grain movement; also that the Pennsylvania, the Baltimore & Ohio and the Cleveland, Cincinnati, Chicago & St. Louis, among the eastern lines, be relieved from the emergency requirement, now in force, of returning box cars belonging to western roads empty on condition that they move grain in them toward the midwest terminals.

Court News

Price for Coal Taken by Railroad

In an action by the shipper of coal against the carrier for the confiscation of the shipment en route by the carrier, which used it as locomotive fuel, the evidence showing that the confiscation was not malicious, the Circuit Court of Appeals, Fourth Circuit, holds that the measure of damages was the market value of the coal at the time and place of confiscation. If the coal had not been taken, it would have gone into certain pools at point of destination, after which the shipper would have been entitled merely to a credit in the pools for an equal amount of coal of corresponding grade. The shipper's actual loss was therefore the market value of the credit.—Norfolk & Western v. Ft. Dearborn Coal & Export Co., 280 Fed., 264.

Commission's Order for Union Stations Held Void

The statutes of Minnesota do not expressly confer upon the Railroad and Warehouse Commission the power to require intersecting railroads to maintain a joint station at the point of crossing, and whether this power is implied in the general control vested in them the Minnesota Supreme Court does not decide, but conceding the implied authority, it holds that an order requiring the Chicago Great Western to construct on its property a station, one fourth of the cost to be borne by the Chicago & North Western, to be maintained at the sole expense of the former, and with no provision for joint occupancy, is an unlawful invasion of the property rights of the two companies, and void.—Palmerlee v. C. G. W. (Minn.) 188 N. W., 328.

State Statute Regulating Car Repair Shops

The federal district court of the District of Minnesota, Third Division, holds that the requirement of the Minnesota statute of 1919, as amended 1921, c. 481, requiring buildings for the construction or repair of railroad cars, is in conflict with section 4 of the Safety Appliance Act, requiring defective cars on interstate carriers' lines to be repaired at the place where the defect is discovered, if feasible, or at the nearest available repair point, and, the federal statute being paramount, the state statute is void as to this requirement.

The whole statute was held void because the section providing for the protection of employees from working outside in inclement weather is too uncertain and indefinite to be valid, this section embodying the real ground of the statute.—C. & N. W. v. Railroad & Warehouse Commission of Minnesota, 280 Fed. 387.

Labor Board Decisions

No Authority Over Lines Outside of U. S.

In a case concerning track forces on the Great Northern lines in Canada, the Labor Board held that it had no authority over the rates of pay and working conditions for employees engaged exclusively in work outside the territorial limits of the United States.—*Decision No. 977.*

Contracting Extra Gang Work

On May 30 and 31 an extra track gang employed on the St. Louis-San Francisco whose laborers were being paid 45½ cents an hour was discharged and the work being done by this gang was turned over to the Walsh Construction Company, which employed negro laborers at a rate of 20 cents an hour. The railroad contended that it had contracted similar work previously and that its action was in accord with the provisions of the Transportation Act obligating the management to operate the property as efficiently and economically as possible. The decision of the Labor Board is the same as in Case No. 1254.

Contracting Coal and Water Supply Work

The Chicago & Alton awarded a contract to Joseph Colianni & Brothers for the handling of coal, sand and cinders, the pumping of water and for engine watchmen, the employees of the railroad having the privilege of going to work for the contractors at a reduced rate of pay. This was brought to the attention of the Labor Board which decided that this case involved the same principles that applied in the case of the Indiana Harbor Belt, that the contract constituted a violation of the Transportation Act, insofar as it purported to remove the employees from the application of the act; and directed the carrier to take up with any employee the matter of reinstatement upon the application of the employee or his representative.—(Decision No. 1254) . . . .

In 1921 the St. Louis-San Francisco advertised for bids for the personal labor required for the operation of individual water stations on a monthly basis. This case (No. 1230) the Labor Board decided substantially the same as that of the C. & A.

Dismissal of Bridge Employees for Refusal to Work Overtime

About 7:15 p. m., on July 29, 1921, 645 ft. of double track trestle on the Stockton division of the Southern Pacific near Banta, Cal., was discovered on fire and 135 ft. was destroyed before the fire was extinguished. It was necessary to call men from adjoining divisions to restore the trestle and track as promptly as possible. Foremen and men were brought from the Sacramento division, arriving at nine the next morning. These men worked until 4 p. m., when they returned to their outfit cars and refused to perform further service at the pro rata rate, notwithstanding that an emergency existed; and for this action they were discharged. In a decision upon a protest registered by the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers the Labor Board decided that the management was justified in the action taken in this case and denied the request of the employees' organization for the reinstatement of the men.—(*Decision No. 1118.*)

Instruction in Traffic Management is now being given by Charles F. Walden at the West Side Y. M. C. A., New York City, and he is preparing a course in the subject which will be available through the United Y. M. C. A. Schools to ambitious men in all parts of the country. Mr. Walden for about 20 years was in the freight traffic department of the Pennsylvania Railroad and subsequently was the president of one of New York city's largest transfer and forwarding corporations. He is offering the class a practical course dealing with every-day problems. He finds that industrial and merchandising concerns are rapidly awakening to the necessity for the services of a traffic expert.

Foreign Railway News

English Firm to Build 17 Locomotives for Spain

Messrs. Babcock & Wilcox, a British concern, have received an order from the Northern Railway of Spain for 17 locomotives. These locomotives will be built at the company's Spanish works at Galindo, near Bilbao. These locomotives will be the most powerful in use in Spain, according to the Times (London) Trade Supplement.

Death of Former American Representative of British Road

Alfred G. Wand, for 20 years general agent in America for the London & North Western, died on October 13. Mr. Wand came to this country in 1898 and remained until his retirement on account of ill-health in 1918. His office was in New York City. He had been in the service of his company for more than 45 years.

Electrification of Argentine Transandine Railway

An increase amounting to 1,500,000 gold pesos over the sum already allotted is provided by a proposed law recently submitted to the Argentine congress, to be used for the electrification of the Argentine Transandine Railway between Zanjon and the Chilean frontier, according to Commerce Reports. A contract between the government and the Argentine Transandine Railway has already been approved under the provisions of the law of October 13, 1921. This agreement provides for joint administration of the Chilean and Argentine Transandine roads, connecting Mendoza and Los Andes. It stipulates that the government shall place at the disposition of the railway company bonds of the Argentine external loan, not to exceed 2,500,000 gold pesos, bearing interest at the rate of 5 per cent per annum, with 1 per cent amortization.

The new line, for which the additional 1,500,000 pesos has been requested, is approximately 45 kilometers in length and connects with the section of the Chilean line, which is also to be electrified.

Death of Well Known British Railway Executive

Charles Aldington, until his retirement in 1921, general manager of the Great Western Railway, died on October 16 at Marazion, Cornwall, where he had resided since his retirement. Prior to his appointment as general manager of the Great Western Railway, Mr. Aldington had held the post of superintendent of the line for nine years, including the whole of the war period. During this period his efforts were directed toward ensuring the smooth operation of troop trains and the carriage of munitions of war, and throughout the war he resided on the premises at Paddington Station, London, so that his services could be available at all hours of the day and night. He became general manager in 1919 on the death of the late Frank Potter, but his health had been undermined by his incessant toil during and after the war. He became seriously ill and retired in June, 1921.

Born at Tamworth, Warwickshire, 59 years ago, Mr. Aldington was educated at Packwood School and joined the staff of the Great Western Railway on the Birmingham division in 1876. After a probationary training at Handsworth and Knowle stations he was transferred to the divisional office at Birmingham in 1879 and to the Northern division staff at Chester in 1881. In 1894, Mr. Aldington was appointed chief clerk in the London divisional superintendent's office. From 1899 to 1902 he was traffic superintendent of the Central London (Electric) Railway. In 1903 he returned to the Great Western and had a year's experience in the general manager's department. Mr. Aldington was in 1904 appointed assistant superintendent of the line. On January 1, 1910, he was promoted to superintendent of the line. His term of office as superintendent of the line coincided with the time when great strides were made in developing the Great Western passenger train service, and in extending the numerous road and rail motor services which Mr. Aldington inaugurated soon after his return to the Great Western in 1902.

Mr Aldington visited the United States and Canada several times and took a keen interest in American railway affairs. His first visit on this side of the Atlantic was in 1900, when he went on an electric traction mission in the interests of the Central London Railway. In 1905 he came to the United States as one of the delegates to the International Railway Congress at Washington, and also in 1909 and 1911 on the business of the Great Western.

Lower Passenger Fares in Britain

Reductions in passenger fares and in the rates charged for perishable freight by passenger trains have been announced by the British railways, effective January 1, 1923. In general, these reductions will bring the level of rates down to 50 per cent above those of pre-war days, instead of 75 per cent above, as at present. In addition to the reductions, there will be a standardization of passenger rates to the basis of 1½d. per train mile, third class, and 2½d. first class. Where present rates are below this standard, they will be raised or lowered under the new tariffs and no rates will be reduced below this basis. On the other hand, all rates will be lowered to this basis, whether the standard reduction would make them that low or not.

It is estimated that the reductions will bring about a loss of revenue of £10,000,000 and negotiations are now in progress between the railways and the railway unions in an endeavor to bring about some reductions in wages in an endeavor to absorb a portion of this loss.

There is some speculation around London concerning the effect which the new tariffs will have on suburban fares, these, in many cases, being considerably lower than the standard rates announced.

Round trip tickets under the new tariff will bear the double rate in all cases. Tourist and excursion fares will be reduced proportionately to ordinary fares. There will be no change made in the rates for season and commutation tickets.

China Notes

PEKING.

Although the financial situation of the ministry of communications has not changed perceptibly during the past few months, the morale has improved considerably. Following the flight of the minister to Peitaiho following the attack upon him by the school teachers of Peking, he resumed office only after having secured certain guarantees of support which tended to clear the situation by making apparent that Wu Pei Fu is "boss." Next he secured from the cabinet a revocation of the pledge to the teachers made by Yeh Kung Cho. In order to take care of the educational needs of the metropolitan area, the cabinet has arranged for a regular pledge from the foreign administered customs revenue. The return of Kao En Hung to the ministry under these conditions has served to break the semi-conscious "going slow" strike which the old "Chiao Tung" clerical staff were conducting in the ministry. Several bureaus are accomplishing as much with less than half the former staff, sleeping during office hours has become perilous, desks are cleared with some regularity, and a general air of cheerful industry prevails. Kao has also set a precedent about preserving "face" and has given an unusual example of "thick skin" for Chinese officialdom.

For the first time in their history the railways of China are facing a concerted strike movement. It began, as reported last month, on the Peking Suiyuan line as a protest against the American Car Loan. No sooner was the government in control, than the Peking Hankow line was paralyzed by a walk-out of shopmen and engine drivers. The representatives, when questioned, could give no coherent account of what they wanted, most of their demands having been met a long time ago by action of the management. This settled, the Lung Hai line underwent the same experience, the complaint being against certain foremen whose dismissal was demanded. A settlement was soon arranged, and by this time the Canton Hankow employees walked out demanding dismissal of certain officials and more prompt payment of salaries. The management endeavored to use vigorous measures, with the result that 150 strikers laid down on the track in front of the train which it was attempting to run. The local military were called upon to disperse the threatened suicides with the result that ten were killed and a score or more injured. This strike is still on, and the connecting line next on the east, the Chuchow Pinghsiang, saw its employees in turn "down tools." Thus the movement had run the length of the "west side" lines beginning at the north and proceeding in regular order to the south. Reports have it that the shopmen of the Peking Mukden line have now presented demands.

At the same time, sympathetic strikes are numerous. The workmen at the Pinghsiang collieries are out, demanding an increase of ten coppers a day—they now receive twenty coppers or about seven cents, gold, per day in the lowest grades. This will probably be granted for if the mines were to be flooded, the Hangyang Steel Works would be helpless for want of fuel. The Canton Hankow as well as the Chuchow Pinghsiang Railway would also lose their principal freight traffic. The Hangyang Steel Works also had a partial walk-out and the Yang Ste Engineering Works are closed for the same reason. The employees of the Hankow Water Works are the latest to be on the rampage. It is well known that certain prominent Russians are spending a great deal of money in small checks on London accounts which are being cashed by coolies. Recently, prominent Chinese educationalists and ex-officials gave public recognition to the Bolshevik movement in terms which identified their interests as being in common. If there is an aristocracy in China it is to be found among the scholar class. At first it seems incredible that this class should be cultivating friendship with Bolshevism. However it must be remembered that China is now under the control of the scholar-official class no longer, but instead is at the mercy of the soldiery, most of whose representatives are near-illiterates. So far, no one has been able to see how the soldier nuisance is to be abated, except by such a demoralization of the country that starvation finally works on the soldier. However, it may possibly be that by giving leadership to the unlearned and unorganized working classes in this way, the scholar class may be able to forge a weapon which can match the arms of the militarists.

However, the ministry of communications is treating the subject of labor disturbances in good faith and along conventional lines. During the past week a conference has been called consisting of eighty-seven representatives of the departments in the several lines together with a few members of the ministry staff, to consider ways and means of improving the conditions of labor on the railways. The meeting had for its object principally the preparing of the officer's minds for the measures which appear sure to come. After considerable discussion it was decided to prepare rules and regulations for a civil service, standard scales of pay, standard leave (vacation) privileges, forms of education for younger employees and for employees' children, and a pension or provident fund system. Considerable attention was given also towards working out piece rates to be applied rather than time wages, as well as bonuses to distribute a portion of the profits during favorable years. Many of these subjects are not new in Chinese experience, but because most of the railway organization has been directed by foreigners, foreign methods of pay rather than the traditional Chinese methods rule at present.

A further contract covering the construction of the Kirin-Huening line in Manchuria has lately been concluded between Japanese interests and the province of Kirin, in which it is agreed that "Japanese shall have charge of the business management and engineering work of the railway." Whether or not the conclusion of this agreement with the province indicates that the Japanese consider Chang Tso Lin's declaration of independence final, it does indicate that these interests have come to the conclusion that some authority nearer to the people of the district than the Peking government must be considered. Considerable local opposition is reported.

Chinese and Japanese in Harbin have organized a Tram and Electric Light Company. The principal interest to Americans in the subject centers around the fourth clause of the agreement, which reads: "The agreements concluded between the China Electric Co. and the American merchants with regard to the purchase of plant, raw materials, etc., shall become null and void."

Who said "Open Door"? The China Electric Company, which is a combination of the Western Electric and the ministry of communications, Peking, held this contract up to a recent date.

In making arrangements for the removal of foreign post offices from China effective January 1, 1923, in pursuance of the agreements made at the Washington conference, the Japanese have refused to consider withdrawing those in the railway zone of the South Manchurian Railway. The Chinese have acquiesced "in order not to jeopardize the friendly relations existing between the two nations."

Equipment and Supplies

Locomotives

THE OLIVER IRON MINING COMPANY may purchase 10 switching locomotives.

THE GRAND TRUNK is inquiring for 10 Mountain type and 10 Santa Fe type locomotives.

THE MONTOUR RAILROAD, reported in the *Railway Age* of September 30 as inquiring for 4 locomotives, has ordered 4 Mikado type locomotives from the American Locomotive Company.

THE PERE MARQUETTE, reported in the *Railway Age* of October 14 as inquiring for 22, 8-wheel switching locomotives, has ordered 20 switching locomotives from the American Locomotive Company.

THE WESTERN PACIFIC, reported in the *Railway Age* of October 21 as contemplating buying 5 Mikado type locomotives, has ordered 6 Mikado type locomotives from the American Locomotive Company.

THE VILLA YON ATOCHA (Argentina) has ordered one Mikado type locomotive from the American Locomotive Company. This locomotive will have 21 by 24 in. cylinders and a total weight in working order of 155,000 lb.

THE VILLA YON ATOCHA (Chili) has ordered one Mikado type locomotive from the American Locomotive Company. This locomotive will have 21 by 24 in. cylinders and a total weight in working order of 155,000 lb.

THE FRUIT GROWERS EXPRESS COMPANY has ordered one 4-wheel switching locomotive from the American Locomotive Company. This locomotive will have 11 by 16 in. cylinders and a total weight in working order of 41,000 lb.

THE AMERICAN WOOLEN COMPANY, Boston, Mass., has ordered one 4-wheel switching locomotive from the American Locomotive Company. This locomotive will have 16 by 24 in. cylinders and a total weight in working order of 99,000 lb.

DENASTON BREAKEY, Breakeyville, Que., Canada, has ordered one 4-wheel switching locomotive from the American Locomotive Company. This locomotive will have 14 by 22 in. cylinders and a total weight in working order of 79,000 lb.

THE PENNSYLVANIA-OHIO ELECTRIC COMPANY, Youngstown, Ohio, has ordered one 4-wheel switching locomotive from the American Locomotive Company. This locomotive will have 14 by 22 in. cylinders and a total weight in working order of 65,000 lb.

THE NEW YORK, NEW HAVEN & HARTFORD, reported in the *Railway Age* of October 7 as having ordered 5 electric locomotives from the Westinghouse Electric & Manufacturing Company, has ordered 7 additional electric locomotives from the same company.

THE MEXICAN RAILWAY COMPANY, LTD., has ordered 10 electric locomotives. These locomotives will be constructed and equipped jointly by the General Electric Company and the American Locomotive Company. The locomotives will have a total weight in working order of 300,000 lb.

Freight Cars

THE PITTSBURGH STEEL COMPANY is inquiring for 25 gondola cars of 75 tons' capacity.

THE SOUTHERN PACIFIC contemplates coming in the market soon for about 3,500 cars.

THE UNION TANK CAR COMPANY is inquiring for from 500 to 2,000, 50-ton tanks cars of 10,000 gal. capacity.

THE DETROIT, TOLEDO & IRONTON is inquiring for 500 box cars of 40 tons' capacity and 500 hopper cars of 55 tons' capacity.

THE CHICAGO, MILWAUKEE & ST. PAUL, reported in the *Railway Age* of October 28 as inquiring for 3,000 gondola cars, 1,500 box cars and 500 automobile cars, is now reported to be considering the purchase of 7,000 gondola cars of 50 tons' capacity and 3,000 box cars of 40 tons' capacity, although the original inquiry has not been increased.

THE LOUISVILLE & NASHVILLE, reported in the *Railway Age* of October 28 as inquiring for 2,000 steel hopper cars of 55 tons' capacity and 1,000 box cars of 40 tons' capacity, has ordered 2,100 hopper cars from the American Car & Foundry Company and has ordered 500 box cars each from the Chickasaw Shipbuilding Company and the Mt. Vernon Car Manufacturing Company.

Passenger Cars

THE CHICAGO & NORTH WESTERN, reported in the *Railway Age* of October 14 as inquiring for 36 coaches and 10 baggage cars, has ordered 40 coaches and 10 baggage cars from the American Car & Foundry Company.

THE NEW YORK CENTRAL is asking for bids until 12 o'clock noon November 27 for the requirements of the New York Central, the Michigan Central, the Cleveland, Cincinnati, Chicago & St. Louis and the Pittsburgh & Lake Erie of passenger equipment as follows: 35, 70 ft. steel coaches with 6-wheel trucks, also alternate bids on cars with 4-wheel trucks; 2 steel dining cars, 72 ft. 6 in. long; 5, 70 ft. steel combination passenger and baggage cars; 10, 60 ft. 6 in. steel baggage cars also alternate bids on 70 ft. cars; 10, 50 ft. steel underframe milk cars and 10 steel passenger motor cars for subway service.

Iron and Steel

THE SAN ANTONIO & ARANSAS PASS has ordered 768 tons structural steel from the Virginia Bridge & Iron Company.

THE GRAND TRUNK of Canada has placed an order, according to a report to the Department of Commerce from Consul General Gunsaulus, Halifax, for 25,000 tons of steel rails with the British Empire Steel Corporation, Sydney, N. S. This order, with others on hand, is said to insure the continuous operation of the Sydney works, employing 3,000 hands, all winter.

Machinery and Tools

THE PENNSYLVANIA is inquiring for one 1,500-lb. steam hammer.

THE CORNWALL RAILROAD is inquiring for a 36-in. by 36-in. by 12-ft. planer.

THE BALTIMORE & OHIO is inquiring for 1 flue welding and swedging machine and 2 motor-driven centrifugal pumps.

THE CHESAPEAKE & OHIO is inquiring for the following machinery: 24-in. by 10-ft. lathe; 20-in. by 10-ft. lathe; 16-in. by 6-ft. lathe; spring forming machine; ¼-in. rotary shear; 3-in. by 36-in. turret lathe; 48-in. upright heavy duty drill; power-driven hack saw; 4-in. pipe machine; 6-in. pipe machine, and a car roofing saw.

Miscellaneous

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS is inquiring for approximately 15,000 barrels of Portland cement.

THE CHILEAN STATE RAILWAYS, 141 Broadway, New York, will receive bids until November 11 for some special tools for repairing Westinghouse air brakes, to include lathes, drills and planers, also for about 600 tons of steel plates for car repairing. Bids are also wanted on November 25 for 14,000 meters of 1¼ in. steel pipe for air brake equipment.

Signaling

THE HALL SWITCH & SIGNAL COMPANY has received an order for 12 single unit, three color "searchlight" signals, 56 relays and 24 signal transformers for installation on English railways.

Supply Trade News

C. E. Naylor has been appointed Texas sales agent of the **Lukens Steel Company**, Coatesville, Pa. Mr. Naylor's office is at 610 Carter building, Houston, Texas.

The Black & Decker Manufacturing Company, Baltimore, Md., has removed its branch office and service station from 318 North Broad street to 824 North Broad street, Philadelphia, Pa.

The Carter Bloxonend Flooring Company, Kansas City, Mo., has received a contract from the Baltimore & Ohio for the installation of 12,000 square feet of bloxonend flooring in a warehouse at Philadelphia.

William Le Compte has been appointed sales manager in charge of the New York territory for Jenkins Bros., 80 White street, New York. Mr. Le Compte has been a member of the sales organization of this company for a quarter of a century.

R. J. Platt, sales representative of the **Sellers Manufacturing Company**, with headquarters at Chicago, has been promoted to assistant general sales agent, with office at the same place, succeeding T. D. Crowley, who has resigned to enter the service of the Creepcheck Company.

T. D. Crowley, assistant general sales agent of the Sellers Manufacturing Company, Chicago, has resigned to become general sales agent of the **Creepcheck Company**, which has opened general sales offices at 564 Peoples Gas building, Chicago. **J. T. Reagan**, western sales manager for the Creepcheck Company, has been promoted to service manager, with the same headquarters. Mr. Crowley was born at Clinton, Iowa, on August 18, 1884, and entered railway service in 1901 as a timekeeper in the track department of the Chicago & North Western. He was later assistant foreman and extra gang foreman in the same department and in 1907 was promoted to assistant roadmaster on the Wisconsin division, with headquarters at Milwaukee. In 1909 he was appointed superintendent of materials in the general storekeeper's department at Chicago and subsequently was promoted to roadmaster, with headquarters at Sparta, Wis. In April, 1914, he went with the Madden Company, Chicago, as sales agent and continued with that firm until his appointment as assistant general sales agent of the Sellers Manufacturing Company in November, 1918, the position he held at the time of his recent appointment. Mr. Reagan was born on July 13, 1887, at St. Louis, Mo., and entered railway service in the transportation department of the Grand Trunk in 1907. In August, 1914, he entered the sales department of the P. & M. Company, Chicago, and in October, 1920, became associated with the Creepcheck Company as assistant general sales agent, the position he held at the time of his recent promotion.

T. D. Crowley

Paul A. Cuenot has been appointed mechanical representative to furnish special tool service to customers of the **Alvord Reamer & Tool Company**, Millersburg, Pa. Mr. Cuenot was formerly connected with the American Locomotive Company and the Pennsylvania Steel Company.

R. S. Gay, formerly Chicago sales representative of Beal Brothers and the Beal Tool Company, and more recently plant manager of Hubbard & Co., Montpelier, Ind., has been appointed a sales representative of the **Safety Car Heating & Lighting Company**, with headquarters at Chicago

Frederick B. Larsen is now field representative for South Carolina, Georgia and Florida for the **Bryant Electric Company**, Bridgeport, Conn. Mr Larsen's headquarters are at Atlanta, Ga. He was for three years manager of the Hunter Electric Company of Clearwater, Florida, and prior to 1919 he was for 12 years sales representative of the Robbins & Meyers Company in the South Atlantic states.

Trade Publications

EXPRESS REFRIGERATOR CARS AND TANK CARS.—The Canadian Car & Foundry Company, Ltd., Montreal, has recently issued bulletins describing steel underframe express refrigerator cars built for the Canadian Pacific and allsteel tank cars of 8,000 gallons capacity built for the Russian Soviet Government. Another bulletin describes helical, semi-elliptic, and elliptic springs manufactured by this company.

CENTRIFUGAL PUMPS.—The Dayton-Dowd Company, Quincy, Ill., has issued bulletin No. 249 illustrating and describing its line of centrifugal pumps. This bulletin includes detailed specifications, efficiency and capacity tables and characteristic curves, as well as a description of the company's method of testing the pumps. The illustrations show the pumps in various combinations and installations.

PACIFIC SOUTHWESTERN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a railroad from Lompoc to White Hills in Santa Barbara County, Calif., 4 miles.

Underwood & Underwood

A Relic of Old Days Put Into Working Order for Service in the Motion Pictures

Railway Construction

BALTIMORE & OHIO.—This company has entered into a contract with the John S. Metcalf Company, of Chicago, specialists in grain elevator construction, for the preparation of plans and specifications for the new grain elevator facilities at Locust Point, Baltimore, Md., in replacement of the two old elevators destroyed by fire July 2 last. Tentative plans which have been worked out by the company and on which the architects will now prepare drawings, specifications, etc., call for a steel concrete elevator of the most modern type. The storage bins with capacity of 3,000,000 bu. will be so arranged that they can be readily increased to 8,000,000 bu. The plans include complete facilities for drying and cleaning grain, and provisions for unloading grain from boats. Safeguards against dust explosion will be used. The elevator will be constructed on the water's edge adjacent to piers, with galleries and belt conveyors reaching eight berths, four of which will be located on an exclusive grain loading pier, to be constructed for that purpose, the other four on a two-story merchandise pier already in use. Provision will be made so that the gallery system can be extended to other piers in the future. It is expected that the architects will have the detail plans in shape for submission to the railroad engineers within three months, after which invitations for bids on the construction work will be issued.

BUFFALO CREEK & GAULEY.—This company has awarded a contract to the Phoenix Bridge Company, Phoenixville, Pa., for six steel bridges.

CHICAGO, BURLINGTON & QUINCY.—This company has awarded a contract to Edgar Otto, Downers Grove, Ill., for the installation of a pumping plant, intake well, suction piping and intake piping for a reservoir at Galesburg, Ill.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has been ordered by the Board of Railroad Commissioners of the State of South Dakota to construct a station at least 24 by 70 ft. at Draper, Jones county, S. D.

CHICAGO UNION STATION.—This company, reported in the *Railway Age* of October 14 as closing bids October 12 for the granite and stone work for the main building of the Union Station and for the construction of a signal tower, has awarded the former to George A. Fuller Company, Chicago, and the signal tower to R. C. Weibolt Construction Company, Chicago. This company, reported in the *Railway Age* of September 16 as closing bids September 18 for the excavation for permanent station tracks between Van Buren and Harrison streets, has awarded the contract to W. J. Newman Construction Company, Chicago. This company, also reported in the *Railway Age* of September 23 as receiving bids for the widening of Canal street, Chicago, from Harrison street, 225 ft. north, has awarded the contract to Paschen Brothers Company, Chicago.

ILLINOIS CENTRAL.—This company closed bids November 8 for a 100,000-gal. creosoted water tank at Herrin, Ill., to cost approximately $15,000. This company will also construct two yard tracks 5,000 ft. long at Broadview, to cost $22,000; two car repair tracks at Clinton, Ill., to cost $16,000, and a wye track 3,000 ft. long at Blackford Ky., to cost $13,000.

MICHIGAN CENTRAL.—This company, in conjunction with the Michigan State Highway Commission, will construct a two-span girder bridge, 118 ft. long, over its tracks at Leoni, Mich. The contract for the substructure, including 1,406 cu. yd. of concrete, 20,600 lb. of reinforcing steel and 1,040 ft. of vitrified tile, has been awarded to the Fargo Engineering Company, Jackson, Mich., and the contract for the steel superstructure to the McClintic-Marshall Company, Pittsburgh, Pa.

SANTA FE & LOS ANGELES HARBOR.—The Interstate Commerce Commission has issued a certificate authorizing this company to construct a new line from a connection with the Redondo branch of the Atchison, Topeka & Santa Fe near El Segundo to Wilmington in Los Angeles County, Calif., 12.54 miles.

Railway Financial News

CHICAGO & ALTON.—*Stockholder Files Intervening Petition.*—The recently formed independent stockholders' committee of this company's leased lines announces that an intervening petition has been filed in the Federal District Court in Chicago against the Chicago & Alton and its receivers by the executors of the estate of William A. Slater, a large holder of the guaranteed preferred stock of the Kansas City, St. Louis & Chicago, on behalf of the minority stockholders of the road, for the restoration of $598,912 alleged to have been wrongfully appropriated by the Chicago & Alton shortly before it went into receiver's hands. It is stated by the petitioners that this sum was the proceeds of the sale of terminal properties of the Kansas City road and was turned over to the Alton Company without consideration in return therefor.

Deposit of Bonds Asked.—The protective committee for the $45,350,000 3 per cent refunding 50-year bonds, of which Charles A. Peabody, president of the Mutual Life Insurance Company of New York is chairman, has asked the holders of these bonds to deposit them on or before December 22 with the New York Trust Company, or with the Illinois Trust & Savings Bank, Chicago. The committee announced that it contemplated arranging to advance the amount of the October 1 interest to holders of the bonds who deposit their holdings of bonds with the committee.

CHICAGO GREAT WESTERN.—*New Directors.*—Charles G. Dawes and John A. Spoor have been elected directors to succeed Col. A. J. Sprague and Clyde M. Carr.

CHICAGO, MILWAUKEE & ST. PAUL.—*Asks Authority to Abandon Line.*—This company has applied to the Interstate Commerce Commission for a certificate authorizing the abandonment of its line from Gratiot, Wis., to Warren, Ill., 7 miles.

MISSOURI, KANSAS & TEXAS.—*Date of Sale.*—The sale of this road, postponed four times, has been set for November 29. The sale of the main line will be held at Colbert, Okla., at 10 a. m. and of the Texas lines at Denison at 3 p. m. the same day.

NORFOLK & WESTERN.—*Reduction in Dividend Rate on Equipment Trust Certificates Authorized.*—The Interstate Commerce Commission has issued a modification of its order of May 27 authorizing an issue of $6,700,000 of equipment trust certificates so as to change the dividend rate from 5 per cent to 4½ per cent and the minimum price at which the certificates shall be sold from 97¾ per cent to 95½ per cent. The company represented to the commission that money conditions are such as to warrant the belief that certificates carrying the lower rate can be marketed on terms more favorable to it than the 5 per cent certificate. The certificates are to be offered for competitive bidding by the Virginia Holding Corporation.

WESTERN MARYLAND.—*Equipment Trust Certificates Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $450,000 of equipment trust certificates to be issued by the Commercial Trust Company of Philadelphia and to be sold at not less than 97.25.

WEST VIRGINIA NORTHERN.—*Certificate for Acquisition Denied.*—The Interstate Commerce Commission has denied this company's application for a certificate authorizing the acquisition and operation of a branch line of track 5,612 ft. long extending from a connection with its railroad near Tunnelton, W. Va., to the coal mine of the Atlantic Coal & Coke Company. The branch line is owned by the coal and coke company. The commission says that the results of past operations have not justified the existence of the railroad from a transportation standpoint and in its opinion the matters of record do not justify the addition to capital account of the large sums proposed to be paid for the branch and a proposed extension.

Treasury Payments to Railroads

Since last announcement, dated October 2, payments under Sections 204, 209, 210 and 212 of the Transportation Act, 1920, as amended, have been made by the Treasury as follows:

Section 204:		
Fulton Chain		$3,881
Georgia Coast & Piedmont		23,127
Glenmora & Western		10,917
Little Rock, Mammelle & Western, Receiver		24,414
Midtown Air Line		14,960
Neame, Carson & Southern		39,199
Northampton & Bath		121,911
Waterville Railway		9,671
Wyandotte Southern		10,189
Section 209:		
Charleston Terminal Company		10,352
Chesapeake, Western		6,864
Lehigh & Hudson River		184,751
Middletown & Unionville		10,304
Oil Fields Short Line		11,588
Pacific Coast		2,343
Salina Northern, Receivers		14,086
Texas & Pacific, Receivers		298,042
Section 210:		
Cisco & Northeastern		27,862
Seaboard-Bay Line		1,100,000
Tennessee Central		937,000
Section 212:		
Chicago, Rock Island & Pacific		1,000,000
Seaboard Air Line		300,000
Total		$4,161,611
Total payments to October 31, 1922:		
(a) Under Section 204, as amended by Section 212 for reimbursement of deficits during Federal Control:		
(1) Final payments, including partial payments previously made	3,847,665	
(2) Partial payments to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	1,138,102	
Total payments a/c reimbursement of deficits		4,985,767
(b) Under Section 209, as amended by Section 212 for guaranty in respect to railway operating income for first six months after Federal Control:		
(1) Final payments, including advances and partial payments previously made	109,356,189	
(2) Advances to carriers as to which a certificate for final payments has not been received by the Treasury from the Interstate Commerce Commission	213,590,672	
(3) Partial payments to carriers as to which a certificate for final payment has not been received, as stated above	126,947,222	
Total payments account of said guaranty		449,894,083
(c) Under Section 210 for loans from the revolving fund of $300,000,000 therein provided		317,886,667
Total		$772,766,517

Repayments on loans under Section 210 have been made by 37 companies to the amount of $98,323,511.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out or received from the several roads the following amounts:

Buffalo & Susquehanna Railroad Corporation	$465,000
Norfolk Southern Railroad Company paid Director General	200,000
Morgantown & Kingwood Railroad Company paid Director General	75,000

Tentative Valuations

The Interstate Commerce Commission has issued tentative valuation reports in which it states the final value of the property owned and used as follows:

	Owned	Used
Arizona & New Mexico, 1917	$4,223,928	$4,223,932
Cumberland & Pennsylvania	4,269,273	4,269,523
Gulf & Ship Island, 1916	9,034,850	9,036,302

The capitalization of the Cumberland & Pennsylvania as of valuation date was $4,904,397 and that of the Gulf & Ship Island $11,700,000.

Dividends Declared

Cripple Creek Central.—Preferred, 1 per cent, quarterly, payable December 1 to holders of record November 15.

Kansas City, St. Louis & Chicago.—Preferred, 1½ per cent, quarterly, payable November 1 to holders of record October 20.

Trend of Railway Stock and Bond Prices

	Nov. 6	Last Week	Last Year
Average price of 20 representative railway stocks	70.31	69.50	56.01
Average price of 20 representative railway bonds	86.65	86.40	77.76

Railway Officers

Executive

J. E. Duffy has been elected president of the Port Huron & Detroit, succeeding T. L. Handy, deceased.

Financial, Legal and Accounting

George A. Kelly has been appointed general solicitor of the Pullman Company with headquarters at Chicago, effective November 1.

F. I. Gowen, vice-president and general counsel of the Pennsylvania with headquarters at Philadelphia, Pa., has resigned these offices and has been appointed special counsel of the company. **C. B. Heiserman,** general counsel of the company with the same headquarters, will succeed Mr. Gowen. Both appointments are effective December 1.

R. P. Jones, assistant general auditor of the Seaboard Air Line, with headquarters at Portsmouth, Va., has been appointed assistant to vice-president-accounting, with headquarters at Baltimore. **L. L. Knight,** auditor disbursements, has succeeded Mr. Jones as assistant general auditor and **H. B. Anderson** has been appointed auditor disbursements.

Operating

B. C. Murphy has been appointed chief dispatcher of the Florida East Coast, Northern division, with headquarters at New Smyrna, Fla.

N. Johnson, trainmaster of the Louisiana & Arkansas with headquarters at Minden, La., has been promoted to superintendent with headquarters at Stamps, Ark., succeeding R. L. Whitener, resigned.

Traffic

William B. Lanigan has been appointed general freight traffic manager of the Canadian Pacific, with headquarters at Montreal. Mr. Lanigan was born on October 12, 1861, at Three Rivers, Quebec. He was educated at St. Joseph's College, Three Rivers, and at Stanstead College. In July, 1877, he began railway work with the Quebec, Montreal, Ottawa & Occidental, now a part of the Canadian Pacific. He subsequently served as telegraph operator on the Grand Trunk until September, 1884, and later served in the same capacity on the Canadian Pacific. He was then agent at various places, and from July, 1891, to December, 1900, was traveling freight agent at Toronto. He later served as assistant general freight agent at the same place, and subsequently became general freight agent, at Winnipeg, of the Western division. In March, 1908, he was appointed assistant freight traffic manager of the Western lines and in September, 1918, was advanced to freight traffic manager of the entire system, in which latter position he was serving at the time of his recent promotion.

W. B. Lanigan

M. C. Browning, general agent of the Louisville & Nashville, with headquarters at Cleveland, O., has been transferred

to Chicago, succeeding F. S. Griffin, promoted. **C. F. Stith**, commercial agent, with headquarters at Kansas City, Mo., has been promoted to general agent, with headquarters at Cleveland, succeeding Mr. Browning and will be succeeded by **M. P. Davis.**

E. W. Soergel, assistant general freight agent of the Chicago, Milwaukee & St. Paul with headquarters at Chicago, has been promoted to assistant to the traffic manager with the same headquarters. **J. A. Farmar**, chief of tariff bureau of the same road and **G. E. Stolp**, oriental freight agent with headquarters at Chicago, have been appointed assistant general freight agents with the same headquarters. **F. J. Calkins**, export and import agent with headquarters at Seattle, Wash., has been appointed assistant general freight agent with the same headquarters.

F. P. Cruice, whose promotion to assistant general freight agent in charge of solicitation of the Atchison, Topeka & Santa Fe, with headquarters at Los Angeles, Cal., was reported in the *Railway Age* of September 30 (page 633), was born in Michigan in December, 1874. He entered railway service with the Michigan Central in 1890. In 1898 he entered the employ of the Santa Fe, Prescott & Phoenix at Prescott, Ariz., as voucher clerk and operator in the general manager's office. In 1902 he was promoted to secretary to the president, which position he held until 1905, when he was promoted to chief clerk to the president. He was promoted to assistant to the president in 1908, and from 1910 to 1912, he was assistant to the president, secretary and treasurer and tax agent. Upon the merger of the Santa Fe, Phoenix & Prescott with the Atchison, Topeka & Santa Fe in 1912, he was appointed assistant general freight and passenger agent of the Santa Fe, Prescott & Phoenix lines, and in 1913, assistant general freight and passenger agent of the Coast lines at Prescott and later at Phoenix. In June, 1921, he was appointed assistant general freight agent of the Coast lines, with headquarters at San Francisco, Cal., and in September, 1921, manager of the agricultural and industrial development department, with headquarters at Topeka, Kan.

Mechanical

Alonzo G. Trumbull has been appointed chief mechanical engineer of the Erie.

W. R. Lane has been appointed road foreman of engines of the Missouri division and **L. L. Lasswell** of the Illinois division of the Atchison, Topeka & Santa Fe, with headquarters at Shopton, Ia. **C. C. Reynolds** has been appointed district road foreman of engines of the Los Angeles division, with headquarters at Los Angeles, Cal. **P. J. Maloney** has been appointed road foreman of engines of the first district of the Albuquerque division, with headquarters at Albuquerque, N. M., and the jurisdiction of **W. Daze** will be confined to the second district of the Albuquerque division, with headquarters at Winslow, Ariz.

F. A. Torrey, general superintendent of motive power of the Chicago, Burlington & Quincy, with headquarters at Chicago, whose retirement was reported in the *Railway Age* of October 28, was born in Pennsylvania and when a boy served an apprenticeship in a machine shop. He entered railway service as a locomotive fireman on the Chicago, Burlington & Quincy at West Burlington, Ia., in March, 1874, and, until February 1, 1887, was a hostler and again a locomotive fireman and later a locomotive engineer. On the latter date he was promoted to road foreman of locomotives on the Ottumwa and Creston divisions, which position he held until April 1, 1889, when he was promoted to master mechanic, with headquarters at Ottumwa, Ia. He was transferred to Creston, Ia., on March 1, 1902, and on September 1, 1903, he was promoted to assistant superintendent of motive power, with headquarters at Chicago, which position he held until April 20, 1905, when he was promoted to superintendent of motive power, with the same headquarters. On January 1, 1911, he was promoted to general superintendent of motive power, with the same headquarters, from which position he retired on November 1 after 48 years of active service with the company.

Engineering, Maintenance of Way and Signaling

F. A. Russell, formerly office engineer in the valuation department of the Missouri, Kansas & Texas, with headquarters at Parsons, Kan., has been appointed professor of railway engineering at the University of Kansas, succeeding C. C. Williams.

F. M. Bisbee, chief engineer of the Atchison, Topeka & Santa Fe, Western lines, with headquarters at Amarillo, Tex., whose retirement on November 1, was reported in the *Railway Age* of October 21, was born on September 27, 1853, at Brunswick, Me., and received an education in civil engineering at the University of Maine. He entered railway service in 1878 as a transitman on the Atchison, Topeka & Santa Fe. Later he entered the employ of the Mexican Central as superintendent of construction and was soon promoted to resident engineer of maintenance. In 1883 he returned to the Atchison, Topeka & Santa Fe in charge of construction and in 1887 was with the Colorado Midland for some months, after which he returned to the Atchison, Topeka & Santa Fe. In December, 1890, he was appointed roadmaster of the Gulf, Colorado & Santa Fe, with headquarters at Cleburne, Tex., and in October, 1892, he was employed by the Lake Shore & Michigan Southern, but soon returned to the Gulf, Colorado & Santa Fe, at Cleburne as superintendent of track, bridges and buildings. In August, 1896, he entered the service of the St. Louis & San Francisco as superintendent of track, bridges and buildings and three years later he became general and chief engineer of the Tennessee Central, which position he held until January, 1901, when he became general manager of the Los Angeles Land & Water Company. From 1903 to 1904, he was employed as an engineer by B. Lantry & Sons, railroad contractors, at Ft. Madison, Ia. In June, 1904, he returned to the Atchison, Topeka & Santa Fe as engineer of the Western lines, with headquarters at La Junta, Col. In May, 1913, he was promoted to chief engineer of the Western lines, with headquarters at Amarillo, Tex., which position he was holding at the time of his retirement.

F. M. Bisbee

Purchasing and Stores

Winfield S. Haines, assistant to the vice-president of the Erie, has been appointed superintendent of reclamation service.

J. E. Toms has been appointed purchasing agent of the Tennessee Central, with headquarters at Nashville, Tenn., succeeding E. H. Gaines.

J. L. Higgins has been appointed purchasing agent and **C. F. Leatherman** storekeeper of the Kansas, Oklahoma & Gulf, both with headquarters at Muskogee, Okla.

Obituary

E. E. Kruthoffer, auditor of freight accounts of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cincinnati, Ohio, died on November 5.

F. S. Gannon, formerly president of the Norfolk Southern and, since 1909, president of the Montana, Wyoming & Southern, died at West New Brighton, Borough of Richmond, New York City, on November 8.

EDITORIAL
Railway Age

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Make It a Real Convention

The decision of the Mechanical Division of the American Railway Association not to hold a regular convention in 1923 has caused some surprise. The decision is attributed to conditions existing in the mechanical departments and in the Mechanical Division itself caused by the shop employees' strike. The mechanical officers have been busy most of the time since July 1 fighting the shop employees' strike and attempting to remedy the effects in the shops and upon railway equipment which have been caused by it. Never in the history of the railroads were any of their officers subjected to a severer test or required to do more arduous, constant work than the mechanical officers have done within the last four and a half months. Not a few of them have been attending not only to their ordinary duties but spending a great deal of time and energy in overalls doing work which previously was done by employees who went out on strike.

In consequence of the strike the conditions in the shops of many railroads are still very unsatisfactory. The principal mechanical officers have had to devote so much time to duties made necessary by the strike that ordinary meetings of the committees of the Mechanical Division have not been held, and in fact it has even been impossible to organize many of the committees. Furthermore, many mechanical officers have expressed fear that they will not be able to do any considerable amount of work on the reports during the rest of the present year.

The conditions which exist and which will continue to exist for months to come do not seem sufficient, however, to make it necessary to hold merely what is called a "business meeting" in 1923.

When next June, the usual month for the mechanical conventions, comes, one year will have elapsed since the shop employees' strike began, and largely because of the unsurpassed energy and loyalty which have been shown by the principal mechanical officers and by many of the supervisory officers and foremen, the railways are handling virtually as much freight business as they ever did before, and in spite of conditions in the shops are steadily reducing the amount of bad order equipment. The existing conditions undoubtedly will be much improved within the seven months which will elapse before the regular time for the mechanical convention. While it probably will not be possible to hold the usual committee meetings and prepare the usual reports meantime, it should be possible to arrange for the preparation and presentation of some very important papers on timely subjects for discussion at the meeting. Furthermore, there are many important subjects concerning which valuable interchanges of experience and opinion could be secured without preliminary preparation of any elaborate reports regarding them. A number of subjects of this kind were mentioned in an editorial which appeared in the *Railway Age* last week.

For some years now the mechanical conventions have been becoming "off again on again" affairs. Sometimes one reason for not holding a convention has been offered and sometimes another. Meantime, the conventions of other important railway technical associations have been held regularly. The American Railway Engineering Association has had its convention in Chicago in March of every year and every year the attendance at and interest in its sessions grew greater. The Railway Fuel Association has regularly held successful meetings. The Traveling Engineers' Association within the last two weeks has held a successful convention regardless of locomotive conditions resulting from the shop employees' strike.

Undoubtedly one of the reasons why for the third time in seven years it has been decided not to hold the regular mechanical convention is that for some years the conventions have been held at Atlantic City and the suspicion has spread abroad that the expenditures in connection with the exhibit and entertainment there were excessive and that the mechanical officers in attendance devoted too much time to diversion and not enough time to work. Everybody in the railroad business within recent years has grown much afraid of doing anything that might cause suspicion or criticism by the Interstate Commerce Commission or the public. It is also undeniable that the reports, papers and discussion at the convention of the Mechanical Division have deteriorated within recent years.

Whether or not it is due to the connection it has established with the American Railway Association, it is a fact that the vitality and initiative which formerly characterized the Master Car Builders' Association and the Master Mechanics' Association have been largely lost.

The work of the large technical associations of the railways of the United States has contributed enormously toward promoting the improvement of practices along all lines and securing the uniformity and standardization where needed, which has enabled our railways to become the most efficient in the world. Never in history was there a time when profound study, interchanges of experience and opinion, and concerted action regarding railway mechanical problems were more needed than now. Six years ago the cost of maintenance of equipment was less than $600,000,000. In 1921, a year of business depression when every possible

economy was practiced, the cost of maintenance of equipment was over $1,250,000,000. The mechanical officers are charged with the direct responsibility of making this vast expenditure efficiently and economically. They also have a very large responsibility with respect to capital expenditures for new equipment which amount to hundreds of millions of dollars a year.

The welfare of the railroads imperatively demands that there shall be some organization of the higher mechanical officers which constantly will study, broadly, profoundly, and constructively—the problems common to all railroads, affecting the design, construction, maintenance and operation of locomotives, cars and shops. If the Mechanical Division of the American Railway Association ceases to do this, as it is ceasing to do it, it will be necessary to leave the work undone or organize some other association to do it. Railway executives in testimony before the Interstate Commerce Commission and Congressional committees have repeatedly within recent years cited the existence and work of the large railway technical organizations as evidence of the constant efforts being made by the railways as a whole to increase the efficiency and economy of operation. Can they afford to allow a condition to develop which will make it necessary for them to tell congressional committees and the Interstate Commerce Commission in the future that with respect to mechanical problems this work on behalf of the railways as a whole is rapidly declining or has virtually ceased?

The initiative in realizing the work of the Mechanical Division should come from the leaders among the railway mechanical officers. It cannot be shown too soon. There is yet time to broaden the scope of the "business meeting" of the Mechanical Division which it has been decided to hold into a meeting at which there will be papers and discussions in addition to the reports of committees such as those on car construction and the rules of interchange which will convert it into a convention which will be highly valuable even though it lasts only a few days. The Mechanical Division will be derelict in its duties to the railroads if it fails to prepare and present at the meeting next year papers dealing with technical, economic and human problems that would justify holding a convention in a far greater emergency than the one which the railroads are now facing.

The National Election and the Railways

It will be very difficult for railway officers to get much comfort from the returns of the recent national elections. Among the public men who voted for the Transportation Act and favored intelligent regulation of railroads who were defeated for re-election were Senator Freylinghuysen of New Jersey, Senator Pomerene of Ohio, Senator Townsend of Michigan, Senator Kellogg of Minnesota and Senator Hitchcock of Nebraska. Two of these senators are Democrats and three Republicans. Three of them, Messrs. Pomerene, Townsend and Kellogg, are members of the Senate Committee on Interstate Commerce. Most of them owed their defeats partly or even largely to their part in helping pass the Transportation Act and their subsequent defense of it.

On the other hand, almost every candidate for senator in the middle western and western states who attacked the Transportation Act in his campaign speeches was elected. Senator La Follette was triumphantly re-elected from Wisconsin. The new senator from Minnesota was elected by a combination of radical farmers and workingmen. The new senator from North Dakota was the candidate of the Non-Partisan League. Iowa's new "republican" senator, Smith W. Brookhart, has long been an advocate of government ownership of railroads and attacked the Transportation Act in his campaign with the most mendacious misrepresentations. Mr. Howell, the new senator-elect from Nebraska, was as mendacious and virulent in his attacks on the Transportation Act and the railways as Brookhart.

The result of the election, in the western states at least, is the expression of a great change of sentiment regarding railway matters within the last three years. Three years ago the western farmers were disgusted with the results of government operation and favored the return of the railways to private operation under a policy of regulation which would enable them to earn reasonable net returns and adequately develop their properties. Railway rates were advanced in 1920 because if they had not been every railroad in the country would have been bankrupted. The prices of farm products began at almost the same time to decline rapidly. The farmers began to suffer severely because the prices of the things they had to sell declined much more than the prices of the things they had to buy. Immediately a host of demagogues sprang up and began to tell the farmers that their troubles were mainly due to high freight rates and that the high freight rates were mainly due to the Transportation Act. They represented that the Transportation Act "guaranteed" the railways a return of 6 per cent, and implied that the railways were getting this while the farmers were suffering great losses.

If ever there was a time in the history of the railways when their officers would have been justified in denouncing and refuting misrepresentations of this kind, and taking advantage of every opportunity and every available means for presenting the facts about the railroad situation, this was the time. For railway officers to denounce and refute misrepresentations regarding the railways is not to go into politics. It is as much the duty of railway officers as *railway officers* to defend the railways from unjust attacks, regardless of who makes them, as to maintain the track or run the trains. Here and there a few replies were made to these misrepresentations, but in most cases they were allowed to go unrefuted and even unchallenged. Most farmers believed them because they often heard them and seldom or never heard them denied. In consequence La Follette, Brookhart, Howell and the rest of their kind hung the hide of the railroads on their political fences in every community where they spoke and will now take it to Washington for further exhibition and perforation. A great industry which will not defend itself in the court of public opinion is more

likely to be profitable in the long run to demagogues than to those who invest their money in it.

Most of the business men of the country now understand the railroad problem, and are willing to cooperate in solving it. The farmers are being misled regarding it, and in the long run they will determine what kind of railway regulation will prevail. Until within recent years the meat packing industry divided with the railways the attentions of demagogues who were seeking the favor and votes of western farmers. The head of a large organization of farmers recently made in public the statement that there was no longer any hostility among the farmers toward the packers, but on the contrary a feeling of friendliness. How was this enmity changed to friendliness? George F. Swift, Jr., chairman of the packing industry's "Committee on Public Relations," recently made the following statement:

"Doubtless there was something to criticise. There generally is in every industry and in every individual. But there was also much to praise. Unfortunately, however, the industry did not tell its story. But the critics of the industry told theirs. Nor did these critics confine themselves to facts. They created an atmosphere of slander; they propagated a swarm of downright untruths—untruths alleging conditions which, were they true, would antagonize any man of common sense and inflame any man of decent feeling. Perhaps packers of those days were too confident that the admirable, efficient service they were rendering would be appreciated and that it would protect their businesses from slander.

"By bitter experience, meat packers have learned the necessity and value of constantly interpreting their industry and its services to the public. Today the industry enjoys a higher standing. Its cheap, efficient service is better understood. Meat packers are more highly regarded and meat products are being re-appraised with respect to healthfulness and high food value."

The packers told their story over and over again in public addresses, newspaper interviews and especially by extensive public relations advertising in newspapers, magazines and farm papers. The Standard Oil Company also has carried on an extensive campaign of public relations advertising. So has the American Telephone & Telegraph Company. So have public utilities throughout the country. Every one of these concerns and industries has by these means greatly improved public sentiment regarding its affairs. The railways have told their story only in a fragmentary way and occasionally. They have never told it through all the channels available in all the ways and with the tireless persistency that it must be told if the public in general is ever to know the facts about railroad regulation and the railroad situation. In consequence, in half the states of the Union, demagogues still find that the surest road to public favor is to tell lies about the railways and advocate legislation for their destruction.

Unless the railroads as a whole, and most individual railways take more seriously their problem of public relations and make real efforts to solve it, they will in time, and in no very long time, make private ownership impossible and government ownership unavoidable.

Brand versus Analysis Buying of Tool Steel

Much of the material used by railroads can and should be purchased according to detailed specifications. Tool steel, however, is not in a class with this material. Attempts to purchase it on specifications based on chemical analysis have proved costly to the railroads and unsatisfactory from the point of view of shop men who used the steel. The final and conclusive test of any tool steel is its cutting capacity, of which it has been well said that 25 per cent depends on chemical analysis and 75 per cent on the experience, skill and care of the manufacturer. Chemical analysis cannot explain the difference in quality of tool steels any more than it can explain the difference between chemically identical diamond and graphite. The large number of tool steel brands, formerly causing so much confusion, has been reduced in the past few years to a comparatively few well-proportioned grades, with properties and qualities well known to shop men by brand name. It is obviously far better to purchase tool steel by brand of reliable manufacturers, holding them responsible for the quality and suitability of the steel, rather than attempt to dictate detailed specifications based on chemical analysis which plays such a small part in the final product. Tool steel is essentially different from structural steel which lends itself more readily to purchase by specification. Tool and structural steels have been aptly compared to a skilled engineer and a laborer. Both steels have similar characteristics as regards strength, fibre, and ability to stand up under varying conditions. The tool steel, however, has certain desirable qualities in excess of the structural steel, just as the engineer has knowledge in excess of the laborer. In tool steel these excess qualities are put there by the manufacturer and designated by some brand name. Metallurgists, heat treaters and chemists may eventually evolve a scientifically exact method of manufacturing tool steel according to specifications in which the results can be exactly predicted from the premises, but in the present state of the art, it is far better to purchase steel-making ability as indicated by brand names rather than attempt to write analysis specifications. Railroad men should also remember how excessively costly poor tool steel proves in the shops and not make the mistake of basing purchases on price rather than quality. In many cases one tool steel, affording only five per cent greater production than another brand, could profitably be purchased even if the price was 100 per cent greater.

The International Union of Railways

The recent formation at Paris of the International Union of Railways is one of the most encouraging developments which have taken place looking toward the restoration of pre-war transportation conditions in Europe. With the setting up of many new nations, especially in Central Europe, the lack of agreements for interchange of equipment and other reciprocal allowances has acted with the serious physical deterioration of the railways as an effectual barrier to any kind of efficiency in international trading. Petty jealousies and intense national feeling prevented the early solution of the problem. With the representatives of the railways meeting together, however, it seems that there is hope for an early restoration of the fairly satisfactory conditions of pre-war days. There is no reason, however, why the newly-formed union should not go much farther than the mere restoration of pre-war efficiency. The railways of Europe were never as closely related to each other as they could have been to their common advantage. Standardization of rolling stock to the extent necessary to permit of universal interchange, standardization of gages, simplification of accounting, avoidance of unnecessary delays for customs examinations—all these are goals

which the union may set before it. Russia, as might have been expected, was not represented in the founding of the International Union. One hears persistent rumors, however, of constantly improving conditions in that country and it may be expected that, before long, it too may join with the rest of Europe in the union. China and Japan belong already, but will not participate actively until the Trans-Siberian Railway is again functioning normally. The International Union of Railways is in a position to accomplish for the railways of Europe some of the results which the American Railway Association and its predecessors have accomplished for the railways of this continent. Consequently it deserves the hearty support of every railway and every nation within its sphere of influence.

Why Shippers Are Unfriendly

There can be no question but that railway executives honestly want to serve the public acceptably and cultivate a friendly feeling toward their roads. Unfortunately, however, with the rapid growth in size of organization, and also as a result of federal control, the morale of the employees in many cases has fallen to a dangerously low ebb. The public has noticed this in indifferent service on the part of the employees and has been constantly irritated by this indifference, which sometimes has bordered on discourtesy. Winthrop Martin, a shipper, tells frankly elsewhere in this issue of his disappointing experiences in dealing with the railroads. He also makes a unique and constructive suggestion, which either by itself, or in a modified form, seems well worth consideration. Fundamentally, of course, the trouble is that the railroads, as they have increased in size, have been notoriously deficient in properly selecting, training and promoting their employees and in training and coaching the foremen and subordinate officers. Fortunately, many of the roads are awakening to the necessity of giving more attention to these and other matters relating to the personnel. Mr. Martin's observations, of course, refer to a limited area; has he overstated the conditions as they exist generally throughout the country? Have our readers other constructive suggestions for remedying the difficulties outlined by Mr. Martin?

Net After Rents

There have now appeared in these columns three references to the use of the figure of "net railway operating income." This is the fourth. The two preceding notes have essayed to define the term and all three have been intended to emphasize its importance and to express a suggestion for its more general and more consistent use. Before going further into the discussion, however, it might be well to emphasize the fact that "net railway operating income" is "net after rents." This comment is rather necessary because of the confusion that may lie in distinguishing between the terms "railway operating income" and "net railway operating income." The former is a figure which has been in use a much longer time than the latter. Briefly it represents the net after the deduction of taxes and of the relatively unimportant item of "uncollectible railway revenues." "Net railway operating income," however, is an entirely different thing. It is after the deduction or addition, as the case may be, of net equipment rents and the net for joint facility rents, which is the reason it is sometimes called "net after rents." All this would seem extremely elemental and hardly worthy of such extended comment, but for the amount of confusion that exists when it comes to differentiating between "railway operating income" and "net railway operating income." One who understands that there is a sharp distinction is inclined to be discouraged somewhat because of the great number of occasions in which one of the figures is shown unwittingly i the place of the other or in which the designation of th figure that may be shown is such that it is impossible t determine which of the two it may be. It is disconcertin further, to see in how many instances the railways in the own monthly reports and still more in their annual repor fail to show the figure of "net railway operating income at all, but remain content with showing merely the olde figure of "railway operating income." Railway accountin is now enough of a science so that there should be greate consistency about this feature. The figures should be carrie down as far as to show the "net railway operating income both in the annual reports and the monthly reports whic the carriers send to the press. In summary, the figure i important enough to be given and to be given correctly unde its proper designation.

Produce or Starve!

President Worthington of the Cincinnati, Indianapolis & Western has something to say on another page about th policies of organized labor as it exist on the railroads today. He directs at tention to certain fundamental princi ples of economics and severely criticise organized labor for not recognizin them. It is important to note, however, that he speaks o organized labor "in the sense that we understand it today." His criticisms are quite likely to be misunderstood if this i not clearly kept in mind. Unquestionably, Presiden Worthington is sympathetic with organized labor having th right motives and under wise leadership. Undoubtedly h would pay a high tribute to that type of organized labo which has remedied abuses in the past and has helped t secure a proper understanding as to the privileges and right of the workman. Unfortunately, however, radicalism within the ranks of labor has caused the pendulum to swing t an extreme radical position. President Worthington's articl indicates the necessity on the part of the railway manage ments for educating the workmen as to their responsibilities and in simple industrial economics.

The Early Bird

WHILE AT FIRST THOUGHT it may seem premature to suggest the consideration of next year's construction program at this time when the present season's work is not yet completed, several roads are already making detailed plans for their 1923 activities. This year has witnessed the gradual resumption of the improvement of existing facilities. On some roads the amount of work undertaken has even approached that of boom years. The heavy traffic with which the roads are now struggling has demonstrated the shortcomings of existing facilities very forcibly and it is to be hoped will soon begin to provide more net revenues from which improvements can be financed, so that the indications point to 1923 being an active year.

The railways have been out of the construction field so long that the organizations to which these activities have given rise in the past have disintegrated in large measure. Few roads have sufficient engineering forces to do other than the minimum amount of work and the experienced locating and construction engineers in their service are few in number. Even more serious is the lack of large contractors' construction organizations familiar with the requirements of railway work. Many of the railway contractors of former days have entered the field of highway construction, while others have gone out of business because of the lack of contracts from the railroads.

It is because of these conditions that the more alert roads are already working on detailed plans for next year. The

engineering department of one road has secured authorization for more than 20 million dollars' worth of improvements and is now preparing plans and specifications preliminary to calling for bids. Other roads are scarcely less active. By calling on contractors for bids on their projects soon these roads will not only be prepared for an early start next spring and secure the use of the facilities quickly, but they will also secure first call on the available contractors.

Whenever activities are resumed on the scale which the present inadequacies of railway facilities demand, there will be a shortage of experienced railway and contractors' organizations which will limit the amount of improvement work which can be completed economically and will lead to competition for service which cannot but add to its cost. The road which anticipates this condition and contracts its work early will be in the same favorable position as the railway which buys its materials in advance of its associates.

Senator Capper on the Railroad Situation

Senator Arthur Capper of Kansas is the leader of the farm bloc in Congress. He is also the wealthy publisher of numerous farm papers. He has done more within recent years to disseminate misinformation regarding railway matters among the farmers than any other man. The sentiment which has been engendered among the farmers by misrepresentations of the Transportation Act and of the facts about the railroad situation was the principal cause of the recent election from many states, especially in the west, of numerous senators and congressmen who advocate a policy of railway regulation which would be more unfair, restrictive and harmful than that which has been followed in the past.

The *Railway Age* recently published an editorial in which it criticized Senator Capper and others for disseminating misrepresentatives regarding railway matters among the farmers. Senator Capper on November 5 devoted a speech at Clearwater, Kansas, to replying to this editorial in the *Railway Age*. He published his speech in his various papers. He denied that he had misrepresented the railway situation, and then proceeded in this very same speech to make another series of wholly misleading statements.

The existing shortage of transportation is so great and serious as to constitute the strongest possible argument from the standpoint of the public welfare for a fair and constructive policy of railway regulation. With respect to this situation Senator Capper said: "As to the present car shortage, that is no new disease. We always have a car shortage with us at this time of year." What are the facts? There was a large car shortage in 1906 and 1907 at the end of a ten-year period during which the total freight handled by the railroads had increased 150 per cent. The railways were then making and for some years continued to make great efforts to so increase their facilities as to remedy this condition. The result was that in the eight years from 1908 to 1915, inclusive there never was a large car shortage except in the fall of 1912, and in six of the eight years there was no car shortage at all.

Meantime, however, because of restrictive regulation the expansion of the railways was rapidly declining, especially after the year 1910. In consequence, when the great increase of business came in 1916 there came a large car shortage which prevailed not only in the fall of each year, but which, except in the spring of 1919, was practically continuous throughout the five years 1916 to 1920 inclusive. Because of the decline of business there was no car shortage in 1921, but the revival of business in 1922 has brought much the largest car shortage ever reported. The largest net car shortage ever reported in any past year was on September 1, 1920, when it was 146,000 cars. The net car shortage reported on October 15, 1922, was 152,034; on October 23, 161,940; and on November 1, it was over 175,500 in spite of the fact that during the two immediately preceding weeks the railways moved more carloads of freight than ever before in the corresponding two weeks of any year in history.

The facts, then, are that during the eight years ending with 1915 there was only one large car shortage, while in six out of the seven years since then there have been large car shortages which have increased in size until we now have one which surpasses all previous records, and which grows larger with every report.

Another statement made by Senator Capper was as follows: "This autumn they (the railways) are doing the greatest business in their history at an increase of 78½ per cent a ton-mile for freight, and of nearly 66 per cent a mile for passengers." Most comparisons between present railway rates and prices are based on the rates and prices of 1913. The average railway rate per ton per mile is now only 57 per cent higher, and the average rate per passenger per mile only 50 per cent higher than in 1913.

Senator Capper also said: "Railway officials estimate that for the last five months of this year the Class 1 roads will earn a net operating income of $480,000,000. This will make a total of $900,000,000 for the year, compared with earnings of $615,000,000 for 1921. $900,000,000 net income equals 5 per cent on $18,000,000,000, the approximate property value of the roads." When Senator Capper said that railroad officials made any such estimate of net operating income for the last five months of this year he said what we believe to be untrue. The *Railway Age* has never seen any such estimate from any railway source, and if any railway official did make it he did not know what he was talking about. To earn in the last five months of the year the amount of net operating income mentioned by Senator Capper, the railways would have to earn an average of $96,000,000 a month. In August they earned only $52,580,000, or at the annual rate of 2.65 per cent on their valuation, and in September, only $58,428,000, or at the annual rate of 2.88 per cent on their valuation. In the first nine months of the year they earned ony $529,413,000 net operating income, or at the annual rate of 3.96 per cent on their valuation. The net operating income earned by the railways in August and September, 1922, was almost $67,000,000 less than in August and September, 1921, when they earned at the rate of only 4½ per cent.

This reduction in net return was due to the reduction of freight rates made on July 1, and to increases in operating expenses caused by the shop employees' strike and by advances in the price of coal. To make their net return for the entire year $900,000,000, the figure mentioned by Senator Capper, they would have to earn in October, November and December a net of $391,000,000. This would be approximately $90,000,000 more than they ever earned in these three months in any year in their history. There is not the remotest possibility that they will earn anywhere near this much and every well-informed man knows it. Any public man who, in the light of these facts, all of which were available when Senator Capper made his speech, would publicly make an estimate that the railways in 1922 will earn an average net return of 5 per cent shows a reckless disregard for facts and a reckless disregard for the effect that his statements are likely to have upon public sentiment, railroad regulation and the public welfare.

No class of people is losing more money now from inadequacy of transportation than the farmer. By minimizing the seriousness of this condition, misrepresenting its causes, and making misstatements adapted to promote the adoption of a policy of regulation which will intensify and prolong it, Senator Capper and other public men influential with the western farmers are doing all they can with respect to railway matters to make worse the bad economic conditions from which the farmers are suffering.

Letters to the Editor

[The Railway Age welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

Mechanical Department is Severely Indicted

New York

To the Editor:

The announcement on page 907 of your issue of November 11, 1922, that the Mechanical Division, A. R. A., convention has been called off for the year 1923, comes as a serious shock to those of us who are particularly interested in mechanical department affairs and developments. Were it not for the reliability of your publication one would be inclined to question the statement that the proposed convention at Atlantic City will be displaced by a business meeting of the Division, to be held at some other place at some time during the year. It seems almost inconceivable that the General Committee of the Mechanical Division could have so far lost its sense of responsibility to the members of the Division, as well as to the railroads at large, as to have taken action of this sort at a time when there was never greater need for a real convention.

What has happened to the mechanical department officers? Have they entirely lost their manhood? What will the executive officers think of this action? They have seen something in recent years of the vital necessity for having the equipment maintained in the best possible condition and they must have learned something of the seriousness of the labor problem in the mechanical department during the past summer. Will they stand patiently by and allow the mechanical officers, through a mistaken sense of loyalty, to stay at home next June when they might far better be gathered in convention, discussing some of these problems, exchanging experiences and educating themselves as to how they may serve their railroads to better advantage?

The time was that the mechanical men gathered in their M. M. and M. C. B. conventions, put over real progressive programs and were a vital force in improving and developing the mechanical department. Can this be said today? If not, why not? Surely the problems now are greater than they ever were before. You have pointed this out repeatedly in editorials and articles in the *Railway Age* during the past few years and yet your constructive suggestions have apparently made no impression. I cannot conceive why this is so. Many mechanical department officers have expressed themselves as being dissatisfied and disgusted with the narrow and inadequate programs which have been followed by recent conventions. They have admired you for your constructive suggestions. Someone seems to be blocking the game. Who is it?

Someone has said that the mechanical department officers have lost caste in recent years. Many people believe that if they pass up the next June convention they will lose the last shred of dignity. You made some excellent and practical suggestions in your editorial last week on "What Will the Mechanical Section Do?" The mechanical department can redeem itself if it will accept your challenge and develop a real program and hold a real convention next June. This does not mean that long-winded, exhaustive reports must be prepared, going into endless detail as to the size of bolts and screws, or limiting dimensions, etc. It does mean some real reports or *individual papers*, prepared by men who are doing things in the strenuous period through which we are passing, which can be discussed to advantage and can be mighty helpful to mechanical men at large. What will the answer be?

D. I. S. Gustee

Give a Thought to the Flagman

Cambridge, Mass.

To the Editor:

Is the shadow of the possible false clear signal to be removed from the signal engineer's mind? Mr. Stevens, signal engineer of the Atchison, Topeka & Santa Fe, in the very interesting paper that he read at Chicago and which you printed on November 4, page 853, talks about the abolition of the flagman in a way that suggests that he really expects to accomplish something in that direction; but can he do it? Can the operating officers, who do not always comprehend all of the fine points of automatic signaling, be induced to put Rule 99 on the shelf?

At present, the flagging rule (including the torpedo rule) is needed because (1) the engineman of the following train may fail to observe a semaphore signal and (2) because the semaphore may be out of order and fail to give him notice of the presence of the train ahead. The automatic stop (as we have known it heretofore) proposes to settle the first point, and Mr. Stevens, apparently, proposes to elaborate the automatic stop (or cab signal) so as to settle the second one also. Just how, he does not explain. The crucial point is the track relay, which must open on the passage of each train and thereby cause the signal behind that train to change so as to indicate to the following train "Stop." Is the train-control specialist going to give us something more certain and more faultless than the track relay? At present, the track relay *is* liable not to open; being closed it does not protect the train; and the train, if stopped or much slackened, must depend for rear protection on the flagman.

Another thing; when you propose to abolish flagging, consider the flagman himself. If you adopt a signal system under which flagging is not required he becomes only a brakeman; or, perhaps, more strictly, a trainman. But if he is faithful and responsible, he still continues to have a general care over the rear end of the train, and his services as flagman may become necessary and important at any time if the automatic train-control apparatus should get out of order. It will be necessary to include in the rules some suitable instructions concerning what to do in case of such failure of apparatus. Therefore, to make it possible that the rear brakeman can be at all times clear in his mind as to the safety of his train from collision, it will be necessary not only that the automatic apparatus be in good order, performing its proper function, but that it give this brakeman *constant assurance that it is so.* The alert and thoroughly competent rear-end man desires this assurance at all times. He desires it today. If his train is stopped on a clear day a quarter mile ahead of a semaphore block signal with horizontal arm plainly within his view, he is satisfied (so far as visual signals are concerned) that his train is protected. He wants this assurance at all stages of his journey, though for most of the time he cannot have it. He most certainly ought to have it, if we are to do away with the rule requiring him to go back; and he ought also to have assurance of an efficient audible as well as visual protection.

Mr. Stevens, presumably, does not claim at present to be doing anything beyond theorizing; but as he is an eminently practical engineer it will be interesting to know if he has considered these essential features.

John C. Harvard.

A New Project for a Railroad to Hudson Bay

Temiskaming & Northern Ontario Building 70-Mile Extension Toward Mouth of Moose River

A NEW CANADIAN railroad route to tidewater on Hudson bay is now being projected in the form of an extension of the Temiskaming & Northern Ontario from its junction with the National Transcontinental at Cochrane, Ont., to James bay. The first 70 miles of this line is now under construction and surveys are being made for its extension to the estuary of the Moose river at the south end of James bay. The story of the Temiskaming & Northern Ontario

Location of the Temiskaming & Northern Ontario Extension

and the extension now under way presents an interesting side light on the effort toward the development of unpeopled areas of Canada through the construction of railways with the aid of provincial or dominion funds.

Less than 20 years ago the northern and largest part of the Province of Ontario, lying between Lake Huron and Lake Superior on the south and James bay on the north, was quite unsettled, and in a large part unexplored, except for a narrow strip of settlement along the shores of these lakes and along the main line of the Canadian Pacific. The belt of country lying immediately north of the lakes and traversed by the Canadian Pacific was rocky and presented a practically unsurmountable barrier to colonization. This belt extends as far north as the "height of land" between the Great Lakes and James bay, and the existence of a large area of clay land further north heavily timbered with spruce and poplar, was not generally known.

It was to tap this clay belt that the province commended the construction of a colonization railway in 1902, from North Bay on the main line of the Canadian Pacific to the north end of Lake Temiskaming. About two years later, the Dominion Government projected the National Transcontinental between Quebec and Winnipeg, and the Temiskaming & Northern Ontario was extended further north to meet the Transcontinental at Cochrane. This was completed in 1908, thus enabling the construction of the National Transcontinental to be carried on east to Quebec and west to Winnipeg.

It will be remembered that the National Transcontinental was to be leased to the Grand Trunk Pacific while the parent company, the Grand Trunk entered into an agreement with the Temiskaming & Northern Ontario Commission for running rights between North Bay and Cochrane, thus completing the connection between the Grand Trunk lines in

Construction Progress View of the Bridge at Mile 11.3

Ontario and the Grand Trunk Pacific lines in the west. War conditions following shortly after the completion of the National Transcontinental completely changed the railway situation in Canada, and, as is well known, the Grand Trunk lost a control of the Grand Trunk Pacific, which along with the Canadian Northern has been incorporated into the Canadian National and the running rights agreement referred to above has never become operative.

Although the Temiskaming & Northern Ontario has not become a real link in the transcontinental railway system as has been anticipated, it has served to develop the country it traverses. A vast area is rapidly being cleared and placed under cultivation, supplies of spruce and poplar and abundant water powers have led to the establishment of large pulp and paper mills, and silver and gold mining is being undertaken at camps such as Cobalt and Porcupine. The construction of the railway has moved the frontier of Ontario 250 miles farther north. The extension now under construction is designed to open up to settlement the area between the National Transcontinental and James bay.

Surveys disclosed that there would be no serious construction difficulties to determine the location of the extension, but that the real problem was to select a route that would best

serve to develop the intervening territory and reach a suitable terminal on tidewater. It was found that the mouth of the Moose river was the most desirable site for a harbor and that the terminal should be located on the west bank of the river opposite Moose Factory, an old Hudson Bay Company post on an island in an estuary of the river.

It is anticipated that the construction of a railway to Moose Factory will create considerable interest in James and Hudson bays, and that during the navigation season of five months, a considerable amount of coastwise shipping will be carried on. On the map it will be seen that in selecting a route for a railway from Cochrane to Moose Factory, the most direct line has not been followed, but it is believed that the route that has been adopted, will serve to open a larger area to settlement, and will better serve to promote the establishment of pulp and paper mills on the Moose river and its tributaries.

The Airplane for Surveys

The initial surveys were carried on by methods usually followed in Northern Canada, the only means of transportation being canoes in summer and toboggans and dog teams in winter. Subsequent to the completion of the exploratory surveys and the selection of a route the Laurentide Air Service, Limited, established an air station near Cochrane and the engineers of the Temiskaming & Northern Ontario have used sea planes to a slight extent. It has been their experience that they are valuable for exploratory surveys in unmapped country, and if they had been available while the surveys preliminary to the selection of a route were being carried on, they would have been of great assistance. The engineering staff, however was not able to utilize them in connection with detailed location surveys.

Currently with the location surveys, topographic surveys were made of the water powers on the Abitibi river. These surveys in part were necessary in order to determine clearances for structures crossing the Abitibi and its tributaries. In all cases these structures are being designed so that they will not restrict the future development of the water powers. Information obtained from the hydrographic surveys, was also used in connection with the investigation of the electrification of the railway, which is now receiving serious consideration.

Construction

The first 70 miles of this extension is now under construction. The general contractors are Grant Smith & Co. and McDonnell, Ltd., Vancouver, B. C. The clearing and grading has been sub-contracted to Noehren & Mannix and the concrete masonry to C. D. French & Co. The work is comparatively light, and the grading quantities, average about 14,000 cu. yd. per mile, while the masonry is relatively somewhat heavier, being about 15,000 cu. yd. in the 70 miles. The maximum gradients are 0.4 per cent southbound and 0.6 per cent northbound. The maximum curvature is four degrees. Embankments are 18 ft. and cuts 24 ft. in width. The location profile showed no solid rock, but a small quantity has been encountered in one or two of the deeper cuts. All structures are of permanent construction. The smaller culverts are reinforced concrete pipe, except in a few cases where by reason of greater facilities in transportation, corugated pipe was used. The larger culverts are of flat top reinforced concrete. The clay is of glacial origin and in the case of most structures, pile foundations are necessary. Spruce suitable for piling is generally found adjacent to the right-of-way. The larger creeks have worn deep ravines and these are crossed by steel trestles, the clay banks of the creeks not being sufficiently stable to permit the construction of large culverts or high abutments.

The contract for the steel bridge work has been awarded to The Hamilton Bridge Works Company, Ltd., Hamilton, Ont. The largest structure is the crossing of the Abitibi river at Mile 44.4 the principal span of which is a 220-foot deck truss. The structures are designed for Cooper's E-60 loading to Canadian Engineering Standards Specifications. The track is being laid with 80 lb. A. S. C. E. section rail, heat-treated angle bars and bolts. The ties are jack pine, untreated.

The Temiskaming & Northern Ontario is under the jurisdiction of a commission appointed by the provincial government, the chairman of the commission being George W. Lee of North Bay. The engineering staff includes S. B. Clement, chief engineer, North Bay, Ont., W. R. Maher, chief locating engineer, A. L. McDougall, division engineer in charge of construction, and A. A. McRoberts, assistant engineer in charge of design of structures.

Railway Commissioners Meet in Detroit

The National Association of Railway and Utilities Commissioners held its thirty-fourth annual convention in Detroit, Mich, on November 14-17, inclusive. The meeting was opened on Tuesday morning, with a short address of welcome by James Couzens, mayor of Detroit. The mayor's talk was especially noteworthy because of its appeal for government ownership. He stated that municipal ownership of street railways is now on trial in Detroit, which has the largest municipally owned street car system in the country. He said that the railway and utilities commissioners had a great power entrusted to them and that was to see that proper service is provided at a reasonable cost; that the commissioners should insist upon public utilities eliminating graft, interlocking relationships, unreasonable salaries, etc.

President C. D. Jackson, of the association, followed with his address of welcome. He made a vigorous attack on the tendency toward centralization in government, and an equally strong plea for the perpetuation of local right and individualism as against socialism and communism. He deplored the national Transportation Act, which, with the amended Interstate Commerce Act, gives the federal commission control of railroad rates within a state when in conflict with interstate rates. He declared that state commissions will continue to resist the further encroachment of the federal power.

The remainder of the morning session was devoted to the reports of the committees on Public Ownership and Operation and Safety of Railroad Operation. The former denounced the Railroad Labor Board, stating that it is clearly apparent to all who have given the subject careful study that the existing dual system of control of the railroads of the country is a failure. The system is wrong in principle, and has proved disastrous in practice, as evidenced by the recent nation-wide railroad strike. It concluded that the only sound economical, logical, reasonable and practical solution to such a perilous situation is to abolish the Labor Board and transfer its function to the Interstate Commerce Commission; at the same time, enacting a law "with teeth in it," which will enable the Commission to enforce its decrees and orders.

The Committee on Safety, the chairman of which was C. C. McChord, of the Interstate Commerce Commission, stated that during the past year a number of serious accidents occurred on the railroads of the United States, which again forcibly calls attention to the necessity for extending the installation of accident preventive safety appliances. The greatest number of serious accidents, this committee claimed, may be attributed to the inherent weakness of the time-table and train order system of operation, necessarily involving the fallibility of the human element. The com-

mittee concluded that the need of automatic train control devices is now paramount, as is also the importance of more efficient power brakes.

Chairman McChord of the Interstate Commerce Commission addressed the commissioners on Tuesday afternoon, choosing as his topic Co-operation. He told of the history and outgrowth of railroad regulation and of the various acts and legal restrictions enacted since the first act regulating commerce was passed in 1887. Speaking of the Transportation Act, he stated that one of its most outstanding features is not generally appreciated and that is car service regulation. He strongly advocated much closer co-operation between the federal and state commissions and the carriers. He stated that the I. C. C. is ready and willing to do its part; that it has commenced a nation-wide investigation of the interstate express rates and charges and has invited all state commissions, through their Washington representatives, to co-operate—not only in respect to the interstate rates, but also in respect to all the intrastate rates. His concluding words were: "Unity of action can, of course, come only from unity of purpose, and that purpose must undeviatingly comprehend the good of the whole. We have laid the foundation. Our co-operative plan announces our purpose and marks the beginning of an epoch in railroad operation."

Committee reports and two round-table discussions took up the remaining time of the convention, which ended Friday. A report from the Committee on Motor Vehicle Transportation discussed the regulatory statutes recently enacted by some states in order to control this type of carrier. This committee stated that, if the railroads hope to retain short haul traffic, it will be necessary for them to make radical changes, both in service and equipment, although, the report continued, it should be the purpose of all regulatory bodies to co-ordinate the various transportation systems of the country in such manner as to render the best service to the public, with the least injury to established rail and boat transportation companies. The committee suggested that a gasoline tax is the most equitable method of requiring the users of highways to contribute in proportion to the use they make of same. Other committees, including that on railroad rates; car service and demurrage; express and other contract carriers by rail; valuation; grade crossing and trespassing; and statistics and accounts, presented their usual annual reports.

The following officers were elected for the ensuing year: D. N. Lewis of Iowa, president; A. Forward, Virginia, first vice-president; H. G. Taylor, Nebraska, second vice-president; J. B. Walker, New York, secretary, and J. H. Corbitt, Tennessee, assistant secretary.

Attendance at the convention was in excess of 100.

If We Do Not Produce We Shall Starve To Death

"Organized Labor" Unless Wisely Led and Conversant With Real Facts Will Bring About Disaster

By B. A. Worthington
President, Cincinnati, Indianapolis & Western

MUCH HAS BEEN SAID and much has been written about the prevailing unrest of labor, and nostrums galore have been offered by "students of human nature," college professors, and an endless array of self-seekers who modestly acknowledge they have found the secret; but when all of these remedies have been simmered down there is not much left that is tangible. In the simmering process, most of it passes off as gas.

It seems more than passing strange that everybody but those in closest touch and directly charged with the responsibilities of getting results from labor knows more about railroad labor troubles and their remedies than management itself knows. The twaddle that has been written about "inalienable rights," "right of strike," "seniority rights," "humanizing industry," "living wages," "labor not a commodity"—an endless list of theories and suggestions—serves principally to becloud the issue. In this impossible potpourri of fantastical and fanatical concoction, we find a financial seasoning—an aid to digestion possibly—in the form of "high finance," "over-capitalization," "valuation of railroad properties for rate-making purposes," "freight cars," "passenger rates," legislation codifying this and that, and restrictions denying this and that, unions defying everything and everybody—it seems that "labor" is running amuck and nobody knows what a halter is or where to find it.

Where Are We Headed For?

If we could only shake our minds free from the foolish obsessions that grip us, we might be able to see things clearly and to understand less hazily. If we do not understand our troubles in these days of ultra-refinement the first thing you know industry will have to submit to dangerous operations, whereas, in fact, it has only the belly-ache because it has been forced to swallow something that it did not want and cannot possibly digest—*and that is all there is to it!* The possibilities that lie right straight ahead of us, if we do not hasten back to common sense, are so terrible to consider that I will assert emphatically, if we could only realize what we are doing and where we are headed for, we would actually shiver in our boots.

Now to get the right view-point on "labor"—and "capital" too, if you please—we must necessarily find some tangible fact, some indisputable common ground to stand upon. We can go on theorizing and debating, and arguing and fighting about "inalienable rights," for instance. The fact is, whether we have any rights at all, alienable, inalienable or otherwise, if we do not *produce* we are going to *starve to death.* And the same thing about "physical valuation of railroad properties for rate making purposes." Suppose, for instance, this physical valuation would "warrant" a freight rate of ten cents, or ten dollars, when the going rate was one dollar. What are we going to do about it? If you lower the rates, the railroads cannot be maintained; and if you increase the rates, the farmers cannot market their produce. And all the way down the list, you might ask yourself seriously, "Well, what about it?" Suppose some of our ideas about "humanizing industry" do not fit into the general scheme of things—to be specific, while we are "humanizing" industry why not try the farming industry—it needs it worse than the railroads. No sanitary toilets (just think of it!), no ice water, no punitive or constructive overtime, no "standard day," no classification of work! Well, what about it?

Necessarily you have got to build on fact. If theory fits into fact, all right—it's a good theory; but you cannot pos-

sibly make fact fit into theory. Fact cannot be altered in any respect. It can be misunderstood and misapplied, and we can pursue the succession of resulting fact as far as we want to—until it becomes impracticable; then, if we have any common sense, we will trace back to see where we got off the right road, and start again from there. If composite American intellect is entitled to the high plane it presumes to occupy, it will never lose sight of the main fact.

The main fact that confronts us today in America is this—hard, substantial and unalterable; in the past 60 years (approximately) America has become a wonderful and powerful nation. Summarized and expressed in units that everybody will understand, bearing in mind always that progress, prosperity, power—everything desirable—has its roots in wealth, the following tabulation taken from authentic sources, is mightily impressive:

ACCUMULATED WEALTH OF AMERICA
(U. S. Bureau of Census)

1840	$7,135,780,000	1890	$65,037,091,000
1860	16,159,616,000	1900	88,517,307,000
1870	30,068,518,000	1904	107,104,212,000
1880	43,642,000,000	1914	204,393,000,000

Now here is fact—basic fact! It is unalterable. Whatever was done in that period, in the main fitted into our conditions well and the results that flowed therefrom were immensely satisfactory. Nothing like it in the history of the world! How proud we ought to feel! How anxiously we should strive to preserve the elements of these facts! Can anybody, in his sane mind, question that? Whether he questions it or not, the fact remains, unalterable—a succession of fact, confirming and endorsing the policies which governed our actions, and blessing us with a superabundance of everything that a sane people might desire!

Produce or Starve!

Are we so superficial, so insanely ambitious, so utterly given over to vain imaginings and selfish aspirations, as to suppose for a lone instant, that this succession of fact will continue indefinitely, or that the present status can be sustained, without continued production? Do we not realize, too, that high costs of production, limitation of output—everything that unionized labor (as we know it)—sponsors today, militates against production? That if we follow the vain theories that have been advanced so insistently and persistently that they have become "recognized" to a certain extent—the theory of ever increasing cost and ever decreasing production—we necessarily must fail in the end? And, at the rate we are traveling in pursuit of a worthless will-o-the-wisp, the end is not far removed?

During this prosperous period of America when, by sheer force of its wealth, it became a factor in the world's affairs, our railroads were built. The close relation that exists between operated railroad mileage and accumulated wealth of America, is easily understood. These two facts are linked together indisputably and inseparably. The antecedent fact upon which this accumulation of wealth has been possible, by which labor profited, directly and indirectly, as it had never profited before, is the fact of the railroads. The level of the "laboring classes" has been raised so high that the laboring man on the streets can scarcely be distinguished from the haughtiest financier. The "working conditions" of labor have been so improved that labor is reduced substantially to pressing a button or throwing a lever. Who made these improvements?

Underlying the physical fact of the railroads is capital! "Organized" capital, if you please! The flow of foreign capital into America was a fact that preceded the fact of the flood of humanity that spread over the continent. "Organized" capital preceded labor and organized it according to the needs of the people; following down this succession of fact we arrive at the financial facts quoted in this article. Are they satisfactory to you? Would you change them?

Another startling fact is the absolute absence of "organized labor" in this entire record of construction—"organized labor" in the sense that we understand it today! It is a remarkable fact—but easily understood when the principle of "organized labor" is understood. It has no place in a constructive program! It is not creative! It would not, could not, and did not fit into the general scheme of things—and we have every material reason to believe that it does not belong there today!

If you analyze "organized labor" as it is operating today, you will find that it is parasitical of origin, destructive in principle, and openly opposed to every attempt to increase production or to reduce the cost of production, both of which are urgently necessary.

For the purpose of this article, I do not believe it is necessary to follow succession of fact much farther. Suffice be it to state that we are at the crossroads, one broad flowery avenue of ease leading off to the beautiful sunset, the sweet Elysium of idle dreams; the other, a rough, hard road to travel possibly, where united effort will carry us to the promise of another day of inspiration which cannot fail for fact. Here, with our feet upon substantial ground always, we may reach the fruit of honest effort, and revel in the substantial benefactions of industry.

Without realizing the motive that compels men of wealth to labor on, even after reaching a point in years where they individually would be justified in retiring, few men are satisfied short of devoting every energy of their entire life to the common cause, and their trained business genius and mature judgment are invaluable to us. Their funds are invested in industry and profits are re-invested in industry whereby production is maintained and workers are profitably employed on a marvelously practical basis—not for additional profits which can mean nothing, but for the satisfactions that flow from voluntary acts that are helpful to the common cause. And so far as relates to the stabilizing effect and broad up-lifting influence upon industry, there is grave doubt whether more wholesome methods may be devised for the distribution of the nation's income. In all the substitutes that are offered, one vital defect is common—the inevitable lack of production that invariably follows the withdrawal of proper incentive.

What We Must Do

It seems to be a fact more or less generally accepted that "collective bargaining," within certain limits, is not to be condemned without a fair trial. There seems to be certain merit in co-operative endeavor, genuinely helpful; but when "collective bargaining" takes the form of unyielding demands, economically impossible, or when wages and working conditions are prescribed by irresponsible parties who have no personal interest in the particular industry or railroad, but who, notwithstanding, are vested with a terrible power of destruction, the organization becomes a thing to be feared—not loved and respected for its wholesome benefits.

What America must do, if it is to maintain its present status, is to get back to earth; that is, get a working basis of fact to build upon. We surely have had enough disturbance—murders, personal assaults, destruction of property and destruction of service—to teach us a real good lesson. The "right to strike" means no rights for anybody but strikers, and "freedom" seems to mean lawlessness. From beginning to end there is not a single fact to justify "organized labor," as we now know it.

The only "organized labor" that fits into our general scheme of things is that organization, brought together, trained, utilized and compensated by organized capital on the basis of economic production. Practically all of our ailments will disappear if we live sanely and naturally and do wholesome things; and what ailments do not disappear spontaneously, may be cured by common law administered by common sense.

A Shipper Comments on Railroad Morale

Conditions Are Deplorable and Drastic Measures Should Be Taken to Improve Them

By Winthrop Martin
San Francisco, Calif.

THE AMAZINGLY complicated problem of the American railways is under attack from widely differing angles. From within and for the employees, Mr Plumb—of the once exciting and now thoroughly moribund "Plumb Plan"—had a fascinating scheme, whereby the investment of merely a few billions would show startling economies in millions. His program lies completely riddled.

The Association of Railway Executives growls and groans periodically, the substance of its plea being, that if the railroads are let alone, and regulation largely withdrawn, they can work their way out.

Then from a distance—usually too great—a host of skilled publicists have taken long-range shots aiming at some solution, but more often their work has been in the direction of diagnosis only.

There is still one angle of approach—a close-up—that I have not seen attacked, the angle of the average and constant railway customer.

Strangled by Red Tape

Living in a California village, a division point on the Santa Pacific, I ship and receive probably 200 cars of freight and travel perhaps 2,000 miles a year. From brakeman and freight clerk, yard master and local agent, to the executives of various departments, I am constantly in touch with what is, I suppose, a typical cross-section of railway management and operation. The preponderant idea in the minds of all these men, their guiding and deep ingrained principle, is "Cleave to the rules and damn the consequences." As a matter of fact, the consequences are thoroughly damned, and with them the railroads in the minds of the shippers.

And why? Not because the personnel is especially chosen for its lack of initiative, its stubbornness, or Mahatma Gandi disposition; but because they pass their official lives in fear and apprehension of a host of distant superiors, and a mass of rules and regulations. The freight tariffs alone, about 15 volumes of them, are so enormously complicated—with exceptions, cross-references, supplements—and so vague in their general terms that an average intelligence, after pawing them for an hour, longs to go out and end it all.

But of course the railways do their utmost to aid in solving and interpreting complicated tariff problems? Of course they do NOT. Consider a recent and still pending case of mine. I was planning the purchase of a carload of corn and corn products from Nebraska. This is the sort of long-haul business that the Santa Pacific craves, so they tell me. But now let us see how badly they want it. This was my first corn shipment from Nebraska and the tariff—a peculiarly intricate affair—was new both to my local agent and to me. Did or did not certain specific products fall into a certain group; if so, well and good, if not the addition of 10 sacks of chick feed would increase the rate $1.60 per ton on the entire carload.

Taking A Chance

Faced with this difficulty, I wrote the district freight agent a specific inquiry as to the rate on the products involved. The universal railway terror—of being by some possibility wrong—so obsessed him that he in turn wired my agent, referring us to the identical tariff over which we had so long and vainly pawed, and giving us not a word as to the interpretation we sought. Ensuing correspondence to Nebraska induced me to chance the shipment as planned, though the delay was costly; on its arrival my local agent assessed the freight on the basis of the lower tariff—and this in spite of the fact that finally the district agent did hand out *as his opinion* that the higher rate prevailed. Yet the incident may not be closed. Subject only to the statute of limitations, a ferreting auditor may drag the item from a mildewed file and an outraged law department may come roaring after me for the difference involved.

The same excessive passion for being on the safe side—at any cost in time and annoyance to the customer—prevails in the matter of refunds for the most obvious sort of overcharges. My last claim took some 90 days in being verified, checked, cross- and re-checked, audited and approved, and then staggered to my desk more dead than alive. And this in the face of the fact that a claim of the same simplicity in normal commercial practice takes from ten minutes to five days for complete adjustment.

The same disposition to avoid the giving out of definite, and therefore possibly compromising, information holds as to traffic rules. Ask the Santa Pacific by letter whether barley can be loaded at Yorktown, milled-in-transit at Hazleton, and consigned to Malta on the through freight rate. To us that seems a simple, definite, and reasonable inquiry. We see no trace of the TNT that undoubtedly lurks there. But the great company knows better. In reply will come a civil letter quoting the general rule on milling-in-transit privileges with not a vestige of an answer to the specific inquiry.

Now these isolated instances of my particular annoyances as a railroad customer are in no sense important, except as they are typical of a very general situation. From scores of shippers I have sought their attitude toward the roads; some are fighting mad, some bitter, some sadly resigned to what they have come to regard as an inevitably bad situation. Not one is even half-way satisfied with the service rendered, or has a reasonably friendly feeling toward the companies.

Lack of Morale

That is truly a serious situation and indicative of some fault far deeper-rooted than mere high freight rates. That fault is, as I see it, an all-pervasive rank-and-file lack of morale that could scarcely be worse if deliberately planned. By and large, railroad employees will fall into two groups, the youngsters eagerly struggling to get out of the game, and the older men plodding drearily along to the day of retirement and a pension. A deliberate effort to inculcate a standard of mediocrity, a dead level of featureless, errorless performance, could have produced no worse results.

Obviously it is no trick at all to draw up a damning indictment such as this, unless with it goes something concrete in the way of diagnosis, and something potentially possible in the way of remedy.

Chief Cause of Discontent

Promotion, or the lack of it on any equitable basis, is one of the chief causes of discontent in the ranks. Now this is a subject on which an outsider can, of necessity, have no detailed or accurate knowledge, except as the promotion policy

affects the great body of employees, which is after all the vital feature. Actually the system of promotion may be a most prefect structure, worked out in the greatest minutiæ, for the elevation of the worthy and the good of the service. But despite all that as an alluring possibility, the railroaders firmly believe that the grossest favoritism prevails in all promotions and that any practice of the grim virtues—loyalty, efficiency, initiative, hard work—merely makes them ridiculous. However much or little truth there may be in this deep conviction is entirely beside the mark. Essentially it is absolutely true so far as they are concerned, and the results in cumulative disloyalty must be staggering.

Take the quaint story of a certain high official and the humble agent at a branch line resort town. This official, whose functions appear largely social and decorative, is habitually hard up in spite of his most adequate salary, and borrowed in fifty and hundred dollar units a rather sizable sum from this agent. Repayment looming awkward, this accommodating chap was rewarded by promotion as agent to one of the most important cities on the entire system. Now that tale, which is universally current and accepted up and down the line, to me seems on the face of it ridiculous and absurd from every angle. Yet that does not in the least reduce its enormous morale-wrecking possibilities over hundreds of miles of the system where every youngster who enters the sevice is regaled with it.

The Poor Agent

Then there is the system of centralization and departmentalization carried to such an extreme that the rank-and-file are removed from all personal contact with their superiors, and contact is made solely by voluminous and formal interdepartmental correspondence. An agent recently gave me a list of 13 chiefs to whom he was responsible for various sections of his work, to whom he reported, and who kept meticulous records of his errors. I am inexorably convinced that that is 12 too many. In theory, instruction, admonishment, and reproof originate by letters from these various department heads; in practice it seems invariably to come from some inexperienced clerk, who knows the rules with commendable accuracy, and who lacks any faint conception of the problems involved in rigid adherence to them in everyday routine. Examples on this score could be given in discouraging profusion, but why waste time on what seems to me the reasonably obvious proposition that such excessive centralization is stultifying to the initiative and ambition of the men who have to support it.

Recruiting for every branch of the service is the third of the major causes of cumulative morale-failure. Until the last 15 or 20 years, different phases of railway work have appealed variously but keenly to a host of youngsters out of school and college. There was real romance, variety, and opportunity in the field, so they thought, and they clamored for admittance. Now that is all in the past, and for reasons already enumerated. In appeal the service is scarcely on a par with routine federal and state employment. The potentially keen and able are seeking what they consider more attractive fields and the effect of this loss will be increasingly apparent as the older men in the service are replaced by the just risen generation.

Where is Help to Come From?

Now what, if anything, and within the limits of possibility, can the roads do about this situation? Obviously they cannot destroy the present huge unwieldy structure, however desirable that course might seem from the angle of pure theory. They will claim that along morale and personnel lines they are already doing an enormous deal, that they provide excellent hospital care for a trifling monthly assessment, that the pension system should prove a lure (it does—to the wrong type of man), that they issue an attractive monthly magazine to all employees filled with "inspirational topics" and "uplift" features. Yet all that is pitifully and even ludicrously inadequate in getting at the real trouble. This magazine is especially an example of all that it should not be. Handed down as pabulum from above, it is full of copy book maxims and urgings of contentment and a sweet optimism in whatever humble position an employee may find himself. Quite naturally, it is received resentfully and read, if at all, mockingly. If it were made a real service paper, actually for and largely by the force, open for suggestions, criticism, and controversial discussions, it would be a real asset in a few months.

The triple problem of promotion, centralization, and recruiting is so widespread and probes so deep into railway management that I doubt if there is any real hope for worth-while relief entirely from within. Rail executives have been in their narrow harnesses for so long and subjected to the "reign of rule" so assiduously that any hope of their wrecking their—to them—perfected structure from within is dim indeed.

In a recent talk with a rail chief well up on the steps of the throne, he was vehemently thankful that he now labored under federal and state commission control, that the evil days of freedom and responsibility were gone forever. This is certainly no place to discuss the merits of government control, but that a rail executive should rejoice to sit under a rule imposed from without is dismally significant. No; help is not likely to come from within alone.

A Constructive Suggestion

But is the following plan, or some modification thereof, so absurd or unworkable on the face of it, that it is unworthy of a trial?

First: Select with infinite care and a seeing eye, 10 men between 30 and 50 years of age, who are reasonably successful in their present work, who are open-minded, thoroughly practical, chosen from widely varying environments, in no sense "experts" or hobby-riders, and above all skilled in the handling of men. That does not seem an impossible task.

Second. Send these men out individually and without contact with each other, giving them no program and no instructions beyond absolute freedom in investigating with a free hand every phase of railroad operation from cellar to roof-tree.

Third: Assemble this crew at the end of six months and throw them together for a ten-day discussion and exchange of information and ideas; and then shoot them out again for another six months on the road.

Finally: Bring them together once more in a jury-room session, holding them until they submit majority and minority reports on improvements in operation, morale, and service to customers. The whole affair would be on a simple and informal basis with no solemn nonsense of testimony and hearings, and no possible grooves into which a jury might slip.

These reports should be of infinite interest and value. They should provide an impartial, intimate, and commonsense survey of the entire situation that would be of enormous value to the rail executives.

From that point on, the cure of necessity must come from within. Mr. Ford has found it possible and desirable to purchase a road *in toto*, to inflict on it all his favorite hobbies and fancies and then so to juggle its traffic and so to feed it freight that it will show a specious profit. The rail executives might easily enough, if the reward loomed large, likewise select a road to be a laboratory and field experiment station on which to practice the procedure outlined by the jury of ten. Certainly the situation is at present so desperate that heroic measures are more than necessary—they are vitally imperative.

The Truth About the Transportation Act

"It Is a Moral and Economic Crime to Assert That Railways Were Over-valued by Seven or Eight Billion Dollars"

By A. B. Cummins

United States Senator from Iowa; Chairman of the Senate Committee on Interstate Commerce

[*Editor's Note.—The Transportation Act was the target for the most false and misleading attacks by many western politicians in the recent political campaign, and it will be the object of similar attacks in Congress after it meets. Senator Cummins, who was one of the principal authors of the act, took little part in the campaign, but delivered one of the ablest addresses in defense of the law at Des Moines on October 30 that has ever been made. Most of his address is reproduced below, because the Transportation Act will be the subject of much discussion and controversy in the months immediately ahead.*]

THE REGULATION by the government of the United States of our railway transportation never has been and I sincerely hope never will be a partisan subject. It is purely an economic problem and with respect to it every man and woman has an unquestioned right to hold and express an individual opinion without regard to party declarations or party affiliations.

I am submitting my views to the people of Iowa upon the subject because I represent them in part in the Senate of the United States and was responsible in a measure for the passage of the Act, and because the regulation of our industries, including railways, will, in my judgment, be the chief matter for consideration in the next session of Congress.

Whatever indignation I may feel respecting the flagrant misrepresentations with respect to the legislation under consideration will not influence me in the least degree in this discussion. I intend to treat the subject from an economic standpoint and from that standpoint alone.

The briefest sort of outline of the physical character of our railway system on the first of January, 1918, will be helpful in understanding the difficulties with which we had to deal in preparing the legislation of 1920.

When the government, in the last days of December, 1917, assumed the control and the operation of the railways, we had substantially 265,000 miles of main-track road. It had been constructed practically without any supervision on the part of the government. It was owned by substantially 900 separate corporations. Some of it was prosperous, some of it bankrupt, some of it in high state of development, some of it poorly built, poorly equipped, and enormously overburdened with capital obligations, but practically all of it absolutely necessary for the tremendous traffic of the country, and to meet the needs of the several communities of the United States. During the first six months of the year 1918 the government returned to their respective owners something like 30,000 miles of this property, consisting mainly of what are ordinarily known as the short-lines.

Federal Control of Railways

Under the Federal Control Act of 1918, the President was authorized to contract for compensation for the use of the property so taken over and retained. The standard fixed for compensation was the average net operating income of the particular road for the three preceding fiscal years. This standard gave to some of the roads, in my judgment, a great deal more than they were entitled, and to some less than they were entitled.

The government operated these roads for twenty-six months; it more than doubled wages and increased the rates 25 per centum. Its net loss for the entire period, assuming that settlements yet to be made are made upon the same basis as those already made, *was at the rate of about* $45,000,000 *per month.* The law provided and the agreements stipulated to return the roads to their owners at the end of federal control in as good condition as they were when taken over on the 1st of January, 1918.

It may be interesting to note that in settlements already made the government has paid, for under maintenance during federal control, $125,428,809—and if future settlements are made on the same basis it will pay $97,167,663 more, making a total of $222,596,472 on this account.

In 1919 the President notified Congress that he would surrender the roads on the 1st of January, 1920, but later modified his notification extending the time to March 1, 1920. It then became the duty of Congress to enact such legislation as was necessary, first, to wind up the affairs of the United States Railroad Administration, and, second, as would enable the owners of these properties to give to the people of the country the transportation service which their business imperatively demanded.

It will be remembered that the railroads were being returned to their owners with an average monthly deficit of substantially $45,000,000 per month. And, also, that for six months before the return application had been pending before the Director General for a further increase of wages amounting in the aggregate to $800,000,000 per year. It was well known that all or a large part of this increase would be granted, and in fact when the applications came to be heard by the United States Railroad Labor Board increases in wages were granted, on the 20th of July, 1920, amounting in round numbers to $650,000,000 per year. It is well to recall at this point that when the government took over the railroads it took over all their cash balances.

Under these conditions Congress continued what is known as the standard contract for six months; and until September 1, 1920, the government has paid or will pay to the railroads which applied for it in apt time, the compensation which was paid during the twenty-six months prior to March 1, 1920. It was also agreed by everyone that the railroads would be compelled to borrow immediately immense sums of money to rehabilitate their several properties, for while the government maintained some of them in reasonably fair condition many of them had been neglected and the equipment especially required the most extensive repairs. We all knew that the credit of even the soundest companies had been seriously impaired, and that it would be impossible for the best of them to borrow money in the immediate future at less than 7 per cent.

This is an outline of the situation, and to meet it and do all that could be done to make it reasonably certain that the railroads would continue to render the service upon which the welfare of the United States absolutely depended, Congress passed the Transportation Act.

I refrain from further discussion of the infinite details of this important measure and proceed directly to the consideration of those parts of the Act which affect freight and passenger rates, only asking you to bear in mind that if rates

had not been increased the railroads as a whole would have incurred after the 1st of September, 1920, for a time at least, a monthly deficit of $100,000,000 per month, and this upon the assumption that nothing had been expended for extraordinary rehabilitation. *If additional revenues had not been provided every railroad in the United States would have been in the hands of a receiver before the 1st of January, 1921, and our system of transportation would have been practically destroyed.* It is, I think, generally admitted that many of the advocates of the government ownership and operation of these utilities, opposed the Transportation Act hoping that the continuance of existing conditions would bring about that result, and I agree that it would have done so.

It is not my intention to inquire into the desirability or wisdom of government ownership and operation. I limit my comment upon that subject to just one remark. It is this: *That if we are to have public ownership of the railroads it ought not to be effected by first physically destroying the efficiency of the facilities of transportation.* If there is to be a change in our policy in that respect it can be and ought to be accomplished through constitutional methods, and without subjecting the people to the almost infinite loss that they would suffer if deprived for any considerable period of adequate means of transportation.

The Increase in Freight Rates

I approach now the specific objections which many people and particularly many powerful agricultural organizations have made and are making against the Transportation Act. It is claimed that the Act is the direct cause of the high freight rates which were established on the 26th day of August, 1920, and which have been and are so burdensome upon industry. I recognize the hardships which the farmers have suffered, and it is not difficult for me to understand their attitude. For reasons which are not pertinent to this discussion their productions went down in 1920 to pre-war levels or below, and at the same time freight rates were increased to a higher level than ever before. This conjunction of two extraordinary events was the severest blow that ever fell upon any industry, and it is not strange that their efforts to escape the disaster commanded all their thought and energy, and it may be that their extreme trials clouded their judgment when they came to inquire into the cause of their misfortune.

In order that there shall be no obscurity about my position with respect to this matter I assert that *the high freight rates* which have oppressed all the people and the farmers particularly *are not due to the Transportation Act,* 1920, but *to other causes over which the government neither had nor has the least control.* I go further and assert that in all probability *freight rates would have been higher without the Act than under it.*

I ask now the most careful and unprejudiced attention to that part of the Transportation Act which it is claimed has had the effect of unduly, unreasonably, and unjustly increasing freight rates.

During the first two years of the operation of the Act, namely, until March 1, 1922, the Interstate Commerce Commission is directed to take as a fair return five and one-half per centum upon the aggregate value of the railroad property, and that, in its discretion, it was authorized to add one-half of one per centum to make provision in whole or in part for improvements, betterments, and equipment, which, according to the accounting system prescribed by the commission, are chargeable to capital account. This means, of course, that not more than five and one-half per centum could be raised for distribution either as interest upon bonds or dividends upon stock. It is to be observed, first, that this proviso of paragraph 3 of the section expired on the 1st of March, 1922, and is not in any manner responsible for the rates which now prevail. I do not, however, say this in apology for it. It is absolutely sound economically. *It is in no sense a guarantee.* It is simply a declaration by Congress that in its judgment a return of five and one-half per cent would meet the Constitutional requirement that private property shall not be taken for public use without just compensation.

The period immediately following the transition from government operation to private operation was chaotic, and it was believed that this rule of rate making would have the double effect of steadying the credit of the railroad systems which were in complete disorder, and at the same time bar the insistence upon the part of the railroads that in view of the high interest rates which they were compelled to pay and the reduced purchasing power of money when applied to both labor and material, for a higher rate of return. In my judgment it fulfilled both these purposes, and it enabled the railroads to render the service without which all business would have been paralyzed. I repeat that it is not a guarantee as at once must be admitted when it is remembered that *during the year* 1920 *the net operating income of all the roads was less than one-third of one per cent,* and during the year 1921 and the first two months of 1922 the net operating income of all the roads was substantially three and three-tenths per cent, and no one contends or has ever suggested that the government is under any obligation to make up the difference between the actual net earnings of the railroads and the five and one-half per cent.

With this statement for the period ending March 1, 1922, let us examine that part of the law which is permanent in its duration. The statute as now in force provides:

> "In the exercise of its power to prescribe just and reasonable rates the Commission shall initiate, modify, establish or adjust such rates so that the carriers as a whole (or as a whole in each of such rate groups or territories as the Commission may from time to time designate) will, under honest, efficient and economical management and reasonable expenditures for maintenance of way, structures and equipment earn an aggregate annual net railway operating income equal, as nearly as may be, to a fair return upon the aggregate value of the railway property of such carriers held for and used in the service of transportation: Provided, That the Commission shall have reasonable latitude to modify or adjust any particular rate which it may find to be unjust or unreasonable, and to prescribe different rates for different sections of the country."

In every respect save one the paragraph just quoted is the declaration of the Constitution as construed again and again by the Supreme Court. That court has many times announced that a rate or body of rates prescribed by a Congress, a legislature, or a commission which does not allow a fair return upon the value of the property which renders the service is confiscatory and unconstitutional. It has more than once set aside a body of rates which allowed a greater rate of return than the railroads have received since September 1, 1920.

It is quite impossible to perceive the justice of a criticism upon this part of the law for it is nothing more than an accurate repetition of the Constitution and the repeated decisions of the Supreme Court interpreting it. If the Congress had directed the Commission to do less than to adjust rates that would make a fair return, or if the Commission without direction had done less, the Act of Congress or the act of the Commission would have been in violation of plain duty and the clearest commands of the Constitution.

The only new thing or element in the paragraph last quoted is the authority given to the Commission to consider what rates will produce a fair return upon the value of the railroads as a whole or in groups instead of considering the railroads singly; and I assert without the least fear of successful contradiction that this authority tends to decrease rates rather than to increase them. More than 90 per cent of the transportation of the United States is competitive in its character, that is to say, that with respect to more than

90 per cent of the traffic the shipper has the choice between two or more railroads. It is apparent that for the welfare of the country substantially all our railroads must be sustained, and it has been the rule of the Interstate Commerce Commission for years to adjust rates upon competitive business accordingly. This necessary practice required rates that might, while giving to one competing railroad a meager return, give to another excessive profits. It must be manifest that if rates are fixed upon the basis of maintaining railroads which have a higher cost of producing transportation than some of its rivals the whole level of rates would be a great deal higher than if they are fixed upon the basis of maintaining the railroads as a whole.

It is this national or group principle that is introduced in the paragraph quoted, and it is this principle which in addition to the suggestion I have already made with regard to the rate of return, which sustains my assertion that freight rates would in all probability have been higher in its absence during the whole period since the Transportation Act was passed, than they have been.

Most people who think at all upon this subject agree that the reasoning which I have laid before you is absolutely sound, and very few people claim that the rate of return fixed in the statute for two years as a fair return, or the rate of return since the expiration of the two years fixed by the Interstate Commerce Commission (5¾ per cent) is too high; and *it would be difficult to find a man with a sane mind but who would claim that the rate of return actually received by the railroads is high enough to escape the condemnation of the Supreme Court, if the question had been submitted to that tribunal.* The critics of the law have practically abandoned that part of their contention and have fallen back upon two other provisions which I will now consider.

It is said that the cost of the maintenance and operation of the railroads since their return to the owners has been excessive, and if these expenditures had been reasonable in amount the net operating income would have been greatly increased. Upon this point the Committee on Interstate Commerce of the Senate, of which I am chairman, has taken an immense volume of testimony. A report is about to be made and I will not anticipate its findings.

If expenditures have been extravagant the fault is not to be attributed to the law. If the facts alleged were proven beyond controversy it would furnish no reason for a repeal or modification of the statute. The Transportation Act in the paragraph to which I have so often referred provides for such rates as "will, under honest, efficient and economical management and reasonable expenditures for maintenance of way, structures and equipment, earn," etc. If we cannot trust the Interstate Commerce Commission to perform diligently and faithfully its duties in this respect then our whole plan of regulation by the government is a failure.

Valuation of Railroad Property

Having a somewhat intimate knowledge of the work of the Commission I am prepared to say that it has done everything in this regard that it could have done. *Of all the many tribunals and departments of the government* charged with the protection of the people against wrong doing *there is no tribunal* or department *which labors more continuously or more intelligently than the Interstate Commerce Commission.* I take pleasure in commending it with all my heart, and while I am conscious that it has made mistakes, for no earthly tribunal is infallible, I venture to say it commands the respect and confidence of the people to a greater degree than any other governmental body administering the laws of the country. In any event, the criticism is not to be directed against the law and if there have been mistakes either of commission or omission in this respect they would have occurred in more serious form if the statute had not been enacted.

The last objection insofar as rates are concerned, involves a subject upon which there has been more misapprehension and more misrepresentation, sometimes intentional and sometimes unintentional, than upon any other, grows out of the statement, current throughout the state, that the Transportation Act validates seven or eight billions of dollars of watered capitalization, and compels the people to pay a return upon seven or eight billions of dollars in excess of the actual value of the railroad property. This charge is flagrantly and obviously untrue, but more honorable men and women have been deceived and misled by it than by any other part of the long continued campaign against the measure. The argument is, that even granting that the rate of return whether designated by Congress or designated by the Commission, when computed upon a value of $18,900,000,000, it becomes excessive, when computed upon a value of $12,000,000,000 the alleged market value of all railway stocks and bonds and that rates could be reduced even though the cost of maintenance and operation is not reduced. The charge is accepted by great multitudes of the people without reflection because they know that there have been vast amounts of railway stocks issued without any consideration. No one has insisted more vigorously than I have that this practice should come to an end, and finally in the Transportation Act it was brought to an end. Everybody knows also that beginning with the first railway construction a very considerable amount of the funded or bonded indebtedness was issued without consideration, and I am glad to say that this vicious financing cannot occur under the Transportation Act. It is, however, a moral and economic crime to assert that because these things have been true that the railroad property of the United States which renders the service of transportation, taken as a whole, was over-valued by seven or eight billions of dollars by the Interstate Commerce Commission when it fixed the value for rate making purposes at $18,900,000,000.

If I cannot make this so plain that any intelligent human being can understand it I will forever despair of establishing the simplest problem in railway economics.

Let us first examine the provisions of the Transportation Act upon this subject. They are found in paragraph 4 of section 422, which added Section 15a to the Act to Regulate Commerce. I quote it:

"(4) For the purposes of this section, such aggregate value of the property of the carriers shall be determined by the Commission from time to time and as often as may be necessary. The Commission may utilize the results of its investigation under Section 19a of this Act, insofar as deemed by it available, and shall give due consideration to all the elements of value recognized by the law of the land for rate making purposes, and shall give to the property investment account of the carriers only that consideration which under such law it is entitled to in establishing values for rate making purposes. Whenever pursuant to Section 19a of this Act the value of the railway property of any carrier held for and used in the service of transportation has been finally ascertained, the value so ascertained shall be deemed by the Commission to be the value thereof for the purpose of determining such aggregate value."

Under this paragraph and in a proceeding properly instituted, known as Ex Parte 74, the Interstate Commerce Commission found, on the 26th of August, 1920, that the railroad property of the United States was, as a whole, of the value of $18,900,000,000. This value was found mainly, if not wholly, under an act passed in 1913, and which now constitutes Section 19a of the Act to Regulate Commerce. Senator Robert M. La Follette, of Wisconsin, was the author of the measure and it was proposed and passed for the sole purpose of giving to the Interstate Commerce Commission a basis upon which to fix rates. In 1920 the Commission had been engaged for seven years in making an inventory and assigning the values of both the real and personal property

of the railroads, and had substantially completed its task. It disregarded all stocks and bonds or other indebtedness and viewed the property just as it existed; in fact, the amount of stocks and bonds which any company had issued became absolutely immaterial. The Commission looked upon the railroads as tangible physical property, no matter from what source the money creating it had been derived. It appraised the property precisely as one would appraise his farm with the buildings upon it or a town lot with its improvements. If there had been $100,000,000,000 of stocks and bonds issued by the railroad companies it would have neither added to nor taken from the value of the property itself. The Supreme Court of the United States had definitely and finally laid down the rule of law for the ascertainment of the value of railroad property. It had declared in many cases that the value of personal property including all structures and improvements is the cost of reproduction less depreciation for age and use, and that the value of the real property or land was at least the value of similar areas of adjacent lands or lots with such additions as would represent the cost of acquiring the lands or lots for railway purposes. Proceeding in this way and in strict obedience to the Constitution and the decisions of the Supreme Court the Commission decided that the property was worth $18,900,000,000. I may not agree, in fact I do not agree, that railway companies should enjoy the benefits of what is known as unearned increment, but the Supreme Court has decided that under the Constitution they are entitled to the increased value of land brought about by general growth and development, and Congress is powerless to change that decision, for the value of property and the elements which enter into that value are judicial and not legislative questions.

The Supreme Court has held that if a right-of-way is donated to a railroad company by the government or by an individual the value of that property is to be considered in determining the value of the entire property of that company. This may seem to be unjust. I think it is unjust, but the Supreme Court says that the Constitution demands it, and as a law-abiding citizen and a law-abiding Senator I accept the conclusion. Property not used for transportation purposes is of course not included in the value upon which rates are based.

At the risk of repetition I venture to state this proposition in another form, because the thing that rankles in the hearts of the people of this state is the feeling induced by the grossest misrepresentation that they are asked to pay a return to the owners of railroad capitalization upon seven or eight billion dollars of watered stock and bonds. If this were true and if there had been any lawful way in which the burden could have been lifted, I agree that the Congress which passed the Transportation Act and every member who voted for it merits nothing but the severest condemnation. The only answer to the proposition is that it is not true, and men who make the statement, if they have studied the subject, are enemies of good government, and men who accept it without inquiry fail in their plain duty as citizens of the Republic.

The railroad property of the United States comprises 265,000 miles of main track road; it consists of right-of-way, land, road bed, bridges, side and second tracks, rails, ties, ballast, station houses, warehouses, elevators, roundhouses, shops, offices, elevated tracks, crossings, and scores of other structures necessary in the construction and operation of a railroad. It also consists of substantially 2,500,000 freight cars, hundreds of thousands of passenger, mail and express cars, 70,000 locomotives, and an infinite variety of other forms of equipment. What is all this property worth? Take any particular company; the property which it uses in rendering the public service is worth just the same in the law whether it has issued fifty millions or a hundred millions of capitalization. The Supreme Court has said that it is worth for rate making purposes what it would cost to reproduce it, less depreciation for obsolescence. If, tested by this standard, the property of all the railroads is worth more than the aggregate amount of stocks and bonds, the railroads as a whole are entitled to that additional value; if the property is worth less than the stocks and bonds that have been issued by the various corporations, the excess of capitalization does not add a penny to the value of the property which renders the public service.

Government Ownership

Suppose those who advocate government ownership should finally become a majority, and the government would undertake to acquire the title to all railroad property. There are two ways in which it could be done: First, to condemn the physical property, in which event the value would be ascertained in precisely the way which the Interstate Commerce Commission has pursued. It could, however, acquire all the stocks and bonds and thus become the owner. If the latter plan were adopted every lawyer knows that these securities would be valued upon the hypothesis that the several roads were, as against any restriction by the government, earning a fair return upon the value of the property ascertained as already indicated, so that the outcome would be substantially the same in either case. The only way in which this result can be avoided is to abolish the Constitution and the Supreme Court. I grant that if we reach the time when the people are willing to adopt the policy of confiscation after having removed these hindrances to that policy, the government can take the railroads with or without compensation, but until we reach that time it is absurd to insist that we can ascertain the value of railroads either by consulting the market value of their securities or by eliminating all the stocks that were ever issued without proper consideration and all the discount upon the bonds that were ever issued for less than par. Whatever you may think, or whatever I may think, with respect to the proper method of valuing such property may be dismissed, for the question has been permanently adjudicated.

I have now given you what seems to me to be the material facts from which you must draw your conclusions upon the proposition I announced in the beginning, and very confidently I submit that no thoughtful man who desires to reach an honest conclusion can do otherwise than acknowledge that the Transportation Act which has been so furiously assailed is not the cause of the high rates, whether freight or passenger, which now prevail.

Cause of High Rates

While it is not strictly pertinent to my present discussion the subject would not be complete if I were not to express my opinion with respect to the cause or causes of these rates. They are due wholly to the increased cost of maintaining and operating the railroads. The expenditures must be deducted from the gross revenues in order to reach the return contemplated by the statute, so that the higher the cost of maintenance and operation, the higher the rates must be. For the year 1920 the total operating revenues amounted to $6,255,417,245; for the same year the total cost of maintenance and operation, including taxes and uncollectible revenue, was $6,124,573,270. These expenditures consisted of maintenance of way and structures, $1,030,503,557; maintenance of equipment, $1,593,481,899; traffic, $73,797,532; transportation, $2,901,583,273; general, $174,102,954; all other expenditures (including uncollectible revenues of about $1,000,000), $238,103,863. For the year 1921 the same items are: Total operating revenues, $5,563,232,215; total expenditures for maintenance and operation, $4,835,593,114. To these expenditures there must be added for the year 1920, expenditures for equipment and joint facility rents, $54,692,311, and for the year 1921, $67,522,377.

These figures taken from the records of the Interstate Commerce Commission tell the whole story. Upon the same volume of business the cost of maintaining and operating a railroad was a great deal more than twice the cost of maintenance and operation in 1917, and the situation was not essentially changed in 1921. To this fact, and to this fact alone, must be attributed the high freight rates of which shippers so bitterly complain, and it should be here noted that the increase in rates beginning with government operation has been about 57 per cent, while the increase in the cost of labor and railroad supplies has been 100 per cent or more.

There have been some sharp criticisms upon the legitimacy of some of the expenditures for maintenance and operation since the roads were returned to their owners. I would like to discuss these things but it is impossible to do it at this time. I repeat that objections of this sort are objections not to the law, but to the administration of the law by the Interstate Commerce Commission. That commission has full authority to examine every item of expenditure and to reduce or altogether expunge any item which has been either exaggerated or is wrongfully inserted in the accounting. I may be permitted to add, however, that if every item which has been challenged in a long and exhaustive hearing before the committee of which I am chairman should be eliminated, or modified, the total expenditure would be reduced less than one per cent. All this means, of course, that the revenues of the railroads cannot be constitutionally lessened in any substantial degree until the railroads themselves are able to reduce their expenses or the government can compel a reduction and that is the matter to which the farmers should turn their attention rather than to assaults upon the Transportation Act.

Should Government Guarantee Farmers a Fixed Price?

One further phase of the controversy deserves some consideration. It has been said that if the government passes a law which provides that railroad rates must be so adjusted that they will yield a fair return upon the value of the railroad property, that the government should likewise make some provision that would insure a market price for farmers' products that would yield to the farmers a fair return upon the value of their property. The government has undertaken to fix the price of transportation and the Constitution says that the price must be so fixed that it will yield a fair return. It would greatly rejoice the railroad corporations if the Act to Regulate Commerce, including the Transportation Act, were repealed, and they be permitted to charge whatever they please, but I assume that there are very few people not connected with the railroads who would be willing to see this done.

I will not discuss the wisdom of putting the farmers of the country in the hands of the government to the same extent as the railroads are. My judgment is that nothing could be more disastrous to the agricultural interests, and so long as the farmers are at liberty to conduct their affairs in their own way there is, of course, no lawful basis for invoking the protection of that provision of the Constitution which forbids the taking of property for public use without just compensation. I am not unmindful of the fact that there are some powerful organizations advocating a movement for the transfer to the government of all industry and all business, but it is not my purpose at this time to enter upon the many hued doctrine of state socialism.

Fifteen pages of the Act cover the establishment of the United States Railroad Labor Board for the settlement of disputes between railroad companies and their employees. I understand perfectly that the railway unions insist upon a repeal of these sections of the Act, and they do so because they fear that the Labor Board will continue to reduce their wages, and that strikes are not as likely to be successful against the judgment of the board as they would be if there were no governmental tribunal to pass upon the justice of the disputes which from time to time arise. I think most of the railroads want the labor sections repealed, for obvious reasons, but it is inconceivable to me that the great body of the people who must in the end bear the expense of every strike or disturbance in transportation will lend their influence to the desires of these two selfishly interested parties. It may be that the Labor Board can be improved; but that we must have some tribunal to settle these disputes and do what we can toward preventing the interruption or paralysis of our transportation system is, I am sure, the judgment of the great majority of the people.

Section 439 gives to the Commission for the first time supervision of the issuance of railway stocks and bonds and it will prevent for all time the harmful speculation in these securities. It also forbids any person from holding an office in two railway corporations unless the Commission finds that neither public nor private interests will be injuriously affected.

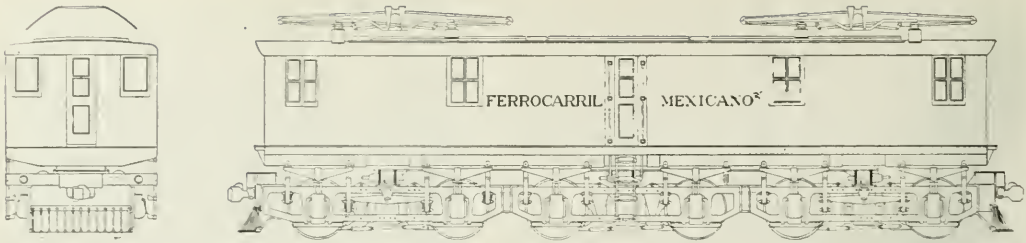
I have mentioned but a few of the sections of which the Transportation Act is composed, but I have referred to enough of them to show how blind and destructive the demand for the repeal of the Act becomes when examined in the light of reason and when tested by the common interest.

I close this discussion with the final comment that *when truth and reason resume their rightful sovereignty the people of Iowa and the country will clearly recognize that the promises now so lavishly made in denouncing the Transportation Act can be fulfilled only when the Constitution is trampled under foot, when the courts cease to perform their functions and when the United States is ready to walk in the footsteps of unfortunate, ill-fated Russia.*

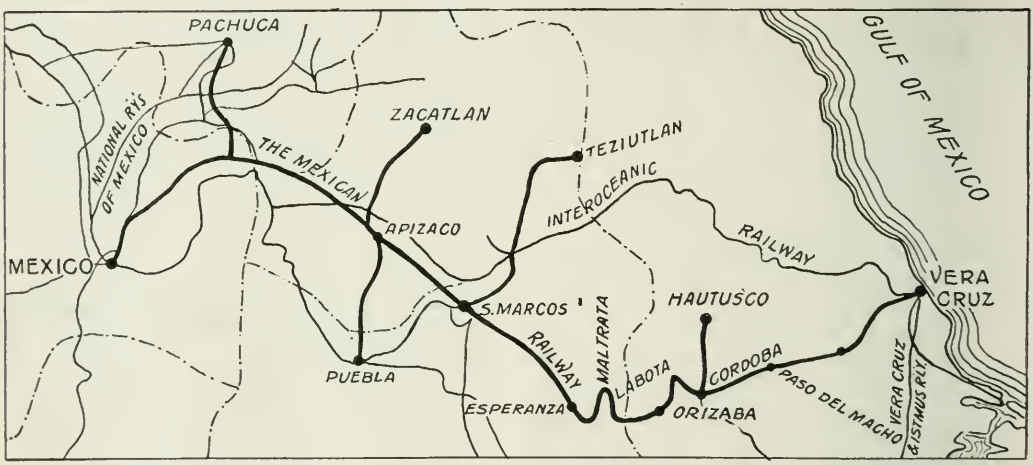
GEORGE GEER, of Bozeman, Mont., 83 years old, has just resigned his position as locomotive engineman on the Northern Pacific after serving as fireman or engineman 54 years, and after 67 years in the railroad service altogether. Mr. Geer says that his eyes are as bright and his brain as clear as they were in 1854 but he thinks it time to avail himself of his privilege of going on to the pension list. He began as a water boy on a wood train on the Buffalo & Erie; was a fireman on the Michigan Central in 1857 and was on the Union Pacific in 1868. He began his service with the Northern Pacific in 1884

Kadel & Herbert

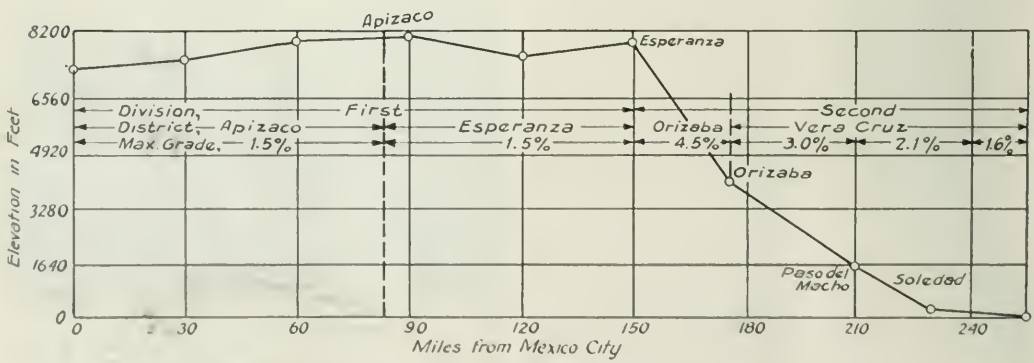
Passengers from Cork to Queenstown, Ireland, Have to Change Trains Where Rebels Have Damaged a Bridge by Dynamiting



End View and Side Elevation of 150-Ton, 3000-Volt Direct Current Type of Electric Locomotive to Be Put Into Service on the Mexican Railway



Map of the Mexican Railway. Initial Electrified Section Will Extend from Esperanza to Orizaba

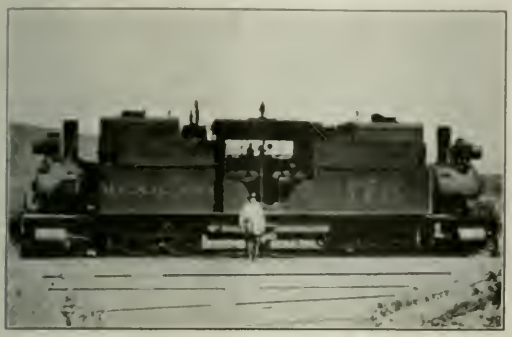


Profile, Showing Divisions and Districts

Mexican Railway to Electrify Thirty Miles of Main Line

The International General Electric Company has received an order from the Mexican Railway Company, Ltd., of Mexico City for the electrification of 30 miles of single track between Orizaba and Esperanza which is on the main line between Mexico City and Vera Cruz. The approximate cost of the electrification project will be between $2,000,000 and $2,500,000.

This is the first main line steam road electrification to be



Double-Ended, Oil-Burning Steam Locomotive Which Will Be Supplanted by Electric Motive Power

undertaken in Mexico and is on the oldest and one of the largest railways in the country. The compelling reasons for electrification were the heavy grades and increasing traffic. Indefinite postponement of the necessity for double tracking the road and a saving which will pay for the entire cost of electrification in five or six years is indicated. The system will be operated at 3,000-volt direct current, power to be supplied at this voltage by the Pueblo Tramway Light and

Passenger Train Hauled by Two Double-Ended Steam Locomotives Ascending Grade North of La Bota

Power Company, whose hydroelectric plant is five miles from Orizaba.

The International General Electric Company will supply ten 150-ton locomotives interchangeable for freight and passenger service, equipment for an automatic substation, the trolley overhead and feeder lines and fittings complete. It will also supervise the complete installation.

The electrification of this portion of the Mexican Railway is the beginning of the main line extensions which will follow as it becomes necessary to increase the capacity of the single track or the number of electric locomotives. The total route mileage of the Mexican Railway is 405 miles, rising from sea level at Vera Cruz to a maximum altitude of between 8,000 and 9,000 feet. Grades as steep as 5.25 per cent are encountered while the ruling grade on the electrified portion will be about 4.7 per cent.

R. B. A. Cautions Against Transportation Act Changes

The Railway Business Association at its annual meeting at the Hotel Commodore, New York, on November 9, adopted five resolutions which are given below. The first of these urged that no changes be made in the Transportation Act at this time. Others dealt with the stability of railway purchases, immigration and the appointment of the fact-finding commission for the coal industry; the fifth was an appreciation of the services of the late T. DeWitt Cuyler. Addresses of C. H. Markham, president of the Illinois Central and J. A. Emery, counsel of the National Association of Manufacturers, were reported in the *Railway Age* of November 11. The resolutions, verbatim, follow:

I

Prosperity is here. Let us make it last. Recovery in agriculture, industry and trade has its mainstay in railway buying. It was the replacement and addition of locomotives, cars, tracks, terminals and accessories which largely revived general business. Railway improvements must continue if the traffic is to be carried. Car shortages are upon us. October almost brought a new peak in car loadings. Shippers are confronted by congestion in freight, limit upon industry and sacrifice of farm products. The foundation of railway purchases is the confidence of railway managers and investors. For Congress to consider early amendments to the Transportation Act would open the door to assaults upon the policy which is designed to give the roads an opportunity to make sufficient earnings. To let it be clearly seen that no amendments of any kind are under serious consideration will leave all concerned free for the work of railway rehabilitation and preparation for the coming burden of traffic. We urge that Congress refrain at this time from all amendments to the Transportation Act.

II

We again emphasize the need of giving railway purchases greater stability. Railway improvements even if sufficient in the aggregate over a period of years would yield their fullest public benefit only if so planned as to relieve instead of aggravate general depressions. Greater stability would give steadier employment to industrial labor and a more constant domestic market to farm and mill products. It would promote adequacy in the replacement and production of facilities and economy also by resort to the credit market when rates are low and to the markets for labor and material when both are plentiful. Essential for a policy of planning ahead and adhering to plan is a clearer public and political understanding of the practical financial problem with which the railway managers and directors have to deal. We note with satisfaction an increasing interest in the subject and systematic study of it by agencies both governmental and volunteer.

III

We favor amendment of the immigration law to provide admission limited by quality of applicants instead of by their number. The present law was enacted at a time of serious domestic unemployment. That occasion has passed. Railroad improvements otherwise feasible and urgently needed are delayed by scarcity of unskilled labor and the execution by us of railway orders for material and appliances is impeded by the same cause, which pervades all industry. Sufficiency of common labor is essential to enlarging employment of skilled operatives and fundamental to general prosperity.

IV

We commend the President for appointing to the Coal Investigation Commission no miner or operator. In a body established by the public to inquire into problems of public service and to

appraise the practices of those engaged in such service the public interest is paramount and advocates speaking for these under inquiry should have no seats. The whole personnel should represent the public as such.

V

A heavy loss is suffered by the whole country in the untimely death of Thomas De Witt Cuyler. Discharging with great ability through an active life in large affairs the many professional, fiduciary and civic responsibilities of a strong citizen, he led the railway executives and performed a unique work in the critical period of remedial railway legislation and of development in administration of the new policy. Success in these vital and difficult processes required that the national railway system should have a representative voice; and in Mr. Cuyler was found a sagacious counsellor and a persuasive public spokesman. In gifts, in devotion to great duties and in character he filled a place among Americans who have served the republic well.

The membership of the association as of October 31 was reported to be 545, as compared with 241 on the same date in 1917—an increase of 79 per cent over the pre-war membership.

Government Report On Sulphur Springs Collision

The Interstate Commerce Commission has issued a report dated October 10 and signed by W. P. Borland, chief of the Bureau of Safety, on a rear collision of passenger trains on the Missouri Pacific at Sulphur Springs, Mo., on August 5 when 34 persons were killed and 186 injured.

This collision was reported in the *Railway Age* of August 12 and 19; and the present document gives few additional details except a considerable number of quotations from the rules.

The conclusions at the end of the report include the following paragraphs:

This accident was caused by the failure of Engineman Glenn, of train No. 4, properly to observe and be governed by automatic block-signal indications; and by the failure of the crew of train No. 32 to protect the rear of their train against following trains, as required by rule, for which Flagman Boston, Conductor Long, and Engineman Gross are responsible.

The evidence points to the conclusion that Engineman Glenn was not complying with the rules relative to the observance of the caution indication of distant signals, but was relying entirely upon that of the home signals. The fact that his train was a fast train and naturally was given a clear track, and held a train order that train No. 1, another fast train, would wait at Wickes until 7:40 p. m. for him very likely had a tendency to lead him to the conclusion that the road would be clear.

In this instance had these rules [flagging rules] been complied with at Sulphur Springs alone it is doubtful, on account of the close proximity of the two trains, if the flagman would have had time to get back a sufficient distance to afford any substantial protection. However, had these rules been generally observed at all stations, including Riverside, which would have required the leaving of torpedoes, . . . it is quite likely that Engineman Glenn's attention would have been called to the fact that he was following another train closely, and he would have been more attentive to the signal indications. . . .

Flagman Boston's most important duty was to protect the rear of his train, yet according to his own statement he made no attempt to do so. . . . Conductor Long was in charge of the train and it was his duty to know that Flagman Boston was obeying the rules, yet it is clearly apparent that he knew Flagman Boston was not doing so with respect to flagging and that it was not customary for him to do so. For this negligence Conductor Long shares in an equal degree the responsibility. . . .

This accident still adds to the already appalling list of similar occurrences and but further emphasizes the necessity for the adoption of means which will automatically compel obedience to signal indications by taking the control of the train away from the engineman when for any reason obedience to block signals on his part is lacking. An adequate installation of such a device in this instance would have prevented this accident.

It appears that it is the practice for operators to copy only such portions of a train order as directly affect the trains for which they are being copied. This is a dangerous practice and contrary to the rules of the railroad company.

While the direct cause of this accident was the failure of the engineman, the underlying cause was lax enforcement of the operating rules, for which the supervising officials of the Missouri Pacific must bear the responsibility.

A rule which requires a train receiving a permissive signal indication to proceed with caution prepared to stop short of train or obstruction clearly requires some positive action on the part of an engineman when approaching or passing such signal and the failure to comply with such a rule is a matter which could easily have been checked up by supervising officials. The lax practice in flagging disclosed by this investigation is also a matter which could scarcely have escaped the attention of the officials. According to the statement of Flagman Boston, when officials were riding with them they made only a pretense of flagging. The Missouri Pacific Railway Co. should promptly take steps to secure proper obedience to its rules and regulations to prevent the recurrence of accidents of this character.

Engineman Glenn had been employed as an engineman since 1890; in December, 1908, he was discharged for responsibility in connection with an accident, being reinstated in March, 1910, since which time his record was very good.

The Southern Pacific has reduced the freight claim payments on its lines since January 1, 1922, sixty per cent.

The "Railroad Building and Loan Association" has been formed by railroad men and others at Dallas, Texas, with L. P. Talley, a banker, as president of the association. Among the railroad men on the board of directors are M. L. Buckner, W. G. Crush, John F. Lehane, H. J. Sewell, E. E. Taylor and W. M. Whitenton.

Underwood & Underwood

The Greek Exodus from Thrace—Scene at Railway Station at Adrianople

Authority for Reduced Rates to Pacific Coast Denied

I. C. C. Interprets Amendments to Transportation Act— Must Foster Water Transportation

WASHINGTON, D. C.

A NEW CHAPTER in the history of transcontinental freight rates has been written by the Interstate Commerce Commission in its decision made public on November 11, denying most of the fourth section applications filed by the transcontinental lines in August, 1921, proposing to establish from and to the Pacific Coast terminals lower rates than are in effect to and from intermediate points on traffic having origin or destination in the defined territories lying, roughly speaking, east of the Rocky Mountains, to meet the low rates by steamship lines between the Atlantic and Gulf ports and Pacific ports. In this decision the commission interprets and gives force to the amendment to the fourth section made by the transportation act and particularly to Section 500 of that act, which declares the policy of Congress to "foster and preserve in full vigor both rail and water transportation." The commission thinks that the amendment prohibiting it from granting fourth section relief where the charge to and from the more distant point is not "reasonably compensatory" for the service performed was Congress's way of saving that it should follow a less liberal policy in dealing with departures from the long and short haul rule than had been followed in former years and it finds that the carriers have failed to make the necessary affirmative showing that losses of revenue would not result from the reductions they had proposed in Pacific terminal rates. The decision is also based in part on the theory that the region west of Pittsburgh would be accorded a preferential rate structure by the proposal of the railroads to blanket the rates from Pittsburgh to the Pacific from all points of origin from the Atlantic to the Missouri river or even westward while keeping in effect rates from eastern origins in the same territory to intermountain destinations graded roughly according to the respective length of the hauls.

Southern Pacific Reductions Allowed

While denying the general westbound application of the transcontinental carriers for reduced rates on various commodities to the Pacific Coast terminals, however, the commission allowed the proposed reductions on crude sulphur from Texas and Louisiana mines to Pacific Coast terminals on the ground that they are reasonably compensatory to the roads. It also approved the application of the Southern Pacific to establish reduced rates from California terminals to New York City by its rail and water line through Galveston on asphalt, beans, canned goods, dried fruit and rice, but with modification increasing the proposed rates by 5 cents per 100 pounds. The other applications denied were for authority to establish reduced rates on sisal and ixtle from El Paso and Gulf ports to Pacific terminals and green coffee from New York, New Orleans and Galveston to Pacific terminals. Commissioner Aitchison dissented in part from the decision of the majority and six other commissioners signed separate concurring opinions objecting to certain findings of the majority.

Departures from Long and Short Haul Rule Ended in 1918

On March 15, 1918, all departures from the long and short haul rule in westbound transcontinental rates were removed under the decisions of the commission finding that, due to the withdrawal of ships for use in the trans-Atlantic service, water competition between the Atlantic and Pacific ports was no longer a compelling force. The commission found that the maintenance of lower rates to the coast than to intermediate points unduly preferred the coast, and expressed the view that commodity rates in certain instances at least might be graded, but generally speaking, the railroads increased the rates to the terminals to the extent necessary to put them on a parity with the intermediate points, resulting in a blanket extending several hundred miles inland from the Pacific Coast. At the hearings on the applications filed in 1921 the carriers showed that the traffic destined to the Pacific Coast had been moving by water in heavy volume and that competition was keener and the water service more efficient than at any time before the war and that considerably more than half the traffic in most of the commodities involved was shipped by water. All but a small portion of the water-borne traffic originated in and west of Buffalo-Pittsburgh territory, indicating that the Pacific Coast interests were making their purchases in that part of the east which is tributary to the water lines and from which they can secure low rates. The commission says that the movement by water may be relatively greater now than it was during the period of the hearings. The rail lines contended that the proposed rates were no lower than necessary to yield them a fair share of the business. It was the declared purpose of the carriers to be conservative and not to meet water competition where it is a matter of serious concern and then only within reasonable limitations.

None of the proposed rates meet even approximately the coast to coast rates of the water lines. They approximated at the time of the hearings the charges available from certain interior points to the Pacific Coast terminals by rail to the Atlantic and Gulf ports and thence by water, plus such incidental charges as marine insurance and unloading and transfer charges at the Pacific Coast terminals. While on traffic to the Pacific Coast it was proposed to keep the Middle West on a parity with seaboard territory, the latter would be required to pay more than the Middle West on traffic to intermountain territory. Before discussing the rates themselves, the commission discussed the effect of the fourth section as amended, finding that the situation presented to it in former transcontinental cases has been changed by the new language in the law. Its discussion on this point is in part as follows:

The Fourth Section as Amended

Where water competition is involved, the applicants contend that they demonstrate the propriety of relief from the long-and-short-haul rule when they show that the competition by water is actual and compelling; that the rates proposed to meet the water competition, while less than they might otherwise be, are necessary if applicants are to secure an equitable share of the traffic; that the proposed rates yield some margin over the extra expense involved in taking on the additional traffic moving thereunder; and that the rates maintained to intermediate points are not unreasonable in themselves. Each of these positions, they contend, is demonstrated on the present record, taken in connection with our finding in *Intermediate Rate Asso.* v. *Director General, supra*, that the rates to intermediate points are not unreasonable or unduly prejudicial. They further contend that the present wording of the fourth section, prohibiting us from granting relief where the charge to or from the more distant point is not reasonably compensatory for the service performed, does not in anywise invalidate the sufficiency of the showing which they here make. In short, they contend that if the proposed terminal rates are all they can get, and yield something in the way of net revenue, they are perforce reasonably compensatory.

For the intermountain interests it is argued that a rate to be reasonably compensatory to the more distant terminal point must bear its full share of operating expenses, interest on funded debt, equipment and joint facility rents, taxes, and the percentage return fixed by us pursuant to section 15a of the interstate commerce act.

We are unable to accept this interpretation of the phrase "reason-

ably compensatory." So interpreted, the long-and-short-haul rule of the fourth section must become absolute or rigid from the very nature of the case. There may be difficulty in discovering to a nicety the exact legislative intent in the amended fourth section. But the rejection of an absolute long-and-short-haul clause by both Houses of Congress is inconsistent with any construction of the phrase in question which would be equivalent in effect to an absolute clause.

A similar but less extreme interpretation of the words "reasonably compensatory" is urged on behalf of various state commissions in the intermountain territory. It is pointed out that there is a margin between a rate which barely escapes being confiscatory and the highest rate which a regulating body may lawfully allow. To the intermediate point a rate might approach the latter limit while a rate to a more distant point might conceivably be less and yet not so low as to be confiscatory. Seemingly, the rate to the more distant point may contribute something less than a full proportionate share of return upon investment and thus theoretically be less than a greater rate to an intermediate point.

We are unable to accept this interpretation of the words "reasonably compensatory" as used in the amended fourth section.

Where a rate imposed by a regulatory body is under judicial review upon the allegation that the rate fixed is confiscatory, it has been held by the courts that a rate may not lawfully be fixed by such tribunal which is based alone on the out-of-pocket costs ascribable to that particular traffic, but that to be lawful the rate must be sufficient to cover a ratable proportion of the average cost of freight traffic generally, including a return on the property devoted to public service. To hold otherwise would compel the performance of a certain specified kind of service by the carrier at less than average cost. The extension of this principle to other classes of traffic, if pursued far enough, would bankrupt the road.

Where, however, carriers voluntarily propose to reduce certain rates to an out-of-pocket *plus* basis in order to augment the total traffic carried, a wholly different situation is presented. The menace of confiscation is absent, for *volenti non fit injuria;* and the additional traffic, if secured with a resulting augmentation of net revenue instead of laying a burden upon other traffic, affords the possibility of lightening the burden thereon by bringing a greater tonnage under contribution to net revenue.

The criteria of a reasonably compensatory rate in a confiscation case are therefore essentially distinct from the criteria of a reasonably compensatory rate where carriers volunteer a reduction on certain rates to an out-of-pocket *plus* basis. In the first set of cases the carrier has presumably been charged with seeking to extract from the public which is served more than the services are reasonably worth; in the second set of cases the carrier is accused by protestants, not primarily of seeking to extort more than the service is reasonably worth to those who receive the service but of working undue discrimination as between those who can and those who can not avail themselves of the lower rates voluntarily proposed.

The criterion of a reasonably compensatory rate suggested by the carriers has been indicated above. It is summarized in the formula "out-of-pocket-expenses-plus-some-profit."

Just as we have rejected the two interpretations of "reasonably compensatory," suggested by the protestants as too narrow, so we are disposed to reject the single criterion suggested by the carriers in the above formula as insufficient, standing alone. It is probably true that this formula was deemed by us as adequate in disposing of fourth-section applications prior to the amendments of the fourth section in the transportation act, 1920. We do not agree with the carriers that the fourth section has not been changed in substance. The amendment has made mandatory what theretofore rested in our sound discretion as to compensation for the service performed to the more distant point, as to circuity, and as to potential water competition. Moreover, in section 500 of the transportation act, 1920, is expressly declared the policy of Congress to foster and preserve in full vigor both rail and water transportation. We think the amendment was the Congress's way of saying that we should follow a less liberal policy in dealing with departures from the long-and-short-haul rule than had been followed in former years. Our administrative power at this time is in some respects narrower than before the amendment. The fourth section, as amended, requires the observance by us of certain administrative rules which we were enforcing prior to the amendment, but which in some measure lay within our sound discretion to modify or change. We are also required now to accord due observance to section 500 of the transportation act, 1920.

Moreover, the requirements of section 15a may not be defeated or jeopardized by the action of particular rail carriers seeking to augment their own net earnings, irrespective of the effect of rate changes adverse to the carriers of the country generally, or of a large territorial group. It clearly would defeat the intent of Congress to foster transportation by rail and water in full vigor if the rail carriers were permitted, at practically little or no profit to themselves, to operate so as to deprive water carriers of traffic which the water carriers would naturally handle. Moreover, it must be borne in mind that where the out-of-pocket theory is used as a rate basis, there is inevitably thrown upon the rest of the traffic the task of providing the bulk of the net return contemplated in section 15a. Too wide an extension of the out-of-pocket theory would transpose the entire burden of producing dividends and interest and meeting other fixed charges upon only a part of the traffic carried.

In the light of these similar considerations, we are of opinion and find that in the administration of the fourth section the words "reasonably compensatory" imply that a rate properly so described must (1) cover and more than cover the extra or additional expenses incurred in handling the traffic to which it applies; (2) be no lower than necessary to meet existing competition; (3) not be so low as to threaten the extinction of legitimate competition by water carriers; and (4) not impose an undue burden on other traffic or jeopardize the appropriate return on the value of carrier property generally, as contemplated in section 15a of the act. It may be added that rates of this character ought, wherever possible, to bear some relation to the value of the commodity carried and the value of the service rendered in connection therewith. We also find that where carriers apply for relief from the long-and-short-haul clause, of the fourth section and propose the application of rates which they designate as "reasonably compensatory," they should affirmatively show that the rates proposed conform to the criteria indicated above. It goes without saying that carriers should not propose rates or rate structures for approval in a fourth-section application which create infractions of other provisions of the interstate commerce act, and particularly of section 3.

Effect on Revenues

Extensive statistical data were offered by the carriers to prove that the proposed rates to the terminals would be sufficient to pay something over and above the out of pocket costs. After outlining these cost studies, the commission says that so far as revenue is concerned it is satisfied that taking the additional business by itself, the proposed rates generally and easily cover the extra out of pocket expenses involved in handling the additional traffic which the railroads expect to be able to obtain by reducing the rates and in certain instances, it says, that the rates would contribute to the net return on carrier property. Were the rate level alone to be considered, it says, it would be difficult to condemn the proposed terminal rates in the general westbound application. Moreover, the going water rates shown were such as not seriously to invalidate the proposed terminal rates as lower than presumably necessary to meet water competition. However, the commission says, such profit as would accrue from the proposed rates apparently would be largely offset by what would be lost thereby on the traffic that would move by rail even without the reduction. Although a large volume of the traffic in question is moving by water, the movement by rail is still very heavy and it is safe to say that there will always be a substantial movement in most of these commodities by rail because, other things being equal, the shippers prefer rail to water. The rail lines by hauling the business overland would deprive themselves of revenue they are now receiving for the haul from points of production to the ports based largely on local rates presumed to be reasonable and fully compensatory. They believe, however, that the proposed rates would yield greater net returns per 100 pounds than the local rates to the ports, although the rates to the ports would probably yield a greater percentage of profit.

Taking, for example, the iron and steel traffic from the Pittsburgh district, by far the most important traffic involved, the commission says that probably somewhere near half is moving by rail. Assuming the movement of 1,000,000 tons per annum, it is stated that by reducing the rate from $1.66½ to $1 there would be a direct loss on the 500,000 tons now being carried by rail of $6,650,000. If the effect of the reduction would be to take away from the boats one-half of the tonnage they now have it would mean a gross gain to the carriers of $5,000,000, which allows nothing for the expense of handling the additional business. If the cost of service were half of the former rate, or 83 cents, the commission says, the cost of handling the added business would

be $4,150,000, or a net gain from the added traffic of only $850,000 to apply against the loss of traffic now being handled of $6,650,000, or a net loss of $5,800,000. Other similar calculations are given and the commission says it is not prepared to say that it could base upon these estimates of collateral losses of net revenue the necessary denial of the applications, but it is of the opinion that before it grants the affirmative relief asked it is entitled to be shown by the carriers the probable extent of such collateral losses of net revenue, if any, and the way in which such losses would be divided as between various carriers and territorial groups. It is pointed out that the lines east of Pittsburgh, although formal parties to the application, stated at the hearing that they were not to be understood as either actively supporting or opposing it and the commission says it seems clear that the lines east of Chicago have little, if any, reason to expect increased gross or net revenue from the proposed rates. The probabilities are that they would suffer substantial losses. For example, it is stated that the eastern lines propose to haul iron and steel about 468 miles from Pittsburgh to Chicago for a division of 15 per cent of the through rate or a proportion of 15 cents instead of from Pittsburgh to Baltimore, about 311 miles, at the local rate, which is of 35 cents.

"If the carriers are of opinion," the commission says, "that no collateral loss in net revenue would result, the obligation to make such showing is upon the carriers. Should they concede the probability of a net loss in revenue to the carriers as a whole, we should have to consider whether such a shrinkage would adversely affect the return at which we are required to aim under section 15a; and if, reasonably assured on this point, we are prepared to allow the carriers to assume voluntarily a shrinkage in their net revenue, the question might arise whether it is lawful to focus the whole gain resulting to the shipping public upon those shippers mainly located in a particular section or sections, or whether the relief might not more appropriately be applied throughout a wider extent of territory and among a greater number of shippers. We find that the carriers have failed to make the necessary affirmative showing as to the collateral losses of revenue which would result from the proposed terminal rates."

The proposed rates on sulphur, the commission says, are reasonably compensatory and as to the Southern Pacific application it finds that the collateral loss of rail revenue involved is negligible. It finds that the rates proposed will be reasonably compensatory except that "out of abundance of caution" it is of opinion that the proposed terminal rates should be increased by 5 cents per 100 pounds. This would produce a rate on barley in excess of the present rate so that item is omitted from the authority granted.

Separate Opinions

Commissioner Meyer, in a concurring opinion in which Commissioners Esch and Lewis joined, agreed with the finding that the carriers have not justified the relief sought, but did not agree with the findings that a violation of section 3 results from the carriers' proposals with respect to rates from Chicago and points in Chicago territory to the Pacific Coast. He said in part:

Practically all articles upon which the rates apply are produced both on the Atlantic seaboard and in Chicago territory. Under normal conditions producers at Chicago have an advantage in being located nearer the Pacific Coast and have correspondingly lower rates. With the establishment of rates via water routes from the eastern seaboard which are lower than the rail rates from either the seaboard or Chicago, the Pacific Coast supplies its requirements very largely from the East with articles which were formerly shipped from Chicago. If the western rail carriers are to participate at all in the transportation of these commodities, it is necessary for them to make rates which will attract traffic to their lines from the seaboard or from Chicago. If the traffic originates on the seaboard they must divide their revenues with the eastern carriers, but if the traffic moves t
transportation charge. If the
the rate from the seaboard, t
board, and the revenue of the w
be depleted. It is therefore the co
ing Chicago with the water carr
which compels the western carr
Chicago if they are to continue to

One of the reasons advanced in
from Chicago is that it is not pro
to the intermediate territory the
cago; and that the coast points we
markets at equal rates which the
have. Water competition does no
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rates to these points therefore may
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port traffic to the intermountain terri
serving the same or other markets o
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supply. To require the blanketing of ra
eastern seaboard to this territory would
ern carriers to participate in equal rates
divide their revenue with the eastern carr
them of a portion of the revenues which th
retain. The intermountain territory now has ne
gets at equal rates, and would not be at all benefi
Chicago from reaching the coast cities while these
have the advantage of the lower rates from the east

The handling of all-rail traffic from Chicago rather
the seaboard would preserve the revenues of the weste
and be of benefit to the public at large served by them, inc.
intermediate points of destination, in that any addition to t.
nues of these carriers may ultimately enable them to corres
ingly reduce rates to intermediate points. It is my judgment
even if because of the impairment of their revenues the carri
should not reduce their all-rail rates from the eastern seaboard, the
western carriers might well be justified in meeting the competition
of the water routes from the East by reducing the rates from
producing points on their lines in Chicago territory in order that
they may not be deprived of the opportunity of hauling traffic to
supply the requirements of the Pacific Coast points.

Commissioner Aitchison, dissenting in part, said:

The record in the westbound application shows that the applicants have met all the affirmative tests stated in the report as criteria; but the application is denied because they have not gone further and disproved a net loss because of collateral changes in traffic which suppositiously may affect injuriously the earnings of some—not all—of the participating carriers. I am not able to conclude that having shown the necessity for relief and having satisfied all other tests as to the reasonably compensatory character of the rates proposed by them, they should be sent hence and denied access to certain important traffic found to be remunerative, merely because they have not in their presentation entered the realm of speculation and proved a negative by conjectural evidence. Therefore I dissent from the denial of that application.

The addition of 5 cents to the terminal charge made by the majority in the eastbound application finds no warrant in the record, and should not be imposed.

Commissioner Potter concurred in this expression.

Commissioner Hall concurred in the conclusions reached except that he objected to the arbitrary addition of 5 cents to the rates proposed by the Southern Pacific as finding no support in the record. As to the general westbound application, he said: It may be that rates and movements from certain groups on certain commodities, iron and steel, for example, could have been so segregated in the presentation that fourth section relief could be granted on some even if denied on others.

Commissioner Campbell concurred in the conclusions of the majority in denying certain of the applications, but objected to the granting of the Southern Pacific and the sulphur applications, on the ground that if the more distant rates are reasonably compensatory, they become fully compensatory and reasonable at many intermediate points. He expressed the opinion that the construction placed on the amendment does not recognize the full intent of Congress and that "reasonably compensatory" as used in the amendment means a rate equal in amount to a non-confiscatory rate.

ɔating
ıen and Firemen*

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ıgineer was worth working for
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.t of valuable information as to the
maintenance of a locomotive.

ıe Employing Officer

pply should be developed in the territory
g men leaving school or university and seeking
ıor the first time, should be informed by circular
ıted matter where to apply to railroad offices and
pply to for the particular job for which men are
This should be done by mailing this information to
. agents to be posted on bulletin boards at stations.
ess men live at railroad division points, they know little
nothing about the opportunities in railroad service. Systematic development of the labor material available will do much in remedying labor conditions on railroads at the time of year when men are needed.

The employing officer should have regular days in his office to confer with applicants for positions, and this information should be given on the circulars. This officer should be a responsible person and carefully selected. The first impression made on an applicant is usually a lasting impression. Does he ask the applicant to sit down and treat him as he would like to be treated by taking interest enough in him to ask where he lives and when he arrived, what vocation he followed, if any, and where he could be found when needed, and, in the meantime, judge his mental and physical fitness for the job before giving him the application to fill out? It will be claimed that no one has time to converse with all the men who apply for jobs. Might it not be cheaper in the end to have some capable person or organization responsible for handling all applicants with the chance of getting the right man at a time of need, instead of finally having to take whoever comes? A kind word of encouragement to the promising man, a word of advice to improve himself by study, a recommendation where to obtain literature by recognized authorities on the subject of firing, and a record or symbol written on the face of his application is all that is needed in the way of a preliminary interview and record.

Progressive Examinations

We believe railroads should establish a system of progressive examinations when a man is employed first as a fireman. He will be given the questions on which he will be examined at the end of the first year; having answered these questions satisfactorily, he will then be given questions for the following year. Having passed this examination, he will be given a third and final set of questions, on which he will be examined before being promoted to engineman. It is not expected that a man will answer these questions without assistance, and in order that he may understand them properly, there should be established a school of instruction in the use of the air brake and all other locomotive appurtenances. He should also be invited, and urged, to ask the master mechanic, traveling engineer or air brake instructor or any other official for such information as may be required on any points in connection with his work.

If a man passes 80 per cent or more in all examinations he should be given a certificate. If a man fails to pass the first or second examination, he should be dropped from the service. At the third examination, if a man should fail to pass 80 per cent of the questions asked, two more trials not less than two months apart will be given him to pass the same examination. If he then fails to pass by a percentage of 80 he shall be dropped from the service.

Firemen passing the third and final series of questions will be promoted in order of their seniority as firemen, except that those who pass on the first trial shall rank when promoted above those who pass on the second or third trial and those passing on the second trial shall rank above those who pass on the third trial.

Enginemen employed shall be required to pass the third series of questions before entering the service.

The report is signed by J. B. Hurley (Wabash), chairman; W. H. Corbett (Mich. Cent.); J. C. Simino (Sou. Pac.); Andrew Wheeler (C. & N. W.), and C. W. Stark (N. Y. C.).

Discussion

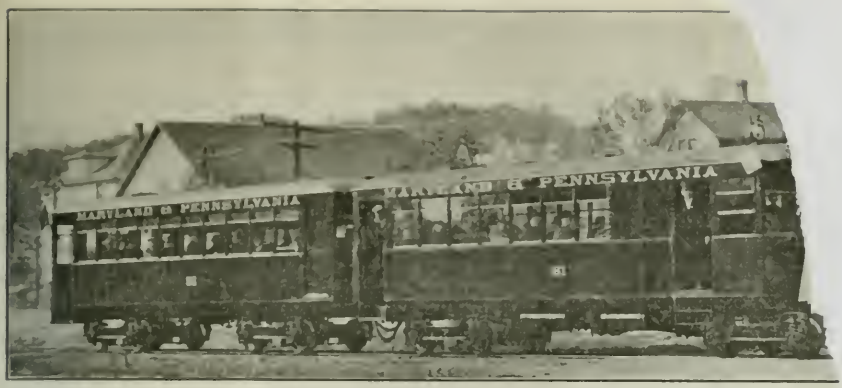
It was evident from the discussion that most of the railroads are following the practice outlined in the paper for examining and promoting firemen. The methods of giving the examination, however, vary considerably. In some cases the new fireman, on entering the service, is given the questions for the first year's examination, which he must answer and turn in by the end of the year. He then receives the questions for the second and third year's examination after having answered the preceding questions. On other railroads the men are not given the examination questions, but are called into the division headquarters to prepare a written examination on questions which they are not permitted to take away with them. The written examination is generally accompanied by an oral examination.

There is considerable variation as to who hires the firemen. In some cases where conditions require the taking on of a large number of men, the men are hired by almost anyone available. The opinion most generally expressed during the discussion, however, was that the traveling engineer should select the new men. It is evident that the problem of securing satisfactory recruits is a difficult one, as compared with conditions in the days when young men were promoted from roundhouse laborers via the ashpit to positions as firemen. One of the difficulties is the inability of many applicants to finance themselves during the period of their trial trips. The opinion was expressed by a number of the members that the railroads should allow student firemen at least the amount of their expenses on the road. This has been solved to some extent on the Baltimore & Ohio by providing the students with meal tickets at certain specified boarding houses.

B. J. Feeney (Illinois Central) follows the practice of passing the word around among the enginemen, firemen and shopmen when new firemen are to be hired. He asks that these employees send men to him with letters of recommendation. This has worked well in securing new employees who come to their jobs with a sense of responsibility and live up to it.

* Abstract of a paper presented before the Traveling Engineers' Association, Chicago, Sept. 1, 1922.

The Missouri Pacific in 1921 paid out $204,972 in livestock claims, or an average of $28.40 per mile of road; and is asking the aid of cattle owners, the press and the public in a campaign to reduce the number of animals killed by trains.



Motor and Trailer Car Driven by 120 h.p. Gasoline Motor

Motor Driven Rail Car with High Power

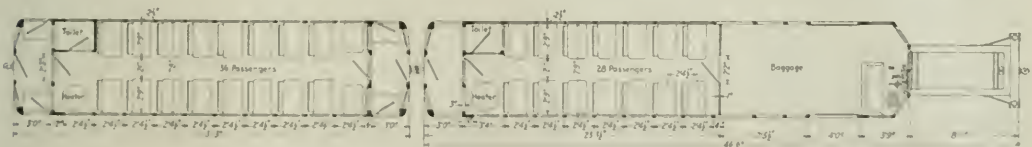
New Equipment for Maryland & Pennsylvania Has 120 Hp. Engine and Seats 76 Passengers

THE MARYLAND & PENNSYLVANIA has recently received a passenger train, consisting of a gasoline motor coach and trailer, with a total seating capacity for 76 passengers, from the Russell Company, Kenosha, Wis. The motor coach is 37 ft. 6 in. in length over the end sills, with a 4-ft. 10-in. baggage compartment and a seating capacity of 28 in the passenger compartment. The trailer coach is 31 ft. 3 in. in length with seats for 40 passengers. Drop seats in the baggage compartment accommodate eight additional passengers. The motor coach is fitted with a 120-hp. motor and weighs 28,000 lb. The trailer weighs 19,000 lb., making a total for the train of 47,000 lb., or 691.2 lb. per seat, excluding the drop seats in the baggage compartment.

The cars are driven by a 5¾-in. by 7-in. six-cylinder Wisconsin gasoline motor, which weighs 1,275 lb. and develops approximately 120 hp. at 1,200 r. p. m. This motor, handling the motor car and trailer, averages 3.8 miles per gallon of gasoline. It is mounted on the underframe in front of the forward truck center and is equipped with an Eismann dual magneto ignition system, Stromberg carburetor and Leece-Neville generator and starting units. A separate 32-volt generator, with a 16-cell storage battery of 70 hours' capacity, furnishes power for the headlight and train lighting. Fuel is carried in two supply tanks with a total capacity of 52 gallons and is fed to the carburetor by the vacuum system, supplemented by air pressure on the supply tanks.

The underframe consists of two 9-in. 25-lb. steel channels spaced 33 in. apart over the outside faces. The drive shaft is carried back through universal joints to the clutch and transmission, which are located under the middle of the underframe. Power for the air compressor and elec light generator are taken off this shaft, in the former cas through a silent chain drive and in the latter through a belt. The transmission provides three speeds forward with a reduction of nearly five to one in low. The reverse gear is specially designed for railway service.

The driven shaft from the transmission passes into a drop gear case just back of the transmission, from this shaft the power is carried down to the drop shaft by a silent chain drive. The shafts inside the case carry two sets of gears. Those on the driving shaft are permanently keyed to the shaft while those on the drop shaft are connected to the shaft by a three position clutch. These gears provide speed ratios of 1.1 to 1 and .76 to 1 for each transmission speed, the



Maximum Size Floor Plan of the Russell Motor and Trailer Cars

purpose being to permit the motor to be operated at a speed lower than that provided by the normal ratio, when the car is traveling at high speed under conditions which do not require heavy duty from the motor.

The drop shaft extends through the case in both directions and from it flexible drive shafts are carried forward and backward to a gear case on the inside axle of each truck. This gear case contains a bevel pinion, supported on ball bearings, which meshes with a bevel gear attached to the axle. The gear case is carried on the axle itself, but attached to it is a torsion arm which is spring supported on a bracket attached to the truck crossframe.

The trucks have a wheelbase of 4 ft. 8 in. They are built up of cast steel pedestal frames of 9-in. I section, connected by structural steel cross members of channel section, and weigh 3,750 lb. each. The side and cross members are joined by top and bottom gusset plates which are riveted to the chan-

...es on the top and bottom ... cast steel wheels 24 in. in ... solid steel axles. The outer and are fitted with ¼-in. ...bearings. The bearings are ... a maximum weight of 40,000 ... mounted in removable cages ... journal box on which the truck ... single coil springs. The truck ... semi-elliptic spring the ends ...wing links from the truck cross ... spring a short channel for the ... side bearings is attached by two ... the spring band.

...ggage compartment and the loca... in the trailer car, the floor plans ...ylvania coaches are similar to those ... which are the arrangements of the ...odies. The bodies of the Maryland ... built separate from the underframes, ...urely bolted. The overall height is 11 ... rail and the floor is approximately 42 in. ...he bodies are of wood frame construction ...ning. The trailer of the Maryland & Penn... is fitted with a blind vestibule at the front end, ... heater is located; the steps at the rear end of ... car serve the front end of this car. The regular ...ent of the builder, however, provides for vestibule ...es at both ends of the trailer car and at the rear end ...e motor car. The vestibules are fitted with side, end ...d trap doors.

Each car is fitted with a toilet and the trailer car carries a small Arco Ideal hot water heater. The motor car is heated by the motor exhaust, a portion of which may be diverted through metal ducts carried along the sides of the car just above the floor.

The cars are fitted with Westinghouse self-equalizing automatic brakes. The brake heads and shoes are of the M. C. B. type and the couplers are Van Dorn vertical plane type, one-half M. C. B. size. The motor car is fitted with a pilot, an electric headlight, a bell, air operated whistle, and marker brackets, to conform to steam railroad requirements.

Freight Car Loading

WASHINGTON, D. C.

THE USUAL END of the year seasonal decline in freight business manifested itself during the week ended November 4, when the total revenue freight car loading was 994,827 as compared with 1,014,480 in the week ended October 28, which marked the peak for this year. The loading for the week of November 4 was, however, 157,251 cars greater than that for the corresponding week of last year and 79,212 cars greater than that for the corresponding week of 1920. As shown by a chart published by the Car Service Division of the American Railway Association, the peak loading this year was from one to five weeks later than it was in the four preceding years. In 1918 the peak was reached in the week of September 23, when 989,788 cars were loaded; in 1919, in the week of September 23, when 995,901 cars were loaded; in 1920, in the week of October 14, when 1,018,539 cars were loaded, and in 1921, in the week of October 21, when 964,811 cars were loaded. Prior to 1918 the car loading figures were not compiled but the ton-mile figures show the peak to have been reached in 1916 about October 1 and in 1917 the peak was in May, shortly after the United States entered the war.

The peak for 1922 was only three-fourths of one per cent below the record for any single week in the history of the railroads. The decline from the high point is usually very rapid toward the end of the year as the wholesale shipments of Christmas goods cease, the grain reaches the elevators, the lakes freeze up and reserve stocks of coal have been accumulated, but as the result of continued heavy coal shipments and the delayed movement of grain because of car shortage in the west it is expected that the decline this year will be less abrupt. For two weeks the loading this year

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO, WEEK ENDED SATURDAY, NOVEMBER 4, 1922.

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year, 1922	Total revenue freight loaded: Corresponding year, 1921	Total revenue freight loaded: Corresponding year, 1920
Eastern	1922	9,794	3,793	56,487	2,238	5,093	6,196	65,359	97,136	246,996	.....	.....
	1921	9,708	3,255	49,440	2,255	4,828	3,086	66,357	78,504	.....	217,433	217,514
Allegheny	1922	3,915	3,785	56,944	5,790	3,201	9,373	51,066	78,613	212,687	.....	.....
	1921	2,581	3,002	50,255	2,617	2,757	4,231	47,882	57,756	.....	171,111	193,511
Pocahontas	1922	243	302	20,167	433	1,624	58	5,713	3,549	32,089	.....	.....
	1921	220	201	22,823	194	1,257	9	5,627	3,323	.....	33,654	33,539
Southern	1922	4,162	2,465	23,283	1,274	21,215	1,373	39,353	46,930	140,055	.....	.....
	1921	3,141	1,975	23,771	526	16,377	522	39,177	38,773	.....	124,262	126,783
Northwestern	1922	15,845	9,969	10,806	1,436	14,324	27,151	27,029	39,429	145,989	.....	.....
	1921	11,168	8,288	7,559	703	11,811	1,871	28,783	34,479	.....	104,662	147,953
Central Western	1922	12,461	15,479	20,819	307	6,615	2,346	31,054	57,787	146,868	.....	.....
	1921	9,701	11,231	18,054	219	6,632	752	31,861	44,693	.....	123,143	132,027
Southwestern	1922	5,492	3,938	5,571	163	7,041	549	15,163	32,226	70,143	.....	.....
	1921	3,700	2,923	5,104	141	7,412	714	15,938	27,379	.....	63,311	64,288
Total Western Districts	1922	33,798	29,386	37,196	1,906	27,980	30,046	73,246	129,442	363,000	.....	.....
	1921	24,569	22,442	30,717	1,663	25,855	3,337	76,582	106,551	.....	291,116	344,268
Total All Roads	1922	51,912	39,731	194,077	11,641	60,013	47,046	234,737	355,670	994,827	.....	.....
	1921	40,219	30,875	177,006	6,685	51,074	11,185	235,625	284,907	.....	837,576	.....
	1920	36,223	31,313	203,820	14,748	56,797	66,893	201,478	304,343	.....	.....	915,615
Increase Compared	1921	11,693	8,856	17,071	4,956	8,939	35,861	.....	70,763	157,251	.....	.....
Decrease Compared	1921	.....	.....	.....	.....	.....	.....	888	.....	.....	.....	.....
Increase Compared	1920	15,689	8,418	.....	.....	3,216	.....	33,259	51,327	79,212	.....	.....
Decrease Compared	1920	.....	.....	9,743	3,107	.....	19,847	.....	.....	.....	.....	.....
Nov. 4	1922	51,912	39,731	194,077	11,641	60,013	47,046	234,737	355,670	994,827	837,576	915,615
Oct. 28	1922	51,913	42,644	197,928	11,388	60,584	48,005	233,680	368,338	1,014,480	951,384	981,243
Oct. 21	1922	53,680	40,473	196,771	10,631	60,344	45,468	231,797	364,595	1,003,759	964,811	1,008,815
Oct. 14	1922	52,492	39,141	196,926	10,208	59,727	46,302	226,123	352,491	983,470	910,529	1,018,539
Oct. 7	1922	50,553	30,359	189,312	9,880	57,844	47,439	228,515	345,267	968,169	899,681	1,011,666

has been greatly in excess of that for the corresponding weeks of any previous year.

The principal decrease as compared with the preceding week was in miscellaneous freight, which showed a reduction of 12,668 cars. There was also a decrease in coal of 5,851 and livestock of 2,915. Grain loading showed a decrease of only one car. There were also slight decreases in forest products and ore, but merchandise l. c. l. increased 1,057 cars. As compared with the corresponding week of last year there were increases in all classes of commodities except merchandise and in all districts except the Pocahontas. As compared with the corresponding week of 1920 there was an increase in all classes of commodities except coal, coke and ore and in all districts except the Pocahontas and the North Western.

The summary as compiled by the Car Service Division is given in the accompanying table.

In a bulletin issued last week the Car Service Division said that there is no index of current business conditions more reliable than the loading of miscellaneous freight on the railroads and, calling attention to the fact that miscellaneous loading for the week of October 28, 368,338, had exceeded all previous records, the bulletin said: "If there existed any adjusted period in the country's history which might with certainty be termed normal, the present record car loadings indicate a full and complete recovery from the post-war deflation.

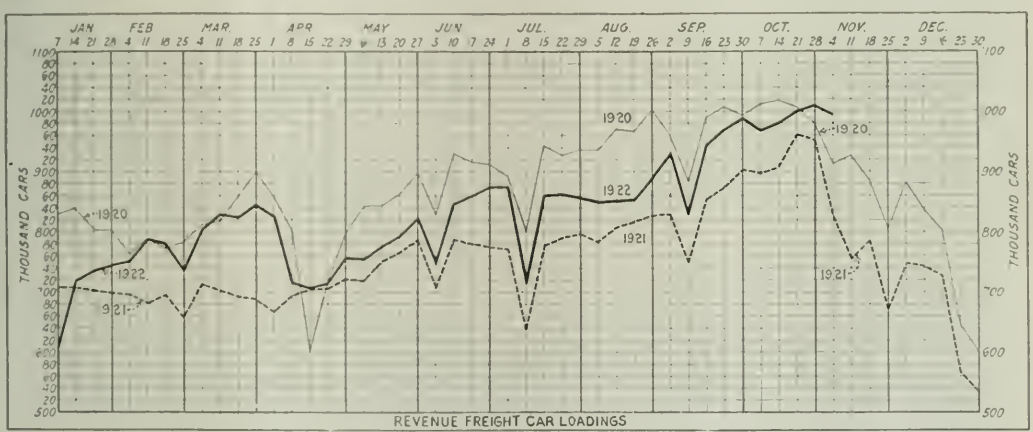
"The fluctuation in the progress of agriculture and industry during and since the war is depicted in the depressions and peaks of the curves for the various years, and an analysis of economic conditions existing during periods of low carloadings gives a fairly accurate picture of the causes of price decline and periods of inflation.

"In analyzing the trend of the loading for 1922 in relation to former years, it will be noted that in spite of the fact that the year was commenced with extremely low loadings, a gradual and healthy improvement is indicated up to the period of the coal strike. This arrangement in this industry, coupled with the effect of the shop strike on the railroads which commenced on July 1, retarded the accomplishment of an immediate return to a period of exceptionally heavy carloadings and an upward trend of prices. Commencing in August, however, the recovery of the railroads was rapid and with the resumption of coal mining in the union fields carloadings have increased to a point where for the week ending October 28 they were but a fraction of one percent under the highest week in the history of the railroads.

"While the general trend of the curves indicates a falling off of business during the months of November and December, this period has been forced ahead during 1922 to a point where we can reasonably expect a continuance of exceptionally heavy loading this year beyond the period of prior years. It is reasonably certain, therefore, that the entire year of 1922, when completed, will be indicative of the fact that business conditions throughout the year and the performance of transportation will lend special emphasis to improved economic conditions and a return to so-called normal conditions."

Earlier in the year the Car Service Division had made an estimate, based on previous experience and assuming a settlement of the coal strike at an earlier date than was realized, that a loading of 1,100,000 cars might be attained by October 21, but the coal strike lasted for some weeks longer and the shop strike also intervened.

The railroads furnished a slightly larger percentage of the open top cars required during the week of October 28 than during preceding weeks, 61 per cent as compared with 59 the week before. While 673,638 cars were required, 408,816 were furnished and 378,092 were loaded. For coal loading the percentage was 57 as compared with 54 furnished the week before.



The freight car shortage for the week ended on October 30 averaged 179,239, an increase of 12,890 cars over the average for the preceding week. The shortage included 91,039 box cars, an increase of 9,305, and 47,273 coal cars, an increase of 698. The largest shortage reported was in the Central Western district, 45,887, while the shortage in the North Western district was 39,164, but the greatest demand for box cars was in the North Western district, where shortages of 27,160 were reported.

The railroads on November 1 had 249,960 freight cars in need of repairs, or 11 per cent of the cars on line. This was a reduction of 20,085 cars since October 15 last. This also was the smallest number of freight cars in need of repairs since March 1, 1921. Since July 1, the date on which the shopmen's strike began, there has been a reduction of 74,623 cars in the number of bad order cars, the total on that date having been 324,583, or 14.3 per cent of the cars on line. On November 1 last year, the number of bad order cars was 345,201.

Of the total on November 1, 198,669 were in need of heavy repairs, a reduction of 16,253 cars since October 15, and 51,291 in need of light repairs, a decrease of 3,832 since October 15.

Effect of the Elections on Railroad Legislation

WASHINGTON, D. C.

AMONG THE QUESTIONS most frequently raised in discussions as to the significance and probable results of the recent elections, which will have the effect of greatly narrowing the present large Republican majorities in Congress, is the one as to how the transportation act will be affected. It is expected that the defeat of numerous of the more conservative of the Senators and Representatives who voted for the law two and a half years ago, and their replacement in many cases by men of more radical tendencies, will tend to renew the agitation which has been carried on since early in 1921 for a repeal of the section under which the Interstate Commerce Commission is directed to make rates in an effort to produce a predetermined percentage of return on the value of the railroad property. Along with this goes the demand for a restoration of the former powers of the state railroad commissions, as the object in both cases is to bring about reductions in freight rates.

However, many of those who are anxious to see the law, or at least its rate-making provisions, given a complete and fair trial without important amendment under conditions somewhat more normal than have prevailed since its passage, see no occasion for serious alarm for some time to come. The new Congress does not get on the job until next December, unless something should happen to force President Harding to call an extra session after March 4, which he now hopes to avoid, and in that time much may develop, just as the improvement in business conditions during the past few months has already changed a general complaint of high rates on the theory that they were stifling traffic to a demand for more cars in which to ship a record-breaking volume of traffic.

While many of those who have just been elected conducted their campaigns to a considerable extent on the issue of opposition to the law, it is much easier to claim than it is to prove that there has been anything like a plebiscite on the question, and until March 4 the Congress will consist of those who have successfully withstood the demand for an emasculation of the act during the past year and a half. The Congress so many of whose members will be retired to private life as a result of the election was criticized as a "do-nothing" Congress. One of the things it did not do was to reduce freight rates, but if good business continues through another year and the Interstate Commerce Commission continues to demonstrate occasionally that section 15-a is no bar to such rate reductions as it thinks justified, even though it may be used as the basis of an argument against reductions it does not think justified (as in the recent transcontinental rate cases), interest in the freight rates may not be so keen in another year as it was last year and the first part of 1922. Also the spectacle of a deadlocked Congress, or a deadlock between the administration and Congress, may be sufficiently interesting to allay the demand which is so prevalent in hard times for Congress to "do something." There is some uncertainty as yet as to the extent to which the radical element, which can hold the balance of power in the new Congress, will be able to so organize itself as to make the necessary trades to put through the legislation it desires, or as to whether it will, as in the past, be mainly successful in obstructive tactics. Even if a majority vote can be secured, there is always the question of obtaining a two-thirds vote to override a presidential veto. As a Senator, Harding did not take part in the final vote on the transportation act, but he was paired in favor of it and he has never expressed any sympathy with the proposals for seriously modifying it, except as to the labor provisions.

The Esch-Cummins bill was not handled exactly as a partisan measure and it was approved by a Democratic President, although most of the votes by which it was put through were Republican and a majority of the Democrats in both the Senate and the House voted against it. Criticism of the act also has been to a considerable extent non-partisan and some of the loudest demands for a repeal or amendment of the rate-making provisions of section 15-a have come from Republicans—notably Senator Capper, who had voted for the bill—but a great deal of denunciation of the law has come as a matter of course from the Democratic side. The great reduction in the Republican majorities in both the House and the Senate in itself, therefore, gives some reason for apprehension but of greater importance is the large number of radicals who have been elected to Congress, regardless of their party affiliations. Among these are such men as Brookhart, Shipstead, Howell and Wheeler, who are expected to form an alliance with Johnson, Borah, LaFollette, Norris and others of the so-called radical group in the upper house, where the Republican majority is so slender that by sticking together they could easily exert a powerful influence on legislation. C. C. Dill, who succeeds Poindexter from Washington, has also been a lecturer for the Plumb Plan League.

In the Senate there will be 52 Republicans and 44 Democrats, but 19 of the Republicans have been classified as radicals, "progressives" or liberals, and 15 of them constitute the "farm bloc," while taking the Senate as a whole, only 40 may be considered conservatives and 56 as liberals or radicals. The Senate committee on interstate commerce, which handles most railroad legislation, has lost four conservative Republicans, Townsend of Michigan, Poindexter of Washington, Kellogg of Minnesota and Frelinghuysen of New Jersey, and two conservative Democrats, Pomerene of Ohio and Myers of Montana. All of these were defeated in the elections except Myers, who was not a candidate. All of them had voted for the Esch-Cummins bill. Senator Cummins, one of the principal authors of the law, will probably remain as chairman of this committee, but he is in poor health and LaFollette is next in line.

In the House there will be 230 Republicans (including one socialist, one independent and one farm labor member) and 205 Democrats, but they have been classified as 210 conservatives and 225 liberals. The House committee on interstate and foreign commerce will lose the following Republicans as the result of the election, including those who were not candidates for re-election: Sweet of Iowa, Stiness of Rhode Island, Jones of Pennsylvania and Burroughs of New Hampshire. These were all considered conservatives and all voted for the Esch-Cummins bill. Representative Johnson of Mississippi, a Democrat, who was against the bill, was also defeated. The chairmanship of this committee will probably remain with Samuel E. Winslow of Massachusetts, a conservative.

At the present time the railroads have no program of affirmative legislation to ask of Congress, although they are vitally interested in proposed anti-strike legislation and other changes in the labor provisions of the law, and it is quite likely that the principal result of the changes in Congress will be to merely increase the number of hostile bills they will have to fight. There are some who believe that the chances of legislation to prevent a recurrence of the shop strike of this summer and of the threat of a trainmen's strike that caused some concern a year or so ago, have been reduced by the effect of the vote demonstration upon the present Congress. This is on the theory that the vote represented a general repudiation of the ideas that have been expressed by the present head of the administration. However, the chances for such legislation were somewhat doubtful before, in spite of the rather strong expressions of public opinion at the time of the strikes, and the intentions of the administration along that line have not yet been definitely announced.

The primary purpose of the extra session called for November 20 is to try to pass the ship subsidy bill, but it is

considered probable that the President will also propose some amendments to the labor provisions of the transportation act, such as he has suggested in the past, in his address or message to Congress at the opening of the session. Some of the leading Senators have been giving some consideration to the subject for some time and Chairman Cummins, on his return to Washington from Iowa, called at the White House on Tuesday and made an engagement to confer with the President later on proposed railroad legislation.

Senator Cummins will endeavor to have Congress consider amendments to prohibit strikes and, by way of compensation for this restriction, to guarantee some kind of a "living wage"; also to transfer the Labor Board from Chicago to Washington and possibly to make it an adjunct of the Interstate Commerce Commission and reorganize it to consist of members representing the public only. The Senator also wants to try again to enact a compulsory consolidation measure and it is understood that he is now considering a plan for the creation of a company to own all railroad equipment. While legislation of this kind may be put through the Senate, the prospects for action in the House are regarded as much less certain, particularly as the introduction of the subject will be a signal for arousing the demand for a repeal of the rate section, and as the short session will be rather crowded with the subsidy bill and the necessary appropriation bills anyway.

Pacific Type for Passenger and Fast Freight

Latest Design for Atlantic Coast Line Is Especially Adapted to Conditions on That Road

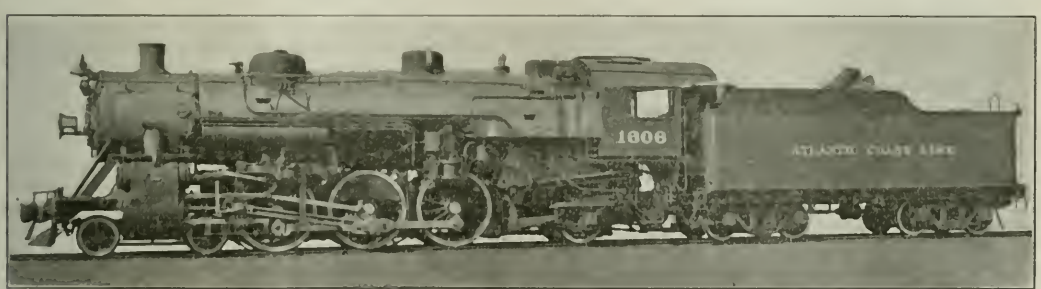
THE MAIN LINE of the Atlantic Coast Line is characterized, throughout the greater part of its length, by comparatively light grades and curves. A heavy passenger traffic is handled, especially during the winter tourist season, and the freight consists largely of perishable goods, which are moved on fast schedules. Up to 1911 a large part of this traffic was handled with locomotives of the Ten-wheel type, but the increased weight of passenger trains required locomotives of greater power than could be obtained with this wheel arrangement and, in the year mentioned, the Pacific type was adopted for the heaviest passenger traffic. These Pacifics, built by the Baldwin Locomotive Works, were subsequently followed by others built on various orders. The latest development of the series is shown in the accompanying illustration of engine 1606, which is one of 45 ordered from the Baldwin Locomotive Works in 1922. A comparison of the leading dimensions of these various Pacific type designs is given in the following table.

Date	Cylinders	Diameter of drivers, in.	Steam pressure, lb. per sq. in.	Grate area, sq. ft.	Water heating surface, sq. ft.	Superheating surface, sq. ft.	Weight on drivers, lb.	Weight, total engine, lb.	Tractive force, lb.
1911	22 in. by 28 in.	72	185	54.2	3,539	...	138,950	220,850	29,600
1912	22 in. by 28 in.	72	200	54.2	2,917	590	139,800	225,900	32,000
1914	22 in. by 28 in.	68	200	54.2	2,635	524	140,400	226,500	33,900
1918	23 in. by 28 in.	68	200	56.5	3,345	792	151,050	243,850	37,000
1922	25 in. by 28 in.	69	200	66.7	3,349	830	166,770	275,950	43,000

A combustion chamber was used in the design of 1914, reducing the tube length from 20 ft. 6 in. to 18 ft. 6 in. This accounts for the reduction in heating surface.

The new locomotives, which are designated as Class P-5-B, are closely similar, in weight and general dimensions, to the standard light Pacifics built for the U. S. R. A. The most important change is a reduction in the driving wheel diameter from 73 to 69 in. This raises the tractive force and gives a ratio of adhesion in the new locomotives of 3.88. The weight on drivers is thus utilized fully and the hauling and steaming capacities are large in proportion to the wheel loads carried in this design.

The boiler has a maximum diameter at the dome ring of 86 in. and is built with a conical connection in the middle of the barrel. This provides an ample water space under the combustion chamber, which is 23½ in. long. The firebox seams are welded throughout and the tubes are welded into the back tube sheet. Flexible bolts stay the combustion chamber and throat, and there is a partial installation of such bolts in the sides and back head. The firebox contains an arch, and the labor-saving equipment includes a power-operated fire door and grate shaker and a coal pusher on the tender.



Pacific Type with 69 in. Drivers for Use in Mixed Service

The valve gear is of the Baker type, controlled by the Ragonnet power reverse mechanism. The valves have a steam lap of 1⅛ in. and an exhaust clearance of ¼ in. and are set with a travel of 6½ in. and a lead of ¼ in. The guides and crossheads are of the alligator type and the piston rods, in accordance with Atlantic Coast Line practice, are bolted to the crossheads instead of keyed.

These locomotives have ample speed capacity for the

passenger train schedules on the Coast Line, and they are also well adapted to fast freight service on lines having moderate grades. They are, therefore, an excellent "all-around" engine for work on this road.

Further particulars are given in the table of dimensions.

TABLE OF DIMENSIONS, WEIGHTS AND PROPORTIONS

Type	4-6-2
Service	Passenger and fast freight
Track gage	4 ft. 8½ in.
Cylinders, diameter and stroke	25 in. by 28 in.
Valve gear	Baker
Valves, kind and size	Piston, 14 in. dia.
Weight in working order:	
On drivers	166,770 lb.
On front truck	54,330 lb.
On trailing truck	54,850 lb.
Total, engine	275,950 lb.
Tender	194,050 lb.
Wheel base:	
Driving	13 ft. 0 in.
Rigid	13 ft. 0 in.
Total engine	34 ft. 11 in.
Total engine and tender	70 ft. 9½ in.
Driving wheels, diameter outside tires	69 in.
Boiler:	
Type	Conical
Steam pressure	200 lb. per sq. in.
Fuel	Bituminous coal
Diameter first ring, outside	74⅝ in.
Firebox, length and width	114⅛ in. by 84¼ in.
Tubes, number and diameter	188—2¼ in.
Flues, number and diameter	36—5½ in.
Tubes and flues, length	19 ft. 0 in.
Grate area	66.7 sq. ft.
Heating surfaces:	
Firebox, including combustion chamber and arch tubes	273 sq. ft.
Tubes and flues	3,076 sq. ft.
Total evaporative	3,349 sq. ft.
Superheating	830 sq. ft.
Combined evaporative and superheating	4,179 sq. ft.
Tender:	
Water capacity	10,000 gal.
Fuel capacity	16 tons
General data, estimated:	
Rated tractive force	43,000 lb.
Cylinder horsepower	2,082
Weight ratios:	
Weight on drivers ÷ total weight	60.4
Weight on drivers ÷ rated tractive force	3.88
Boiler ratios:	
Combined heating surface ÷ cylinder horsepower	2.01
Tractive force ÷ combined heating surface	10.28
Tractive force × diameter drivers ÷ combined heating surface	710
Cylinder horsepower ÷ grate area	31.2

National Industrial Traffic League

THE National Industrial Traffic League held its annual meeting at Hotel Commodore, New York City, on Wednesday and Thursday of this week, with about 400 members in attendance. W. H. Chandler, of Boston, president of the league, occupied the chair, and J. H. Beck, of Chicago, executive secretary of the league, was secretary of the meeting.

The first day was taken up with the first two items on the program, revision of the constitution and an address by Hon. James C. Davis, director general of railroads, United States Railroad Administration. Mr. Davis gave a brief statistical statement of the work which has devolved on the railroad administration since the roads were relinquished by the government and explained, by way of reply to criticisms, the reasons for certain of his acts and decisions. He said, in part: The taking over and operation of the railroads by the federal government, as a measure necessary to the successful prosecution of the World War, was a unique proposition, and the liquidation of the innumerable liabilities and the adjustment of the many and complex controversies resulting is a fascinating story. It was probably the largest liquidation problem ever undertaken. The claims presented for adjustment may be roughly divided into the following classes: 1. Claims of the railroad corporations. 2. The innumerable claims of third persons growing out of the operation of the property. 3. Claims of freight shippers asking reparation. 4. Claims of the carriers for the use of their property.

The property included 250,000 miles of main track—188 large systems and more than 800 short lines. The gross earnings of the property for the calendar year 1917, just prior to federal control, were $4,050,463,579; net railway operating income, $974,778,937. Up to November 1, 1922, the total claims filed by the corporations on final settlement amounted to $958,924,305. Of these claims presented, $677,216,939 have been adjusted. The net amount paid in making these adjustments was $163,509,040.

The settlements so far concluded represent 75 per cent of the mileage under federal control. With the exception of one first class road, adjustments have been made or are still pending with all companies which have presented their claims. When you consider the extent of this property, the opportunity for controversy seems to be almost unlimited, and the adjustment of 75 per cent of the claims without recourse to the courts is a result that is worthy of special consideration. The notion that the railroads were returned to their owners in a much worse physical condition than when they were taken over is not borne out by the investigations made by the Railroad administration. The cost of labor and material greatly increased as between the test period and the period of government operation, but the vast expenditures of the United States Railroad Administration were made under the direct personal supervision of the men who during private ownership had charge of and operated these identical properties, and I believe it is a fair conclusion that the government did everything humanly possible to maintain the property in its possession at the same standard of maintenance established by the owners during private control. Immediately after federal control the railroads did the largest business in their history; if the roads were returned in a dilapidated condition, this result could not have been accomplished.

The railroads suffered serious damage as the result of federal control, but it was an economic rather than a physical damage. When returned they were being operated at a deficit, and were faced with the unpopular and difficult burden of asking an increase in rates and a reduction in wages.

Claims of Third Persons

The claims of third persons consist of an innumerable number of demands of employees and third persons, which may be generally described as based upon personal injuries, fires, and loss and damage. These claims are being adjusted through the agency of the corporations upon whose lines the claims originated. While much progress has been made there were still pending on July 1, 1922, over 14,500 law suits, involving an aggregate of $75,000,000.

Some criticism has arisen as to the attitude of the Railroad Administration in regard to the statute of limitations as to claims against the Administration. The Transportation Act provides that proceedings to enforce claims cannot be commenced after February 28, 1922. If a claim cannot be enforced by suit, it is quite clear that any payment made after the statute has run must be considered a voluntary payment, and I have held that, as a public officer, I cannot disburse public money in the way of voluntary payments. * * * Every one presenting a claim would insist that it was meritorious, and the Administration would at once be in the position of arbitrarily determining what in its opinion was a meritorious claim. The position of a public officer, in the matter of waiving statutory provisions is very different from the position of an individual or a private corporation under similar circumstances. While in some few instances the rule adopted by the Administration has worked an apparent injustice, there are a great flood of claims wholly without merit that have been disposed of, and I feel quite confident that any impartial survey of the situation will justify the conclusion adopted by the Administration.

There is one series of claims that is very unusual. In October, 1918, a great forest fire occurred in Minnesota. An area of some 1,500 square miles was burned over, and several

towns and cities were totally destroyed, notably the town of Cloquet, with a population of some 10,000.

Notwithstanding the fact that there were many fires originating in the burned over section entirely independent of railroad origin, and also notwithstanding the fact that during the period of the conflagration a hurricane was blowing at the rate of 60 miles an hour, the courts of Minnesota have held that if, as a matter of fact, it can be shown that a fire set by a railroad under federal control materially contributed to the conflagration which destroyed individual property, the Railroad Administration is liable. In the trial of some test cases, the jury found against the Railroad Administration, and the Supreme Court affirmed the verdicts.

As a result of this disaster, there were instituted over 10,000 law suits, making claim for an aggregate of some $50,000,000. Having exhausted the defenses which were available to the Administration in litigation, a final conclusion was reached to adjust the losses occurring in that portion of the burned area which was tributary to federally controlled railroads. Up to this time, some 4,000 of these cases have been adjusted, representing aggregate demands of some $20,000,000. The amount paid out, to date, is about $8,000,000, and the total cost to the Government, in completing these adjustments, will be from $15,000,000 to $20,000,000.

Reparation Claims

The adjustment of reparation claims has been the subject of some dissatisfaction. Claims growing out of the charge of unjust rates can be adjusted only after approval by the Interstate Commerce Commission. If the claim is on the informal docket, the approval is made on the recommendation of the Administration. If on the formal docket, the matter must be the occasion of an affirmative finding or order of the Commission requiring payment. * * * The formal awards made by the Commission many times involve quite difficult and complex questions of law. In many important controversies there are differences of opinion as between the members of the Commission, resulting often in dissenting opinions, and at times there is enough involved in doubtful controversies to justify asking the decree of a court, and the Railroad Administration has simply exercised a privilege always accorded carriers under private ownership, of submitting doubtful questions of law to the court. This privilege has been very sparingly exercised.

Since July 1, 1920, when the Railroad Administration commenced paying reparation awards direct, there has been received from the Commission 2,048 awards which have not been subsequently reopened by the Commission.

Of this total, there were 523 formal awards, of which payment has been authorized in 486 cases, involving total payment of $1,707,594. Payment of all the informal awards has been authorized, the total aggregating $1,014,705. There are at this time only 82 awards for which vouchers have not been drawn. Of these 55 are held pending an examination as to whether or not the claimant is indebted to any federally-controlled road. This investigation is required by the provisions of a federal statute. The remaining 37 awards are held pending investigation * * *. The final settlements with the railroads should be completed by say June 30, 1923, and the remaining outstanding matters should be substantially disposed of by the end of the calendar year 1923.

The federal control of railroads was undoubtedly a necessity as a war measure. Whether or not lessons of value were learned as a result of this venture may be the subject of difference of opinion and debate. The cost to the Government was very large. I believe, when the books are finally closed, it will aggregate approximately $1,800,000,000 to $2,000,000,000; $1,200,000,000 to $1,300,000,000 as the general loss by reason of the 26 months of operation, and $600,000,000 to $700,000,000, covering the six months' guaranty period and the adjustment with the deficit short line railroads.

Operating and Maintaining Oil-Burning Locomotives*

In the operation of an oil-burning locomotive great attention should be given to avoiding sudden and great changes in fire-box temperatures. The fireman, by inattention in letting the steam drop back and then forcing the fire to bring the steam up again, not only wastes fuel but works a great hardship on the boiler. Owing to the rapidity with which the temperature can be dropped by cutting down the fire, it is of utmost importance to have the engine crew give special attention to the use of the dampers and handling of injectors or feed water heaters and the blower to prevent abuse of the boiler. In starting a train the locomotive burning oil can develop its maximum power without fear of holes being torn in the fire, but if care is not used in handling the oil-burning engine, this feature will adversely affect fuel economy by producing uneconomical acceleration.

The fuel oil should be heated to about 100 deg. F. in the tank to give the best results, although with the use of very heavy oils it has been necessary to heat the oil to 150 or 180 deg. F. Excessive heating damages the oil by driving off the lighter gases and causing the asphaltum to separate from the lighter oil. This makes the flow to the burner irregular and it is difficult to carry a light fire when drifting or standing.

Frequent sanding of the flues to prevent accumulation of soot promotes economy. Sanding should be done where there is no hazard of starting fires and when the engine is working under heavy conditions at a long cut-off. The intervals between sanding depend upon conditions of operation.

The operation of the firing valve and atomizer require close attention to take care of the varying boiler load, due to changing cut-off. Careful attention in the use of the atomizer and firing valve will eliminate black smoke, except where mechanical defects interfere. Heavy black smoke is not only a direct fuel loss, but rapidly deposits soot on the flues which interferes with the heat transfer to the boiler. A clear stack is deceiving. It may mean only a small amount of air, or it may mean as much as 300 per cent excess. A clear stack is ideal when the gas analysis at the same time shows a high percentage of carbon dioxide, a very low percentage of free oxygen and no carbon monoxide. Under operating conditions it is good practice to regulate the supply of air until a very light brown haze is shown at the stack, which will reduce the amount of excess air and thereby produce economy in the use of fuel. The presence of smoke does not always mean insufficient air. Poor atomization, poor mixture of air and oil, unconsumed oil striking cooling surface and poorly designed or bricked fire-pan frequently cause smoke when the air supply may be far in excess of that required.

Maintenance

Burners should have sufficient air admitted around them to prevent them from becoming heated to a temperature causing carbonization of the fuel at the mouth of the burner, resulting in deflecting the oil spray. The best results have been obtained with a burner located at a point from six to nine inches above the floor of the fire-pan.

The fire-pan should be free from all leaks, except the air openings provided for the combustion of fuel. Leaks in many cases cause the brick work to become loose. Permitting the brick to fall into the bottom of the fire-pan deflects the oil spray. Much can be accomplished in maintaining the brick work by having the fire-pan properly braced, eliminating vibration. Should any carbon be found on the flash-

* Abtsract of a report presented before the convention of the Traveling Engineers' Association.

wall, this should be removed to permit the oil spray to come in contact with a reasonably clean wall.

Both small and superheater flues should be inspected frequently, as there is a possibility of sand collecting in the large flues when leaks exist in the front end. Any restriction in the flues will affect superheating and evaporating efficiency.

The front end arrangement of an oil-burning locomotive is quite similar to that of a coal-burning locomotive, with the exception of the absence of the deflector plate and the necessary netting required to prevent cinders from emitting from the stack. The absence of netting permits of a freer flow of gases in the front end of oil-burning locomotives. If an oil-burning engine is properly drafted and the firebox properly bricked to prevent the localization of high temperatures, the cost of maintenance is about the same as that of a coal-burning engine.

Economic Advantages of An Oil-Burning Locomotive

In comparing the operation of an oil-burning locomotive with a coal burner, the locomotive burning oil has a number of distinct advantages: (1) Reduction in amount of smoke; (2) absence of cinders; (3) largest type of power can be operated without the mechanical stoker; (4) less loss of fuel at the stack; (5) hazard of starting fires along right-of-way reduced; (6) with careful handling the steam can be kept closer to the maximum boiler pressure without frequent or prolonged openings of the pop valve; (7) the fireman is permitted at all times to observe signal indications and operating rules; (8) the use of oil permits a more accurate check of the fuel consumption, which is of great value in compiling individual performance of enginemen, firemen and locomotives; (9) quicker turning of the power may be accomplished with the use of oil, also a reduction of terminal charges because of the reduction in hostler service and the elimination of ash-pit service; (10) better system and lower cost of fuel distribution through the use of pipe lines.

The use of oil is also conducive to longer locomotive runs, as for equal heat value oil occupies much less space than coal. Furthermore, oil when stored does not lose its calorific value as does coal, nor are there any difficulties arising from disintegration such as may be found when coal is stored.

The report is signed by J. N. Clark (Southern Pacific), chairman; J. C. Simino (Southern Pacific), J. C. Brennan (N. Y. C.), E. F. Boyle, W. G. Tawse (Superheater Co.), and Dumont Love (F. E. C.).

Discussion

The principal points brought out by the discussion were the necessity for care in firing up the oil-burning locomotive to avoid the risk of gas explosions in the fire-box, the value of the stack cover for retaining heat in the boiler when the locomotive is in the terminal and a doubt as to whether the risk of roadway fires is entirely eliminated by the use of oil as fuel.

The practice outlined to avoid explosions in firing up oil-burning locomotives, particularly when the fire is to be lighted in a hot firebox, is first to open the blower valve, open the fire door, then turn on the atomizer and finally open the oil valve after the burning waste for igniting the oil has been placed in the firebox. The blower and the open door permits a sufficient volume of air to pass through the firebox to prevent the accumulation of gas which may be formed in the hot firebox should the oil be slow in igniting.

The use of stack covers does not seem to be general practice although a number of roads use them to some extent. Instances were cited where, by the use of the stack cover, it has been possible to retain sufficient steam pressure in the boiler after from 8 to 12 hours in the roundhouse, to permit the engine to be fired up with its own steam in the atomizer.

L. D. Gillett (Dominion Railroad Commission of Canada) raised the question as to the fire hazard of oil-burning locomotives, stating that in Canada an investigation as the result of fires in oil-burning territory had developed the fact that burning tar has been thrown from the stack in quantities sufficient to set fire under favorable conditions, and that a change in the refinery process has eliminated the trouble. The discussion thus started brought out the need of supervision to insure that cigarettes or cigar stubs, pieces of waste, etc., be not thrown into the sandbox, and thence into the firebox, through the tubes and out the stack, only partially consumed, to set fire along the right-of-way and on the adjoining property. Through certain agricultural districts, where considerable grain is grown, the Southern Pacific uses netting in the front ends of its locomotives during the dry season as a precautionary measure against the small sparks thrown out when sanding the tubes. Although it is evident that fires can be set from oil-burning locomotives, the consensus of opinion of the members who have had experience with them, is that the risk is incomparably less than with coal-burning locomotives.

Oregon Wants More Railroads

WASHINGTON, D. C.

THE PUBLIC SERVICE COMMISSION of Oregon has filed a petition with the Interstate Commerce Commission, under paragraph 21 of section 1 of the interstate commerce act, asking it to order the Central Pacific, Southern Pacific, Oregon-Washington Railroad & Navigation Company, Oregon Short Line, Oregon Trunk and Deschutes railways or some one or more of them to extend and construct a line of railroad from Crane, Ore., westward to a connecting point that will give market outlets in California and western Oregon cities to eastern, central and southern Oregon, and to extend and construct connections therewith from the terminals of the present railroads at Kirk and at Bend, Ore., and that such further order be made giving such constructed lines such joint and common use of existing lines as will warrant such construction and thereby adequately serve the territory of eastern, central and southern Oregon and open it to the consuming markets of the East and the Pacific coast markets, ports and terminals. The petition also asks that such railroads be so grouped and such joint and common use be ordered as to assure maximum competition and maximum use of cars, equipment and facilities.

The petition says that there is no railroad extending southeastward from the western part of the state, south of Portland, to any point in eastern Oregon or to that part of southern Oregon lying east of the Cascade mountains; that the existing routes through the state are so circuitous that they constitute continual inconvenience to all inhabitants of the state and are particularly disadvantageous to the marketing of its products; that there is no adequate and efficient line from Lakeview, Klamath Falls, Crane, or Burns to Portland and that the public convenience and necessity require that an adequate and efficient line be constructed from Crane, Bend, Kirk and Eugene to Odell, from Crane to Burns, from Lakeview to Klamath Falls, or from Lakeview north to connect with the proposed Crane-Odell line.

The Oregon commission says that there exist practicable and feasible routes for these extensions and that surveys have been made and in some instances construction actually begun many years since but never completed.

After setting forth the resources of the region, the petition asserts that prompt and effective administration of the state government and the exercise of their duties by state and county officials require more direct routes between central and southeastern Oregon and the northwestern part of the state and that under existing conditions there has always been an annual car shortage in the territories described.

General News Department

The American Railway Association is to hold a special session at the Blackstone, Chicago, on Wednesday, December 6, to consider rules relative to distribution of freight cars and methods of securing observance of car service rules.

The regular monthly meeting of the Western Railway Club will be held at the Auditorium Hotel, Chicago, on Monday, November 20, at 7:30 p. m. Samuel O. Dunn, editor of the *Railway Age*, will speak on "Industry and the Man."

The Pennsylvania's grain elevator at Fifty-seventh and Leavitt streets, Chicago, was destroyed by fire on November 11 with an estimated loss to the building of approximately $200,000, in addition to which 100,000 bushels of oats were destroyed.

The annual meeting of the Telegraph and Telephone section of the A. R. A. will be held at the Hotel La Salle, Chicago, on December 12, 13, 14. This meeting was to have been held in Colorado Springs on September 19, 20, 21, but was postponed on account of railway conditions at that time.

The Chicago, Rock Island & Pacific and the Chicago Great Western, at a hearing held in Des Moines last week, were granted the right to appeal to the United States Supreme Court in their joint effort to prevent the State of Iowa from collecting property taxes based on the state's valuation. A temporary injunction was granted.

The Car Shortage is to be the subject of a debate to be held before the Transportation Club of Louisville, Ky., on Wednesday evening, November 22. T. B. Turner, assistant superintendent of transportation of the Louisville & Nashville, will speak for the railways, and J. Frederick Howard, traffic manager of Henry Knight & Son, for the shippers.

In a strike of freight handlers at the Waverly (N. J.) transfer of the Pennsylvania Railroad on Monday, November 13, about 250 men went out. Leaders of the workmen's brotherhood told New York reporters that a general sympathetic strike of freight handlers all around New York was in contemplation but so far as can be learned they have taken no serious action. The Pennsylvania has replaced the strikers with new men.

The Regan Safety Devices Company, New York city, announces that the installation of the Regan intermittent contact automatic train control apparatus on the Chicago, Rock Island & Pacific, throughout its Illinois division, 164 miles, double track, is to be begun immediately, with the expectation of completing the work in 100 working days. The directors of the railroad company on Tuesday, November 14, confirmed the decision, announced some time ago, to equip this portion of the Rock Island System in compliance with the order of the Interstate Commerce Commission. The apparatus is now being made at the Regan Company's factory at Niagara Falls, N. Y. That part of this train control system which is already installed, Blue Island, Ill., to Joliet, 25 miles, has been in service three years.

Automatic Train Control Order Modified

The Interstate Commerce Commission has modified its automatic train control order to provide that the Northern Pacific may instal automatic train stop or train control devices on one full passenger locomotive division between Mandan and Dickinson, N. D., in lieu of the installation required on the portion of its line designated in the original order, but the Northern Pacific's petition, in so far as it requests a modification of the order so as to permit of the use of an automatic train stop under the control of the engineman, who may, if alert, forestall automatic brake application and proceed, is denied. The commission has also denied a petition of the Chicago, Burlington & Quincy for a modification with respect to the extent of the installation required on its road, and also the joint petition of the New York Central, Boston & Albany, Cleveland, Cincinnati, Chicago & St. Louis, Michigan Central and the Pittsburgh & Lake Erie, asking a postponement of the date.

Conference on Numbering of Steel Called by A. E. S. C.

A conference to consider the desirability of providing a system of designating qualities or kinds of steels by code numbers, has been called by the American Engineering Standards Committee at the request of the U. S. Bureau of Standards. The conference will be held in Room 704, Department of Commerce Building, Nineteenth street and Pennsylvania avenue, Washington, D. C., at 10 a. m., Dec. 6. This conference will attempt to determine the desirability of applying a uniform numbering system to forging steels, casting steels, structural steels, including plates, tool steels or other steels not so classified.

Railway Development Association

The Fall meeting of the American Railway Development Association was held in Chicago, on November 9 and 10. W. W. Harris, editor of "American Railroads," in the absence of Ivy Lee of the Association of Railway Executives, opened the meeting with a talk on publicity, in which he pointed out the benefits to be derived from taking the public into confidence, especially by personal contact. On Friday morning, J. R. Howard, president of the American Farm Bureau Federation, spoke on the farmers' viewpoint on railroad questions. The afternoon sessions of both days were devoted to round table discussions.

Central Railway Club

The regular meeting of the Central Railway Club, Buffalo, N. Y., will be held on Thursday, November 23, at 2 p. m. The principal speaker will be F. W. Brazier, assistant to the general superintendent of rolling stock of the New York Central, who will read a paper on the training of men to act in supervisory capacities and on the best results in handling men.

At 7:30 p. m. in the Hotel Iroquois, the club will hold its annual dinner. There will be special entertainment features and the dinner will be followed by dancing.

A party of members of the New York Railroad Club plan going to Buffalo on a special car to start from the Grand Central Terminal at 8 p. m. on Wednesday.

The speakers at the dinner will be Ivy L. Lee of New York City and Reverend G. F. Williams of Buffalo.

Convention of Chief Interchange Car Inspectors' and Car Foremen's Association

The Chief Interchange Car Inspectors' and Car Foremen's Association held its annual convention at the Hotel Sherman, Chicago, on Thursday and Friday, November 9 and 10. In addition to the discussion of the changes in the rules of interchange which are to go into effect on January 1, papers on the following subjects were read and discussed: Lubrication of Car Journals, Suggestions for Changes in the Rules for Loading Long Material to Better Accommodate Certain Steel Products; The Maintenance of Tank Cars, and Car Department Apprenticeship System.

The following officers were elected for the coming year: President, A. Armstrong, Atlanta, Ga.; first vice-president, William Westall, New York Central; second vice-president, C. M. Hitch, B. & O.; secretary-treasurer, W. B. Elliott, Terminal Railroad Association of St. Louis.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1922

Name of road.		Average mileage operated during period.	Operating revenues			Operating expenses					Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
						Maintenance of									
			Freight.	Passenger	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.				
Akron, Canton & Youngstown	Sept.	170	$171,668	$1,014	$182,756	$28,392	$18,605	$6,154	$61,761	$7,305	$122,217	66.90	$60,539	$30,539	$24,302	$51,341
	9 mos.	170	1,540,829	12,154	1,625,057	188,719	173,989	52,501	459,384	77,304	951,484	58.60	673,573	583,974	346,020	173,080
Alabama & Vicksburg	Sept.	141	135,749	58,659	214,447	49,268	34,116	6,716	105,875	11,226	209,233	97.60	5,214	—11,215	—5,495	68,015
	9 mos.	141	1,526,580	513,139	2,199,723	418,330	404,500	74,891	863,040	106,201	1,884,021	85.70	315,702	141,913	181,701	90,254
Vicksburg, Shreveport & Pac	Sept.	171	170,233	83,472	277,918	56,494	54,113	8,057	122,249	12,647	256,028	92.10	21,890	4,283	—237	69,387
	9 mos.	171	1,665,292	811,535	2,671,738	479,048	465,338	89,166	1,058,879	122,098	2,234,934	83.70	436,804	265,678	196,908	259,560
Ann Arbor	Sept.	293	354,759	39,861	417,939	56,433	81,196	8,901	201,008	16,794	364,344	87.20	53,595	31,155	—9,890	83,884
	9 mos.	293	3,132,040	387,767	3,691,770	454,745	656,568	84,784	1,654,493	139,249	2,989,958	81.06	701,812	508,111	293,025	240,937
Atchison, Topeka & Santa Fe	Sept.	8,855	13,109,400	3,368,865	17,827,530	2,581,798	4,143,080	254,078	5,416,440	316,544	12,690,390	71.20	5,137,140	3,286,004	3,483,064	4,347,431
	9 mos.	8,856	91,270,749	31,613,034	133,794,999	23,160,408	31,471,939	2,363,825	42,348,419	2,989,499	102,145,456	76.30	31,649,543	21,029,754	22,241,504	32,760,959
Gulf, Colo. & Santa Fe	Sept.	1,907	1,771,086	387,245	2,295,687	308,095	495,576	44,876	683,007	69,394	1,597,574	69.70	695,114	611,255	566,993	476,429
	9 mos.	1,907	12,466,953	3,013,260	16,587,083	3,306,733	4,034,575	383,756	5,435,668	606,837	13,754,223	82.90	2,832,860	2,183,453	1,624,798	5,256,219
Panhandle & Santa Fe	Sept.	857	594,840	123,439	770,674	163,258	237,927	7,608	234,954	17,608	660,889	85.80	109,785	85,220	54,565	287,715
	9 mos.	857	4,164,085	1,032,234	5,567,051	1,463,791	1,682,159	63,091	1,837,293	169,540	5,208,895	93.60	358,156	154,307	—122,454	1,396,634
Atlanta & West Point	Sept.	93	139,330	75,440	242,266	30,823	44,669	8,852	85,446	10,413	183,201	75.60	59,065	41,442	31,071	38,144
	9 mos.	93	943,261	640,578	1,827,096	239,152	384,518	70,580	706,917	92,545	1,526,782	83.50	300,314	197,940	129,651	113,632
Western of Alabama	Sept.	133	152,965	72,285	249,671	28,841	45,254	9,004	79,004	10,186	174,802	70.00	74,869	52,877	55,998	51,770
	9 mos.	133	1,097,294	585,570	1,892,328	239,701	401,212	76,160	624,065	95,843	1,465,116	77.40	427,212	320,142	326,061	173,319
Atlanta, Birmingham & Atlantic	Sept.	639	247,417	49,260	363,719	61,684	84,397	20,593	167,106	14,406	348,256	95.70	15,463	5,085	11,369	—116,982
	9 mos.	639	2,276,436	349,503	2,859,061	529,826	778,674	189,448	1,437,125	142,815	3,078,643	107.60	—219,582	—347,123	—433,290	—1,421,910
Atlantic Coast Line	Sept.	4,926	3,687,072	1,098,469	5,266,434	648,806	1,184,689	93,085	2,030,445	132,116	4,109,984	78.00	1,156,451	806,205	1,024,367	12,977
	9 mos.	4,923	35,389,353	11,779,557	51,464,507	6,042,175	10,259,544	941,961	18,989,150	1,238,570	37,740,541	73.30	13,723,966	11,131,908	10,839,608	2,973,291
Charleston & West. Carol	Sept.	342	181,616	39,068	235,500	36,575	35,698	6,612	99,265	6,689	184,839	78.50	50,661	39,471	35,558	—2,657
	9 mos.	342	1,947,297	341,811	2,420,116	398,021	347,403	59,468	990,341	59,104	1,854,337	76.60	565,779	465,857	394,163	—230,181
Baltimore & Ohio	Sept.	5,235	10,047,537	2,270,586	13,619,379	1,900,308	5,570,386	273,334	7,006,166	458,749	15,341,852	112.60	—1,712,473	—2,333,060	—2,665,952	3,055,536
	9 mos.	5,235	110,224,098	19,908,533	140,346,795	17,405,677	33,729,538	2,655,449	58,852,411	4,256,096	118,167,188	84.20	22,179,607	15,852,342	12,491,220	15,271,197
Balti. & Ohio Chic. Term	Sept.	91	.....	.....	243,351	35,744	47,892	1,861	156,948	9,240	257,239	105.70	—13,888	—65,285	26,951	83,715
	9 mos.	91	.....	.....	2,241,513	322,587	296,006	16,919	1,292,754	92,260	2,062,828	92.00	178,685	—258,114	746,775	385,973
Staten Isl. Rapid Tran.	Sept.	23	61,585	107,106	202,183	58,736	39,866	1,642	119,924	14,471	234,638	116.10	—32,455	—52,458	—65,434	—10,250
	9 mos.	23	675,112	949,121	1,850,415	469,619	297,530	17,432	1,064,563	122,913	1,972,047	106.60	—121,632	—277,343	—397,542	213,422
Bangor & Aroostook	Sept.	625	345,176	77,717	445,375	131,412	131,917	3,797	156,067	18,613	443,794	99.60	1,581	—29,809	25,983	255,813
	9 mos.	625	4,844,786	666,602	5,717,373	1,124,839	1,117,266	35,551	1,627,618	173,421	4,089,960	71.50	1,627,413	1,212,616	1,350,770	629,491
Belt Ry. of Chicago	Sept.	32	.....	.....	529,693	54,858	53,961	2,199	246,378	9,319	366,715	69.20	162,978	127,723	123,848	129,103
	9 mos.	32	.....	.....	4,367,086	426,007	432,661	19,229	1,963,118	87,492	2,928,507	67.10	1,438,579	1,121,749	1,219,677	1,201,541
Bessemer & Lake Erie	Sept.	225	1,829,830	36,876	1,892,209	100,265	343,447	13,399	517,791	26,364	1,008,346	53.30	883,863	864,603	963,313	432,911
	9 mos.	225	9,065,105	292,423	9,555,981	988,741	2,786,580	132,965	3,033,871	231,463	7,221,127	75.60	2,334,854	2,054,200	2,398,941	1,492,594
Bingham & Garfield	Sept.	34	28,172	.....	28,072	15,651	5,378	1,662	4,253	4,096	31,101	110.80	—3,029	—5,629	7,465	—30,778
	9 mos.	34	151,660	859	154,234	144,842	33,681	12,285	44,451	37,922	273,720	177.50	—119,486	—161,598	—65,048	—210,330
Boston & Maine	Sept.	2,287	4,043,329	2,240,317	7,072,244	1,041,400	1,612,067	49,512	3,024,860	188,001	5,954,201	84.20	1,118,043	864,875	549,650	772,803
	9 mos.	2,287	35,160,637	17,053,482	58,474,927	8,762,298	11,445,613	490,997	26,252,788	1,918,886	49,112,772	84.00	9,362,155	7,490,030	5,124,865	2,206,699
Brooklyn Eastern Dist. Term	Sept.	9	116,887	.....	124,471	5,014	13,773	73	52,325	4,245	75,431	60.60	49,040	42,828	42,828	27,480
	9 mos.	9	1,116,011	.....	1,186,194	50,840	159,241	1,394	449,002	43,054	704,021	59.40	482,173	424,211	424,211	229,879
Buffalo & Susquehanna	Sept.	253	164,410	4,280	172,415	33,612	45,809	1,774	58,194	8,452	147,841	85.70	24,574	12,996	10,644	23,699
	9 mos.	253	951,984	50,425	1,037,772	285,578	324,739	18,989	389,423	80,541	1,099,270	105.90	—61,498	—94,120	60,972	—40,934
Buffalo, Rochester & Pittsburgh	Sept.	589	1,207,726	145,654	1,432,276	275,540	675,536	18,280	640,150	42,922	1,654,931	115.50	—222,655	—257,691	—177,813	32,162
	9 mos.	589	8,470,409	1,232,515	10,247,301	1,685,824	4,135,688	167,194	4,300,237	347,318	10,656,474	104.00	—409,173	—729,193	—376,546	475,273
Canadian Pacific (Lines in Me.)	Sept.	233	108,967	27,760	152,504	30,178	33,377	4,587	80,315	3,387	151,844	99.60	660	—15,340	—19,559	—33,948
	9 mos.	233	1,510,071	301,726	1,952,722	320,861	380,131	38,889	948,103	33,658	1,721,642	88.20	231,080	87,080	—5,975	—141,155
Carolina, Clinchfield & Ohio	Sept.	295	522,494	42,166	578,914	67,992	136,564	16,073	167,704	20,850	408,904	70.60	170,010	114,905	178,807	253,088
	9 mos.	295	5,196,731	352,001	5,660,343	663,536	1,205,915	194,970	1,432,526	174,590	3,668,547	64.80	1,991,796	1,606,147	2,261,339	1,674,278
Central of Georgia	Sept.	1,920	1,438,768	430,630	2,088,289	264,304	400,000	59,559	731,376	69,972	1,529,496	73.20	558,793	444,632	474,837	249,217
	9 mos.	1,918	11,785,359	3,763,227	16,719,217	2,209,270	3,193,119	585,181	6,386,790	666,987	13,097,196	78.30	3,622,021	2,761,869	2,943,996	611,472
Central of New Jersey	Sept.	688	3,020,737	955,501	4,270,435	513,116	830,471	37,870	1,909,586	103,134	3,413,058	79.90	857,277	620,530	601,931	710,132
	9 mos.	688	25,192,424	7,338,060	34,952,975	4,117,456	9,048,872	307,838	15,284,257	936,364	29,852,129	85.40	5,100,846	2,772,143	2,449,013	5,781,293
Central Vermont	Sept.	532	469,151	122,976	658,461	85,273	93,984	16,474	326,579	19,563	542,854	82.40	115,607	98,036	61,479	97,298
	9 mos.	532	3,745,359	924,900	5,215,322	810,576	851,151	116,399	2,674,694	207,764	4,673,140	89.60	542,182	383,107	134,949	—950,274
Chesapeake & Ohio	Sept.	2,550	4,519,157	992,952	5,874,732	872,499	2,201,066	72,932	2,352,155	162,348	5,693,434	96.90	181,298	86,539	—74,853	1,386,457
	9 mos.	2,548	51,516,235	7,899,945	62,504,957	7,771,662	15,876,383	701,417	22,383,925	1,437,129	48,385,672	77.40	14,119,285	11,702,843	12,064,253	9,265,419
Chicago & Alton	Sept.	1,050	1,102,266	498,841	1,811,615	319,102	597,740	53,592	988,517	54,368	2,022,691	111.70	—211,076	—287,135	—360,458	412,189
	9 mos.	1,050	13,443,004	4,540,947	19,697,110	2,661,392	5,466,676	501,088	8,247,076	509,160	17,480,010	88.70	2,217,100	1,537,834	476,112	1,021,666
Chicago & Eastern Ill	Sept.	945	1,497,464	396,145	2,062,688	236,716	562,977	37,644	925,592	62,032	1,835,691	89.00	226,997	116,684	225,182	619,597
	9 mos.	945	12,839,735	3,403,280	17,565,066	2,122,248	4,526,741	379,568	7,498,497	588,873	15,213,147	86.60	2,351,919	1,527,970	1,460,273	1,073,575
Chicago & North Western	Sept.	8,403	9,172,705	2,385,528	13,189,311	1,754,576	2,992,533	148,724	5,627,309	308,122	10,888,021	82.60	2,301,290	1,470,428	1,174,897	2,578,140
	9 mos.	8,403	72,181,524	22,261,631	106,391,636	14,153,017	21,253,032	1,368,009	46,152,800	2,793,947	86,328,362	81.10	20,063,274	13,372,025	12,735,532	4,614,136
Chicago, Burlington & Quincy	Sept.	9,393	11,464,423	2,643,361	15,398,172	2,328,667	3,788,267	170,268	6,359,354	359,425	13,097,432	85.10	2,300,740	1,273,012	1,130,024	3,151,750
	9 mos.	9,393	85,172,533	21,229,831	117,145,301	15,772,987	24,729,975	1,721,543	45,438,928	3,143,105	91,531,737	78.10	25,613,564	17,218,753	15,890,297	21,159,587
Chicago Great Western	Sept.	1,496	1,564,834	386,576	2,137,762	339,983	505,323	58,836	920,680	50,987	1,891,385	88.50	246,377	164,396	5,143	205,478
	9 mos.	1,496	12,780,319	3,235,393	17,580,178	2,880,425	3,969,096	572,050	7,479,017	498,848	15,520,487	88.30	2,059,691	1,329,842	128,689	1,059,040

REVENUES AND EXPENSES OF RAILWAYS

Month of September and Nine Months of Calendar Year 1922—Continued

Name of road.		Average mileage operated during period	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rental 1921
Chicago, Ind. & Louisville	Sept.	654	937,802	262,115	1,347,675	138,788	296,166	32,224	530,134	33,023	1,046,825	77.70	300,850	239,889	[illegible]	[illegible]
	9 mos.	654	8,202,237	2,273,070	11,587,330	1,239,043	2,519,899	292,912	4,391,523	315,041	8,884,800	76.70	2,702,530	2,134,716	[illegible]	497,574
Chicago, Milwaukee & St. Paul	Sept.	11,030	10,650,438	2,239,761	14,421,141	1,957,446	2,800,147	177,827	6,286,120	294,050	11,592,955	80.40	[illegible]	1,977,888	1,564,107	[illegible]
	9 mos.	11,030	82,189,764	18,211,941	112,545,176	15,094,135	25,322,987	1,667,738	48,324,183	2,870,002	93,858,687	83.40	18,686,489	[illegible]	[illegible]	[illegible]
Chicago, Peoria & St. Louis	Sept.	246	103,560	15,494	130,169	21,239	21,575	4,362	78,934	10,962	137,072	105.30	—6,903	[illegible]	[illegible]	—15,731
	9 mos.	246	1,299,605	165,897	1,569,610	255,547	306,420	39,679	930,393	95,001	1,627,040	103.70	—57,430	[illegible]	—361,275	[illegible]
Chicago River & Indiana	Sept.	38	....	.....	540,474	62,586	70,463	723	215,387	11,175	360,333	66.67	180,141	[illegible]	[illegible]	[illegible]
	9 mos.	38	....	.....	2,458,331	264,052	262,506	3,031	961,510	40,599	1,531,698	62.31	926,633	740,651	[illegible]	[illegible]
Chicago, Rock Isl. & Pac.	Sept.	7,661	7,387,249	2,447,150	10,689,360	[illegible]	2,267,483	[illegible]	4,445,692	235,757	8,409,465	78.70	[illegible]	[illegible]	[illegible]	[illegible]
	9 mos.	7,661	66,951,926	20,009,864	87,592,818	10,992,477	18,268,979	1,599,426	37,179,131	2,066,607	70,538,014	80.50	17,054,804	[illegible]	[illegible]	[illegible]
Chic., Rock Isl. & Gulf	Sept.	461	407,011	82,281	524,574	91,390	70,627	12,717	218,230	12,943	405,970	77.40	118,604	[illegible]	[illegible]	[illegible]
	9 mos.	461	3,251,503	700,083	4,307,758	643,307	660,624	120,455	1,823,786	123,305	3,477,945	80.70	829,813	[illegible]	[illegible]	[illegible]
Chic., St. Paul, Minn. & Omaha	Sept.	1,749	1,788,123	518,952	2,497,933	365,191	471,758	33,750	1,063,278	69,092	2,012,291	80.60	[illegible]	[illegible]	[illegible]	[illegible]
	9 mos.	1,749	[illegible]	4,597,102	20,608,862	2,662,148	3,576,867	300,610	9,297,771	644,110	16,566,046	80.40	4,042,816	[illegible]	[illegible]	[illegible]
Cincin., Indianapolis & Western	....	347	283,598	41,871	348,541	50,900	75,117	10,355	140,868	19,148	296,475	85.00	[illegible]	[illegible]	[illegible]	[illegible]
	9 mos.	347	[illegible]	417,672	3,078,002	403,449	657,077	99,706	1,349,143	176,073	2,704,043	87.90	373,959	[illegible]	36,211	[illegible]
Colorado & Southern	Sept.	1,099	907,985	203,345	1,198,658	208,614	281,588	16,769	446,790	42,268	1,005,510	83.90	[illegible]	[illegible]	[illegible]	[illegible]
	9 mos.	1,099	7,349,657	1,556,745	9,618,461	1,405,740	2,015,516	123,944	3,540,384	394,001	7,553,496	78.50	[illegible]	1,463,770	[illegible]	[illegible]
Ft. Worth & Denver City	Sept.	456	593,524	216,527	865,463	82,790	233,922	9,449	274,412	32,904	641,958	74.20	223,505	[illegible]	[illegible]	151,573
	9 mos.	456	4,777,370	1,688,939	6,895,511	581,022	1,318,661	104,373	2,225,873	318,225	4,593,847	66.60	2,301,663	[illegible]	[illegible]	[illegible]
Wichita Valley	Sept.	256	86,553	25,524	121,542	19,900	14,839	44	47,623	1,360	83,603	68.80	[illegible]	[illegible]	[illegible]	[illegible]
	9 mos.	256	616,916	199,674	882,182	180,272	75,440	398	377,372	12,939	643,850	72.90	[illegible]	[illegible]	78,678	[illegible]
Columbus & Greenville	Sept.	167	100,480	32,796	140,774	31,582	11,980	2,428	43,423	8,308	97,730	69.40	43,044	[illegible]	[illegible]	[illegible]
	9 mos.	199	818,737	250,322	1,124,470	259,179	105,232	29,192	412,143	77,417	883,310	78.50	241,160	[illegible]	[illegible]	[illegible]
Delaware & Hudson	Sept.	887	2,241,738	474,423	2,971,904	351,973	1,165,990	52,694	1,283,651	147,524	3,031,411	102.00	—59,507	—145,197	[illegible]	[illegible]
	9 mos.	887	20,964,792	2,966,803	26,459,641	4,065,635	7,655,503	399,375	11,126,901	1,318,018	24,996,294	94.50	1,463,347	683,808	[illegible]	[illegible]
Delaware, Lack. & Western	Sept.	994	4,403,345	1,371,009	6,564,549	711,462	2,002,800	113,778	3,055,744	152,825	6,090,514	92.80	474,035	[illegible]	[illegible]	[illegible]
	9 mos.	994	36,537,496	10,530,749	53,770,523	[illegible]	12,454,417	1,025,193	[illegible]	1,420,385	45,531,748	84.70	[illegible]	[illegible]	[illegible]	[illegible]
Denver & Rio Grande Western	Sept.	2,593	2,515,575	551,567	3,328,741	548,596	713,430	46,105	1,148,154	76,785	2,585,652	77.70	743,089	575,840	[illegible]	[illegible]
	9 mos.	2,593	17,623,136	4,317,300	23,820,965	3,619,667	4,620,043	408,332	7,910,660	746,737	17,747,636	74.50	6,073,329	4,631,890	[illegible]	2,316,651
Denver & Salt Lake	Sept.	255	141,428	24,289	179,737	66,215	59,759	1,247	50,230	5,987	[illegible]	107.10	—12,701	—21,701	—19,049	31,478
	9 mos.	255	713,851	156,746	945,214	384,000	265,191	8,944	336,148	53,880	1,048,163	110.50	—102,949	—183,979	[illegible]	[illegible]
Detroit & Mackinac	Sept.	285	146,276	31,785	192,398	17,258	47,799	1,524	58,255	8,504	133,277	69.30	59,121	48,713	47,513	[illegible]
	9 mos.	385	1,014,864	269,601	1,390,338	224,708	456,056	20,489	524,955	51,488	1,276,868	91.80	113,470	20,704	[illegible]	42,331
Detroit & Toledo Shore Line	Sept.	61	289,874	....	293,483	32,503	28,154	2,205	95,162	7,479	165,503	56.30	127,980	100,993	[illegible]	89,979
	9 mos.	61	2,566,290	....	2,590,833	252,209	194,918	20,448	725,697	64,922	1,258,194	48.60	1,332,639	[illegible]	[illegible]	[illegible]
Detroit, Toledo & Ironton	Sept.	454	640,085	11,840	666,139	262,919	271,580	7,101	322,607	22,989	887,196	133.20	[illegible]	[illegible]	[illegible]	—91,761
	9 mos.	454	6,493,788	93,479	6,687,749	1,283,395	1,657,713	52,874	2,385,446	178,747	5,557,756	83.10	1,129,993	1,016,301	[illegible]	[illegible]
Duluth & Iron Range	Sept.	278	732,919	17,394	811,117	121,665	130,470	1,809	211,825	21,002	487,270	60.10	323,847	264,156	[illegible]	[illegible]
	9 mos.	281	5,018,167	145,270	5,584,337	870,610	884,651	11,356	1,517,283	159,328	3,445,429	61.70	2,138,908	1,745,042	[illegible]	[illegible]
Duluth, Miss. & Northern	Sept.	307	1,954,223	35,840	2,160,036	198,095	211,929	2,948	406,626	19,084	840,355	38.90	1,319,681	[illegible]	[illegible]	1,243,773
	9 mos.	306	10,704,451	341,830	11,912,194	1,899,381	1,305,039	28,668	2,555,646	177,971	[illegible]	46.90	6,329,996	[illegible]	5,153,612	[illegible]
Duluth, South Shore & Atlantic	Sept.	591	250,197	100,437	398,516	65,122	25,459	6,424	187,762	11,567	301,561	75.70	96,955	63,953	57,725	[illegible]
	9 mos.	591	2,117,964	790,070	3,237,120	573,538	488,278	59,175	1,658,380	101,594	2,928,801	90.50	308,319	23,047	15,023	[illegible]
Duluth, Winnipeg & Pacific	Sept.	178	136,338	22,535	162,576	32,767	44,058	3,360	71,532	5,003	157,620	97.00	4,956	[illegible]	[illegible]	[illegible]
	9 mos.	178	1,242,332	182,149	1,471,710	271,555	375,320	38,395	657,623	49,105	1,391,974	94.60	79,136	[illegible]	[illegible]	[illegible]
Elgin, Joliet & Eastern	Sept.	459	1,541,908	5	1,707,341	193,998	295,114	11,253	573,205	34,497	1,107,394	64.90	599,947	511,613	[illegible]	169,194
	9 mos.	459	13,402,303	40	15,044,516	1,328,535	2,690,048	109,520	4,865,305	306,284	9,297,090	61.80	5,747,426	4,959,765	[illegible]	[illegible]
El Paso & Southwestern	Sept.	1,139	757,783	151,809	964,070	158,420	141,883	26,241	234,581	65,334	[illegible]	65.80	329,246	258,741	[illegible]	[illegible]
	9 mos.	1,139	6,393,046	1,431,872	8,348,969	1,384,295	1,295,915	251,337	2,176,431	443,322	5,622,703	67.30	2,726,266	1,886,468	[illegible]	[illegible]
Erie	Sept.	2,039	5,543,722	1,137,781	7,380,297	1,206,370	3,118,756	130,479	3,971,411	284,462	8,761,508	118.70	—1,381,211	—1,676,119	[illegible]	[illegible]
	9 mos.	2,039	50,434,737	10,051,433	66,083,455	8,065,034	21,539,079	1,210,067	30,987,274	2,555,721	64,742,392	98.00	1,341,063	—1,149,941	[illegible]	[illegible]
Chicago & Erie	Sept.	269	770,804	71,172	897,748	153,251	218,364	17,110	414,295	30,738	833,030	92.80	64,718	9,715	[illegible]	[illegible]
	9 mos.	269	7,002,533	538,008	8,118,388	983,894	1,414,712	174,015	3,595,414	304,153	6,472,707	79.70	1,645,681	[illegible]	1,358,154	[illegible]
New Jersey & New York	Sept.	45	16,150	105,498	126,906	18,514	30,388	1,235	74,340	4,193	128,670	161.30	—1,764	—4,764	[illegible]	—6,474
	9 mos.	45	165,677	908,569	1,118,687	441,241	186,523	11,935	628,746	30,677	999,119	89.30	119,568	[illegible]	—140,449	—115,047
N. Y., Susq. & Western	Sept.	135	224,199	63,093	325,747	46,849	69,754	3,411	231,343	11,081	362,435	111.30	—36,688	[illegible]	—72,979	[illegible]
	9 mos.	135	2,065,679	554,711	2,933,026	418,153	539,038	31,904	1,797,843	80,507	2,876,568	98.10	56,458	—171,496	[illegible]	[illegible]
Florida East Coast	Sept.	764	482,135	177,912	758,584	210,870	240,461	13,667	288,447	34,903	793,516	104.60	—34,952	110,465	135,245	[illegible]
	9 mos.	764	6,044,246	2,948,600	10,213,238	1,641,925	1,767,612	119,448	3,166,161	252,519	7,037,463	68.90	3,175,775	[illegible]	[illegible]	[illegible]
Ft. Smith & Western	Sept.	219	119,706	27,585	156,980	28,466	22,968	4,871	49,125	6,638	112,651	71.90	44,329	37,903	8,018	[illegible]
	9 mos.	249	883,895	208,223	1,174,984	232,832	214,213	43,036	414,617	61,792	973,851	82.90	201,133	147,413	71,440	[illegible]
Galveston Wharf	Sept.	13	....	....	142,157	32,490	2,875	613	31,934	9,865	93,756	66.00	48,401	30,769	30,731	[illegible]
	9 mos.	13	....	....	1,071,982	440,343	33,312	6,933	250,224	36,856	919,198	85.70	152,784	—1,362	74	[illegible]
Georgia	Sept.	328	313,266	110,451	456,034	41,471	91,457	21,284	218,559	18,437	391,436	85.80	64,598	57,490	56,437	[illegible]
	9 mos.	328	2,515,605	889,338	3,684,841	365,991	644,552	177,590	1,789,907	172,735	3,152,692	85.60	532,149	463,755	476,802	72,187
Georgia & Florida	Sept.	405	89,006	16,312	112,410	15,420	16,019	7,492	40,711	5,868	85,722	76.30	26,688	20,413	16,437	—2,092
	9 mos.	405	799,285	116,057	982,857	150,600	152,134	73,007	391,836	57,083	826,584	84.10	156,273	99,462	38,133	—188,177

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF SEPTEMPER AND NINE MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues			Operating expenses					Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
			Freight.	Passenger.	Total (inc. misc.)	Maintenance of—Way and structures.	Maintenance of—Equipment.	Traffic.	Transportation.	General.	Total.				
Grand Trunk Western	Sept.	347	1,172,617	190,916	1,444,764	171,617	347,904	247,859	4,847,374	449,011	9,419,006	77.80	2,686,409	2,071,006	475,562	—853,297
	9 mos.	347	9,963,661	1,447,307	12,105,415	1,198,535	2,620,449	556	97,452	12,266	227,188	103.30	—7,282	—24,182	—73,629	—202,252
Atlantic & St. Laurence	Sept.	166	143,249	54,421	219,906	85,093	30,776	43,201	1,081,984	107,870	2,063,411	102.30	—45,867	—201,184	—753,854	—1,116,036
	9 mos.	166	1,497,163	353,576	2,017,544	524,547	289,238	3,280	71,008	3,387	115,174	85.10	20,112	8,801	—2,084	6,206
Chic., Det. & Can. Gr. Tr. Jct.	Sept.	59	116,244	6,786	135,286	22,263	15,268	31,510	594,519	31,976	895,327	55.00	733,517	643,979	482,919	198,181
	9 mos.	59	1,410,208	78,010	1,628,844	125,092	112,365	7,799	222,718	15,827	371,338	91.00	36,732	33,004	—16,573	—130,753
Det., Gr. Haven & Milwaukee	Sept.	189	353,153	17,687	408,070	65,332	59,599	77,411	1,896,924	145,404	2,965,215	77.06	885,972	835,692	261,639	—541,673
	9 mos.	189	3,243,144	334,041	3,851,187	425,518	423,354	127,063	4,287,015	187,195	8,513,250	76.10	2,666,889	1,823,783	1,836,120	3,218,755
Great Northern	Sept.	8,235	8,789,972	1,402,606	11,180,139	1,208,872	2,682,781	1,236,383	29,508,053	1,878,785	57,353,743	78.80	15,456,331	9,449,381	10,084,242	4,212,635
	9 mos.	8,262	54,258,092	11,133,461	72,810,074	9,989,573	14,307,141	2,447	42,577	2,183	84,554	80.20	20,796	12,485	9,268	11,673
Green Bay & Western	Sept.	262	84,044	12,310	105,350	20,450	16,746	21,635	387,098	23,537	770,233	76.10	241,023	168,712	130,923	97,095
	9 mos.	262	792,715	143,170	1,011,256	193,033	145,002	25,832	239,588	32,176	553,272	63.40	319,146	279,471	285,812	343,036
Gulf Coast Lines	Sept.		637,851	166,799	872,418	137,283	119,616	237,845	2,109,988	314,314	5,160,741	67.40	2,462,862	2,118,449	2,023,354	2,493,206
	9 mos.		5,711,238	1,405,199	7,623,603	1,228,504	1,181,089	7,102	80,799	11,683	189,615	70.90	77,801	59,897	59,187	43,008
Gulf & Ship Island	Sept.	307	211,132	40,409	267,416	48,016	41,710	68,685	675,781	103,995	1,580,445	71.30	635,800	474,142	433,275	155,975
	9 mos.	307	1,727,924	351,132	2,216,245	393,890	334,963	14,155	114,371	14,618	268,722	74.90	90,053	52,908	46,427	27,276
Gulf, Mobile & Northern	Sept.	436	312,760	30,852	358,775	51,223	74,355	125,179	1,123,637	138,444	2,414,484	73.80	855,903	665,483	546,809	—35,917
	9 mos.	436	2,831,232	303,618	3,270,387	488,510	547,980	10,770	467,681	29,682	1,141,502	84.30	213,370	127,452	147,257	296,942
Hocking Valley	Sept.	348	1,144,970	100,800	1,354,872	134,466	499,126	103,900	3,331,029	277,659	7,108,947	73.50	2,561,948	1,758,309	1,854,329	313,952
	9 mos.	348	8,048,789	779,624	9,670,895	990,225	2,416,767	180,299	5,175,157	283,896	11,292,937	76.80	3,417,412	2,459,669	2,480,288	1,490,926
Illinois Central	Sept.	4,784	11,674,276	2,118,524	14,710,349	2,066,057	3,545,201	1,669,075	40,348,099	2,743,420	84,841,304	76.80	25,586,704	17,218,620	17,623,366	13,685,148
	9 mos.	4,784	85,066,454	17,610,585	110,428,008	14,347,951	25,355,262	24,841	640,040	45,321	1,515,792	82.40	324,405	206,494	196,724	113,960
Yazoo & Miss. Valley	Sept.	1,380	1,387,817	343,409	1,840,197	437,531	365,206	232,172	5,537,859	436,891	12,145,378	89.40	1,443,265	378,613	348,298	135,516
	9 mos.	1,381	9,924,067	2,829,902	13,588,643	3,207,117	2,742,282	26,148	564,658	45,488	1,137,306	76.20	357,063	322,483	245,483	75,457
International & Gr. Northern	Sept.	1,159	1,163,930	218,117	1,494,369	225,817	271,451	238,121	4,538,297	422,172	8,598,130	83.00	1,764,444	1,457,609	988,747	—214,549
	9 mos.	1,159	7,435,378	1,844,021	10,362,574	1,520,513	1,828,716	4,693	54,541	5,504	108,621	93.50	7,565	—755	—3,749	—5,361
Kans. City, Mexico & Orient	Sept.	272	99,404	9,117	116,186	28,171	15,803	41,954	539,031	56,635	1,077,422	107.00	—70,499	—143,457	—149,469	—25,245
	9 mos.	272	839,858	93,200	1,007,013	228,654	211,148	5,210	58,801	8,295	109,553	97.20	3,099	—3,381	—20,044	—30,375
Kans. City, Mex. & Orient of Tex	Sept.	465	92,921	12,546	112,652	21,092	16,155	42,394	644,929	60,101	1,238,908	114.70	—158,459	—213,265	—343,368	—538,696
	9 mos.	465	917,636	96,823	1,080,449	218,959	272,525	37,137	545,989	61,794	1,218,049	76.60	372,290	231,051	231,971	332,718
Kansas City Southern	Sept.	767	1,363,730	170,688	1,590,829	199,574	174,095	327,033	4,756,954	608,996	10,085,476	76.30	3,125,450	2,253,965	2,103,847	3,189,419
	9 mos.	767	10,496,570	1,491,361	13,210,926	1,730,733	2,667,858	4,930	51,058	8,248	101,636	53.10	89,595	78,676	62,778	50,264
Texarkana & Ft. Smith	Sept.	81	160,842	13,699	191,231	16,359	21,044	46,467	450,973	77,864	907,999	59.90	606,940	510,991	364,570	311,739
	9 mos.	81	1,255,934	129,172	1,514,939	158,559	175,071	5,388	85,075	10,637	170,495	64.40	94,072	84,492	66,822	11,308
Kans., Okla. & Gulf	Sept.	314	241,964	11,955	264,567	47,764	21,397	49,079	749,844	90,793	1,499,579	71.80	587,616	498,979	385,683	—86,008
	9 mos.	314	1,894,938	109,441	2,087,195	399,151	209,153	284	36,647	2,462	72,933	45.10	88,806	83,320	87,129	51,594
Lake Superior & Ishpeming	Sept.	33	136,286	56	161,739	23,125	10,415	1,978	195,110	23,223	489,644	54.60	407,821	357,035	367,559	—200,182
	9 mos.	33	751,881	604	897,465	184,278	85,055	.....	53,973	1,875	76,116	113.20	—8,853	—12,994	—5,626	18,775
Lake Terminal	Sept.	13	.....	.....	67,263	7,720	12,547	.....	392,057	14,837	578,398	74.20	200,590	150,053	219,454	71,471
	9 mos.	13	.....	.....	778,988	82,002	89,502	1,410	104,697	8,215	172,796	93.00	12,907	729	—10,401	27,234
Lehigh & Hudson River	Sept.	96	170,707	4,071	185,703	23,680	34,794	13,215	775,327	69,581	1,407,529	83.30	282,106	160,884	11,912	316,237
	9 mos.	96	1,561,613	35,358	1,689,635	241,044	310,407	6,498	150,040	14,606	222,607	72.80	105,319	98,694	91,959	140,154
Lehigh & New England	Sept.	235	378,684	1,735	387,946	61,340	50,123	86,898	1,090,424	144,274	2,668,380	92.60	213,290	130,484	203,239	771,776
	9 mos.	236	2,799,209	17,006	2,881,670	491,839	855,643	24,130	526,326	50,429	1,126,542	78.00	318,222	240,939	141,887	—97,257
Lehigh Valley	Sept.	1,335	4,518,596	729,119	5,656,065	727,977	2,117,236	100,192	2,669,215	60,681	5,762,220	100.80	—46,135	—121,648	—295,976	1,571,287
	9 mos.	1,334	37,054,467	5,339,475	45,833,132	5,386,797	13,982,181	948,545	21,225,256	1,136,892	42,895,218	93.60	2,937,914	1,269,263	740,832	2,713,299
Los Angeles & Salt Lake	Sept.	1,137	1,023,660	476,462	1,634,700	349,473	421,165	40,926	546,839	41,240	1,452,167	88.80	182,533	70,070	38,396	72,588
	9 mos.	1,140	8,082,238	3,917,214	14,253,008	2,992,050	3,166,077	423,166	4,697,069	382,544	12,076,857	84.70	2,176,151	1,177,599	830,492	896,300
Louisiana & Arkansas	Sept.	302	201,212	27,784	237,253	51,849	30,358	7,650	78,036	8,907	176,404	74.40	60,849	38,281	41,435	81,147
	9 mos.	302	2,085,776	290,916	2,443,655	479,328	339,014	68,632	751,305	74,567	1,748,241	69.90	735,414	541,299	531,765	260,063
Louisiana Ry. & Nav. Co.	Sept.	343	274,893	33,604	323,197	75,234	39,237	10,077	110,329	10,893	248,845	76.90	77,352	61,046	29,147	71,916
	9 mos.	343	2,090,820	274,799	2,491,775	577,983	356,058	93,282	983,975	103,692	2,113,938	84.80	377,817	231,080	5,781	275,531
Louisville & Nashville	Sept.	5,038	6,813,236	2,048,082	9,534,463	1,405,797	2,649,936	208,473	3,689,029	202,528	8,241,409	86.00	1,333,054	1,036,229	1,279,741	1,479,048
	9 mos.	5,038	67,793,397	16,648,465	90,134,839	12,901,714	22,724,386	1,908,963	34,286,114	2,034,357	74,234,359	82.40	15,900,480	12,504,423	12,963,167	991,293
Louisville, Henderson & St. Louis	Sept.	199	196,185	56,847	311,723	74,458	19,370	5,836	91,273	8,028	158,965	63.80	112,758	50,077	78,170	50,053
	9 mos.	199	1,708,209	531,507	2,424,134	481,086	297,881	55,655	818,436	74,403	1,727,461	71.30	696,673	576,033	442,487	197,291
Maine Central	Sept.	1,194	1,157,842	463,735	1,762,208	278,113	298,063	14,128	771,331	47,768	1,415,233	80.30	346,975	259,314	280,782	215,088
	9 mos.	1,194	10,577,142	3,533,821	15,269,304	2,460,832	2,864,580	121,708	6,666,842	421,282	12,562,205	82.30	2,707,099	1,848,235	1,868,545	—467,530
Midland Valley	Sept.	383	317,250	74,790	408,462	80,298	45,000	5,181	116,885	14,243	261,563	64.00	146,899	130,115	120,020	103,527
	9 mos.	383	2,626,375	629,966	3,402,646	515,765	403,871	43,731	1,019,001	133,485	2,107,297	61.90	1,295,349	1,163,240	1,069,101	529,958
Minneapolis & St. Louis	Sept.	1,649	1,115,569	156,211	1,344,801	177,842	222,822	23,014	672,241	37,308	1,132,707	84.20	212,093	137,084	101,315	119,803
	9 mos.	1,649	9,286,297	1,377,566	11,285,759	1,586,412	1,991,158	213,352	5,355,869	353,926	9,498,677	84.20	1,787,081	1,184,599	719,466	—438,057
Minn., St. Paul & S. Ste. Marie	Sept.	4,383	4,117,794	724,370	5,253,092	621,457	662,028	64,044	1,904,548	108,142	3,382,115	64.40	1,870,977	1,622,373	1,562,179	808,304
	9 mos.	4,383	24,667,210	5,503,369	33,296,947	4,926,611	5,205,941	550,584	14,032,165	934,141	25,751,191	77.30	7,545,756	5,268,487	4,894,260	—1,484,180
Mississippi Central	Sept.	258	106,804	18,171	130,588	23,008	24,090	5,899	44,945	6,554	104,496	80.00	26,092	19,847	25,098	12,512
	9 mos.	259	902,674	148,198	1,095,791	174,046	278,434	51,441	383,254	62,775	949,944	86.70	145,847	89,611	101,824	—99,342
Missouri & North Arkansas	Sept.	344	80,254	16,289	102,498	8,705	8,568	1,519	49,935	2,261	70,988	69.20	31,510	29,679	16,237	.....
	9 mos.	304	270,625	68,583	362,978	33,406	44,799	8,187	202,904	16,206	305,502	84.10	57,476	52,289	—65	.....

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Missouri, Kansas & Texas	Sept.	1,670	2,095,649	452,153	2,780,639	355,069	666,450	47,033	912,950	75,804	2,065,418	74.30	715,221	572,483	632,264	720,080
	9 mos.	1,670	16,428,662	4,198,029	22,720,719	2,474,325	4,519,746	417,553	6,833,353	801,909	15,109,330	66.50	7,611,389	6,111,659	6,593,342	4,490,887
Mo., Kans. & Tex. of Texas	Sept.	1,737	1,370,475	419,167	1,915,971	321,128	464,071	36,885	734,717	61,704	1,626,662	85.40	279,309	—24,896	—9,494	145,012
	9 mos.	1,737	10,046,401	3,744,267	15,138,428	2,478,936	2,427,142	362,726	6,077,952	670,608	11,998,356	79.30	3,140,072	2,067,674	1,041,057	1,077,038
Wichita Falls & Northwestern	Sept.	329	102,845	21,201	134,313	30,690	10,742	864	47,770	7,826	97,597	72.70	36,716	—5,873	—1,624	64,923
	9 mos.	329	820,115	201,077	1,107,565	250,343	152,568	8,288	471,243	76,288	955,742	86.30	151,823	46,003	—119,119	432,576
Missouri Pacific	Sept.	7,149	5,859,851	1,319,136	8,049,230	1,510,096	1,677,158	138,890	3,699,156	241,970	7,294,410	90.60	754,820	400,567	79,734	1,821,022
	9 mos.	7,299	54,203,369	12,370,097	73,122,930	12,900,121	14,766,449	1,384,996	30,017,867	2,332,036	61,642,204	84.30	11,480,726	8,194,474	5,344,679	7,066,544
Mobile & Ohio	Sept.	1,165	1,328,933	150,827	1,564,115	193,462	387,434	31,960	572,888	44,612	1,231,038	78.70	333,077	278,980	199,006	403,076
	9 mos.	1,165	10,874,447	1,274,764	12,817,557	1,568,867	2,654,590	387,686	4,958,639	425,675	10,004,115	78.00	2,813,442	2,304,656	1,806,300	517,908
Monongahela	Sept.	106	349,807	41,592	399,645	52,250	83,921	1,185	119,033	8,912	265,301	66.40	134,344	126,344	64,504	148,008
	9 mos.	106	2,201,544	274,347	2,518,106	360,126	428,553	12,071	720,824	83,951	1,606,525	63.80	911,581	839,417	499,103	228,697
Monongahela Connecting	Sept.	7	.....	.....	126,144	30,051	26,671	506	72,265	4,781	134,274	111.80	—14,130	—16,165	—2,645	—16,664
	9 mos.	7	.....	.....	1,181,981	160,521	215,223	4,731	550,388	64,103	994,966	84.20	187,015	167,683	188,862	—92,800
Montour	Sept.	56	208,738	520	209,181	27,458	27,806	1,254	30,145	5,862	92,525	44.20	116,656	114,798	115,750	162
	9 mos.	56	581,811	6,479	596,269	159,894	224,045	9,059	164,299	54,862	612,159	102.70	—15,890	—5,271	38,180	161,198
Nashville, Chatt. & St. Louis	Sept.	1,258	1,482,209	456,639	2,038,629	272,188	546,155	67,004	564,067	56,596	1,810,759	88.80	227,870	191,919	186,784	408,840
	9 mos.	1,258	11,521,148	3,441,464	16,126,717	2,514,206	4,145,062	615,590	6,399,387	517,343	14,224,791	88.20	1,903,926	1,573,161	1,893,277	844,525
Nevada Northern	Sept.	165	65,312	5,421	74,343	12,650	4,882	453	11,817	2,595	32,397	43.60	41,946	35,496	34,809	—4,262
	9 mos.	165	312,792	38,742	387,235	87,997	35,165	3,892	75,363	26,079	228,496	59.00	158,739	102,133	11,941	—94,058
Newburgh & South Shore	Sept.	7	.....	.....	131,441	17,681	38,159	.....	57,692	3,560	117,092	89.10	14,349	2,674	10,330	17,255
	9 mos.	7	.....	.....	1,416,014	101,507	324,595	.....	557,351	32,491	1,015,944	71.70	400,070	287,101	264,195	38,916
New Orleans Great Northern	Sept.	274	145,542	33,565	189,024	28,924	20,444	4,970	65,965	9,426	130,328	68.95	58,696	43,633	45,936	16,970
	9 mos.	274	1,477,247	320,338	1,883,963	284,503	271,821	46,520	600,372	90,282	1,295,940	68.79	588,023	451,917	408,956	65,041
New York Central	Sept.	6,098	18,733,076	8,555,428	31,111,393	3,221,924	9,310,269	310,181	12,553,901	753,656	26,519,621	85.20	4,591,772	3,001,809	3,111,204	5,428,413
	9 mos.	6,098	148,312,248	67,888,474	246,552,435	28,370,672	64,320,206	2,849,257	92,404,425	6,813,662	197,792,117	80.20	48,760,318	34,108,184	35,657,023	32,817,360
Cincinnati Northern	Sept.	244	213,558	14,864	235,554	52,236	42,031	5,974	81,690	6,592	191,222	82.50	41,332	29,662	10,633	115,897
	9 mos.	244	2,235,063	138,354	2,442,257	515,715	466,641	45,857	847,196	73,244	1,944,178	79.00	498,079	360,006	171,083	595,682
Cleve., Cin., Chic. & St. Louis	Sept.	2,406	5,193,381	1,440,172	7,200,006	873,239	2,340,696	101,442	2,880,881	168,834	6,424,849	85.20	775,157	482,114	198,597	1,778,356
	9 mos.	2,410	44,480,356	12,125,603	61,379,687	7,116,498	12,728,194	1,005,836	23,416,048	1,542,728	46,266,419	75.40	15,113,268	11,605,588	10,215,491	5,174,399
Indiana Harbor Belt	Sept.	119	.....	.....	998,465	139,804	142,912	4,256	417,573	21,083	725,628	72.70	272,837	240,858	111,356	131,183
	9 mos.	119	.....	.....	7,303,536	905,954	798,524	37,323	2,852,671	173,558	4,768,030	65.30	2,535,506	2,192,426	1,446,591	161,670
Kanawha & Michigan	Sept.	176	386,395	46,897	448,560	—1,869	186,190	1,450	176,594	4,339	366,704	81.80	81,856	55,979	63,012	60,107
	9 mos.	176	2,057,089	396,801	2,577,481	500,692	1,048,912	37,088	1,076,637	92,015	2,754,907	106.90	—177,426	—418,721	—334,837	284,852
Lake Erie & Western	Sept.	Included in New York, Chicago & St. Louis.														
	9 mos.															
Michigan Central	Sept.	1,862	5,003,315	1,815,670	7,578,188	821,296	1,797,561	84,054	250,183	133,970	5,417,208	71.50	2,160,980	1,700,132	1,627,211	2,035,993
	9 mos.	1,862	39,339,770	14,239,929	59,354,546	6,245,824	12,801,769	814,728	20,739,363	1,272,579	42,501,173	71.60	16,853,373	13,313,918	12,483,297	9,814,582
Pittsburgh & Lake Erie	Sept.	227	2,666,832	259,456	3,026,790	311,482	716,001	18,181	1,080,006	59,455	2,187,852	72.30	838,938	676,533	841,513	—82,697
	9 mos.	227	16,217,147	2,032,843	18,919,524	2,414,790	7,895,073	182,289	6,780,749	554,592	17,847,193	94.30	1,072,331	329,109	1,368,264	1,289,730
Toledo & Ohio Central	Sept.	503	1,224,167	70,359	1,365,296	146,712	390,336	11,109	541,035	30,642	1,122,176	82.20	243,120	192,598	202,769	155,799
	9 mos.	503	3,213,614	569,151	6,097,593	1,139,257	2,036,458	100,834	2,825,979	237,385	6,365,381	104.40	—267,788	—747,656	—634,425	928,293
New York, Chicago & St. Louis	Sept.	1,242	2,987,110	170,656	3,283,203	456,473	717,897	77,283	1,327,321	117,136	2,704,517	82.40	578,686	361,401	339,370	488,180
	9 mos.	1,242	26,419,149	1,323,558	28,640,024	3,579,915	5,532,592	693,062	10,817,859	1,014,594	21,691,911	75.70	6,948,113	5,349,018	5,125,893	3,129,581
N. Y., New Haven & Hartford	Sept.	1,985	5,164,675	4,674,746	11,086,238	1,449,876	2,509,309	58,815	4,509,832	256,352	8,958,191	80.80	2,128,047	1,766,678	1,245,279	668,491
	9 mos.	1,986	43,345,111	36,581,836	89,944,465	12,583,755	18,737,888	495,150	36,783,875	2,549,255	72,533,404	80.60	17,411,061	13,957,183	9,860,468	3,019,179
Central New England	Sept.	295	458,511	18,988	503,726	160,540	110,011	4,354	201,485	10,860	487,250	96.70	16,476	—5,605	—12,058	156,285
	9 mos.	295	4,452,842	172,948	4,869,980	1,077,209	770,313	38,140	1,776,714	101,458	3,762,910	77.36	1,107,070	904,503	551,380	871,925
New York, Ontario & Western	Sept.	569	729,276	291,892	1,182,769	176,271	234,012	17,680	552,767	29,549	1,010,662	85.40	172,107	147,021	117,906	162,546
	9 mos.	569	4,973,448	2,684,881	9,193,954	1,297,588	1,613,665	138,873	4,331,366	267,854	7,665,739	83.40	1,528,215	1,210,945	836,335	1,161,868
Norfolk & Western	Sept.	2,237	6,665,744	881,898	7,857,559	1,163,809	2,399,165	77,710	2,662,388	146,034	6,465,496	82.30	1,392,063	791,606	875,727	1,443,300
	9 mos.	2,237	60,225,342	6,692,861	69,335,378	9,031,521	15,916,555	705,278	21,001,504	1,324,698	48,082,591	69.30	21,252,787	16,595,055	18,191,494	8,796,765
Norfolk Southern	Sept.	930	501,352	125,915	664,373	102,384	110,654	21,215	262,640	24,861	522,530	78.60	141,843	109,523	84,552	89,280
	9 mos.	930	4,698,689	1,097,329	6,122,293	913,643	976,255	196,879	2,560,411	268,104	4,911,399	80.26	1,210,894	933,042	720,330	391,464
Northern Pacific	Sept.	6,630	7,616,269	1,408,475	9,846,468	1,097,429	2,494,007	117,432	3,359,759	193,775	7,354,367	74.70	2,492,101	1,767,011	2,109,089	2,455,292
	9 mos.	6,643	50,190,932	11,795,544	68,294,756	9,697,911	16,185,711	1,253,221	26,093,263	1,915,663	55,982,673	82.00	12,312,083	5,775,925	8,386,743	3,567,995
Northwestern Pacific	Sept.	496	487,737	236,893	800,169	79,748	132,250	8,644	279,537	15,358	517,200	64.60	282,969	233,810	211,465	249,418
	9 mos.	501	3,252,958	2,065,184	6,026,369	910,180	776,707	63,943	2,308,789	131,866	4,205,224	69.80	1,821,145	1,393,154	1,253,878	1,380,887
Pennsylvania	Sept.	10,381	41,348,961	14,188,331	60,712,345	7,922,936	15,060,302	537,338	25,220,294	1,267,795	50,937,018	83.90	9,775,327	6,667,838	6,298,532	3,841,895
	9 mos.	10,381	311,154,422	107,774,003	459,752,494	57,276,507	116,536,307	5,113,613	177,755,149	11,878,098	375,621,280	81.70	84,131,214	62,535,594	56,712,505	23,900,990
Balti., Chesa. & Atlantic	Sept.	87	92,615	50,840	151,126	15,234	26,320	1,452	95,677	4,135	142,818	94.50	8,308	825	—544	27,278
	9 mos.	87	807,344	366,522	1,223,742	125,935	313,413	17,326	700,480	33,856	1,191,015	97.30	32,727	—12,933	—14,138	74,022
Cumberland Valley & Mart.	Sept.	33	74,892	6,002	83,916	14,718	17,308	852	34,632	2,096	69,606	82.90	14,310	8,502	4,187	9,035
	9 mos.	33	590,554	52,958	673,596	92,476	149,667	8,016	285,026	22,447	557,632	82.80	115,964	75,757	35,960	317,682
Cin., Lebanon & Northern	Sept.	Included in Penn. R. R.														
	9 mos.															
Grand Rapids & Indiana	Sept.	Included in Penn. R. R.														
	9 mos.															

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Long Island	Sept.	398	734,256	1,986,980	2,980,012	330,392	460,921	15,263	1,254,354	55,157	2,140,885	71.80	839,127	631,478	563,706	828,478
	9 mos.	398	6,388,479	15,121,537	23,587,475	2,457,712	3,702,946	154,341	10,065,454	510,522	17,079,810	72.40	6,507,665	5,123,334	4,523,253	2,809,181
Maryland, Del. & Va.	Sept.	82	60,869	51,525	125,510	8,385	13,384	743	84,338	2,728	109,578	87.30	15,932	13,934	12,412	5,404
	9 mos.	82	569,613	295,063	894,717	85,873	220,763	16,626	585,208	22,314	930,784	104.00	—36,067	—56,474	—67,547	—40,945
New York, Phila. & Norfolk	Sept.	122	802,826	101,636	953,337	54,140	183,367	7,089	316,609	16,252	586,848	61.60	366,489	344,727	306,863	—56,483
	9 mos.	122	4,915,351	751,434	6,120,180	512,443	1,505,754	67,909	2,800,427	131,656	5,098,079	83.30	1,022,101	831,643	602,392	—748,265
Pitts. Cin., Chic. & St. Louis	Sept.	Included in Penn. R. R.														
	9 mos.															
West Jersey & Seashore	Sept.	359	496,372	975,326	1,574,061	186,754	231,819	22,653	702,183	35,009	1,196,356	76.00	377,705	263,975	232,753	170,108
	9 mos.	359	3,675,927	6,393,592	10,890,240	1,481,187	1,887,695	152,194	4,840,094	254,408	8,730,904	80.20	2,159,336	1,340,080	1,147,507	623,348
Peoria & Pekin Union	Sept.	19	21,891	4,417	157,825	27,112	31,774	331	61,038	8,868	109,123	69.10	48,702	33,702	65,417	37,055
	9 mos.	19	121,430	35,105	1,308,999	225,927	128,291	2,150	556,991	80,872	994,231	76.00	314,768	183,268	412,241	147,140
Pere Marquette	Sept.	2,212	2,636,146	433,120	3,370,584	399,184	501,119	47,476	1,234,101	98,326	2,285,016	67.80	1,085,568	945,155	789,360	916,495
	9 mos.	2,218	21,587,701	3,815,052	27,984,584	3,351,088	5,520,884	465,915	10,614,060	935,262	20,949,528	74.90	7,035,056	5,724,512	4,610,628	4,423,661
Philadelphia & Reading	Sept.	1,196	5,479,317	893,478	6,782,686	686,640	1,339,142	65,789	2,959,324	143,881	5,209,024	76.80	1,573,662	1,424,712	1,343,941	1,648,122
	9 mos.	1,197	45,178,753	7,337,327	55,691,782	6,658,973	15,125,155	561,498	21,530,837	1,313,954	45,237,565	81.20	10,454,217	8,600,294	6,741,276	6,700,448
Atlantic City	Sept.	176	123,713	338,330	483,819	78,022	40,194	4,925	272,904	4,672	400,770	82.80	83,049	63,783	12,355	87,769
	9 mos.	176	1,107,798	2,584,250	3,799,303	547,643	336,642	58,686	2,062,425	42,861	3,046,906	80.20	752,397	473,052	216,755	297,332
Perkiomen	Sept.	41	105,365	10,143	119,851	8,887	3,980	112	39,621	878	53,515	44.70	66,336	62,380	56,728	23,160
	9 mos.	43	847,660	77,257	957,317	67,206	37,691	973	394,986	8,317	509,506	53.20	447,811	401,665	347,233	347,331
Port Reading	Sept.	21	123,460	....	149,527	9,806	2,562	229	52,837	1,310	66,744	44.60	82,783	69,850	38,841	13,697
	9 mos.	21	916,365	....	1,293,205	166,775	106,414	2,061	469,322	15,967	76,537	58.80	532,668	400,972	—13,289	101,159
Pittsburg & Shawmut	Sept.	102	80,050	4,067	88,761	23,969	26,392	2,224	41,231	5,708	99,524	112.10	—10,763	—10,894	16,603	53,617
	9 mos.	102	701,581	44,748	765,642	230,214	302,073	15,076	267,614	60,483	875,460	114.30	—109,818	118,624	4,166	130,024
Pittsburg & West Virginia	Sept.	85	215,513	9,017	251,616	39,171	56,499	3,006	72,383	11,869	193,558	76.90	58,058	23,174	95,380	—47,461
	9 mos.	85	1,701,143	79,095	2,047,543	290,198	536,930	31,609	514,912	134,100	1,590,947	77.70	456,596	212,650	567,288	—224,455
Pittsburg, Shawmut & Northern	Sept.	210	143,715	5,632	153,646	22,393	33,300	1,688	61,914	7,374	136,676	88.40	26,970	24,588	34,309	—28,009
	9 mos.	210	739,602	57,691	830,764	183,160	385,237	14,633	369,476	60,372	1,012,925	121.90	—182,161	—203,454	—202,379	—175,404
Quincy, Omaha & Kansas City	Sept.	252	93,444	23,457	128,715	30,612	20,012	938	68,551	1,964	121,913	94.70	6,802	2,877	—3,168	7,070
	9 mos.	252	547,306	212,531	822,241	268,864	134,598	7,299	409,628	20,353	838,776	102.00	—16,535	51,915	—97,851	—184,316
Richmond, Fred. & Potomac	Sept.	117	507,245	302,376	946,638	125,905	146,191	8,323	324,571	27,626	645,830	68.20	300,808	248,093	215,339	142,735
	9 mos.	117	4,162,809	2,432,215	8,084,749	978,188	1,097,997	72,941	2,794,110	242,900	5,354,476	66.20	2,730,273	2,277,310	1,873,309	901,635
Rutland	Sept.	415	264,740	165,076	538,061	108,490	92,012	8,704	218,669	12,114	441,759	82.10	96,305	74,348	81,327	100,012
	9 mos.	415	2,264,438	1,144,983	4,280,835	841,863	794,552	74,635	1,935,172	118,674	3,778,753	88.30	502,082	311,983	351,785	269,506
St. Louis San Francisco	Sept.	4,760	4,309,750	1,523,853	6,414,570	1,012,272	1,260,696	78,350	2,635,694	181,494	5,141,648	80.20	1,269,922	938,691	724,243	1,824,567
	9 mos.	4,760	40,955,676	13,558,117	58,891,289	8,714,457	11,178,436	750,497	21,804,822	1,689,804	43,916,929	74.60	14,974,360	11,961,611	11,425,141	13,420,134
Ft. Worth & Rio Grande	Sept.	215	105,134	28,557	146,292	30,309	33,148	2,675	58,713	4,956	129,744	88.70	16,548	12,880	—1,921	5,801
	9 mos.	135	622,495	258,730	974,513	369,776	208,656	24,321	455,701	50,588	1,106,752	113.60	—132,239	—165,956	—229,882	—197,850
St. Louis, San Fran. & Tex.	Sept.	134	124,263	15,037	145,094	20,160	23,288	3,820	55,034	6,481	108,757	75.00	36,337	34,299	10,705	57,781
	9 mos.	134	1,059,065	135,046	1,248,854	265,302	209,019	33,434	514,685	61,462	1,083,019	86.70	165,835	147,989	—49,271	266,898
St. Louis Southwestern	Sept.	968	1,539,811	103,973	1,690,367	228,672	216,837	37,566	489,465	49,163	1,023,788	60.60	666,579	563,621	483,391	493,385
	9 mos.	968	11,223,021	1,131,857	12,871,797	1,784,718	1,794,244	376,468	3,559,324	475,538	8,035,965	62.40	4,835,832	4,188,872	3,850,981	3,519,329
St. Louis Southwestern of Texas	Sept.	807	593,291	80,033	711,383	128,609	147,971	19,270	323,888	29,291	648,115	91.10	63,268	39,212	39,817	—18,406
	9 mos.	807	4,243,292	775,011	5,359,194	1,546,156	1,312,496	178,120	2,791,912	276,538	6,095,562	113.70	—736,368	—953,343	—891,021	—902,515
San Antonio & Aransas Pass	Sept.	739	541,119	99,056	681,127	74,161	119,804	9,524	200,378	20,902	423,964	62.20	257,233	243,476	234,542	132,195
	9 mos.	739	3,223,666	649,642	4,146,667	804,585	963,905	84,699	1,785,850	232,159	3,866,484	93.20	280,183	153,861	54,258	17,341
San Antonio, Uvalde & Gulf	Sept.	317	58,925	19,381	86,620	15,510	15,094	3,075	32,664	6,606	72,922	84.20	13,698	10,827	—1,121	2,827
	9 mos.	317	562,660	157,541	800,618	133,839	102,462	25,755	305,306	59,190	625,253	78.10	175,395	148,626	45,382	94,994
Seaboard Air Line	Sept.	3,503	3,603,259	644,580	3,700,004	409,641	795,891	109,126	1,454,652	159,434	2,950,757	79.80	749,247	574,002	320,499	408,573
	9 mos.	3,563	22,804,615	6,481,483	32,734,520	3,690,130	5,726,127	1,091,547	13,897,957	1,411,340	26,087,482	79.70	6,647,038	5,087,621	2,724,181	890,061
Southern	Sept.	6,971	6,665,003	2,600,289	10,137,296	1,407,846	1,474,433	184,022	3,984,092	287,918	7,422,894	73.20	2,714,402	2,213,327	1,569,095	2,206,959
	9 mos.	6,971	61,300,056	22,141,092	91,535,805	13,039,505	15,832,130	1,851,976	36,674,902	2,831,531	70,941,734	77.50	20,592,071	16,294,978	12,801,964	7,196,191
Alabama Great Southern	Sept.	318	325,427	145,434	517,598	87,129	65,895	16,929	234,219	20,785	420,772	81.30	96,826	63,346	50,052	84,264
	9 mos.	318	4,399,832	1,337,359	6,088,431	721,740	1,279,172	162,586	2,439,224	218,318	4,921,571	80.80	1,166,860	786,623	751,428	497,890
Cin., N. O. & Texas Pacific	Sept.	338	759,275	249,537	1,090,769	159,622	226,224	27,861	456,586	37,840	917,343	84.10	173,426	109,462	38,904	207,284
	9 mos.	338	8,840,614	2,383,959	11,828,017	1,464,026	3,128,371	255,327	4,434,736	373,853	9,739,562	82.30	2,088,465	1,446,035	1,004,454	1,406,408
Georgia, Southern & Florida	Sept.	402	189,877	97,896	317,032	64,058	52,098	7,638	144,203	14,249	284,556	89.80	32,482	11,839	2,145	29,171
	9 mos.	402	2,218,757	885,560	3,358,943	560,580	570,657	78,298	1,479,927	110,591	2,825,093	84.10	523,850	371,294	216,386	—570,567
New Orleans & Northeastern	Sept.	207	175,635	71,191	303,136	68,564	94,786	9,769	181,687	14,119	372,767	123.00	—69,631	—106,149	—99,780	—3,598
	9 mos.	207	2,747,153	687,672	3,878,183	617,184	919,653	95,207	3,864,563	151,767	3,680,540	94.90	197,643	—145,458	—209,910	—243,973
Northern Alabama	Sept.	110	111,888	12,676	128,231	16,453	6,657	1,045	56,432	2,784	83,371	65.00	44,860	40,890	9,237	—1,688
	9 mos.	110	862,600	103,497	989,973	159,682	51,960	11,417	395,211	26,620	643,985	65.10	345,988	309,663	85,486	—69,066
Southern Pacific	Sept.	7,118	11,399,574	3,865,659	16,808,629	1,977,068	2,941,828	237,853	5,373,696	454,722	11,251,733	66.90	5,556,896	5,051,890	4,793,807	4,371,292
	9 mos.	7,118	86,655,891	33,401,766	132,684,350	17,614,203	22,981,468	2,112,970	45,429,665	3,895,152	94,488,606	71.20	38,195,744	26,894,292	25,766,910	25,460,082
Arizona Eastern	Sept.	382	303,489	98,168	444,498	39,184	34,328	2,592	74,064	18,092	169,257	69.20	75,211	47,974	33,607	23,250
	9 mos.	382	1,963,447	253,298	2,306,467	301,481	268,576	28,255	670,622	166,835	1,442,756	62.60	863,711	645,220	515,632	11,597

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF SEPTEMBER AND NINE MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Atlantic S. S. Lines	Sept.	952,460	59,848	1,062,196	16,377	282,300	19,907	602,952	29,744	951,280	89.60	110,916	99,263	98,813	18,081
	9 mos.	7,067,367	469,553	8,559,057	115,489	1,717,313	172,549	4,933,561	244,641	7,183,553	83.90	1,375,504	1,264,115	1,266,940	115,867
Galv., Harris. & San Ant.	Sept.	1,512,453	368,687	1,985,158	379,033	394,193	37,655	812,501	74,131	1,702,745	85.80	282,413	224,759	161,901	341,898
	9 mos.	11,719,141	3,356,914	15,968,577	3,014,254	3,119,046	333,559	6,377,177	650,698	13,575,890	85.00	2,352,687	1,922,812	1,538,408	1,626,955
Houston & Tex. Central	Sept.	1,037,759	305,257	1,425,588	211,543	208,954	24,015	413,410	45,645	899,773	63.10	525,815	479,742	431,811	242,136
	9 mos.	7,349,884	2,612,120	10,639,066	1,924,665	2,033,544	213,747	3,755,292	382,286	8,290,210	77.90	2,348,856	1,948,461	1,640,761	485,892
Houston East & West Tex.	Sept.	224,478	44,974	282,318	51,583	52,482	3,639	107,582	8,301	215,478	76.30	66,840	59,707	37,748	45,545
	9 mos.	1,866,008	374,566	2,286,013	460,810	459,565	31,275	911,195	73,235	1,919,335	84.00	366,678	309,605	170,201	154,662
Louisiana Western	Sept.	246,542	85,373	355,070	64,479	55,965	8,945	93,445	17,262	244,324	68.80	110,746	84,807	89,977	62,899
	9 mos.	2,075,211	779,074	3,064,744	588,182	571,702	79,820	906,970	158,664	2,341,362	76.40	723,382	498,511	513,678	499,858
Morgan's La. & T. R. R. & S. S.	Sept.	544,934	151,453	748,665	131,954	169,778	15,263	248,390	32,911	603,445	80.60	145,220	98,748	85,062	92,673
	9 mos.	3,942,568	1,360,817	5,761,891	1,233,700	1,338,251	144,133	2,333,842	299,069	5,391,854	93.60	370,037	49,846	—176,133	—451,339
Texas & New Orleans	Sept.	554,027	150,307	746,756	168,179	176,943	10,676	239,074	26,421	627,047	84.00	119,709	90,965	40,370	45,134
	9 mos.	4,642,254	1,374,460	6,398,765	1,296,251	1,681,650	96,553	2,462,545	231,122	5,815,172	90.50	583,593	372,055	78,679	—439,740
Spokane International	Sept.	100,427	17,309	122,804	15,744	9,732	4,881	33,007	5,909	69,973	67.00	52,831	47,354	42,931	20,587
	9 mos.	705,043	116,215	864,253	132,136	75,457	27,942	306,208	53,341	601,482	69.60	262,771	213,360	151,824	147,781
Spokane, Portland & Seattle	Sept.	430,516	159,081	659,625	74,139	109,493	9,411	203,169	19,187	424,899	64.40	234,726	174,726	169,716	279,622
	9 mos.	3,525,976	1,299,355	5,323,461	513,440	793,475	92,033	1,783,244	179,483	3,439,148	64.60	1,884,313	1,150,827	1,048,894	966,575
Tennessee Central	Sept.	198,687	41,809	254,317	39,099	37,332	5,525	109,095	9,422	200,417	78.80	53,900	48,801	6,643	.....
	9 mos.	1,189,186	325,296	1,613,559	257,639	227,915	44,915	697,330	66,060	1,293,762	80.20	319,797	284,572	86,152	.....
Term. R. R. Assn. of St. Louis	Sept.	.....	.....	345,926	98,465	82,281	945	161,035	3,220	349,329	101.00	—3,403	—63,446	23,079	125,673
	9 mos.	.....	.....	3,324,892	724,550	376,239	9,518	1,132,650	51,216	2,325,257	69.90	999,635	497,101	1,525,786	1,321,779
East St. Louis Connecting	Sept.	.....	.....	153,704	13,793	7,840	268	55,901	2,214	80,016	52.10	73,688	65,617	57,738	38,216
	9 mos.	.....	.....	1,505,446	119,551	66,991	2,756	509,247	23,369	721,914	48.00	783,532	686,751	609,387	226,459
St. L. Merchants' Bridge Term.	Sept.	.....	.....	418,650	43,240	31,842	835	132,887	5,799	214,603	51.30	204,047	178,383	166,975	87,144
	9 mos.	.....	.....	2,785,261	369,870	250,003	8,454	1,249,646	41,681	1,919,654	68.90	865,607	688,406	828,302	448,965
St. Louis Transfer	Sept.	.....	.....	57,590	10,954	4,953	155	33,188	1,421	50,671	88.00	6,919	6,030	—957	36,301
	9 mos.	.....	.....	546,396	92,170	40,600	1,593	297,240	14,709	446,312	81.70	100,084	94,849	22,700	321,753
Texas & Pacific	Sept.	1,904,192	607,977	2,719,009	407,330	672,024	51,158	1,012,864	88,718	2,257,722	83.00	461,287	361,184	278,431	206,910
	9 mos.	15,071,876	5,267,070	22,021,594	3,883,809	4,402,485	434,780	8,390,414	831,616	18,116,389	82.30	3,905,205	2,927,530	2,314,911	2,395,305
Toledo, Peoria & Western	Sept.	90,639	33,651	141,067	32,445	21,854	2,431	73,556	7,534	137,820	97.70	3,247	—7,776	—3,051	2,693
	9 mos.	720,760	381,983	1,210,502	229,030	279,021	25,141	632,454	69,728	1,235,286	102.00	—24,784	—124,264	—147,429	—342,576
Toledo, St. Louis & Western	Sept.	1,028,526	30,431	1,102,485	122,165	127,397	22,280	348,806	218,197	838,832	76.10	263,653	160,849	96,717	154,776
	9 mos.	7,317,867	267,293	7,942,474	980,920	1,211,595	193,490	2,518,823	412,049	5,316,765	66.90	2,625,709	2,143,834	1,852,245	872,359
Trinity & Brazos Valley	Sept.	195,168	23,295	224,239	33,653	22,779	2,933	73,294	14,175	145,632	62.20	78,607	71,535	53,243	47,856
	9 mos.	1,847,136	189,198	2,114,817	497,382	402,276	28,807	765,741	118,862	1,807,747	85.50	307,070	243,850	—104,320	52,178
Ulster & Delaware	Sept.	68,670	50,138	155,086	34,664	34,757	2,145	83,962	8,440	164,281	105.93	—9,195	—15,198	—17,369	13,782
	9 mos.	539,426	436,695	1,287,370	207,803	199,095	29,725	646,354	72,958	1,160,164	90.12	127,206	73,149	38,872	69,483
Union	Sept.	.....	.....	1,016,401	72,916	160,138	162	456,548	6,823	696,587	68.50	319,814	325,814	450,663	284,267
	9 mos.	.....	.....	8,320,821	658,943	1,593,946	2,061	3,426,011	63,307	5,744,268	69.00	2,576,553	2,469,808	3,078,688	1,667,634
Union Pacific	Sept.	8,803,321	1,605,522	11,280,849	1,570,062	2,407,737	109,429	3,198,009	271,303	7,763,253	68.80	3,517,596	2,922,699	2,845,281	4,086,963
	9 mos.	55,067,363	13,053,795	75,012,189	9,330,656	15,611,416	1,226,011	21,991,610	2,744,424	52,461,768	69.90	22,550,421	17,335,506	17,040,175	20,180,973
Oregon Short Line	Sept.	2,906,073	481,023	3,614,100	491,941	621,009	39,227	1,484,408	113,123	2,805,701	77.60	808,399	549,199	517,930	1,283,271
	9 mos.	19,609,915	4,164,750	25,690,735	4,113,507	4,883,396	401,902	8,699,567	1,042,097	19,676,955	76.60	6,013,780	3,541,578	3,352,808	2,984,314
Oregon-Wash. R. R. & Nav.	Sept.	1,990,764	553,209	2,767,385	636,180	520,535	55,724	1,206,000	116,346	2,571,184	92.90	196,201	14,931	—76,309	223,733
	9 mos.	14,345,771	4,311,692	20,499,723	4,571,756	3,875,932	540,234	9,118,355	1,120,800	19,493,851	95.10	1,005,872	—625,038	—1,344,234	—540,082
St. Joseph & Grand Island	Sept.	229,855	25,195	274,371	46,990	72,686	2,376	114,667	11,252	247,971	90.40	26,400	9,895	1,061	44,167
	9 mos.	1,909,747	228,198	2,288,938	424,890	439,954	22,873	1,014,350	108,079	2,010,146	87.80	278,792	121,463	42,376	—24,071
Utah	Sept.	125,055	859	126,948	34,985	31,475	392	41,158	5,224	113,035	89.00	13,913	7,770	19,277	24,109
	9 mos.	1,224,726	6,714	1,243,947	211,161	328,594	3,368	303,681	43,811	890,114	71.50	353,833	296,548	177,755	—38,929
Virginian	Sept.	1,132,005	79,173	1,297,386	170,977	403,201	12,741	437,886	30,042	1,047,876	80.80	249,510	99,550	133,570	191,348
	9 mos.	12,996,721	608,907	14,542,992	1,638,581	3,454,872	104,536	3,462,560	279,941	8,924,249	61.40	5,618,743	4,536,382	4,665,729	3,960,501
Wabash	Sept.	3,538,643	789,067	4,763,877	722,909	1,142,959	116,966	1,972,889	137,392	4,104,602	86.20	659,275	467,329	219,377	751,951
	9 mos.	32,630,828	6,843,369	42,740,987	6,258,200	8,461,265	1,034,981	18,123,744	1,341,714	35,406,682	82.80	7,334,305	5,616,985	3,244,356	2,589,019
Western Maryland	Sept.	1 632,484	91,793	1,819,778	287,602	423,272	34,161	664,772	44,340	1,476,600	81.10	343,178	283,178	267,211	242,932
	9 mos.	11,262,704	742,217	12,908,023	1,761,262	2,723,252	310,434	4,620,128	412,603	10,026,435	77.70	2,881,588	2,451,588	2,272,686	2,201,556
Western Pacific	Sept.	1,112,715	208,582	1,411,951	190,049	209,471	33,316	436,502	35,095	931,688	66 00	480,263	403,950	399,018	251,975
	9 mos	6,374,926	1,741,485	8,729,245	1,488,704	1,581,343	294,774	3,278,187	336,501	7,169,882	82.10	1,559,363	811,826	967,752	951,171
Wheeling & Lake Erie	Sept.	767,132	51,655	935,247	214,847	313,086	16,864	431,718	33,949	1,011,044	108.10	—75,797	—164,190	—212,574	220,088
	9 mos.	8,496,595	619,699	9,930,429	1,669,916	2,236,186	160,295	3,710,955	307,836	8,114,242	81.70	1,816,187	843,990	590,042	1,317,274

Railroad Meeting of A. S. M. E.

Three papers on locomotive design and operation will be presented at the railroad session of the annual meeting of the American Society of Mechanical Engineers to be held at 29 West Thirty-ninth street, New York, Wednesday afternoon, December 6. The titles of the papers and the authors are as follows: Steam Distribution in the Locomotive, G. H. Hartman, Locomotive Appliance Company; Stresses in Locomotive Frames, R. Eksergian, Baldwin Locomotive Works; Mechanical Drafting of Locomotives, F. H. C. Coppus, Coppus Engineering Company.

On Wednesday evening the society will hold a joint session with the American Economic Association at which L. F. Loree, president of the Delaware & Hudson, will deliver an address. E. M. Herr of the Westinghouse Electric & Manufacturing Company will speak on the subject of the Human Element in Industry.

Wage Statistics for August

The Interstate Commerce Commission's summary of wage statistics for the month of August, 1922, shows an increase in the total number of employees of 126,250, as compared with the number reported for the preceding month. The number of employees in the maintenance of equipment group, counted as of the middle of the month, showed an increase of 78,936 over the corresponding number for July, the first month of the shopmen's strike, making a total as of August 15 of 299,385 maintenance of equipment employees.

Considerable increase is shown in the average earnings per employee due to a greater proportion of overtime, and the fact that August had 27 working days while July had only 25.

Compared with the previous month, the increase in the number of employees, by groups, was as follows:

Executives, officials, and staff assistants	122
Professional, clerical, and general	9,616
Maintenance of way and structures	28,625
Maintenance of equipment and stores	78,936
Transportation (other than train, engine, and yard)	5,696
Transportation (yardmasters, switch tenders, and hostlers)	97
Transportation (train and engine service)	3,158
Net increase	126,250

A comparison of the number of employees and their compensation, by months, follows:

Month	Number of employees	Total compensation
August, 1921[1]	1,679,927	$227,745,895
September, 1921[1]	1,718,330	223,972,822
October, 1921[1]	1,754,136	237,602,959
November, 1921[1]	1,732,353	225,304,006
December, 1921[1]	1,637,151	214,921,396
January, 1922[1]	1,552,014	205,178,639
February, 1922[1]	1,545,040	194,523,427
March, 1922[1]	1,579,158	216,704,408
April, 1922	1,578,133	203,413,071
May, 1922	1,628,228	216,672,028
June, 1922	1,685,414	222,932,689
July, 1922	1,467,824	193,571,244
August, 1922	1,594,074	224,976,644

[1] Excludes Detroit, Toledo & Ironton Railroad.

English Store Door Delivery Discussed by Terminal Engineers

The subject of English methods of store door delivery was presented by F. C. Horner, transportation engineer, before the Society of Terminal Engineers at the Engineering Societies building, New York City, on November 4. Mr. Horner's paper was attended by a moving picture of the work at one of the large railway freight stations. Following this there was an open discussion covering the salient points of his paper as well as those brought out at the September and October meetings when the subjects of store door delivery and shipping containers were presented. Store door delivery in England is, to all practical purposes, a sidewalk delivery made by the railroads and although this service is optional with the shippers or consignees, about 80 per cent of l. c. l. freight is thus handled. The tariff rates for all of the roads show or will show shortly the charges separated into rail haul and cartage items. A minimum rate is provided and certain exceptions are made such as minerals for instance. No classification is made, however, in regard to cartage. The average rate is approximately $1.50 a ton with an average haul of about 2½ miles in London.

Unless otherwise specified, delivery is always made by the railroad, the aim of the roads being to get the freight out of the station promptly. This arrangement is country wide, the railroads arranging with a local trucker in small towns to handle the l. c. l. shipments when there is not sufficient volume to justify railway owned equipment. Motor trucks are now being used to a limited but growing extent. Car load service will be given when wanted. When a shipper or consignee desires to truck his own freight, he is given every facility and is limited only in one respect. He must deliver or call for freight during certain specified times. The average consignment in England is about 300 lb. as compared to 900 lb. in this country.

A. R. A. Offers Co-operation in Work of Coal Commission

The co-operation of the railroads was tendered to the United States Coal Commission, in a letter sent to John Hays Hammond, the chairman, by R. H. Aishton, president of the American Railway Association, on November 14. Extracts from this letter appear below:

"While the railroads of the country have not been officially addressed by the commission concerning the subjects under investigation," Mr. Aishton said, "it is their desire to be as helpful as possible in aiding the commission to obtain a solution of the problems before them. As you are fully aware, the railroads are the largest users of coal, and are therefore vitally interested in the economic problems concerning this industry, from the standpoint of the consumer, as well as the distributor of the product. The railroads and their various agencies extend their helpful co-operation to the commission with a view of aiding in every possible way in bringing about a successful accomplishment of the tasks before you."

Revenues and Expenses for September

The Interstate Commerce Commission's summary of revenues and expenses for Class I roads for September and nine months of 1922 is as follows:

Item	September 1922	September 1921	Nine Months 1922	Nine Months 1921
Average number of miles operated	235,058.13	234,974.18	235,231.63	234,854.39
Revenues:				
Freight	$355,402,370	$354,841,357	$2,846,610,826	$2,894,218,771
Passenger	[2] 97,504,148	[3] 100,599,536	[4] 802,566,601	[5] 893,687,823
Mail	7,383,568	7,376,941	66,550,312	71,256,168
Express	12,980,046	10,426,998	94,023,878	70,544,920
All other transportation	15,680,420	14,668,027	130,395,621	120,935,012
Incidental	10,668,226	9,960,834	83,821,569	89,220,282
Joint facility—Cr	765,660	637,769	7,410,439	5,761,415
Joint facility—Dr.	181,891	163,698	1,581,712	1,256,137
Railway operating revenues	500,202,547	498,347,764	4,029,797,534	4,144,368,254
Expenses:				
Maintenance of way and structures	67,585,109	72,748,042	547,885,294	580,247,777
Maintenance of equipment	120,040,733	103,778,465	893,894,517	946,134,097
Traffic	6,849,320	6,873,477	64,568,193	63,649,851
Transportation	197,636,508	177,700,887	1,561,063,088	1,734,583,431
Miscellaneous operations	4,303,461	4,024,987	35,631,272	37,573,124
General	12,753,995	13,140,769	117,246,654	127,611,225
Transportation for investment—Cr.	607,778	499,484	4,728,802	4,424,323
Railway operating expenses	408,561,348	377,767,143	3,215,560,216	3,485,375,183
Net revenue from railway operations	91,641,199	120,580,621	814,237,318	658,993,071
Railway tax accruals	26,422,050	25,919,081	227,531,452	209,534,410
Uncollectible railway revenues	118,867	99,920	1,023,701	883,816
Railway operating income	65,100,282	94,561,620	585,682,165	448,574,845
Equipment rents—Dr balance	5,080,637	4,787,807	42,618,429	39,750,543
Joint facility rents—Dr. balance	1,562,181	2,167,438	13,645,090	14,755,463
Net railway operating income	58,457,464	87,606,375	529,418,646	394,068,840
Ratio of expenses to revenues (per cent)	81.68	75.80	79.79	84.10

[2] Includes $3,317,091, sleeping and parlor car surcharge.
[3] Includes $2,932,258, sleeping and parlor car surcharge
[4] Includes $24,352,547, sleeping and parlor car surcharge
[5] Includes $24,704,519, sleeping and parlor car surcharge

Traffic News

The Chicago & North Western has issued a booklet entitled "Forty Ways, and More, to California and the North Coast."

The Associated Traffic Clubs of America will hold a special meeting on December 5 and 6 at the Hotel Statler, St. Louis, Mo. The Traffic Club of St. Louis will hold its annual meeting and banquet on the evening of December 5 and delegates to the national meeting are invited to attend as guests of the St. Louis club. The Fort Worth Traffic Club, of Fort Worth, Tex., is the thirtieth club to join the national association.

The National Coal Association, through a special committee, calls upon the United States Coal Commission to take action looking to the furnishing, for the coal industry, of a continuous, regular and adequate supply of the means of transportation. "The railroads of the country should be given sufficient freedom, independence and revenue to enable them to obtain the money necessary to provide proper equipment and other facilities to meet their increasing business. They should be regulated only to an extent necessary to insure the proper use and distribution of these facilities when obtained." The causes of the present difficulties in the coal industry include lack of adequate railroad service and the commission is asked to compare the existing freight rates with the rates existing prior to the war; and also to study the effect of adequate transportation facilities on production and cost of coal.

Hearings before Interstate Commerce Commissioner Aitchison on a proposed revision of the coal car distribution rules, including the question of the right of the railroads to assign cars for railroad fuel, were resumed at Washington on November 15 and are expected to continue for some time. Among the witnesses on the first day were A. G. Gutheim, formerly of the Car Service Division of the American Railway Association, C. H. Markham, president of the Illinois Central, F. H. Alfred, president of the Pere Marquette, and E. J. Pearson, president of the New York, New Haven & Hartford, who testified that the only alternative to the assigned car rule at times of shortage is the confiscation of coal by railroads, which results in a general increase in coal prices. The National Coal Association also expected to put a number of witnesses on the stand. Representatives of the state railroad commissions also sat with Commissioner Aitchison.

J. D. Battle has been appointed traffic manager of the National Coal Association, with offices at Washington, D. C., effective December 1, succeeding John Callahan, who recently resigned to enter the coal brokerage business. Mr. Battle has had extensive railroad service, beginning with the Georgia Railroad, and later with Atlantic Coast Line and Charleston & Western Carolina joint terminals. From 1918 until the end of federal control he was connected with the Car Service Division of the United States Railroad Administration at Washington, handling the subject of intensive loading of, and efficient use of, freight cars. When the carriers were returned to their owners, he was appointed a traveling inspector for the American Railroad Association, being recalled to Washington in June of 1920 to assist in directing the work of various terminal committees that were organized for the purpose of clearing up accumulation, etc., resulting from the switchmen's strike. Since September 15, 1920, he has been assistant traffic manager of the National Coal Association.

Oral arguments as to whether the Interstate Commerce Commission should require the railroads to issue interchangeable mileage or scrip coupon tickets at reduced rates were heard by the commission at Washington on Wednesday. Francis I. Gowen, special counsel of the Pennsylvania, presented the argument for the carriers, contending that there is no justification for such a reduction in railroad revenues and S. Blumberg presented the argument for the National Council of Traveling Men's Associations, urging that a one-third reduction in rates on a $100 coupon book, would so stimulate freight and passenger traffic as to result in an increase in revenues. Commissioner Hall seemed somewhat skeptical as to whether freight traffic could be stimulated beyond what it has been during the past few months and asked whether Mr. Blumberg thought the record showed a basis for the determination of just and reasonable rates lower than the rates which the commission has already determined to be just and reasonable. Mr. Blumberg argued that Congress by passing the law leaving the fixing of the rate to the commission had intended the commission to make some reduction.

New England Governors' Committee Discusses Railroad Consolidation

The Joint New England Railroad Committee, appointed some months ago by the governors of the six New England States, sat in Boston last week to hear the views of shippers and others concerning the problem of helping the New England railroads to improve their conditions. The presiding officer was James J. Storrow, chairman of the committee. The first speaker was Henry C. Attwill, chairman of the Massachusetts Public Utilities Commission. Mr. Attwill thought that in all probability the railroads could recover their former financial health if they could have four additional sources of income as follows:

1.—Compensation from those who receive the special privilege of having their freight switched to and from private tracks.

2.—More adequate compensation from the United States Government for the carriage of mail.

3.—More revenue from the carriage of express matter.

4.—Compensation for the carriage of baggage.

The most generally expressed opinion among shippers was that the consolidation of New England railroads with trunk lines west of the Hudson River would be detrimental to the port of Boston and to New England generally. Charles A. Andrews, former president of the Associated Industries of Massachusetts elaborated this view.

Professor William J. Cunningham of Harvard University gave a brief outline of the recent freight rate history of the country, and set forth the advantages of consolidating New England lines with larger systems. New England merchants fear unfavorable changes in freight rates if such consolidations were to be carried out but Professor Cunningham reminded them that the Interstate Commerce Commission would see that New England was not dealt with unjustly. To objections about absentee management, the speaker referred to instances of that kind already in effect which are not inimical to the public interests; for example, the Atchison, Topeka & Santa Fe, which is managed from Chicago and the Boston & Albany which the New York Central people manage to the satisfaction of the citizens of Massachusetts.

On Friday, the third day of the hearing, John E. Oldham presented an elaborate argument in favor of the affiliation of the New England roads with trunk lines.

Coal Production

Preliminary returns to the Geological Survey on coal loaded at the mines in the week ended November 11 indicate a total production of 12,600,000 net tons; 10,700,000 tons bituminous and 1,900,000 tons anthracite. Revised estimates for the week ended November 4 show 10,617,000 tons of bituminous and 1,839,000 tons of anthracite. The rate of output of soft coal is now higher than in 1918 and 1921, and of course much higher than in 1919 when at the corresponding period the great strike of that year had begun; the present rate is lower than the same season in 1920.

The mine reports for the week ended October 28 indicate improved traffic conditions in Ohio, Westmoreland, and Somerset counties, Pennsylvania, Maryland, Northern West Virginia, the New River and Kanawha districts of Southern West Virginia, Western Kentucky, and all the trans-Mississippi states excepting Arkansas. Transportation disability grew more acute in Indiana, Pittsburgh and Central Pennsylvania districts, Pocahontas, Hazard, Harlan, and Southern Appalachian fields, and in southwestern Virginia. In Illinois, and the Panhandle of West Virginia, Winding Gulf, Tug River, and Logan districts, and in Alabama, the transportation situation remained practically unchanged. Reports of "no market" were received from operators in nearly all the states west of the Mississippi.

Shipments of soft coal through Hampton Roads declined dur-

ing the first week in November. Cargoes consigned to New England decreased to 149,466 tons and exports dropped to 10,379 tons.

Since August 21, approximately 10¾ million tons of bituminous coal have been dumped into vessels at Lake Erie ports. The tonnage dumped has been more than a million tons a week during the last 8 weeks, a high record for sustained heavy movement.

According to the Ore and Coal Exchange the total soft coal handled at Lake Erie piers during the week ended November 5 was 1,088,104 net tons, as compared with 1,026,388 tons in the week preceding. Stocks of bituminous coal on the commercial docks at Duluth, Superior, Ashland and Washburn increased from 1,034,520 net tons on October 1, to 1,946,875 tons on November 1. The supply of anthracite increased from 12,370, to 104,430 tons during the same period.

In spite of this large increase, however, the present reserves of soft coal are less than one-third of those on November 1, 1921, and the anthracite supply is only about one-eighth of that a year ago.

Car Relocation Orders

Additional orders for the movement of box cars to western railroads for the purpose of relieving the acute shortage in the northwest, and of 4,050 coal cars to the Louisville & Nashville, were issued by the Car Service Division of the American Railway Association following a meeting of executive and operating officers at Washington on Saturday. A conference was first held with Commissioner Aitchison, who is understood to have insisted that the practical railroad officers devise some plan for relieving a situation caused to a considerable extent by violations of car service rules and later a meeting was held at the offices of the Car Service Division.

Although a large number of cars of western line ownership have been returned under the order of October 26, the results were not fully felt on the roads which were not able to receive cars directly at Chicago, such as the Great Northern, Northern Pacific and Union Pacific, and those roads have had their box car supply depleted to a greater extent than others. Therefore, an additional program was set up by which all western line cars arriving at Chicago empty this week, regardless of ownership, were to be made up into solid trains of approximately 100 cars each to be delivered alternately to the three lines, although some provision was also made for the Soo Line. The first train under this arrangement left Chicago on Monday over the Illinois Central for the Union Pacific. The trains of empty cars were to be moved on the same schedules as fast freight and, if necessary, the program will be continued for another week.

Also to make available the maximum number of cars for this purpose orders were issued to the eastern lines to deliver 745 box cars daily at Chicago, of western line ownership if possible, but their own cars if necessary, as follows: Wabash, 15; Grand Trunk Western, 20; Pere Marquette, 25; Erie, 45; Michigan Central, 115; New York Central, 125; Pennsylvania, 100; Baltimore & Ohio, 200, and Philadelphia & Reading, 100, to be divided equally between the Baltimore & Ohio and the New York Central. Arrangements were also made for the daily delivery of 50 cars by the Central of New Jersey, 125 by the Boston & Maine, and 150 by the New Haven, some to be moved westward by Canadian lines, and a meeting was held on Monday to arrange for the movement of box cars from the Southern lines through St. Louis.

The coal car orders provided for the movement within 10 days to the Louisville & Nashville of 750 cars by the Chicago & Northwestern, 750 by the Chicago, Milwaukee & St. Paul, 250 by the Ann Arbor, 500 by the Pere Marquette, 500 by the Michigan Central, 150 by the Detroit & Toledo Shore Line, 100 by the Toledo, St. Louis & Western, 200 by the Minneapolis & St. Louis, 300 by the Chicago Great Western, 250 by the Minneapolis, St. Paul & Sault Ste. Marie, and 300 by the Great Northern.

Under the order of October 26 reports received by the Car Service Division show the delivery of 9,997 western box cars by the New England group of lines, including 6,314 loads, and 16,632 box cars from eastern lines to western lines, including 10,207 loads, at Chicago, Peoria and St. Louis. Also the New England lines have been delivering 200 to 300 empty coal cars a day to the anthracite coal roads.

Commission and Court News

Interstate Commerce Commission

The commission has declined a request of President Howard of the American Farm Bureau Federation that it order an embargo on Canadian grain moving over transportation lines in the United States.

The Interstate Commerce Commission's Bureau of Tariffs has published the third issue of its schedule of sailings of steam vessels which are registered under the laws of the United States and which are intended to load general cargo at ports in the United States for foreign destinations.

The Interstate Commerce Commission has issued orders permitting the states of Utah and Nevada and the chambers of commerce of Salt Lake City and Provo, Utah, to intervene in the case of the application of the Southern Pacific to acquire control by lease and stock ownership of the Central Pacific. The Union Pacific and the Southern Pacific have filed briefs with the commission on the petition of the Union Pacific for a dismissal of the Southern Pacific application which was argued orally on November 4.

The commission has issued orders permitting the states of Utah and Nevada and the chambers of commerce of Salt Lake City and Provo, Utah, and San Francisco and Fresno, Calif., to intervene in the case of the application of the Southern Pacific to acquire control by lease and stock ownership of the Central Pacific. The Union Pacific and the Southern Pacific had filed briefs with the commission on the petition of the Union Pacific for a dismissal of the Southern Pacific application which was argued orally on November 4.

The Public Utilities Commission of Kansas has filed a complaint with the Interstate Commerce Commission praying for reduction in the rates on grain, hay and grain products in Western territory which were increased 35 per cent in 1920, reduced 13 per cent by a decision of the Interstate Commerce Commission last year, but were not included in the general 10 per cent reduction ordered by the commission this year. The commission is asked to establish reasonable and non-discriminatory rates. It has assigned the case for a hearing before Examiner Hunter at Washington on December 11.

I. C. C. to Take Evidence on Southern Pacific Application

The Interstate Commerce Commission on November 14 announced that after considering the motion of the Union Pacific to dismiss the application of the Southern Pacific to acquire control of the Central Pacific it had been voted that the commission will not, without the hearing of any evidence, decide the question of jurisdiction, or its power to grant or deny in whole or in part the application of the Southern Pacific, or the propriety of taking such action. The motion to dismiss the application without the taking of testimony was therefore denied, and the hearing set for November 21, will proceed.

Court News

Placing Freight Cars So as to Obstruct View of Crossing

The placing of freight cars upon a side track so that the view of a crossing is obstructed is not an independent ground of negligence, so that where the evidence in an action for damages to an automobile by collision at a crossing was conflicting as to whether the bell was rung, the Iowa Supreme Court holds that the trial court's error in submitting the negligence of placing box cars so as to obstruct the view, which was the only other ground of negligence, as an independent ground of recovery, was prejudicial error, necessitating reversal. Anderson v. U. S. R. A. (Iowa) 188 N. W. 826.

Foreign Railway News

New Branch of Mexican National to Be Put Into Operation

At odd times for the last several years construction of the extension of the branch line of the National Railways of Mexico from Cuatro Cienegas to Sierra Mojada has been carried on. It is now stated that the line is practically finished and will soon be placed in regular operation. It connects with the Mexican Northern Railroad at Sierra Mojada and with the Eagle Pass-Torreon division of the National Railways at Monclova. It is about 150 miles long and traverses a region that is known to be rich in minerals and coal.

French Railway Labor Act Revised

The bill providing for a revision of the working day on French railroads effects small economies in the operation of the roads, which are now working under a heavy deficit, according to Commerce Reports. A distinction is made between active labor and mere presence on the job. In the former class the 8-hour day still obtains, while in the latter the length of the day varies according to the nature of the work. Each employee must put in 2,504 hours of work a year, with extra pay for overtime. The indefinite nature of this provision for overtime payment is expected to neutralize the good features of the bill.

Allowance is made for a reduction of 30,000 in forces and a decrease of 250,000,000 francs in the annual pay roll, while the eight-hour day law increased the operating forces by 110,000 and the pay roll over 1,000,000,000 francs.

Track Improvements on Mexican National

The entire division of the National Railways of Mexico between San Luis Potosi and Tampico is to be laid with new ties and ballast. The contract for getting out the ties has already been let. It is stated that this division is to be practically rebuilt in many places, the grade reduced and the line otherwise improved. In order to promote the conservation of ties for use in Mexico instead of sending them out of the country, especially to the southwestern part of the United States, the Mexican government recently placed an export duty, equivalent to about 47½ cents on each tie. It is stated that in the Sierra Madre mountains of the state of Chihuahua there was quite an industry of manufacturing ties for export to the United States. It is expected that the new duty will be prohibitive and that the railroads of Mexico will now be able to get all the ties they may need at lower cost than formerly.

Fog Signaling in Great Britain

The first of the autumn fogs descended upon the London area one day recently, and the commuting population made the train journey to town to the accompaniment of a fusillade of fog-signaling, according to the Times (London).

The men who take up their station at distant signals to protect the traffic are drawn from the permanent way staff, and a list of the men available is kept at every station. On the occurrence of fog, these men are either called for special duty, or voluntarily report themselves to the signalman, and, after lighting their familiar fire and arming themselves with a supply of detonators (i.e., torpedoes), take up their responsible duties.

While the signal is in the danger position the fogman must keep two detonators on the rail and show a red lamp or flag to the driver of the train approaching the signal. If the "line clear" signal is given the detonators are removed. Sometimes the detonators are placed in position by hand, but when the fogman has to protect more than one track, detonator-laying machines are used.

Even these comparatively simple arrangements involve the railways in considerable cost. One railway in the London district, which has not a large suburban traffic, nevertheless uses half a million detonators a year, and these cost 2s. 6d. per dozen. The total number of detonators used on all the railways for various purposes, but mainly for fog signaling, runs into many millions a year. During conditions of general fog thousands of men are engaged in fog-signaling work.

Formation of the International Union of Railways

Representatives of European railways, meeting at Paris from October 17 to 21, formed the International Union of Railways (abbreviated in French to U. I. C.). The meeting at Paris was agreed upon at the Genoa conference and the principal purpose of the newly-formed union is to facilitate the movement of international traffic. M. Mange, general manager of the Orleans Railway, was chosen to head the union, which will have its headquarters at Paris.

The administration of the association will be in the hands of a managing board, representing the countries forming the union. Assisting this board will be five commissions as follows:

1. On Passenger Traffic.
2. On Freight Traffic.
3. On Reciprocal Accounts and Exchanges.
4. On Exchange of Rolling Stock.
5. On Technical Questions.

A general assembly of all members of the association will be held regularly at five-year intervals. Voting will be, under certain safeguards, proportionate to route mileage. Decisions cannot be made binding without sanction of governments of all nations affected.

Countries represented at the formation of the union were: Great Britain, Austria, Germany, Belgium, Bulgaria, Denmark, Spain, Esthonia, Greece, Netherlands, Hungary, Italy, Lettonia, Lithuania, Luxembourg, Norway, Poland, Portugal, Roumania, Saare Valley, Serbia, Sweden, Switzerland, Czecho-Slovakia, France, the Oriental Railways and the League of Nations. Japan and China were represented but will not take an active part in the work of the association until the re-opening of the Trans-Siberian Railway again puts them into communication by rail with Europe.

Railway Labor Situation in Britain Better Than Ever Before

"The brightest feature of the British railway situation is found in the happy relations between the companies and their men," according to The Engineer (London). "Never, during the hundred years of railways, has this aspect of the railway position been so good. There is, at present, a noticeable esprit de corps among the men, a greater desire to give a day's work for a day's pay, both in the operating and the manufacturing and repairing branches, that is beneficial to men and masters, and consequently therefore to the railway proprietors and railway users. We will not allow ourselves to think that a fear of the effects on labor of railway grouping is the cause of this change; though it must be recognized that one consequence of the big amalgamations now being made may be considerable reductions in the number of men employed.

"We prefer to believe, and will almost go as far as to affirm, that the attitude of the men is the result of the unions having been recognized and of the men themselves having been given a greater interest in the operation of the railways. This interest is not as great as Sir Eric Geddes intended when, in the outline of his proposals, made public towards the end of June, 1920, he laid down that the boards of management should include representatives of the employees, elected from and by the workers. Subsequent discussions, directly between the companies and the men's unions, led to clauses being agreed upon for inclusion in the Railways Bill—now the Railways Act, 1921—for the recognition of the three railway unions, the continuance of the Central and National Wages Boards, and for the establishment of Whitley Councils.

"The Whitley Councils cover local departmental committees at stations and depots, sectional councils on each railway representing the various grades, and a railway council for each railway. Above the railway councils is the Central Wages Board, and the final court is the National Wages Board. Both the companies

and the men have expressed their determination to give the conferences a fair trial, and, judging by what has happened since the councils were inaugurated in April, they would seem to be doing all the good that was expected of them. . . . ."

Railroad Construction in Finland

The president of Finland has recently sanctioned the government's proposition to the Finnish diet, covering a program of railroad construction to be handled during the next five years, according to Commerce Reports. This program is based upon the assumption that 75,000,000 Finnish marks could be devoted to such work annually. Altogether the different lines recommended for construction in this connection have a total somewhat in excess of 500 miles. Therefore, it may be expected that Finland will construct about 100 miles of railroad annually during the next few years.

In addition to the above construction work that is to be carried forward under government auspices, provision is made for additional construction whenever the various communes will provide the necessary funds for supplementary construction. Obviously it is not possible to estimate the extent to which public sentiment will support such a program, but reports indicate that something along these lines may develop.

Sir William Acworth Compares Railroad Operating Statistics of Various Countries

Sir William Acworth recently addressed the Institute of Transport on British Railway Operating Statistics, making some comparisons between them and similar statistics of other countries. The average length of haul in Great Britain was 58 miles, about the same as in Germany. The average freight train load in Britain was 135 (long) tons and per route mile British railways carried 900,000 tons per annum, as compared with one million in Germany and Russia and 1,650,000 tons in the United States. The average train load in other countries was: Austria, 200; Canada, 400; China, 250; France, 150; Germany, 225; India, 200; Japan (narrow gage), 140; U. S. A., 650.

This comparison, he said, suggested an important practical conclusion. There was room on the existing railways for the existing number of trains. Improvement in train loading ought at least to keep pace with increase of traffic, and especially having regard to the effect of the new grouping, he had no doubt that it would. Further, there was the prospect of electrification increasing freedom of movement on the most crowded sections. If this were so, British railways ought to be able to get along for many years to come with no new capital expenditure for widening main through routes.

The average number of cars per train seemed to be much the same—35 to 40—in England, France, Germany, and the United States. The capacity of the average French or German car was probably 40 per cent higher than the English standard. The American car was four times as large. As to the proportion of loaded to empty cars there seemed also little difference, at least between England, Germany, and America. But the car mileage per diem showed a startling difference. In England it was roughly 9 miles; in Germany 21; in America—as a whole—it was now about 24 though under stress of war it at one time got to over 30.

Dealing with the effect of railway charges on the cost of living, he said statistics showed that the average haul of potatoes was 114.68 miles, and the average charge per ton mile 2½d.—roughly, 8 lb. for 1d. With farmers selling potatoes at less than £2 per ton, farmer and railway between them received 1.625d. for 5 lb. The average housewife could work out from her grocer's bill the amount of what were euphemistically called "other expenses." A year's experience as a member of the Railway Rates Advisory Committee had convinced him that the railways tried to give the shippers what they wanted.

The constant plea of the shippers was that they wanted to get back to pre-war conditions, but they could save a great deal of money by adopting new and more economical methods. The extravagant retail methods of British shippers were shown by the fact that they employed 1,360,000 cars to move twenty thousand million ton miles, while Germany had 700,000 cars to move 38,000 million ton miles and France 332,000 cars to move nearly 18,000 million ton miles.

Equipment and Supplies

Locomotives

The Georgia Railroad is inquiring for 5 locomotives.

The Delaware & Hudson is inquiring for 1 locomotive tender.

The Lehigh Valley is inquiring for 30 locomotive tenders.

The Colorado Midland is inquiring for one Mikado type locomotive.

The Chicago, Burlington & Quincy is inquiring for 50 Mikado type locomotives and 10 Santa Fe type engines.

The Central of New Jersey, reported in the *Railway Age* of November 4 as inquiring for 4 Pacific type locomotives, has ordered 5 Pacific type locomotives from the Baldwin Locomotive Works. This company is now inquiring for 10, 8-wheel switching locomotives.

Freight Cars

Baltimore & Ohio is inquiring for 2,000 hopper cars of 55 tons' capacity.

The Ulen Contracting Corporation, 120 Broadway, New York City, is inquiring for 35 flat cars.

The Union Pacific has placed an order with the American Car & Foundry Company for 100 tank cars.

The Central Railroad of Brazil is inquiring through the car builders of this country for prices on 200 box cars and 200 gondola cars.

The Great Southern Refining Company, Lexington, Ky., is inquiring for about 80 tank cars of from 6,000 to 10,000 gal. capacity.

The East Jersey Railroad & Terminal Company has placed an order with the American Car & Foundry Company for 36, 50-ton tank cars of 10,000 gal. capacity.

Watson, Robb & Company has purchased 13 service box cars from the Canadian Car & Foundry Company, which they have converted into two office cars, five bunk cars, two cook cars and four service dining cars.

The Chicago, Rock Island & Pacific, reported in the *Railway Age* of October 14 as inquiring for 500 box cars and 500 gondolas, has ordered the former from the Western Steel Car & Foundry Company and the latter from the American Car & Foundry Company. This company is now preparing specifications on an additional 1,500 cars, also reported in the *Railway Age* of October 14, with the above inquiry.

New Freight Cars for the Southern Pacific

The immediate construction of 7,000 freight cars, to cost more than $8,000,000, has just been authorized by the executive committee of the Southern Pacific Company. This new equipment, which will be delivered during 1923, does not include refrigerator cars for handling perishables, as the company's supply of refrigerators is provided by the Pacific Fruit Express Company, in which the Southern Pacific owns a one-half interest. The new equipment program of the Pacific Fruit Express, soon to be announced, will add a substantial number of refrigerators to the 21,598 it now owns. Plans for the construction of the new cars for the Southern Pacific are nearing completion and it is expected that a large proportion of the cars will be built on the Pacific Coast with Pacific Coast materials and labor. The new cars will be of the most modern design. The total number of cars owned by the Southern Pacific Company at present is more than 58,000.

Passenger Cars

THE NATIONAL RAILWAYS OF MEXICO are in the market for 10 steel mail cars, 40 ft. long.

THE CENTRAL OF BRAZIL contemplates buying in the near future between 50 and 100 cars of various types for passenger service.

THE PENNSYLVANIA has ordered 3 gasoline motor cars from the J. G. Brill Company. These cars are for use on the Smyrna branch, Bustleton branch and the Berwick branch.

THE BROOKLYN RAPID TRANSIT COMPANY reported in the *Railway Age* of July 22 as contemplating the purchase of 50 cars, is now inquiring for 50 trailer cars for use in its subways.

THE CENTRAL OF NEW JERSEY, reported in the *Railway Age* of October 21 as having placed orders for 65 cars for passenger service, has placed additional orders for 25 coaches with the American Car & Foundry Company, and 25 coaches with the Standard Steel Car Company.

Iron and Steel

THE CHICAGO & NORTH WESTERN is inquiring for 500 tons of bar iron.

THE CHICAGO & WESTERN INDIANA has ordered 5,000 tons of rail from the Illinois Steel Company.

THE NORTHERN PACIFIC has ordered 127 tons of steel from the Minneapolis Steel & Machinery Company for repairing its Mississippi river bridge.

Machinery and Tools

THE GULF & SHIP ISLAND has ordered from the Niles-Bement-Pond Company a 5-ton, 72-ft. span overhead crane.

THE LAKE ERIE & WESTERN has placed an order with the Shepard Electric Crane & Hoist Company for a 1¼-ton hoist.

THE BALDWIN LOCOMOTIVE WORKS has ordered one, 130-in. by 84-in. by 20-ft. planer from the Niles-Bement-Pond Company.

Signaling

THE CITY OF PHILADELPHIA has placed an order with the Hall Switch & Signal Company for 45 single unit, three color "searchlight" signals.

THE MISSOURI, KANSAS & TEXAS has ordered from the Union Switch & Signal Company interlocking for Frisco Crossing, Okla., where the M. K. & T. and the St. L.-S. F. cross the Red River on a joint track. The interlocking machine has ten mechanical levers and three electric switch units, style S-8.

Kadel & Herbert

Collision at a Junction on the Northern Railway (France) at La Briche Fort, Six Miles from Paris

Supply Trade News

W. W. Sayers, representative of the **Link-Belt Company**, with headquarters at Chicago, has been promoted to chief engineer of the Philadelphia works and eastern operations, with headquarters at Philadelphia.

A. H. Hunter, president of the **Atlas Steel Corporation**, Dunkirk, N. Y., has resigned as president, but is still a member of the board. No action has been taken as yet toward electing a successor to Mr. Hunter.

The Chicago Malleable Castings Company, Chicago, has acquired from the Railway & Traction Supply Company of Chicago, all rights for the manufacturing and selling of the Little Giant and Hercules bumping posts.

The Southern Dry Dock & Shipbuilding Company, Orange, Tex., has arranged for a change of name to the **Orange Car & Steel Co.** Its operations in the future will be concentrated on steel railroad car construction and repairs.

F. F. Rohrer, assistant to manager of both the power and railway departments of the **Westinghouse Electric & Manufacturing Company**, has been appointed general contract manager of that company. In his new appointment, which is effective immediately, Mr. Rohrer will be a member of the staff of W. S. Rugg, general sales manager. In his new position, Mr. Rohrer assumes responsibility for service to customers under contracts and will have general supervision of all contract and order work of the company. In addition to this general work, he will continue to have direct charge of the contract work of the power and railway departments which duties he performed in his previous position. Mr. Rohrer, wsa born in Harrisburg, Pa., April 22, 1876, and attended school there until 1895. He entered the employ of the Westinghouse Company as a student in 1896. After serving in the shops for four years, during which time he obtained extensive training in the manufacturing and testing departments he was transferred to the sales department. His services in the latter department have included a number of positions of responsibility. During the war, Mr. Rohrer was a member of the Committee of the War Industries Board appointed to conserve the production of turbine-generating equipment for government needs. After the armistice was signed, he became the representative of the Westinghouse Company in the settlement of contracts which were terminated as a result of the ending of the war. When this work was completed, he served in the capacity of assistant to the managers of both the power and railway departments, which position he held until his present appointment.

F. F. Rohrer

The Norwalk Iron Works Company, South Norwalk, Conn., has opened a Chicago office at 627 W. Washington boulevard in charge of L. R. Bremser, who for 13 years was associated with the Gardner Governor Company.

E. C. Wilson, formerly connected with the U. S. Light & Heat Corporation and the Vapor Car Heating Company, with offices at Chicago, has been appointed western sales manager for the **Ohio Locomotive Crane Company** of Bucyrus, Ohio, with offices in the Railway Exchange Building, Chicago.

Railway Construction

ATLANTIC COAST LINE.—This company has awarded a contract to Fairbanks, Morse & Co., Chicago, for the construction of a 150-ton concrete coaling station at Jesup, Ga.

BALTIMORE & OHIO.—This company has placed a contract with the Seaboard Construction Company, Philadelphia, Pa., covering the remodelling of second-hand girders and the erection of a new superstructure for the bridge carrying its tracks across Stone Coal creek, Macpelah Junction, W. Va. The new bridge at this point is to consist of a 55-ft. through plate girder span, replacing a timber trestle. Remodeled second-hand girders are to be used. For this remodeling, certain new material will be required, which is to be furnished by the McClintic-Marshall Company, under the tonnage contract recently placed with them by the railroad.

CANADIAN NATIONAL.—This company has awarded contracts to Symes & Company, Fort William, Ont., for the laying of 12,500 ft. of 8-in. water pipe at Mount, Ont.; to the Jamieson Construction Company, Edmonton, Alta., for the laying of 6,500 ft. of 8-in. water pipe at North Battleford, Sask.; to J. D. McArthur, Winnipeg, Man., for a dam at Rivers, Sask.; to the Northern Construction Company, Winnipeg, for a water supply system at Pattee, Sask.; and to P. W. Graham, Moose Jaw, Sask., for the construction of an addition to the office building at Saskatoon, Sask.

CHICAGO, ROCK ISLAND & PACIFIC.—This company closed bids on November 14 for a frame icehouse at Eldon, Ia., to cost approximately $12,000.

CHICAGO, ROCK ISLAND & PACIFIC.—This company, with the Vicksburg, Shreveport & Pacific, has been ordered by the Louisiana Public Service Commission to build sheds over the train platforms at the joint station at Ruston, La.

COLORADO, COLUMBUS & MEXICAN.—This company, through its attorney, John Phillips, of Wichita Falls, Texas, has filed a petition with the Interstate Commerce Commission for a certificate authorizing the construction of 550 miles of electric railroad in New Mexico, Texas and Arizona, including a main line from Columbus, N. M., on the Mexican border, to Farmington on the Denver & Rio Grande, with various branches including one to El Paso, Texas. The company has been incorporated in New Mexico with an authorized capital stock of $5,000,000 and asks the commission for authority to issue $20,000,000 of bonds to be sold at not less than 85.

GULF COAST LINES.—This company will construct a six-stall concrete roundhouse at Brownsville, Tex., to cost approximately $50,000.

ILLINOIS CENTRAL.—This company, which was reported in the *Railway Age* of November 11 as closing bids November 8 for a 100,000 gal. creosoted water tank at Herrin, Ill., has awarded a contract for the work to Joseph E. Nelson & Sons, Chicago. This company will also improve its water facilities at Calumet, Iowa.

KANSAS CITY SOUTHERN.—This company has been ordered by the Louisiana Public Service Commission to build a station at De Quincy, Ia.

MINNEAPOLIS & ST. LOUIS.—This company has awarded a contract to the Railroad Water & Coal Handling Company, Chicago, for the construction of a water treating plant of 25,000 gallons' capacity at Manly, Iowa.

SAN ANTONIO & ARANSAS PASS.—This company has awarded a contract to the Virginia Bridge & Iron Company for the construction of a bridge over the Brazos river near Wallis, Texas.

ST. LOUIS-SAN FRANCISCO.—This company closed bids on November 13, for a 300-ton concrete coaling station at Fort Smith, Ark.

ST. LOUIS-SAN FRANCISCO.—This company will construct a storeroom at Ft. Smith, Ark

Railway Financial News

ALABAMA & MISSISSIPPI.—*New Company.*—See *Mississippi & Alabama.*

BOSTON & MAINE.—*Bonds Sold.*—A banking syndicate composed of Merrill, Oldham & Co., Paine, Webber & Co. and Blodget & Co. of Boston, Cyrus Peirce & Co. of San Francisco and Reilly, Brock & Co. of Philadelphia has sold $4,000,000 6 per cent mortgage bonds due January 1, 1933, at 95½ and interest, to yield about 6.62 per cent. These bonds are part of an issue of $112,985,979 and are secured by a first mortgage on 1,651 miles of line, subject only to $2,838,000 underlying bonds on 153 miles.

CHICAGO GREAT WESTERN.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $10,206,000 of first mortgage, 50-year, 4 per cent gold bonds and $3,580,000 of 4 per cent preferred stock to be exchanged for bonds of the Mason City & Fort Dodge.

GEORGIA, FLORIDA & ALABAMA.—*Abandonment of Boat Line Authorized.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment of operation of a boat line between Carrabelle and Appalachicola, Fla., 32 miles, which has been operated by the company as a part of its line of railroad. The commission says that it is apparent that the boat line serves no substantial public need which cannot be met adequately by other available means of transportation.

ILLINOIS CENTRAL.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $968,000 of refunding mortgage 4 per cent gold bonds to be pledged from time to time as collateral security for short term notes.

INTERSTATE.—*Asks Authority to Issue Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue $1,500,000 of common stock for the purpose of purchasing 1,000 all steel hopper cars.

KENTWOOD & EASTERN.—*Asks Authority to Abandon Line.*—This company has applied to the Interstate Commerce Commission for a certificate authorizing the abandonment of its line from Kentwood to Scanlon, Miss., 16.53 miles.

MACON & BIRMINGHAM.—*Operation to Cease.*—At a hearing in the Superior Court of Macon, Ga., on November 11, Judge H. A. Mathews ordered the suspension of all service on this road, effective November 15. He stated his order was based upon the fact that further operation was unsafe for human life, due to the poor condition of the road bed, and that the receiver had no funds and had exhausted all his credit. This road is 97 miles long, from Sofkee, Ga., westward to La Grange. The Official Guide shows the line as operated only for freight service.

MARIETTA & VINCENT.—*Asks Authority to Abandon Line.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from Moore's Station to Vincent, Ohio, 10 miles.

MISSISSIPPI & ALABAMA.—*To Reopen Line.*—Under this name a company has been organized in Alabama for the purpose of rehabilitating and continuing the operation of the 17 miles of line formerly operated as part of the Alabama & Mississippi between Vinegar Bend, Ala., and Leakesville, Miss. Operation on the Alabama & Mississippi between Vinegar Bend and Pascagoula, Miss., 78 miles, was discontinued August 14, 1922.

NEW YORK CENTRAL LINES.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized the New York Central lines to assume obligation and liability in respect of $12,660,000 of 4½ per cent equipment trust certificates to be issued by the Guaranty Trust Company of New York, and to be sold at not less than 95.

PACIFIC SOUTHWESTERN.—*Asks Authority to Issue Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue $100,000 of stock to be used in the

construction of a railroad from Lompoc to White Hills, Calif., 4 miles.

SANTA FE & LOS ANGELES HARBOR.—*Authorized to Issue Stock.*—The Interstate Commerce Commission has authorized this company to issue $50,000 of capital stock to be sold at not less than par and the proceeds used for construction purposes and the Atchison, Topeka & Santa Fe has been authorized to acquire control of the company by purchase of its capital stock and by lease.

SAVANNAH & SOUTHERN.—*Sale Ordered.* This 32-mile line will be sold under court order on December 5. Julius Morgan was appointed receiver for the road March 2, 1922.

UPPER MERION & PLYMOUTH.—*Authorized to Issue Stock.*—The Interstate Commerce Commission has authorized this company to issue $350,000 of common stock for the purpose of acquiring additional equipment and discharging certain indebtedness.

Tentative Valuations

The Interstate Commerce Commission on November 15 made public its tentative valuation of the properties of the Rutland and the Addison railroads as of June 30, 1917. The final value of the property owned by the Rutland is given as $21,881,255 and that of the property used, including that leased from the Addison, the Central Vermont, the New York Central and private parties as $22,205,821. The outstanding capitalization on date of valuation was $19,952,600. The investment in road and equipment, including land, was stated in the books of the carrier at $22,500,622. This is readjusted in the report to $20,269,100.

The commission has also issued its tentative report on the valuation of the New Orleans Great Northern as of 1916, in which it states the final value as $7,201,388. The capital obligations outstanding as of the valuation date amounted to $15,923,000. The investment in road and equipment as stated on the books of the company was $16,045,668 which is readjusted by the commission to $15,201,241.

The commission has also issued tentative valuations in which the final value of the property owned and used is stated as follows:

Shreveport, Houston & Gulf, 1918, owned $92,578.
Yosemite Valley, 1916, owned $3,436,492.

Dividends Declared

Alabama Great Southern.—Common, 3½ per cent, semi-annually, payable December 28 to holders of record November 29; preferred, 3½ per cent, semi-annually, payable February 16 to holders of record January 19.

Canadian Pacific.—Common, 2½ per cent, quarterly, payable December 30 to holders of record December 1.

Catawissa. 1st and 2nd preferred, $1.25, payable November 18 to holders of record November 3.

Chicago & North Western.—Common, 2½ per cent, semi-annually; preferred, 3½ per cent, semi-annually; both payable January 15 to holders of record December 14.

Chicago, Rock Island & Pacific.—6 per cent preferred, $3.00, semi-annually; 7 per cent preferred, $3.50, semi-annually; both payable December 30 to holders of record December 8.

Colorado & Southern.—Common, 3 per cent, annually; first preferred, 2 per cent, semi-annually; second preferred, 4 per cent, annually; all payable December 30 to holders of record December 16.

Pittsburgh, Bessemer & Lake Erie.—Preferred, 3 per cent, semi-annually, payable December 1 to holders of record November 15.

Southern Pacific.—1½ per cent, quarterly, payable January 2 to holders of record November 29.

Union Pacific.—Common, 2½ per cent, quarterly, payable January 2 to holders of record December 1.

Trend of Railway Stock and Bond Prices

	Nov. 14.	Last Week	Last Year
Average price of 20 representative railway stocks	66.27	70.31	56.21
Average price of 20 representative railway bonds	85.64	86.65	78.77

THE EXPLOSION of the boiler of a locomotive of a freight train of the New York Central at Moreland, N. Y. on the night of November 11 killed four employees and injured three. This engine was the second one of a double head southbound freight, and the boiler was thrown into the air and fell 400 ft. ahead of the train and the leading locomotive ran into it.

Railway Officers

Executive

John G. Walber, whose appointment as vice-president in charge of personnel of the New York Central was announced in the *Railway Age* of October 28, page 823, was born on April 12, 1871, at Cincinnati, O. He was educated in the public schools of that city. He entered railway service in 1885, since which he has been consecutively: To 1893, clerk in the office of president and general manager, Ohio & Mississippi; 1893 to 1899, private secretary to the second vice-president and traffic manager of the Baltimore & Ohio Southwestern at St. Louis, Mo.; 1899 to 1904, chief clerk in the office of the vice-president and general manager of the same road at Cincinnati, O.; 1904 to 1908, assistant to the general manager, with the same headquarters; 1908 to 1909, general superintendent of transportation of the Baltimore & Ohio at Baltimore, Md.; 1910 to 1912, assistant general manager of the Baltimore & Ohio; 1912 to 1914, assistant to third vice-president; 1914 to 1921, secretary of the Bureau of Information of the Eastern Railways at New York; 1921 to the time of his recent appointment, executive secretary of the bureau.

Operating

V. S. Burnham has been appointed trainmaster of the San Joaquin division of the Southern Pacific, with headquarters at Bakersfield, Cal.

P. E. Odell has been appointed general manager of the Gulf, Mobile & Northern and the Meridian & Memphis, with headquarters at Mobile, Ala.

R. G. Parks has been appointed superintendent of car service of the Atlanta, Birmingham & Atlantic and the office of car accountant has been abolished.

O. A. O'Neill, yardmaster of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been promoted to trainmaster, with headquarters at Montevideo, Minn.

Traffic

E. N. Todd has been appointed freight traffic manager of the Canadian Pacific.

W. M. Kirkpatrick has been appointed general freight agent of the Canadian Pacific.

George Stephen has been appointed assistant freight traffic manager of the Canadian Pacific, Western Lines, with headquarters at Winnipeg, Man.

H. F. Twining has been appointed general agent of the Ft. Dodge, Des Moines & Southern, with headquarters at Ft. Dodge, Iowa, succeeding **A. L. Hillman**, resigned.

A. L. Still, passenger agent of the Gulf Coast Lines, with headquarters at Brownsville, Tex., has been promoted to assistant general agent, with headquarters at Mexico City, Mexico.

G. W. Sloan has been appointed assistant general freight agent of the Nashville, Chattanooga & St. Louis, with headquarters at Nashville, Tenn., succeeding W. L. Nichol, promoted.

H. J. Niemann, assistant general freight agent of the Vicksburg, Shreveport & Pacific, with headquarters at New Orleans, La., has been promoted to general freight agent, with the same headquarters.

M. D. Riggs, passenger agent of the St. Louis-San Francisco, with headquarters at Cincinnati, O., has been promoted to district passenger agent, with headquarters at Fort Worth, Tex., succeeding **E. Mitchell**, promoted.

Mechanical

W. B. Whitsitt has been appointed assistant mechanical engineer of the Baltimore & Ohio and **W. R. Hedeman** has been appointed chief draughtsman.

J. E. O'Brien has been appointed manager of the mechanical department of the Seaboard Air Line, effective November 15. Mr. O'Brien will report to the president and to the vice-president and general manager. Mr. O'Brien was born on December 4, 1876, at Stillwater, Minn., and was graduated from the University of Minnesota in 1898, in which year he entered railway service as a special apprentice on the Northern Pacific at Livingston, Mont. From November 1, 1901, to November 25, 1903, he was in charge of general inspection of material and tests for that company at St. Paul, Minn. On the latter date he became master mechanic of the Dakota division at Jamestown, N. D. From December 1, 1904, to August 1, 1909, he was assistant shop superintendent at South Tacoma, Wash. On the latter date he was promoted to mechanical engineer, with headquarters at St. Paul. On January 1, 1910, he left the Northern Pacific to become superintendent of motive power of the Western Pacific, with headquarters at San Francisco. In 1913 he left this position to become assistant superintendent of motive power of the Missouri Pacific and a short time thereafter was promoted to superintendent of motive power, which position he resigned in the early part of 1922.

J. E. O'Brien

Engineering, Maintenance of Way and Signaling

Irwin H. Schram, regional engineer of the Hornell region of the Erie with headquarters at Hornell, N. Y., has been transferred in a similar capacity to the Chicago region with headquarters at Chicago.

B. B. Shaw, division engineer of the Chicago, Rock Island & Pacific, with headquarters at Little Rock, Ark., has resigned to become chief engineer of the Cuba Railway, with headquarters at Camaguay, Cuba.

Obituary

F. H. Ustick, general superintendent of the Chicago, Burlington & Quincy, with headquarters at Burlington, Iowa, died on November 13, at Denver, from pneumonia, which followed an operation for appendicitis.

A. F. Vickroy, superintendent of the Union Pacific, with headquarters at Denver, Colo., whose death on October 17 was reported in the *Railway Age* of October 28, page 824, was born on January 16, 1861, at Avoca, Neb. He entered railway service in 1873 as a supply clerk on the Kansas Pacific (Union Pacific) at Ellis, Kan., and from 1874 to January, 1879, held the positions of shop clerk at Wamego, Kan., timekeeper in the motive power department at Armstrong, Kan., telegraph operator at Carr, Colo., clerk and operator in the division superintendent's office at Denver, Colo., and agent at Hugo, Colo., consecutively. When the Union Pacific absorbed the Kansas Pacific in January, 1879, he was transferred to Wallace, Kan., where he remained until May, 1881, when he was promoted to dispatcher, with headquarters at Denver, Colo. In January, 1883, he was promoted to chief dispatcher at Como, Colo. (Colorado & Southern), and from January, 1884, to September, 1901, he was dispatcher and chief dispatcher at Denver, Colo. He was promoted to superintendent of the Kansas division, with headquarters at Ellis, Kan., which position he held until September, 1906, when he was made assistant superintendent of the Wyoming division, with headquarters at Cheyenne, Wyo. On April 1, 1907, he was promoted to superintendent of the Colorado division, with headquarters at Denver, Colo., and held this position until the time of his death. From April 1, 1907, to May 1, 1915, he was also president of the Denver Union Depot Company.

O. L. Kinney, general western passenger agent of the Pere Marquette, with headquarters at Chicago, died on November 10 from an attack of apoplexy while driving from his home in Oak Park to his office in Chicago. Mr. Kinney was born in 1875 and entered railway service in 1894 as an office boy with the Grand Trunk, rising through various promotions to the position of ticket agent. He entered the employ of the Pere Marquette on April 28, 1902, as a ticket agent at Toledo, O., later being promoted to city passenger agent and division passenger agent, with headquarters at Toledo. In 1914, he was promoted to general western passenger agent, with headquarters at Chicago, which position he was holding at the time of his death. During the period of Federal control he was employed as division passenger agent for the Pere Marquette group of lines at Chicago and upon the dissolution of this group resumed his former duties and title.

O. L. Kinney

Emil E. Kruthoffer, auditor of freight accounts of the Cleveland, Cincinnati, Chicago & St. Louis, died at his home in Cincinnati on November 5. Mr. Kruthoffer was born in Batavia, Isle of Java, May 22, 1853, his father at that time being manager of a Dutch East Indies trading company. He was educated in Europe and was a graduate of a college at Frankfort, Germany. At the completion of his studies, at the age of 19, he came to America, remaining in New York City for a short time. He then went to Ohio, locating in Noble county as bookkeeper for his uncle in a large country store. Subsequently he was employed as a steward, or clerk, on a steamboat plying the Ohio river. In 1872 he entered railroad service with the Cleveland, Marietta & Pittsburgh as bookkeeper. He was assistant auditor from 1875 to 1877 and auditor from 1877 to January 1, 1882, on which latter date he became a clerk under E. B. Thomas, general manager of the Cleveland, Columbus, Cincinnati & Indianapolis, which in 1889 was merged by consolidation into the Cleveland, Cincinnati, Chicago & St. Louis Railway. He later became traveling auditor, which position he held until April 1, 1890, when he was appointed freight accountant, the latter position being changed in title to auditor of freight accounts on July 1, 1905.

E. E. Kruthoffer

EDITORIAL
Railway Age

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Railroads and Public Relations Advertising

THE NEED for a better understanding of the railroad situation by the public, and especially the farmers, is plain. To public misunderstanding of the railroad problem is very largely due the results of the recent election in many states, especially in the west. The attitude of a very large part of the men elected to Congress is such as to justify fear that unless there is a substantial change of public sentiment before the new Congress meets, legislation seriously adverse to the railroads will be passed.

During the present year the *Railway Age*, realizing that public sentiment regarding railway matters, especially in western territory, was undergoing an alarming change, repeatedly urged the railways to make greater efforts to set themselves right before the public. There has been an increase of public relations work, but it has been wholly inadequate to the needs of a time when more misleading propaganda against the railways has been carried on than ever before.

There is no more effective means available for presenting the case of the railways to the public and influencing public sentiment than advertising in magazines and newspapers of general circulation and in the farm papers. Public relations advertising is often discussed as if its main purpose and effect are to influence the policy of the press through the counting room, but as a matter of fact the editorial policies of reputable publications are influenced by advertising to a very much smaller extent than many people believe. The real purpose and effect of public relations advertising should be to present to the public in an attractive and interesting way correct information which will influence public sentiment because the information is correct and suggests correct conclusions.

Several railways have done considerable public relations advertising, but no other railway has done as much of it in its own territory, or done it as systematically and thoroughly, as the Illinois Central. Every month for over two years the Illinois Central has published in every daily and weekly English language newspaper of general circulation in its territory an advertisement 30 column inches long dealing with some matter of common interest to the railroads and the public. In these advertisements it has told its patrons and employees the causes and remedies for grade crossing accidents, the way in which every dollar earned by the Illinois Central is spent and the reason and remedies for the shortage of transportation. During the shop employees' strike it explained the causes of the strike and asked for the co-operation of the public in the emergency, and urged its employees to stay at work or return to work. These are but a few examples of the subjects with which its advertisements have dealt.

It cannot be questioned that the Illinois Central is among the best managed railroads in the country. Few railways have done as well in the last two years. Few succeeded in keeping as many of their shop employees at work during the recent strike, as quickly restored their shop forces to normal or were as little affected by the strike in respect to earnings and expenses. In the first nine months of 1922 the Class I railways of the country as a whole had $411,000,000, or over ten per cent, less total earnings than in the same months of 1920. On the other hand, the Illinois Central in these months increased its total earnings by $6,500,000, or over six per cent, as compared with the same months of 1920. The operating ratio of the Class I railways as a whole declined from 96.3 per cent in the first nine months of 1920 to 79.79 per cent in the corresponding months of 1922, or 16.51 points. The Illinois Central's operating ratio declined from 95.2 to 76.8 per cent, or 18.4 points. In the months of August and September, 1922, when the railways' earnings and expenses showed most plainly the effects of the reductions of rates and the shop employees' strike, the net operating income of all the Class I railways declined $77,000,000, or over 40 per cent as compared with the same months of 1921. In these same months the net operating income of the Illinois Central almost doubled, increasing from less than $2,900,000 in 1921 to over $5,600,000 in 1922.

When the management of a railroad is able to show such a record as this its opinion regarding any question of railway policy is entitled to most respectful consideration. Is there any relationship between the Illinois Central's public relations advertising and the operating and financial results it has secured? The management of the Illinois Central is the best judge of that, and its principal officers are unanimous in the opinion that there is such a relationship. They believe that its public relations advertising has been a potent influence in helping it to increase its earnings and in securing co-operation from its employees and patrons in handling its business efficiently and economically. The advertisements have all been signed by President Markham. They have helped to give personality to the railroad, a thing every railroad needs. They have influenced public sentiment favorably to it, and this has attracted business. They have made its employees and its public understand railroad problems better, and this has helped to build up morale and to nullify the effects of anti-railroad propaganda.

It might be assumed that the public relations advertising the Illinois Central is doing costs a good deal of money. The

total annual cost of it is about $100,000. This is 7/100 of one per cent of its total earnings, and 9/100 of one per cent of its total operating expenses in 1921. If every Class I railway in the country had spent relatively as much in 1921 for this purpose as the Illinois Central, the total expenditure would have been less than $4,000,000. Absolutely, this is a large amount of money. Compared with the total earnings of the railways and the importance of a better understanding of the railroad problem by railway employees and the public, it is a small sum.

The total expenditures made by the railways for advertising has shown a marked decline within recent years, both in absolute amount and in proportion to earnings and operating expenses. Omitting the two years of government operation, the total outlay for advertising in 1913 to 1921, inclusive, was as follows:

Year	Advertising Expenses	Operating Revenue	Per cent of Total Revenue	Operating Expenses	Per cent of Operating Expense
1913.....	$9,275,698	$3,125,135,798	.296	$2,169,968,924	.427
1914.....	8,122,328	3,047,019,908	.266	2,200,313,159	.369
1915.....	7,141,908	2,956,193,202	.241	2,088,682,956	.342
1916.....	7,745,466	3,691,065,217	.209	2,426,250,521	.319
1917.....	7,305,790	4,014,142,747	.182	2,829,325,124	.258
1920.....	4,138,198	6,178,438,459	.066	5,833,731,629	.070
1921.....	6,362,810	6,516,556,462	.097	4,562,668,302	.139

It will be seen that the total advertising expense in 1921 was one-third less than in 1913, and that whereas in 1913 almost 3/10 of one per cent of earnings was spent for advertising, in 1921 less than 1/10 of one per cent was spent for advertising. Because of the increase in the cost of advertising space, the decline in the amount of advertising done was much greater than these figures indicate. In 1923 the railways as a whole could spend as much for other kinds of advertising as they did in 1922 and increase by over $3,000,000 the amount spent by them for public relations advertising, and still not make their total expenditure for advertising exceed what it was 10 years ago.

The *Railway Age* does not suggest that each railroad should individually adopt a public relations advertising program relatively as large as that of the Illinois Central. Perhaps better results would be secured if part of the expenditure for this purpose were made by the individual railways and part of it jointly by groups of railways or by the railways as a whole. It does, however, seem most probable that systematic and persistent presentation of the facts about the railway situation through advertising throughout the country would have in time a very beneficial effect upon the relations of the railways with their employees and the public. Several large concerns or groups of concerns such as the American Telephone & Telegraph Company, the meat packers, and the Standard Oil Company have systematically carried on such advertising campaigns for long periods, and got excellent results. The railways that have done such advertising believe it has been worth far more than it has cost.

There are many ways in which more public relations work should be done, but it seems clear that public relations advertising should, and even must be used if all the many millions of people to whom transportation facts and conditions should be presented are to be reached and influenced.

Important Problems Before the Mechanical Division

The Mechanical Division of the American Railway Association has given as the reason for deciding not to hold its regular convention in 1923 the inability of the members to attend committee meetings or to work on reports. This decision was based on conditions just after a nation-wide strike and was undoubtedly influenced by the circumstances existing during the past few months. There is no prospect of another disruption of shop forces; in fact, the worst crisis that can be anticipated at present is a record-breaking traffic. It seems pertinent to inquire at this time what constitutes an emergency that would justify a railroad officer in giving up his work in the technical associations.

There are, of course, emergencies which threaten to stop the operation of the railroads. When they occur, the most important duty of every railroad man is to overcome them. It is well to prepare for emergencies; but it is a mistake to stand in such dread of unforeseen possibilities that the expectation of a crisis will put a stop to progressive and constructive work. Second only in importance to keeping the railroads running is the problem of making them more efficient and economical. Except under extreme conditions, no railroad officer should be too busy to give his attention to anything which promises to add materially to the efficiency and economy of operation. If he cannot do this, there is something wrong with his organization.

The technical associations of railroad officers exist because they afford the most effective means of solving problems of importance to all the railroads. They are co-operative organizations to which the railroads contribute a small amount of time in committee work and in return get the best judgment of representatives of all the roads on the subjects considered. The important railroad problems which form, or should form, the subjects of discussion at technical conventions have not been dispelled by the strike. On the contrary, they have become more pressing due to the large number of new men taken into the service and the amount of equipment in bad order. Eventually, the railroads must bend their energy to solving these problems in the way that will best promote economy and efficiency. Postponing the solution will inevitably cause avoidable waste in railroad operation. It will not save time because the officers of the individual roads will each have to consider these matters which should have been settled for all by the committees. This, in the aggregate, will take much more time than would have been required for a very thorough study on behalf of all the roads by members of the association.

What are some of the problems before the mechanical department on which concerted study and action are needed? First, and most important, is the problem of training employees. Practically every railroad now has considerable

numbers of mechanics who are inexperienced in railroad work. Some also have a considerable proportion of foremen who were promoted during the strike. Very little of the minutiæ of railroad mechanical work has been set down in books. How are these men to be instructed to give them a thorough understanding of their work in the shortest possible time? What policies should be adopted regarding foremen to insure that they will remain loyal in any future crisis? How can they be trained to interpret the policy of the railroads to the men under them so as to counteract the lying propaganda of labor organizations which has proved so destructive to the morale of the workers? A frank interchange of experience and opinion on these topics alone at the next Mechanical Division convention should repay the railroads for all the time which the officers would be required to spend in preparing committee reports.

In addition to these human problems, there are pressing technical problems which the railroads cannot afford to put off for two years. The question of wheel loads and rail stresses is a good illustration. Ever since 1914 the American Railway Engineering Association and the American Society of Civil Engineers have been analyzing the effect of single wheel loads and a combination of wheel loads under both static and dynamic conditions. These tests have brought out the fact that isolated wheels, such as the trailing wheels or two-wheel leading trucks, produce greater stresses in relation to the weight carried than do the locomotive drivers. This indicates that the weight of the locomotive should not be distributed evenly between the wheels, but that greater loads can be carried by the center drivers than by the end drivers and that the load should be still further reduced on the leading and trailing trucks. The Mechanical Division has had a committee co-operating with the American Railway Engineering Association since 1920 and its report should not be further postponed. Other investigations have indicated that heavily loaded freight cars set up far greater stresses in rails than is commonly believed to be the case. This work has such an important bearing on locomotive and car design that the conclusions of the committee should be reported and discussed at the earliest opportunity.

Other questions of special importance at this time are corrosion and decay in cars, the selection and testing of draft gear and the operating results obtained with new designs of locomotives. These are actual problems which the mechanical department must settle sooner or later. It is the function of the Mechanical Division to see that the right solution is presented to the railroads as promptly as possible. These questions are of such importance to the railroads that their consideration should not be deferred.

Hire of Equipment

Railway operating income represents net after taxes. Net railway operating income—the term which the *Railway Age* has recently been discussing at some length in these columns—represents, on the other hand, a net after rents—namely, equipment rents and joint facility rents. The editorials that have already appeared have been intended to throw some much needed light on the difference between the two terms "railway operating income" and "net railway operating income", and also as a plea in favor of a more general and more consistent use of the latter term. Continuing the discussion leads one next to comment on the good judgment which was shown in working out a figure—we refer to that of "net railway operating income" which pays proper regard to the matter of equipment rents. There has been much discussion in accounting circles concerning the proper place and the proper manner in which equipment rents should be shown in the income account. It is not intended, however, just yet at least, to participate in that discussion. We shall content ourselves in this instance in showing just how great an effect the inclusion of equipment rents may have on the operating results. Mr. Ford's railroad, the Detroit, Toledo & Ironton has thus far failed to show those wonderful results which Mr. Ford promised. The D. T. & I.'s monthly earnings reports not only have not been good—they have, on the contrary, been extremely poor. Not enough attention has been paid to the fact that the road's difficulty has been due to equipment rents—or to put it into the terms of our discussion, due to the fact that the monthly reports have had to show net after rents rather than net after taxes only. The figures show that for the nine months ended September 30, 1922, Mr. Ford's railroad had a net after taxes of $1,016,301—a very satisfactory figure, but that it had a net after rents of only $5,650—a very poor figure. A selection of the figures follows:

Detroit, Toledo & Ironton

	Sept., 1922	Nine mos., 1922
Net after taxes	—$233,982	$1,016,301
Net after rents	383,097	5,650
	Sept., 1921	Nine mos., 1921
Net after taxes	$31,779	$893,082
Net after rents	—91,761	352,447

These figures point out that the D. T. & I. needs cars. They also serve as a pertinent example of how much more complete the story of net earnings may sometimes be told if "net railway operating income" is shown rather than merely railway operating income.

Simplified Schedule System at Jackson Shops

Undoubtedly one great objection of many practical railroad men of the old school to shop schedule or routing systems is that certain forms have to be filled out, involving more or less clerical work. Shop schedules consist, however, of far more than filling out forms by some clerk. *They are essentially a method of locating weak departments, speeding up operations and increasing shop output.* They have demonstrated their ability to perform these three functions, and the number of forms used, or details developed, can be readily suited to individual shop needs. A shop schedule, notable for few printed forms as well as for its effective control of shop operations, is installed at the Michigan Central Shops, Jackson, Mich., as described elsewhere in this issue. This schedule has admittedly been one of the important factors enabling the Jackson shops to recover rapidly from the effects of the strike and within three months show an important increase above normal output. The most noticeable feature about the schedule system at Jackson, the one without which no shop schedule can be successful, is that everyone believes in it from the superintendent of motive power down through the ranks. If in any shop the superintendent or general foreman does not believe in the schedule, and give it his hearty co-operation and support, it will be absolutely ineffective and useless. The next feature is that the importance of the work of the schedule supervisor has been recognized. In this case he has been given the title of schedule foreman and made responsible not only for scheduling locomotives, but following up work orders, trucking all material through the shops and shipping

to outside points. To handle details of this work the schedule foreman has under his personal direction an assistant, a work order clerk and ten laborers provided with six power tractors for trucking material. The movement of material is plainly a function of the schedule department although not commonly so considered and the way in which the efficient trailer tractor system at Jackson shops is directed by the schedule foreman is therefore of exceptional interest. The next feature of importance is the special efficiency gang composed of five practical shop experts who devote their entire time to tracing delays as indicated by red marks on the schedule board, locating the weak points in various departments and strengthening them. When one department has been brought up to standard, usually some other becomes the limiting factor and, by correcting these deficiencies, there is a continual improvement in shop operation and output.

Importance of T. & T. Meeting

After several postponements occasioned by the strike of the shop crafts, the Telegraph and Telephone Section of the American Railway Association will hold its annual meeting at Chicago on December 12, 13 and 14. This meeting is the first since that held at Richmond, Va., last March and a number of interesting and valuable reports have been prepared for presentation, which afford an opportunity for constructive work. The section, however, has another opportunity to make this meeting one of the most valuable ever held if it has the courage to discuss the problems arising out of the strike. The meeting can thus be made to cover discussions of technical and the human problems which go hand in hand in any organization. In order that the greatest good may result, railroad managements should see to it that their telegraph department officers are in attendance. Even though problems relating to the strike are not discussed on the floor, the information gained from an interchange of ideas and experiences among the various groups of men in attendance after the sessions will be invaluable. It is fair to assume that those present will come away better equipped to inaugurate savings in the telegraph department which will more than repay the railroads many times over the expense involved. A concrete example of this is where one telegraph department officer was at a meeting when the application of the symbol system to messages was discussed thoroughly. On his return, he inaugurated this system on his road with the result that it enabled him to dispense permanently with operators at certain locations. This road has received a high return on the investment made by having its representative present. Other roads should benefit in similar ways.

The L. C. L. Problem and Motor Trucks

LESS-THAN-CARLOAD freight comprises between four and five per cent of the total tonnage handled by the railways. Yet it requires more than 23 per cent of the cars. While the rates received for its transportation are higher than for carload freight, it is loaded and unloaded by the roads at their expense through stations provided by them. These stations must be located close to the industrial centers if they are to secure the traffic, which means that the investment for land is high. All of these factors make such great inroads on the revenues derived from this traffic that only in rare instances does it contribute its share to the net revenues of the roads. In fact, in many instances, particularly with short hauls, the roads are actually carrying the traffic at a loss. This situation calls for serious consideration by railway officers and gives special timeliness to the able discussion of the motor truck as an aid in the solution of this problem, presented by W. H. Lyford, vice-president of the Chicago & Eastern Illinois, which appears elsewhere in this issue.

The disproportionately large demands for cars to handle this traffic are specially important at the present time when cars are so much in demand, particularly the type required in this service. While some reduction in the number of cars required may be secured by heavier loading, aided by more transfer or assembling points, the relief possible from such measures is limited owing to the relation between heavy loading of l.c.l. freight and claims. There is, however, one place in which improvement can be effected. In many large cities it is the practice to transfer l.c.l. freight between railways in cars, which movement consumes many car days. Furthermore, it is the practice of many roads to transfer the freight between the several receiving and delivery houses and a central assembly and break-up platform or between large industries and this platform by trap cars. In this service the motor truck offers large possibilities, as pointed out by Mr. Lyford. That this is no new idea is indicated by the use of demountable bodies on trucks at Cincinnati, the trailer plan at St. Louis and the more recent suggestions at New York.

The second great opportunity for reduction in cost lies in the use made of the freight station. At the present time the shipper delivers his freight at the station at any time he pleases and the consignee calls for it at his convenience, usually allowing it to remain in the house three or four days. Because he has to call for and deliver his freight, he patronizes the road whose station is located nearest to his plant, thereby forcing the roads to use expensive property, so expensive in fact that as Mr. Lyford points out, the interest charges alone on real estate occupied by at least one freight house in Chicago are more than $2.30 per ton of freight handled.

If the railways could move all freight to the warehouse of the consignee the day it was received, the relatively large proportion of the floor space now required for storage could be restored to its real purpose, relieving the congestion and postponing for a long time expenditures for more area now pressing. It is doubtful if the railways can afford to undertake to deliver this less than carload freight individually because of the duplication of effort and heavy expense. There are also considerations which favor the development of this service by an independent cartage company working in conjunction with all of the railways in a city and making a special charge for it. Such a company should, by reason of the volume of its operations, be able to render the service for shippers for less than it now costs them independently. By working in conjunction with the railways, it could relieve them of the necessity for a large part if not all of the storage. By a further co-ordination of activities and the transfer of the cartage responsibility to another company, much of the objection of shippers to a more remote and less expensive location for the freight stations could be overcome. This again suggests the use of motor trucks.

In the early days of the motor truck, its sponsors launched extensive campaigns to "ship by truck." In launching the motor truck as a competitor of the railways, its friends hindered its development along logical lines. By failing to realize its possibilities as an aid in the solution of their problems, the railways may be losing an equal opportunity. The motor truck is a transportation agency which has a definite future. It is the problem of the railways to utilize it as an adjunct in its operations. In no phase of railway operation are there greater possibilities than in the handling of less than carload freight.

What Increased Coal Prices Are Costing the Railroads

THE NET OPERATING income of the railways sharply declined in August and September. It was 40 per cent less in these months than in the same months of 1921. This decline has been attributed to the reduction of rates made on July 1, and to the effects of the shop employees' strike.

Detailed statistics of operating expenses for August which recently have been made public by the Interstate Commerce Commission disclose that there was another factor which was of very great importance. This was the increase in the average price that the railways had to pay for coal.

Before the coal strike began last spring the average price the railways were paying for coal was declining, and in April, the month immediately following the beginning of the strike, when the prices charged into the accounts were those paid immediately before the strike began, the average cost of railroad coal was $3.46 a ton. From that time the cost began rapidly to increase, and in August it was $4.87, an increase since April of $1.41, or over 40 per cent.

The railways use about 12,500,000 tons of coal a month. Therefore, this increase in its cost of $1.41 a ton added about $17,500,000 to their operating expenses in August. This increase in operating expenses resulted in an equivalent reduction of their net operating income. The reduction in their net operating income as compared with August, 1921, was $37,600,000. Therefore, the increase in the cost of coal alone was responsible for almost one-half of the entire reduction of their net operating income.

The railroads have had a strike of their own. It has cost them a great deal of money. Nobody has proposed to allow them to advance their rates to offset the increased expense caused by the shop employees' strike. On the contrary, most of their rates, including those on coal, are now 10 per cent less than they were before July 1 when the shop employees' strike began.

The coal operators had a strike in their mines. They lost it. In consequence they are paying the same wages to the miners now that they were prior to April 1. The coal strike caused a shortage of coal. The coal operators have, in consequence, increased the price the railways have to pay for coal almost 40 per cent.

The railways are not only being forced, out of reduced rates, to pay the cost of the shop employees' strike, but also a large part of the cost of the coal strike. They consume about one-third of all the coal produced. Therefore, they are paying, roughly, one-third of all the increase in the cost of coal due to the coal strike.

It may be said that the advance in the price of coal was commercially justifiable because of the shortage of it. But there is also a shortage of transportation about which the coal operators frequently complain. If the coal operators are justified in increasing the price the railroads have to pay for coal 40 per cent because of the shortage of coal, upon what theory of morale or economics can it be contended that the railroads should be required, not merely to refrain from advancing rates on coal, but to continue to haul it at rates which are 10 per cent lower than they were before the coal strike began?

The *Railway Age* does not wish to be understood as advocating an advance in the rates on coal. It does contend that for the railways, under present conditions, to be required to haul coal at reduced rates and to be forced to pay coal prices that have been advanced 40 per cent since last spring is an economic and moral outrage.

When is the increase in the prices the railroads have to pay for coal going to stop? In only one month of 1920 or 1921 was the average price they paid as high as in August, 1922. This was in November, 1920, when it was $4.92. We have no disposition to advocate government regulation of the price of coal. But those in the coal business are certainly doing their best to afford justification for the advocacy of such a policy.

There is in some sections a powerful agitation for further reductions of railway rates. Those carrying on this agitation might well direct their attention to the price of coal. How can the railways be expected to reduce rates again when within six months the price of their coal, one of the largest items in their operating expenses, has been increased 40 per cent?

New Books

Biographical Directory of Railway Officials of America. Edited by Elmer T. Howson, Western editor, Railway Age; D. A. Steel, associate editor, Railway Age, and J. B. Tebo. 718 pages, 6 in. by 9 in. Bound in cloth. Published by the Simmons-Boardman Publishing Company, Woolworth Bldg., New York.

The publication of the Biographical Directory was begun by the Railway Age Company in 1885 for the double purpose of furnishing a complete list of American railway officers arranged alphabetically for personal reference rather than under the titles of their companies and also providing a concise record of their railway history. The 1922 edition is the eighth in this series of directories. While the need for an alphabetical list of railway men is now supplied from other sources, the increasing value of a directory confined to the personal history of the men who build, control and carry on the operation of the railways of North America has been demonstrated in the years which have passed since the appearance of the first edition and the Biographical Directory has come to be recognized as an indispensable reference book in every railway library, as it is the only comprehensive history of the professional careers of American railway officers published. The purpose of the directory is to give a concise and accurate record of the railway service of general, divisional and departmental officers.

The present volume shows a larger number of new names than any previous edition; only approximately 1,850 of the more than 5,000 officers whose sketches appear in this volume appeared in the last, or 1913, edition. It is of interest to note that only approximately 650 of the men whose sketches appeared in the 1913 edition are holding the same position as then, indicating that a new generation has come into the command of our railways. More than 3,000 of the sketches incorporated in this volume have been inserted for the first time.

In addition to the sketches of men in active railway service, there are also included sketches of a number of railway officials of extended service who have left important railway positions to engage in other business, but whose railway records still continue to be a matter of general interest. Sketches are also included of many former railway officers now retired and still living. As in the 1913 edition, biographical sketches of the members of the Interstate Commerce Commission and of many of the state railway commissions are grouped in alphabetical order at the end of the volume. To these have been added the members of the Railroad Labor Board.

THE RAILWAY CLUB OF PITTSBURGH will hold its regular meeting at Fort Pitt Hotel, on the evening of Thursday, November 23. F. X. Millholland, assistant to senior vice-president of the Baltimore & Ohio, will speak on Public Relations of the Railroads.

Letters to the Editor

Expedited Service and Rate Making

St. Louis, Mo.

To the Editor:

I have been impressed, sometimes favorably and sometimes otherwise, with the views of Secretary of Commerce Hoover, as published from time to time, respecting freight rates and transportation. I think I see a fundamental feature running through his statements, which, I believe, if recognized and acted upon will result in mutual benefit to the carriers and to the public. Mr. Hoover held, in his testimony before the Interstate Commerce Commission, in General Rate Investigation Docket No. 13,293, that the class rates, or those covering the higher grades of merchandise, might well be advanced, making reductions only in the rates on the lower grades of commodities.

If the carriers would so adjust their methods of handling these different classes of shipments, and recognize that there should be a distinct and well-defined service commensurate with the value of the goods, so that high-class shipments should not be delayed in transit or held in suspense in consequence of maximum train tonnage rules, much higher rates might quite reasonably be demanded. In fact, I believe the shippers and receivers of the higher grades of merchandise would willingly pay higher rates if such rates were predicated on schedule of such speed and guaranteed regularity as would preclude the filling in with cars of pig iron, or other low-grade commodities, in order to bring the train load up.

In other words, if the public were assured of a specially expedited, dependable service on high-class shipments, rates might be maintained on the basis of such schedules, provided a system of refunds, or forfeitures, for failure to make or offer delivery at destination within a resonable, fixed number of hours over schedule were adopted.

My thought is that in this manner we might have a service intermediate with the present merchandise service of the railroads and the American Railway Express service. It may be said that some of the lines have high-class merchandise trains —symbol trains, if you please. It will be found, however, on careful examination of the rules governing the make-up of these trains that low-grade shipments may be put in to make up maximum train tonnage loading. As the maximum speed of a train can be no greater than the bearings of the heaviest loaded car therein will permit, that necessarily becomes the maximum service that can be accorded the higher grade commodities in that train.

The value of the goods is an important factor—important to the carriers in that every unnecessary day in transit adds to the risk, without additional compensation therefor, to say nothing of the loss incident to the misuse of equipment. The importance to the owner of the goods lies in the fact that the value of the goods represents idle capital and every needless day in transit is an unreasonable drain on his working capital, and detracts from his legitimate turnover accordingly. Adam Smith said, over a hundred and fifty years ago (and it is just as applicable to the commerce of today), that "the greatest and most important branch of the commerce of every nation is that which is carried on between the inhabitants of the town and those of the country." Therefore, is it not of vital importance that our transportation system shall provide the most expeditious, economic methods and facilities for the exchange of the products of the farm (the sustaining forces of life) for the finished articles of manufacturing and jobbing centers?

Obviously, this should be done with as little waste of energy and capital as possible. In other words, goods ready for consumption should be moved with the greatest possible dispatch, while the basic articles of commerce may well be moved on a maximum train tonnage basis, so long as industries are kept regularly and amply supplied.

What the shipper wants is service, and he is willing to pay a good price for the genuine article. P. W. Coyle,
Traffic Commissioner, St. Louis Chamber of Commerce.

Concerning Statistical Comparisons

New York, N. Y.

To the Editor:

In the *Railway Age* of November 4, page 831, D. M. Neiswanger criticises certain features of an article of mine in a previous issue. It is only fair to state that the *Railway Age* had held this article for some time and that therefore certain statements were somewhat antiquated. Insofar as his remark that the statistics quoted are erroneous, would say that the original copy of my article specifically stated that these were not all as of the months of July (as was stated in the published version), but were for summer months readily comparable. Mr. Neiswanger was thus misled through the caption over the statistical table. It would seem superfluous to add that the figures used were taken from reports of the U. S. R. A. and the I. C. C., and were not the product of my imagination.

I admit fully the error in the wording of the phrase "average number tons per car-mile" in order to get entire phrase on one line; I felt that railroad men would readily understand that this meant per *loaded* car-mile.

As for the aspersion that .50 cents per car-mile is not a true figure for the cost of handling a heavy official car, or Pullman, would say that this is an *average*. Service of another character is naturally reflected in any average. For authority, might add that this estimate was made by one of the high officials of the Railroad Administration, as the files will disclose. Since that time I have seen higher calculations.

Referring to the remark (in connection with my discussion of passes) that I neglect the principle of "long established consideration of employees, particularly those older in service," would refer the gentleman to the first paragraph on page 703, which especially mentions this factor, almost in the words which he uses.

Mr. Neiswanger's further criticism of my remarks regarding lighter loading of trains as an economy concludes with the contention that this "is open to considerable doubt." Judging by the mass of material appearing in the *Railway Age* and elsewhere, both pro and con, his statement is more than correct, and from the disagreements as between eminent authorities, it would appear that one theory is as valuable as another. His discussion of the economics of the subject is a valuable contribution, but can it not be refuted by arguing from the human equation? Mr. Hungerford in his recent book, depicts a trainman on a northwestern road, who, after creeping over the division on a freight drag, is deadheaded east on his rest period to take out another train. The chapter is well worth reading, and the man who wears out his life to assist in making "tonnage records," etc., show up well, can hardly be blamed for not being loyal to his company. This subject might be stretched into an entire article, for the feelings engendered in the hearts of trainmen forced to take out trains too heavy for the locomotive can never be measured in dollars and cents, nor in gross tons per train.

The further computations of what *might* have been, etc., had there been fewer bad order cars, had business been heavier, and such surmises, I pass over with the suggestion that such hypotheses are about as valuable and informative as the rating of football teams by comparative scores—the probabilities never come true under actual conditions.

Franklin Snow.

Schedule Assists in Rapid Shop Reorganization

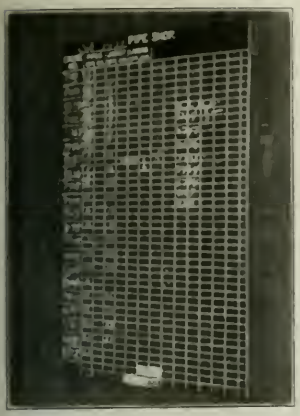


Fig 1—Typical Department Schedule Board

Output of Jackson Shops of the Michigan Central Quickly Raised Above Normal by Simplified Shop Schedule

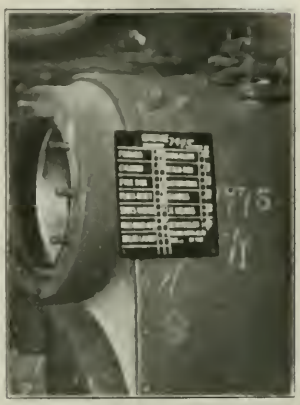


Fig 2—Dates for Erecting Shop Operations

WITH A NORMAL output of about 18 heavy and 20 light repair locomotives a month, the Michigan Central repair shops at Jackson, Mich., closed down during the first three weeks of July as a result of the strike, and the output dropped practically to zero. Reopening the last of the month, the shop force was being rapidly recruited when the so-called Willard-Jewell strike settlement occurred and many of the striking shop men returned, swelling the total shop force in the month of October to almost 25 per cent above normal. During August and September the shop organization was gradually rebuilt and the output increased until, in October, all departments were well balanced and functioning smoothly, so that 25 locomotives were given heavy repairs and 20 light repairs. This output represented an even greater increase over pre-strike months than the proportionate increase in men employed. It was a striking achievement considering that new men were trained, old men relocated, departments built up and the entire shop put on a production basis in three months.

In view of the results obtained, a brief analysis of the shop force and output by months, as shown in Table I, will be of interest. The total number of employees at Jackson previous to the strike was about 862, of whom 556 worked in the repair shops and 306 in the roundhouse. When the strike was called on July 1, only 60 men reported for work and these men were sent to the roundhouse together with the shop foremen to keep as many locomotives as possible in service. The output of heavy repair locomotives was slow in picking up during August and September, as shown in the table, owing to the concentration of work on light repairs; but by October, the shop output had increased fully 25 per cent and the roundhouse 23 per cent.

TABLE I—EMPLOYEES AND OUTPUT OF JACKSON SHOPS, APRIL TO OCTOBER, 1922

	April	May	June	July	Aug.	Sept.	Oct.
Shop force	555	554	569	211	346	641	783
Roundhouse force	323	311	282	160	229	225	288
Total employees	878	865	851	371	575	866	1,071
Heavy repair locomotives	15	18	15	0	6	5	25
Light repair locomotives	23	20	19	8	20	41	20
Locos. turned in 24 hrs.	64.2	54.7	51.9	60.2	64.6	65.1	70

Salient Features of Shop Organization

Credit for the rapid reorganization of Jackson shops is doubtless due first of all to the character and ability of the supervisory officers and shop foremen who remained loyal to the railroad in the emergency. They formed the foundation on which the new organization was built. Unquestionably, the factor of second importance, and the one forming the basis of this article, is the simple and effective shop schedule or routing system, by means of which shop operations are controlled. Next in importance is the efficient power-trucking system, directed by the schedule foreman, and designed to secure material and parts from the storehouse or stripping gang, keep them moving through the various shop departments, and truck them to the erecting shop for assembly as soon as they are finished. Mention should also be made of the special shop efficiency department consisting of the assistant shop supervisor and five specialists who devote practically all their time to tracing and removing the causes of delay as indicated by red marks on the schedule board. This department has developed many improved methods, jigs and fixtures which tend to speed up the schedule and increase the general efficiency of the shop as a whole.

Simplified Shop Schedule System

The schedule system employed at Jackson shops is unusually simple, being carried out with as few printed forms as possible. Its success is largely due to the fact that everyone believes in it and works for it, from W. H. Flynn, superintendent of motive power; F. P. Neesley, division master mechanic, and C. W. Adams, shop superintendent, down to the youngest shop foreman.

In brief, the master schedule consists of an immense board, 7½ ft. high by 21 ft. long, taking up the entire front wall of the room in which the foremen meet frequently to discuss the progress of the work. This board is ruled in squares, and provided with a heading, as illustrated in Fig. 3. Horizontal columns *A* indicate the dates on which various operations are due, columns *B* showing the dates on which these operations are actually completed. In case of delay, these dates are marked with red chalk, indicated in the illustration by numbers enclosed in circles. Obviously, a red date is a signal for investigation and action by all concerned.

About the twenty-second of each month, the shop superintendent and foremen meet in the foremen's room to schedule engines for the following month, and another meeting is held on the tenth of the month to make necessary schedule revisions. From work reports and inspectors' reports the condition of each locomotive is known, and a reasonably accurate estimate can be made of the time needed for each repair operation. Dates are accordingly chalked on the master schedule board. All the foremen are present, and if they feel that any of the dates cannot be met, the matter is thrashed out then and there. It is the intention, however, to set the schedule slightly ahead of what can be accomplished, and continually shorten the schedule as better shop methods are developed.

The foreman of each important department has a printed form covering the work of his department, to be filled out in accordance with the master schedule and carried by him for

reference. This form is also duplicated in chalk on a department board, located in a conspicuous position for the information of the workmen. Fig. 1 shows such a board in the pipe shop.

Dates for the completion of erecting shop work on each locomotive are chalked on an 8-in. by 9-in. piece of sheet iron, painted, lettered and attached to the cylinder, as shown in Fig. 2. Dates when material should be received from the machine shop and when it should be applied to the locomotive are shown. Erecting shop men are thus enabled to tell exactly when different operations are due without consulting every important machine and job throughout the shop. Workmen naturally try to get the slips onto the O.K. hook as fast as possible. Moreover, foremen can walk through their departments and tell at a glance which machines have a lot of work ahead and which will soon be caught up.

Dates on the master and department schedule boards are made with yellow chalk, the date when the work is actually completed being put on with blue chalk, except in the case of delays, when red is used. Delays are, therefore, indicated on the master department schedule boards by red dates which are conspicuous and attract attention. In order to avoid

W. H. Miller — GEN'L. FOREMAN — MICHIGAN CENTRAL SHOP ROUTING

ENGINE NUMBER	DATE IN	FRONT END STRIPPED	FLUES OUT	MACH. STRIPPED AND DEL.	PISTON VALVE BUSHING OUT	JACKET OFF	LAGGING OFF	FRAMES	CYLINDERS	CROSS TIES	DECK CASTING	FIREBOX	FLUES RESET	BOILER FITTINGS	BOILER STUDS	HYDROSTATIC TEST	STEAM PIPES	SUPERHEATER ARRANGM'T	PISTON VALVE BUSHINGS	ROCKER BOXES	ENG. BLANKED FOR TEST	UNIT TEST	VALVES IN	STEAM CHEST AND COVER	STEAM TEST AND BLOWEDOUT	FRONT END NETTING	FRONT END	WHEELS	EC
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
(A) 7758	12	12	14	13	14	15	16	23	23	23	23	18	18	18	18	18	27	25	18	24	20	27	20	X	27	29	29	20	X	
(B)	12	12	14	13	14	15	16	23	23	23	23	18	18	18	18	18	25	25	18	(29)	20	25	20	X	(29)	(31)	(31)	20	X	
(A) 8278	18	18	20	19	20	21	22	25	25	25	25	27	27	27	27	27	X	X	25	X	X	26	26	26	27	27	27	23	23	
(B)	18	18	20	19	20	21	22	(28)	(28)	(28)	(28)	27	27	27	27	27	X	X	(29)	X	X	31	31	(1)	(2)	(2)	(26)	(26)		
(A) 8328	23	23	26	25	25	26	27	27	27	27	27	25	25	25	25	25	25	26	X	X		27		X	27	29	29	25	X	
(B)	23	23	26	(26)	25	26	27	(1)	27	27	27	25	25	25	25	25	25	26	X	X		(1)		X	(1)	(2)	(2)	(26)	X	

Fig. 3—Reproduction of Upper Section of 7½-ft. by 21-ft. Master Schedule

the foreman. The only other forms in connection with this simplified schedule system are two small ones used to report delays to the foremen, and causes of delay to the shop superintendent. There are, however, two additional small shop forms, one being a work order slip form for outside work and small material not mentioned on the schedule, and the other consisting essentially of a form issued by the schedule foreman for the movement of material.

Work Order Slips Effectively Used

The work order slip (Fig. 4) is of sufficient importance to be described in some detail. In general, it is made out in triplicate by a foreman who needs work done in another department. The original white slip goes to the department which will do the work; the second blue slip goes to the routing office which looks up pattern numbers and gets the rough material from the storehouse or casting platform; the third yellow slip is retained by the issuing foreman for reference. When the work is completed, the time is entered on the original slip; it is signed by the foreman and returned to the routing office which arranges for the finished material to be trucked to the proper department. The work order slip also serves as a record of time spent on individual jobs and is used in computing costs.

A typical work order slip, made out for 20 hexagon head frame bolts, is illustrated in Fig. 4. It is issued by an erecting shop foreman against the blacksmith department which, if the bolts are not in stock, makes them on the forging machine, illustrated in Fig. 5.

Special attention is called to the work order board attached to the forging machine water pipe, as illustrated. One half of the board is painted black and marked "Work Order," the other half being painted red and marked "O.K." Two hooks are provided at the bottom, and when a work order slip is received at the forging machine, it is hung on the black hook at the left. When the work is completed, the slip is transferred to the red "O.K." hook at the right. Most people hate to see a lot of work piled up ahead of them waiting to be done and advantage is taken of this trait of human nature by means of the work order board. It is used not only at the forging machine, illustrated, but at

questioning and possible censure, there is a definite effort on the part of both foremen and men to have as few red dates as possible appear on the boards.

In addition to the monthly schedule meeting, the foremen meet every Monday, Wednesday and Friday after working hours to check up the progress of the work, settle any questions which may arise, and discuss any suggestions for improved shop operation. Minutes of these meetings are taken in shorthand and later distributed to the various foremen

FORM MC-MP1B — Adopted 4-19 — 500 blks 4-23-K-1139

THE MICHIGAN CENTRAL RAILROAD CO. No 8851

WORK ORDER SLIP — TIME WORK SLIP RECEIVED

LOCO. No. 8076 SHOP Blksmith DATE 10 - 9 - 192 2

QUANTITY	DESCRIPTION OF WORK
20	1" x 6" Hex. Head Frame Bolts

When Wanted 10 - 11 - 22

DATE AND TIME JOB FINISHED 10-11 9 A. M. P. M. — John Doe, Foreman — A. R. Smith, Foreman

Fig. 4—Typical Work Order Slip Made Out Against the Blacksmith Department

who thus have a permanent reminder of the points discussed. These meetings prove extremely effective in ironing out any differences which may arise between the respective foremen, enabling them to work as a unit for the general betterment of the shops.

Schedule Foreman Has Charge of Routing System, Trucking and Shipping to Outside Points

Shop schedules can never be a success unless run by men of extensive practical shop experience. Obviously, if a clerk is employed simply to go through the motions of filling out

forms in the office, the results are as favorable as far as increasing shop output is concerned. As previously intimated, the importance of the schedule is appreciated at Jackson and a real job has been created for the schedule foreman who has general charge of the routing system, work order slips, trucking material, and shipping to outside points. This schedule foreman is relieved of minor details by an assistant who checks the progress of the work each morning and afternoon. A clerk is also provided in the routing office to take care of all work order slips and shop orders.

The importance of the prompt movement of material and helped which not only speeds the movement of material through the shops but saves a great amount of hard manual labor, formerly required when trucking by hand. The trailer system has another advantage in that material can be loaded on the trailers and then moved, a considerable number of units at a time, without tying up a tractor or being compelled to wait for one.

The importance of the schedule foreman in the scheme of shop operation described is evident and it seems logical that the man who has charge of the progress of both schedule and outside work should also have charge of getting the material,

SCHEDULE — JACKSON SHOPS — MONTH OF September 1922

2	3	3	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61
CENTERS	DRIVING BOXES	SHOES AND WEDGES	TRAILER TRUCK	ENGINE TRUCK	PIPES UNDER JACKET	BOILER LAGGED	JACKET	SPRING RIGGING	REVERSE SHAFT AND BOXES	REVERSE LEVER AND REACH ROD	BOILER WORK	CAB	CROSSHEADS	PISTONS AND RUNNING BOARDS	RUNNING BOARDS AND CAB	REWHEELED	AIR BRAKE EQUIPMENTS	SIDE RODS	MAIN RODS	BRAKE RIGGING	GRATES	ASHPAN	ASHPAN OPERATING DEVICE	PILOT	VALVES SET	HEADLIGHT	PIPE WORK	TENDER	ENGINE OUT	CLASS OF REPAIRS	
20	20	X	23	18	23	24	22	25	25	25	25	25	29	25	23	31	28	25	26	2	31	31	26	26	2	2	2	2	2		7758	
20	20	X	29	18	23	24	22	30	30	30	25	25	25	25	29	(2)	26	26	30	2	31	31	26	(2)	2	(7)	2	(7)				
23	24	X	25	27	27	28	25	25	25	25	2	25	25	27	25	3	31	27	29	5	2	2	2	29	5	5	5	5	3		8278	
23	24	X	31	27	27	28	26	25	30	29	27	25	30	27	27	(5)	(2)	29	(2)	(7)	(7)	(7)	(7)	(2)	5	(7)	5	(9)				
25	25	27	27	25	28	29	27	27	27	27	27	27	29	29	27	5	2	29	2	8	5	5	5	2	7	7	7	7	3		8328	
26	28	(1)	(1)	25	(1)	(2)	29	27	30	27	31	29	(2)	29	31	(6)	(7)	31	5	(2)	(9)	(9)	(9)	(6)	7	12	7	12				

Board, Taking Up the Entire Front Wall of the Foremen's Room at Jackson Shops

its relation to the shop schedule is recognized by giving the schedule foreman three Ford gasoline tractors and three Mercury storage battery tractors together with 10 laborers for operating the trucks and handling material. The schedule foreman, knowing when the work on various locomotive parts is completed, is in the best position to see that this material is moved promptly. As fast as one operation is completed on a part it is moved along to the next machine.

Fig. 5—Men Like to Get Work Order Slips on the "O. K." Hook

The schedule foreman also has direct charge of ordering and shipping all material to outside points, which work bulks large in the Jackson shop operations. While the erecting shop is of the longitudinal type and more or less difficulty is experienced in transporting material through it on that account, an effective trailer and tractor system has been developed which not only speeds the movement of material through the shops but saves a great amount of hard manual labor, formerly required when trucking by hand. The trailer system has another advantage in that material can be loaded on the trailers and then moved, a considerable number of units at a time, without tying up a tractor or being compelled to wait for one.

The importance of the schedule foreman in the scheme of shop operation described is evident and it seems logical that the man who has charge of the progress of both schedule and outside work should also have charge of getting the material, moving it from point to point about the shop and shipping it to outside points when completed.

Unusually Heavy Repair Work at Jackson

A close examination of the master schedule, illustrated in Fig. 3, will show that the first three locomotives were allowed 18, 16 and 14 days in the shop, the time actually taken being 23, 18 and 17 days respectively. While these shopping periods may appear unduly long, it should be noted that in each case the locomotive was given unusually heavy repairs involving jacket and lagging removal and firebox repairs. Probably there are shops no larger than those at Jackson, which turn out more than 25 heavy repairs a month, but in fairness it should be pointed out that locomotives sent to Jackson shops are given unusually heavy repairs and in fact many locomotives, credited only with light repairs, receive practically heavy classified repairs owing to the rigid Michigan Central ruling on mileage. (Unless a locomotive has made a specified mileage, it cannot be given general repairs.) The proximity to the roundhouse and consequent large number of light repair locomotives also tends to disrupt the shop organization for heavy repair schedule work. In fact, preference is given to light repair or roundhouse work whenever it conflicts with the schedule work.

Shop Efficiency Department

Railroad shops, unfortunately, are not like the "one horse shay," with each department as strong as the other. In consequence a close observation of the master schedule board will usually show weaknesses in certain departments. Obviously, it is the duty of the shop superintendent to take the necessary steps to strengthen weak departments, but one man cannot attend to all the details of this work which is handled at Jackson shops by a special efficiency gang, under the direction of the assistant shop supervisor. The gang consists of two machinists, two boilermakers and one blacksmith, all expert workmen experienced in their respective lines.

A series of red marks in the same department, as shown on the schedule board, always indicates some trouble which may be caused by inefficient machines or methods. In either case some slight change will often remedy matters and

allow this department to get its work done on time and eliminate the red marks. As a rule, when one department has been brought up to the mark in this way, some other department proves to be the limiting factor and so it goes. As a result of the work of the efficiency department, a continual improvement in shop methods and output is obtained.

Among the devices which have been developed comparatively recently may be mentioned a double crown brass turning jig, a power-operated device for pulling in cylinder bushings, a jig for milling throttle lever quadrants, a motion work bushing press, several effective brass room tools, a set of guide liner dies, etc.

Experimental Room

Another unusual feature at Jackson shops is an experimental room in which is segregated all the tool work done for the efficiency department. This experimental room is entirely separate from the main toolroom, being equipped with an 18-in. lathe, an upright drill, a 24-in. shaper and a grinder. All new jigs and fixtures, or devices intended to facilitate the shop work are made in this experimental room, which is allowed to be used for nothing else. It is well known that where work of this kind is carried on in the ordinary toolroom it becomes sidetracked whenever a rush job comes in, and the result is a delay in the development of new tools if the work is not stopped altogether.

In view of the results accomplished, it may safely be said that the shop schedule, as installed at Jackson shops, has justified its existence. It amply fulfils the expectations of those who for years have advocated this method of controlling railroad repair shop operations.

Proposed Railroad Legislation

WASHINGTON, D. C.

PLANS FOR THREE distinct types of railroad legislation, for which it is hoped to obtain consideration by Congress at the extra session, which convened on November 20, or the regular session, which begins in December, are now being worked out by various groups. One type of proposed legislation is that on which Senator Cummins and other administration leaders are working designed to strengthen the Transportation Act by provisions to prevent strikes, requiring compulsory consolidation of railroads and possibly a general equipment company. At the same time members of the agricultural bloc and other so-called progressives have renewed their agitation for a repeal of the rate-making section of the law and the section which authorizes the Interstate Commerce Commission to remove discriminations caused by the action of the State authorities. Heads of railroad labor organizations and their supporters in Congress, while planning to oppose any anti-strike legislation, are also planning an effort to push amendments to the act to abolish the Railroad Labor Board and at the same time to work with the interests that are for a repeal of the rate-making, or so-called "guaranty," section of the law. Senator Cummins has conferred with the President regarding the amendments which he will propose, but he has already indicated that he has little expectation of obtaining definite action during the present session of Congress, and the President did not touch on the subject in his address before Congress.

The reason advanced for proposing compulsory consolidation is that the railroads during the two years and a half that have passed since the law was enacted making consolidations permissive, if approved by the Interstate Commerce Commission, have not displayed more affirmative interest in consolidation plans, although it has recently begun to appear that numerous plans for extensive consolidation have been considered by various groups of railroads, and are merely being delayed by the apparent necessity of awaiting the Interstate Commerce Commission's complete plan for grouping the railroads of the country into a limited number of systems. The Hill roads have been before the commission for several days, urging a consolidation of the Great Northern, Northern Pacific, Burlington and Colorado & Southern in place of the commission's tentative plan which would combine the Burlington with the Northern Pacific and the Great Northern with the St. Paul, and hearings were also begun this week on the petition of the Southern Pacific to retain control of the Central Pacific pending the commission's determination as to how the Western roads should be grouped. The New York Central, Pennsylvania and other roads have also taken several steps in the direction of further consolidation by obtaining permission from the commission to make long-term leases of subsidiaries, and apparently would be ready to proceed with actual consolidation as soon as the commission is in a position to give its approval.

A call for a national conference of "progressives" to meet in Washington on December 1 and 2 and to organize a "progressive" group in Congress was issued on Saturday by Senator La Follette and Representative Huddleston, as chairman and vice-chairman of the People's Legislative Service. The call proposed a meeting of "progressive" members of Congress for December 1 and a gathering of "progressive" leaders generally on the following day. Senator La Follette also issued a statement announcing that among the objects proposed are the defeat of the administration's ship subsidy bill and proposed anti-strike legislation. At about the same time, Senator Capper, chairman of the Senate farm bloc, issued a statement outlining a program of legislation including a reduction of freight rates. Just what Senators and Representatives will join in the movement is not revealed, but there were reports that some friction might be created by the failure of Senator La Follette to consult with all elements of the "progressive" group before calling the meeting. Senator La Follette also attended on November 18 a meeting of the officers of the 16 principal railroad labor organizations associated with the Conference for Progressive Political Action, called by W. H. Johnston, president of the International Association of Machinists, to discuss the legislative situation resulting from the recent elections and particularly plans for opposing proposed anti-strike legislation. At the same time, it is understood that the plans were considered for favoring legislation to abolish the Railroad Labor Board and a call was issued for a national meeting to be held in Cleveland on December 11.

International

Derailment Near Paris, France

The Human Problems of Modern Industry*

The Development of Democracy in Business Is Under Way—It Needs Wise Leadership and Direction

By Samuel O. Dunn
Editor, *Railway Age*

THE HISTORY of industry and of its relations to the people in the leading countries of the world during the last century, and especially during recent years, presents a strange paradox. The development of modern industry has resulted in a vast increase of production which has enabled every class of people to establish and maintain material standards of living higher than ever were attained by any but a very few in earlier times. It has also made possible reductions of the hours of labor and increase of the hours available for leisure, for intellectual improvement and for pleasure of a vast majority of people.

If any man whose life ended prior to a century ago, or even prior to a half century ago, had foreseen this vast increase of production, this great improvement in standards of living and reduction of hours of work, he might have anticipated that it would usher in a golden age of harmony, peace and contentment among men. Quite the contrary has been the result. There never was a time when there were bitterer quarrels or fiercer struggles in industry than within recent years. The great war and its effects have intensified these struggles, but they began before it occurred and would have continued if it had not occurred.

They have been waged not only between large industries and their employees, but also between large industries and their customers. Both before and since the war the railways have been engaged almost constantly in carrying on controversies with their patrons regarding rates as well as with their employees regarding working conditions and wages. Almost every large industrial combination also has been the object of attacks in the courts which indirectly were the results of efforts made by their patrons to break their power and reduce their rates.

These great struggles between industry and the people are being carried more and more into politics. More and more are efforts made to use legislation and government administrative bodies to settle differences arising between large industries and their employees or patrons; and when legislation and government commissions are invoked their general tendency is to settle the questions submitted to them adversely to large industrial concerns.

Finally, growing more and more active and influential is a class of labor leaders, politicians and agitators with complexions varying all the way from a pale pink to a deep red, who are striving by propaganda, by political action, by strikes and even by violence to overthrow part or all of our existing political and industrial institutions and to establish in their place institutions varying all the way from a mild form of state socialism to the "dictatorship of the proletariat" in both government and industry as it is exemplified in Russia.

Modern Industry the Cause of Social Unrest

No intelligent man would question the seriousness of some of the struggles between large industries and their employees or patrons which have occurred within recent years. There are those who are convinced that these struggles are direct and inevitable results of the development of modern industry and of the way in which many large industrial concerns have been managed and that unless very important changes are made in the management of many of these concerns the struggles between them and their employees and patrons will become more frequent, more bitter and more destructive of the welfare of all concerned.

There can be no question about what has been the principal cause of the great increase of production in modern times. Until a little over a century ago there had never been any really great improvement in the physical machinery of industry. Almost all the power used in agriculture, in manufacture and in transportation had been furnished by the muscles of men and animals. It was chiefly the discovery and utilization of new sources of power, mainly steam and electricity, that made possible the development of modern industry. In order to make the best use of these new sources of power large manufacturing and transportation units were created which rapidly drove out smaller ones. Other improvements in the physical machinery of industry, such as those in means of communication, stimulated the tendency of industrial and transportation concerns to increase in size. Owing to these and other causes we have witnessed within comparatively recent years the development of concerns in many lines of business which are enormously larger than any which existed prior to a generation ago.

How has this great increase in the size of industrial and transportation concerns helped to create the social unrest and antagonisms which now cause so much trouble?

First, it has tended to put great power into the hands of the managers of these large concerns, and it is a law of human nature that men who have great power will be tempted to abuse it to further their own interests and the interests of those they represent. There is hardly a large concern in the country that has not at some time and in some ways abused its power in dealing with its employees and patrons.

Secondly, where great power is possessed, or thought to be possessed, people have a tendency to believe that it is being abused, or to fear that it will be abused even though actually it is not being abused at all and there is not the slightest intention of doing so.

The Need of Personal Contacts

The owners and managers of small concerns come into frequent contact with their employees and patrons and therefore their employees and patrons know what kind of men they are, and the owners and managers know constantly the feeling and attitude of their employees and patrons and can act accordingly. The owners of large concerns usually are numerous stockholders who are widely scattered and hardly ever come in contact with the employees and patrons. Even the managers of large concerns come into direct contact with only a very few of the employees and patrons. In consequence usually they are almost unknown to the many thousands of people with whom indirectly they are dealing; and often they themselves know extremely little about what is in the minds of all these many thousands of people.

If, in addition, as often happens, the principal officers of a large concern deliberately refrain from making any efforts to come into contact with as many of their employees and patrons as they can, or even from making any public state-

*From a paper read before the Western Railway Club, Chicago, on November 20.

ments regarding affairs of the company in which the company and its employees or patrons have a common interest, you have a situation which, human nature being what it is, is certain to beget a lack of mutual understanding which will tend to develop into suspicion, then into antagonism and then into great and dangerous struggles. When the employees and the public begin to suspect, dislike and attack the big concerns in any field the smaller concerns in that field are likely to become the objects of similar suspicion, dislike and attack.

There is not the slightest likelihood of any reduction of the size of industrial concerns. The most radical advocates of socialism or syndicalism or guild socialism would not favor this. On the contrary, they favor wholesale consolidations of all the concerns in each field and seizure of their ownership by the public and transfer of their management either to the government, or to the employees under schemes similar to the Plumb plan.

We have recently seen production seriously interfered with by two great strikes in this country. These strikes were due to controversies between employers and employees. We are now seeing the production and commerce of the country limited by inadequacy of transportation. This is due partly to labor troubles but much more largely to years of government regulations of railways based largely on public misunderstanding and prejudice. Bad human relations in industry are tending to arrest the progress of industry.

What is "Democracy in Industry"?

The policy most persistently and persuasively advocated by the critics of the present industrial system is that of "democracy in industry." This is their principal slogan, although they do not always mean the same thing by it. In fact it is used to mean everything from certain mild forms of government regulation to the Russian soviet scheme of complete ownership and management of industry by the proletariat. It is absurd to call the Plumb plan and similar schemes plans for establishing "democracy in industry." The Plumb plan provides that the public shall buy the railways and turn them over to the management of those on their payroll. If the railways under the employees' management earn any more than interest on the investment in them, one-half of the surplus will be given to the public and one-half distributed among the employees. If a deficit is incurred the public will pay it all. There never would be any surplus, however, because those in the payroll would fix their own pay through a board selected entirely by themselves. Democracy is supposed to be the rule by the many. Where would be the democracy in an industry which was owned by 100 per cent of the people and ruled by only two per cent of them for their own benefit?

How Shall Democracy Be Attained?

However, one may not be very favorably impressed by the plans for establishing democracy in industry which are advocated by those who seek to overthrow the existing political and industrial order, and may, at the same time, believe that an increase of real democracy in industry is inevitable. In fact, there already have been some very great increases of democracy in industry. Labor unions in some industries have acquired so much power that they are able at times for considerable periods practically to dictate their own terms to employers. Witness the recent strike in the coal mining industry and its results. This is one form of democracy in industry, since it involves dictation by hundreds of thousands of employees to a few employers. Our policy of government regulation of railroads affords another illustration of one form of democracy in industry. It involves dictation by the many who use railway service to the comparatively few companies that render it.

The great movement for democracy in government which began some generations ago has been resisted to the last extremity by the upper classes in some countries. The results in those countries, of which France in the eighteenth century and Russia in the present century afford the most striking examples, have been tremendous social explosions and upheavals in which the upper classes, and, indeed, the entire countries have been almost ruined. In England, on the other hand, the upper classes yielded step by step. Vicious class antagonisms were avoided and under conditions of democracy the property owning and more intelligent classes of Great Britain have succeeded in maintaining their leadership in politics and in government down to the present time.

Does not this political history hold a lesson for the present generation, which is confronted with the insistent demand for more democracy in industry? Does it not suggest to the leaders of industry the wisdom of not resisting all efforts to increase democracy in industry, but on the contrary, of furthering its development along lines which will give employees and the public a larger participation in the management and control of industry, while leaving its leadership and direction still in the possession of the comparatively few men of large ability who alone are equal to its leadership and direction?

The employers of past generations took practically the position—and many take the same position today—that it was their right to fix working conditions and wages in their business, and that labor could accept these conditions and wages or go without work. Now, capital furnishes the physical machinery and selects the directing minds of industry, but labor furnishes the manual skill and labor which operate the machinery. There never was and is not now anything unnatural or unreasonable in the desire of labor to have an equal voice with the management in settling the terms and conditions of the employment relationship. But, if the employees are in any real sense to deal with the management regarding these matters, they must do so through representatives chosen by themselves. This necessarily means some organization of the employees. It is very doubtful, indeed, whether some kind of organization of the employees of any large concern can long be prevented. If this is true, then the question is whether the employees of the individual concerns shall be encouraged by the management to form organizations of their own, or whether this shall be discouraged and resisted by the management with the almost certain ultimate result that practically all of the employees will become members of national labor organizations.

From the standpoint of both employers and employees, dealings between each concern and its own employees are far preferable to dealings by each individual concern with national labor organizations. Only agreements between each concern and its own employees can adapt working conditions and wages to the local conditions with which they are immediately surrounded. Personally I have no doubt that all large industrial concerns should favor an increase of democracy in industry which will result from allowing and encouraging their employees to form organizations of their own and from dealing fairly and frankly with such organizations.

Furthermore, it seems highly probable that most large industrial concerns would derive benefits from encouraging conferences between representatives of the employees and representatives of the managements regarding many questions of operating efficiency. In the long run it is as much to the interest of employees as it is to employers to have each concern efficiently operated. About 12 years ago when the record for industrial accidents, and especially railroad accidents, was at its very worst in this country, many industries, including the railways, organized safety committees composed of officers and employees. There has been since then a very remarkable reduction of fatal accidents on the railways.

Undoubtedly this has been mainly due to the work of these safety committees. There does not seem any good reason why it would not be possible and desirable to form similar committees on the railways and in many other industries to bring about co-operative effort by the employees and managements to eliminate waste and increase efficiency. There are many employees in every industry who could do valuable work on such committees and if they did work on them they would not only make contributions toward increased efficiency but also learn some of the difficulties which the managements have to overcome in reducing waste and securing economies.

The Democracy of Ownership

There is another form of democracy in industry which every large business concern should earnestly and energetically promote. This is the diffusion of the ownership of its securities among its own employees and patrons. Most large concerns, and especially the railroads, are regarded by their employees and patrons as being a kind of alien institutions which exploit those who work for them and from whom they get business in order to pour profits into the coffers of a small class of rich people who do business and live at ease in or within a comparatively small radius of Wall Street. So long as the employees and patrons of a large concern regard it thus it will always be very difficult to convince them that they have any interest in its prosperity. Some large industrial concerns have adopted successful means of getting large numbers of their employees to become stockholders. Some of the largest and best managed public utilities in the country are making great and successful efforts to get large numbers of their customers to buy their securities and thereby establish what is called "customer-ownership." The best kind of industrial democracy which could possibly be established would be a democracy of ownership. Substantial difficulties would have to be overcome in securing a widespread diffusion of the securities of railways among their employees and patrons, but it may be they would not be so great as the managements now believe. No management probably knows just how great they would be because so far as I know no management ever has really tried to overcome them.

No great result is ever attained without thorough study and great effort being made to attain that result. There has been study and effort to improve human relations in modern industry but the conditions which exist show clearly enough that this study and effort have been very far from sufficient. The principle of arbitration of all great controversies between employers and employees that cannot be settled by direct negotiations should be insisted upon; but the thing most needed is the adoption of methods and the creation of a spirit which will tend to prevent the development of controversies to a point where they cannot be settled except by arbitration or strikes.

The Menace of Destructive Propaganda

Without doubt one of the principal causes of the bad human relations existing in modern industry is that employees and most of the public have been allowed by the managements to be grossly misled regarding the way in which large concerns really are managed and the profits that are made in them. Most members of the classes that own property and manage commercial and industrial concerns seem to have very little idea of the amount, the character, or the real purpose of the radical literature attacking the present social and industrial order which is being disseminated throughout every country of Europe and America among those who work for wages. Let extensive propaganda go unchecked long enough and it will overthrow any human institution. The propaganda to which I have referred, whether carried on by bolshevists, syndicalists, guild socialists, I. W. W. or parlor socialists, is intended to convince that large majority of people who do not own or manage property that the present system of private ownership and management of property, and especially of large industries, inevitably works the enrichment of the few and the robbery and impoverishment of the many. It preaches that the many, by forcing the payment of wages which industry cannot stand, or by constant strikes and violence, or by governmental action of various kinds, should indirectly or directly take over to itself the virtual ownership and the actual management of all industries.

This kind of propaganda is supplemented by propaganda carried on among small property owners and farmers which attempts to create sentiment among them against the existing order by greatly exaggerating the profits made by the railroads and large manufacturing and mining companies, with the object of causing regulation of their management, their rates and their prices which will help to make private ownership and management of them impossible.

Even if all the problems arising from the relationship of employer and employee could be solved temporarily at least there would not long be peace in industry. The present railroad situation illustrates that. The wages of all railway employees have now undergone some, and those of certain classes substantial, reductions, and probably there would be no more serious controversies between the railways and their employees for some time if the present rates were let alone. But already there is a widespread and energetic agitation for further reductions of rates among the farmers. This is partly due to the fact that the farmers really are suffering severely from an unwholesome disparity between the prices they can get for their products and the rates and prices they have to pay for the transportation and commodities they buy, and partly to reckless propaganda which has been carried on among them to make them believe that while they are suffering losses the railways are guaranteed large profits. If railway rates should soon be reduced again it would be necessary for the railways to start at once to secure further reductions of wages, and then the controversies between them and their employees would begin on a large scale again.

Take the Mystery Out of Big Business

There is a certain large railroad system which from every standpoint is one of the best operated and most successful in the United States. The management of this railroad has tried in numerous ways to establish close relations with its employees and patrons, and has presented to them by newspaper advertising and every other available means the facts about the railroad and what it is doing. It also has been especially prompt and courageous in refuting misrepresentation of this railroad itself and of the railways as a whole. When the recent shop employees' strike came this railroad, from the very beginning, kept one-half of its shop employees and was one of the very first in the country to build up a 100 per cent force. Probably there is no other railroad in the country which is today more popular with and the object of fewer criticisms and attacks from its employees and patrons. Its management is fully convinced that the educational work it has carried on for months and years among its employees and patrons has contributed very greatly toward enabling it to maintain its shop forces, to secure efficient work from its employees, to handle a record-breaking business and largely to increase its net earnings at a time when those of many railways actually declined.

What the management of this railway has done, those of others can do. With respect to this matter of educational work among the employees and patrons of large concerns there are two conclusions I have reached after years of study and observation and which I venture to state and emphasize. The first is that our present system of private ownership and management of large industrial and trans-

portation concerns cannot be permanently maintained without a better understanding and more good will being established between these concerns and their patrons and employees. The second is that the amount of educational work which must be done by such concerns among their employees and the public, if a better understanding is to be secured, must be very greatly increased. There are at least a hundred politicians and labor radicals who are actively engaged in carrying on propaganda to secure the adoption of a ruinous policy of regulation and the destruction of private ownership of railroads in this country to every single man who is actively engaged in combating this propaganda. There are literally scores of radical labor organizations and farmers' organizations that constantly employ men to deliver addresses and secure publicity in every community in the country attacking private management of railroads. There are literally hundreds of thousands of railway employees who, under the direction of radical leaders, are everywhere carrying on propaganda against the managements of the railroads. How many of the 20,000 railroad officers make any effort to combat this propaganda?

The Esch-Cummins Transportation Act was passed to destroy the restrictive policy of railway regulation which formerly prevailed, and to establish in its place a constructive policy. Almost from the time it was enacted it became the object of the most false and misleading attacks that political and labor leaders ever carried on with respect to any piece of legislation in this country. At the recent national election almost every important member of the National House and Senate who voted for and defended that law who was up for re-election was defeated, while almost every candidate who made his campaign largely one of attack upon that law was elected. In consequence, there is the very gravest danger that all the important constructive provisions of the Transportation Act will be destroyed. If this should be the case the railways probably will have to look for protection of their right to earn a reasonable net return to the federal courts. But in the long run the courts themselves cannot be relied upon to afford sufficient protection to property owned by large concerns.

In the long run the preservation of the present industrial order will depend upon public sentiment. Whether public sentiment in regard to railroads and other large industries will be friendly or hostile, wise or unwise, constructive of destructive, will largely depend upon whether the managements of these concerns make real, persistent and intelligent efforts to solve their human problems. Big business must establish closer relations with its employees and the public and destroy popular suspicions and prejudices by taking all the mystery out of big business or big business will have more serious troubles in the future than it ever has had in the past.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR LOADING again declined during the week ended on November 11 to 953,909 cars but was still greatly in excess of the loading for the corresponding week of last year, 755,777, and also in excess of that for the corresponding week of 1920 when it was 927,586. This makes the third consecutive week of loading in excess of 1920. Increases as compared with 1920 were shown in all districts except the Pocahontas and Central Western and in grain and grain products, forest products, ore, merchandise, l. c. l., and miscellaneous freight while there were increases as compared with last year in all classes of commodities. A part of the decrease in loading as compared with the previous week is attributed to election day.

The freight car shortage also showed a decrease during the period from November 1 to 8 to an average of 174,498, while the surplus averaged 4,990.

The railroads of the country repaired and turned out of their shops during the period from October 15 to November 1 last the largest number of locomotives for any semi-monthly period in approximately the last two years, according to reports received by the Car Service Division. During the period, 13,490 locomotives were repaired. This exceeded by 2,086 the number turned out of the shops from October 1 to October 15 last. Locomotives in need of repair on November 1 totaled 18,366, or 28.5 per cent of the number on line. This was a decrease of 865 since October 15, at which time 19,231, or 29.8 per cent, were in need of repairs. Of the total, 15,101 were in need of repairs requiring more than 24 hours. This was a decrease since October 15 of 834. The remaining 3,265 represented locomotives in need of light repairs, which was a decrease of 31 within the same period. On November 1 the railroads had 46,096 serviceable loco-

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS. COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, NOVEMBER 11, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	11,022	3,695	55,946	2,305	5,773	5,254	63,834	89,868	237,701	.....	.....
	1921	8,268	3,534	42,068	1,944	4,279	2,788	60,281	64,863	.....	188,025	226,000
Allegheny	1922	3,906	3,491	55,825	5,963	3,427	8,122	48,956	73,838	203,528	.....	.....
	1921	2,056	3,036	40,211	2,727	2,524	2,632	39,627	54,393	.....	147,206	201,013
Pocahontas	1922	247	164	18,455	526	1,501	62	5,798	3,391	30,144	.....	.....
	1921	194	287	22,376	169	1,225	1	5,460	3,297	.....	33,009	37,435
Southern	1922	4,007	2,533	22,533	1,266	21,917	1,296	38,611	45,404	137,567	.....	.....
	1921	2,838	2,022	21,932	547	16,998	817	37,531	37,011	.....	119,396	130,118
Northwestern	1922	14,832	10,058	10,574	1,734	14,249	22,026	24,788	38,132	136,393	.....	.....
	1921	9,843	9,264	7,024	696	11,932	1,364	26,519	28,420	.....	94,262	131,895
Central Western	1922	11,768	14,414	19,760	332	6,362	2,143	30,714	53,343	139,336	.....	.....
	1921	8,409	13,752	17,325	183	6,656	664	30,501	37,679	.....	114,169	132,936
Southwestern	1922	5,719	3,642	5,719	147	2,165	480	15,349	31,021	69,240	.....	.....
	1921	3,378	2,847	3,914	111	2,152	269	15,608	26,051	.....	59,710	68,189
Total Western Districts	1922	33,319	28,114	35,553	2,213	27,774	24,649	70,851	122,496	344,969	.....	.....
	1921	20,730	24,843	28,263	990	25,740	2,297	72,628	93,150	.....	268,141	333,020
Total, all roads	1922	52,701	38,001	188,312	12,273	60,392	39,383	228,050	334,997	953,909	.....	.....
	1921	34,086	33,722	154,850	6,377	50,766	8,735	215,527	251,714	.....	755,777	.....
	1920	34,507	38,911	222,874	15,110	56,356	49,693	201,261	308,984	.....	.....	927,586
Increase compared with 1921		18,415	4,279	33,462	5,896	9,626	30,648	12,523	83,283	198,132	.....	.....
Decrease compared with 1921		.....	.....	.....	.....	4,136	.....	26,789	26,013	26,323	.....	.....
Increase compared with 1920		17,994	.....	.....	.....	.....	10,300	.....	.....	.....	.....	.....
Decrease compared with 1920		.....	910	34,562	3,837	.....	.....	.....	.....	.....	.....	.....
November 11	1922	52,701	38,001	188,312	12,273	60,392	39,383	228,050	334,997	953,909	755,777	927,586
November 4	1922	51,912	39,731	194,077	11,641	60,013	47,046	234,737	355,670	994,827	837,576	915,615
October 28	1922	51,913	42,644	197,928	11,388	60,584	48,005	233,680	368,338	1,014,480	951,384	981,242
October 21	1922	51,685	40,473	196,771	10,631	60,344	45,468	231,797	364,595	1,003,759	964,811	1,008,818
October 14	1922	52,492	40,141	196,926	10,308	59,535	46,362	226,123	352,491	983,470	910,539	1,018,539

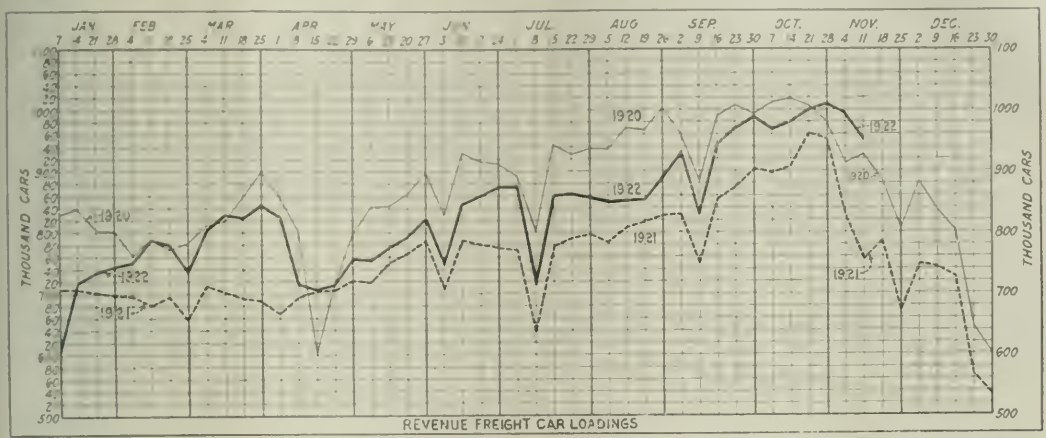
Compiled by the Car Service Division of the American Railway Association.

motives an increase of 9.9 over the number on October 15

The Car Service Division has compiled a chart in which it says is depicted the real basic problem in the distribution of the country's production. The variations in shipments are indicated at the top of the chart and the resultant periods of car shortage and surplus are shown below.

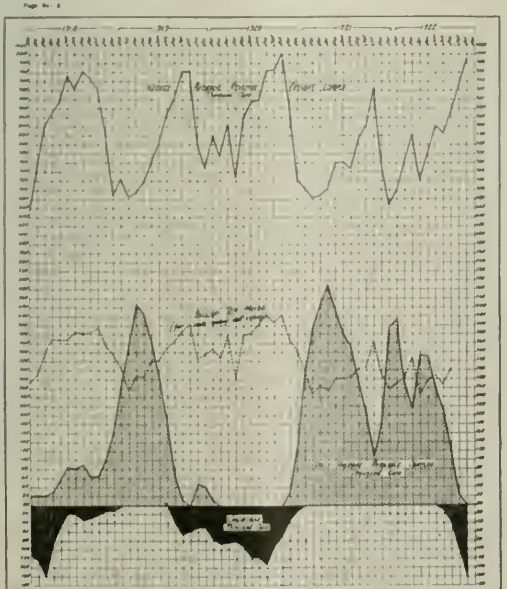
"To even out the distribution throughout the entire year," the bulletin says, "where the character of the commodity will ing of equipment and its expeditious movement. But the elements of movement and number of cars will not alone furnish a panacea for car shortage. To reach the curve in our development where more cars are busy during periods of car surplus and less cars are required during periods of car shortage represents a common ground of research and endeavor for both shipper and carrier.

"During the past 120 months (1912 to Nov., 1922) the



permit, thereby minimizing the severity of car shortages, putting idle capital in the form of car surplus at work, thus permitting of a stability in price level will go far in solving the country's spasmodic economic and transportation difficulties.

"Directly related to less acute fluctuations are the factors of (1) distribution organization, (2) trade practices, (3) trade units, (4) storage capacities, (5) capacity loading, (6) prompt loading and release of cars—together with the build-



country has passed through 87 months of car surplus and 43 months of car shortage. Both periods are expensive to the public and tend to increase distribution costs."

National Industrial Traffic League

The National Industrial Traffic League held its annual meeting in New York City on November 15 and 16. The address of Director General James C. Davis, on the first day of the meeting, was reported in the *Railway Age* of November 18, page 948.

The principal business of this convention was the consideration of the report of the legislative committee; and the main feature of this report was a series of conclusions concerning the character and work of the United States Railroad Labor Board, which conclusions are noticed at the end of this article. These conclusions were adopted with great enthusiasm and without amendment.

Besides the conclusion that the Labor Board ought to be abolished, the report contains numerous other radical recommendations. In adopting it, the League has given its endorsement to the Newton Bill, H. R. 11,822. This bill would repeal the present provision of law under which the Interstate Commerce Commission is to make a plan to consolidate all of the railroads of the country into a few systems, and instead would enact a simple provision under which the Commission may authorize consolidations upon application of interested carriers. It amends section 13 of the Act to regulate commerce so that a state regulatory body may pass upon the general level of intrastate rates which are complained of before the Interstate Commerce Commission, before the federal body makes any order which will have the effect of advancing intrastate rates. This means the adoption of the Shreveport doctrine, with a proviso; the opinions of state bodies being, however, subject to review by the Interstate Commerce Commission.

The Newton bill also provides a substitute for section

15-A of the Interstate Commerce Law by reducing this paragraph to a simple declaration that common carriers are entitled to earn a fair return and that the Commission shall always consider this element. It also amends the section regulating telegraph, telephone and cable companies, providing that the law shall apply to them in all respects the same as to railroads, where this is practicable; and in particular to suits based on loss, damage or delay.

Other sections of the report of the legislative committee relate to various bills designed to prevent destruction of railroad property, to penalize malicious mischief, and to broaden the Erdman Act, providing for conciliation in labor disputes, so that it would apply to all railroad employees. All these measures were approved by the meeting. The League condemns all proposals limiting the freedom of persons seeking employment with common carriers.

The League also went on record as opposing all measures empowering Congress to make railroad rates directly, as for example the pending bill to require the abolition of the surcharge on passenger fares now collected in all cases where the passenger rides in a sleeping or parlor car. It is held that the Interstate Commerce Commission should be free to adjust railroad rates according to its own judgment. The League also made clear that it does not favor the agitation to repeal the Esch-Cummins Act, and it recommends that the Carmack amendment to the Interstate Commerce Law, section 20, be further amended so that a suit may be filed against the delivering carrier or the initial carrier as the shipper may elect.

The League favors the bill prohibiting commercial bribery, which, among other things, would forbid the payment of money to railway employees with a view to obtaining preferred freight service. It opposes all proposals that the Interstate Commerce Commission should regulate the wages of the employees of common carriers and opposes the pending bill which provides penalties against shippers for making false statements in claims for damage to freight, etc. In such claims, incorrect statements are often made without evil intent and there is no provision for a penalty against the railroad employee in similar circumstances.

Diversion, Demurrage and Other Things

The committee on diversion and reconsignment, H. D. Rhodehouse, chairman, presented a long report embodying proposed changes in rules recently discussed with the carriers' committee at a public hearing in Chicago. This report was subjected to a lengthy discussion, participated in by many members, and the conclusions of the meeting, as handed back to the committee, will be the subject of further conferences with the railroads.

A similar course was taken with a brief report of the committee on car demurrage and storage, W. H. Day, Jr., chairman. This report, recommending modifications of rule 1, section B, was adopted substantially as presented.

The committee on freight classification, N. D. Chapin, chairman, presented a report recommending action looking to closer relations between the members of the League and the railroad committee, together with certain proposed changes in the classification rules; and this report was adopted.

Other reports, adopted with little or no discussion, were those of the weighing committee, the committee on embargo rules and regulations, the special committee to confer with railroad traffic executives, and the express committee.

A special committee on merchant marine, Seth Mann, chairman, made a long report containing numerous recommendations, among which is one to the effect that export bills of lading should be left under the jurisdiction of the Interstate Commerce Commission, so far as concerns the movement of traffic within the limits of the United States, rather than in the hands of a new board, which is chiefly concerned in the successful operation of ships.

Under the head of new business, the League adopted a resolution declaring that the National Industrial Traffic League commends the railroads for their efforts to rehabilitate themselves, and calls upon all regulating agencies, commercial organizations and the public at large for patience with the carriers during their forward progress; "the performance of the carriers in the face of handicaps has, generally speaking, been all that could have been expected under the circumstances; and this, in our opinion, is a further evidence that the policy of private competitive operation of the railroads, as advocated by the National Industrial Traffic League, is correct; and it is hereby reaffirmed."

The officers of the League for the ensuing year are: President, Charles Rippin, traffic commissioner of the Merchants Exchange, St. Louis, Mo.; vice-president, Paul M. Ripley, traffic manager, American Sugar Refining Company, New York City; treasurer, E. C. Wilmore, traffic manager, Sefton Manufacturing Corporation, Chicago; executive secretary, J. H. Beek, 111 West Washington street, Chicago.

Dallas, Tex., was selected as the place in which to hold the Spring meeting.

Shippers' Views of the Railroad Labor Board

The "conclusions" concerning the character, status and usefulness of the United States Railroad Labor Board, presented by the legislative committee and adopted by the league, are substantially as follows:

First: We believe in preserving freedom of contract. This principle was wisely written into our fundamental law when our government was founded, and we have always found trouble when we sought to depart from it. It should apply to labor as well as to capital and to contracts of employment as well as to commercial dealings.

Second: We are opposed to having governmental agencies make wages or intervene in the ordinary relations between employers and employees. When our government undertakes to perform these functions it is drifting dangerously near outright socialism. Such a policy will destroy the individual initiative of the workmen, and at the same time undermine the discipline and respect for authority which is necessary in an efficient business organization. The continuance of the Labor Board will undoubtedly have these tendencies.

Third: The Labor Board has failed to accomplish the good results which its advocates predicted for it. It has been demonstrated that it will not prevent strikes, nor will it stop them when once they have started. It has not prevented the intimidation of workers, the destruction of property, the impairment of transportation, nor the taking of human life when labor sought to ignore its mandates. In fact, the acts of the board tend to precipitate many of those troubles. This is no fault of the Labor Board as at present constituted; it is the fundamental danger inherent in any scheme where the government undertakes to make labor contracts for private industries and supplant the time-tested plan of direct dealing between employers and employees.

Fourth: The continuance of any national board to adjudicate controversies between railroads and their employees will necessarily result in nationalization of the industry. It solidifies the national organizations of the employees and in like manner consolidates the executives. All of them on each side must stand shoulder to shoulder for the conflict, while the public pays the bill. There has been too much of this shoulder to shoulder business already. National organizations mean national agreements, and national agreements ignore the important differences in conditions applying in various sections of the country, and at various points in every section. Any attempt by government agencies to make uniform rules and decisions will take away from railroad managers the power and incentive to use business discretion in dealing with local conditions peculiar to each line.

Fifth: We believe that the controversies and grievances arising can generally best be handled between the officers and the men on each particular line. Let us get back to normal operations where the officers in charge of a railroad are supposed to run that railroad and the workmen on that railroad handle their own cases without being subjected to dictation by some national union officer who feels that he has to dictate in order to keep his organization intact. It is impracticable for one national government board to determine the needs and conditions on every division of every railroad in this broad country without doing injustice to one side or

the other. Besides, the business organization and operation of a railroad should remain as far as possible a private enterprise.

Sixth: The very existence of a national tribunal to handle labor questions is a standing invitation to submit every kind of minor grievance for its consideration. The present Labor Board has had to hear and consider thousands of individual grievance cases, many of them being most trivial in character. This demonstrates that the existence of the tribunal will of itself invite disputes which otherwise would be quickly settled by the shop committee or grievance committee on a particular line.

Seventh: The Labor Board is not necessary. For many years, we have had national laws which provided machinery for the settlement of labor disputes in the only way they can ever be settled satisfactorily, namely by conciliation and arbitration. The first of these was enacted in 1888, and provided for general arbitrations. This was superseded in 1898 by the Erdman Act, which provided in detail a plan for handling these disputes and created what is known as the Federal Board of Mediation. In 1913, the law was revised but both the Erdman Act and the revisions applied only to employees having to do with the handling of trains. This law should be broadened so as to apply to all employees of common carriers engaged in interstate commerce, and we so recommend. This law has averted numerous strikes, and most of the disputes determined under it have been individual line grievances. In fact, it can hardly be otherwise. The law should provide for publication of arbitration decisions in important cases, and we so recommend.

Eighth: The operation of such an agency as the Labor Board has a tendency to crystallize rules of seniority and working conditions which will not be to the best interest of the employees. During the past generation, we have seen numerous men rise from laborers, clerks, trainmen or mechanics to become presidents or chief officers of our greatest railroad systems. The individual initiative of the workmen in the ranks has made our railroads the most efficient and progressive in the world, but the events of the past four years have operated to check this progress. Every possible step should be taken to leave a free, open road for every railroad worker to rise as he becomes proficient and we cannot expect this when we have a governmental agency to hedge the workmen in by hidebound rules.

Finally: We believe that private industry will be better off without the railroad labor board. The artificial scales maintained by the national body for railroad labor operate to create unrest in labor conditions affecting private industry. The great inequality between common railroad labor and farm labor, thus continued by the labor board in defiance of the laws of supply and demand, has been one of the greatest factors in creating the serious crisis facing the farmers of this country. The farmers and the public pay these bills, and certainly the government should have no part in the continuance of these conditions.

November Meeting of Signal Section in New York

Brief Report on Economy Effected by Signals—Address by George M. Basford

THE SIGNAL SECTION of the American Railway Association held its eleventh meeting in New York at the Hotel McAlpin on Tuesday and Wednesday, November 21 and 22, with a registered attendance of 333. C. A. Christofferson (N.P.), chairman of the section, presided.

The Committee of Direction, in session on Monday preceding the meeting, abolished the third meeting of the section each year and directed that the annual convention be held in Chicago in March of each year during the same week as the conventions of the Maintenance and Construction Section and also the Electrical Section of the Division IV—Engineering, A. R. A., of which the Signal Section is a part. In view of this new schedule, it is tentatively announced that the 1923 annual convention will be held at the Drake hotel in Chicago, beginning Tuesday, March 13.

At the beginning of the afternoon session on Tuesday, L. C. Porter, commercial engineer of the Edison Lamp Works of the General Electric Company, Harrison, N. J., gave an illustrated lecture on the development of electric lamps for use in electrically lighted railway signals. Curve charts, showing operating characteristic and photographs of testing equipment, together with actual field applications, were shown on the screen. Valuable information was offered on how and why signal lamps are so designed, which was followed with directions on the installation and operation of such lamps to secure the longest life at the least operating expense.

On Wednesday morning George M. Basford, one of the founders and a charter member of the Railway Signal Club, the forerunner of the present Signal Section, was requested to address the meeting. Mr. Basford spoke of the many recent improvements in steam locomotives and reminded the signal engineers that improvements in signaling were equally important as operating factors, and should be their constant study. Signaling should be presented as an economical improvement, capable of saving money in train operation as well as saving lives of passengers. The signal engineer should be busy studying methods of increasing track capacity rather than discussing in detail the proper sizes of bolts and nuts. These details should be thrashed out in committee meetings, not on the floor of the convention. The signal engineer has the opportunity to greatly increase the track capacity of the average single track division with signaling and he should set his goal to make such a line equal, as nearly as possible to a double track road. Signaling is to be looked at not so much as a production of specifications as a means of increasing the net returns to your company. "Do you, as signal engineers, realize that you must also be operating officers? Do you appreciate your association and your opportunities? Develop the highest standard, and then do your best to see that your road lives up to them."

When the committee on Highway Crossing Protection reported, A. H. Rudd, chairman, said that the subjects assigned to the committee for study had been found to be ones which came under the jurisdiction of the Maintenance and Construction section. He moved that the report as published in the proceedings be withdrawn and the motion was carried. He then stated that the committee had been instructed to report on standardization of aspects for mechanical or electrical devices at highway crossings as a substitute for crossing watchmen, gatemen and flagmen.

After the conclusion of the committee reports automatic train control was discussed informally for about an hour. Among those taking part in the discussion were A. H. Rudd, J. M. Waldron, R. C. Johnson, P. J. Simmen and R. W. Richards. Mr. Richards described very briefly an induction apparatus which he is developing at his shop in Baltimore, Md.

Important Savings Produced by Signaling

Savings that are accomplished by various installations of signal apparatus and automatic crossing flagmen are shown in tables in the report of Committee XIX—Economics of Railway Signaling. On a single track division, an installation of 43.6 miles of automatic block signals, with a few interlockings, showed a saving of $190,000 a year in operating expenses.

Of 71 distant-operated switch machines that were installed on 11 different roads for the operation of outlying

passing track switches, an estimated saving of from $2,500 to $8,700 a year was reported for each machine, with a saving of from 10 min. to 30 min. for each train stop eliminated, and an annual saving of coal of from 970 to 1,300 tons.

By consolidating eight small interlockings into the control of only four towers, certain railroads show a saving of $35,000. One railroad reports that by combining the control of three small plants into one having 171 operating functions, it was possible to effect a saving of $43,000 a year in operating costs. A saving of $5,000 a year was accomplished by spending only $2,000 for some automatic interlocking control apparatus.

Reports from 15 roads show that a saving of $165,000 a year was made by the installation of automatic flagmen which replaced 186 crossing watchmen at 133 highway grade crossings. The committee emphasized the fact that because of economy of operation, the additional protection obtained by having 24-hr. automatic flagman service, and the elimination of the human element, this phase of signaling should receive careful attention.

The chairman stated that the committee now had under preparation for presentation at the annual meeting, time charts, dispatchers' sheets and data, covering in detail the methods of determining the savings effected on a certain single track division equipped with automatic block signaling.

In the discussion of this report, H. M. Sperry explained that a rate of $0.40 per minute for a tonnage freight train delay was an average figure covering all items of expense. He further stated that on one road an installation of distant control switch machines and signal protection at the end of a double track costing not over $5,000 had shown a saving of $65,000 a year on a basis of the elimination of train delays to some 30 freight trains a day. The report of the committee was accepted as information.

Other Committees Reporting

Committee VI—Standard designs, presented revisions of five drawings, i.e., binding posts; concrete signal foundation; concrete battery box and various gage plates. Five new drawings showing operating rods for switches were presented for discussion. The opinion was expressed that although some of the new standard switch rods were patented, there was competition in their manufacture and sale and therefore the section might well adopt several different devices as standard. The committee was then directed to complete the plans to include details, facing point and lock connections. The remainder of the report, on enameled steel single blades, was accepted as information.

Committee XV—Valuation, presented a progress report. One of the important items being studied by this committee is establishing percentage multiples to show variation in the cost of signal apparatus from the period indicated by the I. C. C. as the "1914 Period" to the present date. The report was accepted as information.

Committee VII—D. C. Relays, asked for suggestions with reference to the standardization of relays having both front and back contact adjustments. After considerable discussion, the matter was accepted as information and referred to the committee for further consideration.

Committee XVI—Oils, reported progress. The committee has secured the co-operation of the petroleum department of the Bureau of Mines. Thirty-six samples of semaphore oil from various roads are now being tested and analyzed, the data to be used in preparing specifications. The report was accepted as information.

Committee XI—Batteries, presented a specification for cylindrical dry cells, which after a brief discussion was accepted for presentation at the annual meeting.

Committee II—Mechanical interlocking, offered a specification for electro-mechanical interlocking machines together with requisite sheets. After extensive discussion, including numerous suggestions to the committee, the report was referred back for further consideration.

Committee VIII—A. C. Signaling, presented a report including a comprehensive method of making readings and recording the operating characteristics of alternating current track circuits. Charts, tables and diagrams in the report simplify the solution of a. c. track circuit problems and thus offer a means of effecting economies in track circuit operation. This report was accepted for presentation at the annual meeting for inclusion in the manual.

General Contingent Fund, $25,000

WASHINGTON, D. C.

WHILE NO public announcement has been made and while in the nature of things most people are not even inclined to suspect it, the "general railroad contingent fund" contemplated by the transportation act, to be made up of the one-half of the excess income above six per cent which the fortunate roads are required to turn over to the Interstate Commerce Commission under the "recapture" provisions of the law, is in actual existence and contains about $25,000. It is not yet, however, a revolving fund: As directed by the law, the commission has deposited the fund in a bank at Washington where it is drawing interest. It consists of what a few roads have sent to the commission voluntarily, in response to its orders to the carriers to report their returns for that part of 1920 during which they were not under guaranty and for the year 1921, on the basis of the amount of property investment which they reported in connection with the rate case of 1920, and to send it checks for one-half of the excess.

Of 692 roads that filed returns for 1920, only 17 reported excess income, amounting to $645,186. Of 654 filing returns for 1921, 21 reported excess income amounting to $696,944, but not all of the money due the government has been paid and the commission, it is understood, has not been able to accept the payments made as the amounts due because it has not yet completed the valuations of the individual roads on which the law provides that the six per cent return shall be figured. For the same reason it is not yet able to order any road to pay over an exact sum in compliance with the law or to say what roads other than those that have reported excess income were in fact in such a plutocratic state as to have earned more than six per cent in the two lean years referred to.

Many of the carriers filed their returns under protest, some contending that the recapture provision of the law is unconstitutional, and others that returns should not have been asked for the last four months of 1920, while exception was also taken to the idea of basing the percentage of return on the property investment accounts, which many roads claim are less than the actual value.

Until the valuation work is more complete, and perhaps until after there has been a court test of the law, it is not expected that the contingent fund will be of much assistance to the weak roads.

The commission also has another fund consisting of repayments of loans, from the $300,000,000 fund also provided for by the transportation act. Some $98,000,000 has already been repaid on these loans and is available for new loans but only on applications filed within two years from the date of the passage of the law. Mr. Warfield's National Railway Service Corporation and some other companies whose wants had not been entirely satisfied from the original fund have some applications pending but for some months the commission has not been making extensive loans and the amount to its credit in the Treasury has increased.

Labor Board Renders Two Significant Decisions

Contracting and Overtime Involved in Latest Rulings—Both Are Favorable to the Employees

TWO SIGNIFICANT decisions were rendered by the Railroad Labor Board in the past week, one involving the practice of contracting on the Western Maryland and the other in a dispute between the Southern Pacific, Texas and Louisiana lines, and its maintenance of way employees over the assignment of these employees to a ten-hour day, the method of paying them and their supervisory officers for the ninth and tenth hours of service and for going to and returning from work.

In the Western Maryland case the Labor Board held that the several contracts entered into between that road and George E. Fowble, C. J. Wolfe, W. K. Hossack and the Dickson Construction and Repair Company for the operation of its shops and the performance of certain other operations, were in violation of the Transportation Act and Decisions 2, 119 and 147 of the Board.

An interesting point was involved in this case arising from the carrier's contention that a strike called at the shops involved on March 25, 1922, was a strike by the employees of the contractor against the contractor and that, therefore, even if these employees were at the time of the strike order, employees of the railway company, "they have withdrawn from the jurisdiction of the Board by reason of their strike and can now have no standing before the Board."

In discussing this point the Board, in its decision, said:

This brings the Board to the consideration of the new question as to whether the employees lost their right to present their contention against these shop contracts owing to the fact that they discontinued work under the contracts. In other words, the carrier contends that it can close down its shops, put its employees under a contractor, arbitrarily reduce their legally-established wages, and deprive them of the railway shop rules embraced in an agreement of the parties and in the decisions of the Board, although said wages and rules had previously been put into effect by the carrier, and the 30-day notice provided by the agreement and the requirements provided by Congress in the Transportation Act for negotiating such changes in wages and working conditions had not been complied with. Then, having thus violated its obligations, legal and moral, to the men, the carrier takes the position that the men can not present their grievance to the Labor Board, because they have refused to work for the so-called contractors under the diminished wages and mutilated working rules imposed by this process. No court or tribunal animated by the principles of equity should give ear to such a contention as that made by the carrier in this case.

These contracts were merely subterfuges by which the carrier arbitrarily changed the wages and working conditions of these employees without compliance with the provisions of the law. If it be said that the decisions of the Board embodying the wages and rules taken away from these employees were not legally binding on the carrier, it must be remembered that these decisions had been accepted, and put into effect by the carrier and had thus, in effect, become agreements between the parties which could not be terminated except in accordance with the express provisions of the agreements themselves as well as the Transportation Act, 1920. Any effort upon the part of the carrier to change these accepted and effective decisions would have constituted a new dispute, which the statute imperatively directs shall be brought to the Labor Board for adjustment. In these cases, the employees sought conferences with the carrier, but they were denied this right. If it be insisted that the men should have continued work under the contracts and should have brought ex-parte disputes to the Board, let it be noted that the carrier claimed that it had shut down its shops and denied that the men were its employees. At that time, the Board had not yet held that men so situated were as a matter of law employees of the carrier, and the employees of course had no means of knowing that the Board would so hold.

If this had been a case in which the carrier had violated a decision affecting some ordinary matter of wages or rules, there would have been no question as to the duty and necessity of the employees to remain at work until the question in dispute could be adjudicated by the Labor Board. In this case, however, the carrier had taken steps which purported to close its shops, transfer its employees to a new employer, remove them from the application of the Transportation Act, 1920, and obliterate their wage and rule agreements. This was equivalent to a lockout. This was done under a claim of legal right and the employees apparently acquiesced in the carrier's view of the matter that the shops had been closed and that they had not been thrown out of employment. The Labor Board can not afford to strain at a technicality and say that these men, with their entire status as railway employees apparently destroyed by a deliberate act of the carrier, should not be heard to complain before the Board because they stopped work under the contractor. With the principle once thoroughly established that the carrier's effort to expel them from its employment in the way described was illegal and ineffectual, the duty of the employees might be different in the view of the Board.

Three Members File Dissenting Opinion

A dissenting opinion, signed by R. M. Barton, a member of the public group on the Board, and Samuel Higgins and Horace Baker, members of the railroad group, was appended to the decision, these men taking exception to that portion of the decision pertaining to the rights of the employees who went on strike. An abstract of the dissenting opinions follow:

In this case, the facts show that these employees on whose behalf this application was made have and had before the making of this application gone on a strike, voluntarily removing themselves from the service.

The strike was ordered before the matter was brought to the attention of the Board by Mr. Jewell's advice of March 23, which notified the Board of the strike, but did not invoke the Board's action. The strike went into effect on March 25, 1922, and the men left the service without waiting for or invoking action by the Board and pending the Board's correspondence with the parties. In fact, no application has been filed, but the Board took jurisdiction on June 6, 1922, on the ground that the dispute was one likely to interrupt interstate commerce.

After the former employees—on whose behalf action is now invoked by a protest made on the hearing—had left the service, their places were filled by others who have since been doing the work required. It is shown that over 700 men were employed and have been rendering satisfactory service. Written petitions, signed and acknowledged by more than 350 of these employees, representing that they were employed and accepted service in good faith and asking that these relations be not changed, interfered with, or destroyed by the Board, have been filed in their behalf. Their rights are involved and are entitled to consideration.

If the employees here represented had remained in the service and continued to work so as to prevent an interruption of the operation of the carrier, and had submitted the case to the Board for the protection and enforcement of their rights, the same relief would have been granted to them as has been awarded in like cases to other employees. But we are of the opinion that by going on a strike, refusing to do the work required, and voluntarily removing themselves from service, thus compelling an interruption of the operation of the carrier unless their places were filled by other employees, the parties on whose behalf this application is filed have removed themselves from the jurisdiction of the Labor Board and the protection of the Transportation Act, 1920.

The Labor Board was created for the very purpose of settling these disputes and preventing an interruption of transportation. It was intended to prevent acts by either or both parties that would result in such interruption. It matters not that the carrier was first in fault in such case; it is the duty of the other party to comply with the positive mandates of the Act and bring the matter before the Board for decision.

The employees by taking the matter into their own hands to settle it by a strike have violated the spirit, purpose and express directions of the Act; they have removed themselves from the jurisdiction of the Board and prevented it from granting any relief.

The provisions of the Act and the regulations of the Labor Board were entirely ignored. If such action can be sanctioned or condoned the very conditions sought by the Act to be removed and prevented will be encouraged and brought about. The em-

ployees in question voluntarily removed themselves from the class entitled to be heard.

If the matter had been merely a question of equity between the rrier and the employees affected by the contract, we might have een able to agree with the majority, but in our view, with all due respect to the conclusions of the majority, this was not and is not the real question. The decision involves the much more vital question of public interests, public policy, and the enforcement of the Transportation Act, 1920—the carrying out of its spirit and purpose, to which, in our opinion, the equities between the parties must yield.

The decision, in our opinion, also wrongfully affects and destroys the rights of the new employees who accepted employment in good faith. It is contrary to previous announcements and decisions of the Labor Board.

After calling attention to previous orders of the Board pertaining to the rights of employers who go on strike, the minority continue:

We think that the decision adopted by the majority is in effect a reversal of these decisions, orders, and announcements, or at least a very unfortunate modification of them. And we especially regret the effect on the rights of the new employees who may be presumed to have relied on the positions taken by the Labor Board.

We note the position of the majority that the action taken by the carrier was in effect a lockout, but in our opinion this is more technical than real and rather a play upon words. As a matter of fact, all the employees were continued in exactly the same service by the change until they voluntarily left. Other employees in other lines and under like conditions have continued in the work and have been granted relief on the ground that the change was ineffective as to their status as employees of the carrier; that they still remained such and were entitled to the benefit of the provisions of the Act and the protection of the Board.

Board Renders Significant Decision on Overtime

Another significant decision was rendered by the Board recently in a dispute between the Southern Pacific, Texas & Louisiana Lines, and its maintenance-of-way employees. Three questions were involved in this dispute, namely:

"(a) Are employees in the track and bridge-and-building departments entitled to pay under Decision No. 501 for going to and returning from work.

"(b) Are supervisory employees entitled to overtime for the ninth and tenth hours when the force is assigned to work ten hours per day, and

"(c) Is the carrier violating the provisions of Decision No. 501 in assigning employees to work ten hours per day?"

On all three of these questions the contentions advanced by the employees were upheld, the Labor Board deciding that:

"(a) Employees' time will start and end at designated assembling point for each class of employees covered by the agreements governing maintenance-of-way and bridge-and-building department employes,

"(b) Supervisory forces shall be compensated on the same overtime basis as the men supervised when the general force is required to work in excess of eight hours per day, and

"(c) The carrier violated the meaning and intent of section (c-1) and section (h), Article V of Decision No. 501 in establishing the ten-hour day as outlined."

In discussing these questions the Board in its decision said:

Opinion Question ("a") The Labor Board has carefully analyzed the evidence submitted and the positions taken by the respective parties to this dispute, and while principle 12, Exhibit B of Decision No. 119, states that "for eight hours' pay eight hours' work should be performed," it is felt that the characteristics of the service required in the maintenance-of-way and bridge-and-building departments justify certain latitude in the definition of "work" or service.

The nature of the work and the varying locations at which such work is performed in these departments necessitates the designation of points at which men may assemble prior to proceeding to their point of work. After assembly and upon leaving such designated assembling points, the Board feels that it has been generally understood and recognized that the employees were under the supervision of the foremen and that the foremen were considered as being on duty and required to perform the functions incumbent upon that position while proceeding to the point of work, such as the inspection of track and remedying any defect that might be detected while in transit.

The Board does not feel that the time consumed can be properly considered the "men's time" as they are subject to service while en route. The same principle applies to the return to the designated assembling points at the close of the day.

Question ("b")—The Labor Board directs especial attention to that portion of section (h), Article V of Decision No. 501, reading, "service in excess of the working hours or days assigned for the general force" and "such work will be paid for on the basis provided in these rules in addition to the monthly rates."

In the promulgation of this rule it was recognized that there would be incidental services necessary for the supervisory forces to perform requiring their services in excess of the hours worked by the general force, such as making reports, recording time, and similar duties usually incumbent upon the position of foreman. However, as specifically stated in the rule, this exception only referred to service in excess of the working hours or days assigned for the general force, and which was considered a part of the employees' "responsibilities and or supervisory duties."

Section (a-1), Article V of Decision No. 501 provides:

> "Except as otherwise provided in these rules eight (8) consecutive hours, exclusive of the meal period, shall constitute a day's work." (II, R. L. B., 469.)

This rule and other rules relative to overtime, etc., are equally applicable to the supervisory forces, except in so far as the specific exceptions are referred to in section (h) of Article V and which have been hereinbefore referred to.

Hence, it can be properly said that when the "general force" is required to work 10 hours per day the overtime rules are applicable to said general forces and likewise to the supervisory forces in charge for the ninth and tenth hours because of the fact that these two hours do not represent time in excess of the hours or days assigned for the general force. Incidental duties performed in excess of 10 hours, however, such as making reports, etc., which are considered part of the responsibilities or supervisory duties, are excepted in the same manner as if on an eight-hour basis.

Question ("c")—The Labor Board after a careful analysis of the subject matter in dispute promulgated Decision No. 501, in which decision is incorporated the following rule "except as otherwise provided in these rules, eight (8) consecutive hours, exclusive of the meal period, shall constitute a day's work." There was also incorporated in this decision rules providing for the payment of service performed in excess of eight (8) hours per day and on Sundays and holidays, which was not considered a part of the standard measure of a day's work. This decision also embodied a rule which provided a method for changing the starting time of the various classes of employees covered thereby.

The evidence in this case clearly shows that the carrier did not seek or hold conference with the duly authorized representatives of the employees prior to the time certain of the changes complained of were placed in effect. In other words, the starting time of certain employees, which was formerly 8 a. m., was changed to 7 a. m. without proper compliance with section (c-1), Article V of Decision No. 501. Instruction of the carrier with respect to foremen being assigned to 10 hours per day without additional compensation for the two extra hours was not in conformity with the meaning and intent of the provisions of Decision No. 501 as will be noted from the foregoing opinion with regard to Question "b."

The entering of 10 hours' time in conformity with the carrier's instructions was an improper entry, as will also be seen from the Board's opinion expressed above. In the course of the oral hearing conducted in connection with this dispute, the representatives of the carrier indicated that the assignment of the employees to 10 hours per day was prompted by the thought that the supervisory forces could be worked these additional hours without extra compensation therefor in addition to their monthly rate. The position of the carrier if predicated upon this thought was indeed unjust and unreasonable and one which the Labor Board cannot sustain.

The Labor Board recognizes that the carrier has a right under the rules incorporated in Decision No. 501 to work its forces nine, 10 and even a longer number of hours should an occasion arise necessitating and justifying such an assignment, with the provision, however, that the meaning and intent of the rules are adhered to.

E. I. Nichols, of the Baltimore & Ohio Chicago Terminal, has been elected chairman of the steam transportation committee of the Chicago Safety Council, succeeding S. S. Morris, of the Illinois Central. This committee had charge in Chicago of the recent careful crossing campaign.

Southern Pacific Asks to Retain Central Pacific

Officials Point Out Dismemberment of System to Result If Court Decision Under Sherman Law Is Carried Out

WASHINGTON, D. C.

A HEARING on the application of the Southern Pacific to retain control of the Central Pacific through lease and stock ownership pending the completion of the commission's consolidation plan, was begun before Commissioners Meyer and Potter of the Interstate Commerce Commission at Washington on November 21 and was expected to take several days. The application is being vigorously contested by the Union Pacific on the ground that jurisdiction of the matter is still with the United States court which was directed to carry out the mandate of the Supreme Court that the two companies be separated and a large number of commercial organizations and state and local authorities have taken sides in the controversy and were represented at the hearing. So many intervening petitions were offered at the opening that Commissioner Meyer ruled that they should be filed in writing and the commission would pass upon them later. When E. F. Tredwell offered such a petition on behalf of the California Producers' and Shippers' Association, in opposition to the Southern Pacific application, Fred H. Wood, counsel for the Southern Pacific, said that the Southern Pacific at the proper time would move to strike its petition from the files as not offered in good faith. He said the organization is "nothing but the Union Pacific under an alias."

Lewis J. Spence, director of traffic of the Southern Pacific, presented a lengthy statement to show the effects of the separation, along with exhibits showing the traffic interchange, etc., and the indirect corporate relationships. He presented a map which showed a large number of gaps in the Southern Pacific lines that would be left if the Central Pacific were removed from its control.

Seeks I. C. C. Authority for Lease

"By this application," Mr. Spence said, "the Southern Pacific seeks authority to control the Central Pacific, first, by lease until December 31, 1984, subject to termination by order of the commission if and when found by the commission to interfere with the consummation of its final plan of consolidation, and, second, by ownership of all the issued and outstanding capital stock of the Central Pacific during the continuance of the lease." The purpose of this application is to avert the injury to the interested carriers and the public growing out of the operation of these lines as separate and independent companies and at the same time to protect the public interest for the future by making the control sought terminable by the commission so that this control, if authorized, may never under any pretext or under any conditions become a barrier to the bringing about of the consolidations contemplated by the Transportation Act in the manner provided in the plans finally adopted by the commission, whatever they may be.

"The Southern Pacific is now in physical possession of the Central Pacific lines under a lease dating from February 17, 1885, which has been declared void by the Supreme Court of the United States in its recent decision as being in contravention of the Sherman Anti-Trust Act. While the original leasehold interest began February 17, 1885, an amended lease was executed December 7, 1893. This lease, but for the decision of the Supreme Court, would have terminated December 31, 1984.

"The proposed new lease is practically identical in terms with the lease of December 7, 1893, as amended except (1) the provision of Article First of the proposed lease to prevent interference thereof with the commission's final plan of consolidation, (2) the omission from the proposed lease of a provision of the old lease for amendments thereof by consent of the parties or in the event of dispute by reference to arbitrators, and (3) the addition of a clause to the fifth paragraph in the proposed lease providing that if the capital stock of the Central Pacific now deposited with the Central Union Trust Company of New York, as trustee, as security for the payment of the Southern Pacific's 4 per cent Gold Bonds (Central Pacific Stock Collateral) shall be sold under the provisions of said deed of trust, such sale shall constitute a termination of this lease."

Central Pacific Would Lose 500,000 Tons of Transcontinental Freight

Setting up of an independent Central Pacific with consequent withdrawal of Southern Pacific support to the Central Pacific-Ogden route would result in loss of more than one-half million tons of transcontinental freight per annum by the Central Pacific line, or more than six times the tonnage which, upon any theory, can be assumed to have been diverted from the Central Pacific-Ogden route to the Southern-El Paso route as a result of the ownership and operation of Central Pacific lines as a part of the Southern Pacific System, Mr. Spence said.

Mr. Spence said that less than 3½ per cent of the tonnage of the Sunset-Gulf route is transcontinental business. "A fundamental change followed the opening of the Panama Canal in 1914, which has almost eliminated the Sunset-Gulf route from transcontinental business," he said, "and has substituted the canal steamship lines as the agency for transporting substantially all the traffic of the character which was formerly shipped by the Sunset-Gulf route."

"The Sunset-Gulf route does not and can not compete with the Central Pacific-Ogden route or any other route for perishable freight or any other freight that is not adaptable to steamship transportation."

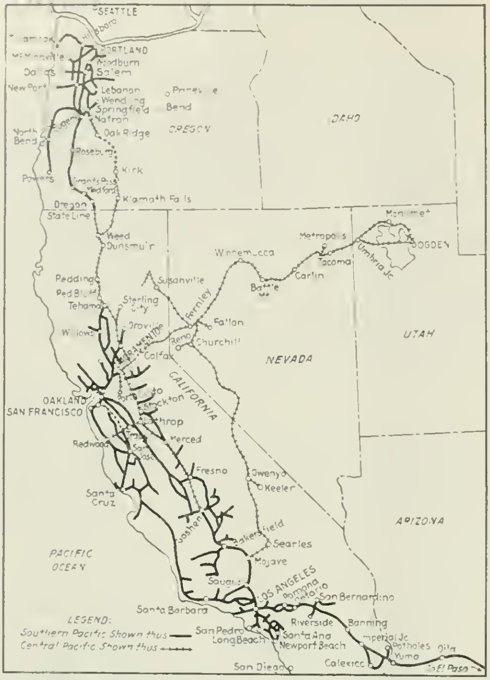
Pointing out that at Ogden and El Paso the transcontinental routes of the Southern Pacific lines were 755 miles apart, Mr. Spence said that the Ogden line and its connections primarily form a route from and to Central-Northern California and Oregon while El Paso route primarily forms a route from and to Southern California and Arizona and New Mexico and that their alternative uses are incidental to their major use in the accommodation of traffic between different sections of the country for which their alternative use is impracticable.

The entire tonnage handled by the Sunset-Gulf route to and from all Central-Northern California points reached by the rails of the Central Pacific was less than seven-tenths of one per cent of the tonnage via the Ogden and El Paso routes to and from all points East of Ogden and El Paso in 1921, according to the witness.

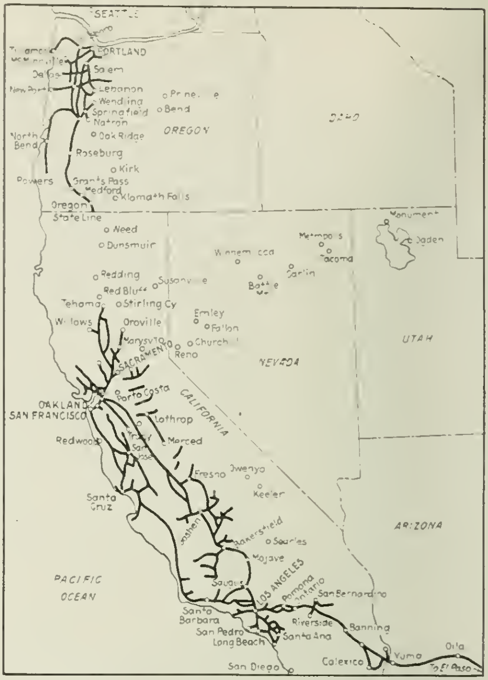
"This," he continued, "is the traffic that has been so industriously used as the principal basis for the disruption of a system, the greatly preponderant use of which is for traffic in which the Union Pacific System has no interest whatever."

Separation of Central Pacific from Southern Pacific Lines would leave the Southern Pacific with no incentive for soliciting the more than 135,000 tons of freight it moves annually from Oregon via Central Pacific-Ogden route nor any incentive for soliciting the more than 215,000 tons of

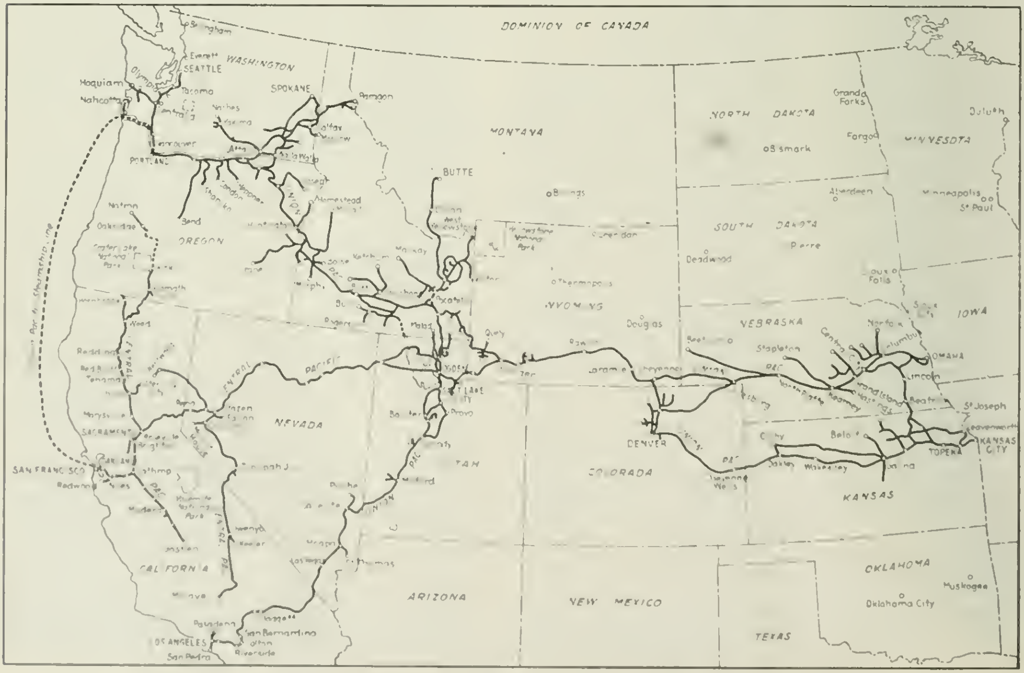
A Southern Pacific Presentation of the Southern Pacific-Central Pacific Case



Map No. 1—Southern Pacific Lines (Pacific System)



Map No. 2—As Southern Pacific Lines Would Be Without Central Pacific



Map No. 3—As Union Pacific System Would Be If It Acquired Central Pacific Lines

freight it moves annually from Southern California via Central Pacific-Ogden route Mr. Spence said. In the event of separation over 915,000 tons of this Oregon and Southern California traffic may be expected to move over all the Union Pacific lines from Portland and Los Angeles.

Mr. Spence said his estimate of tonnage loss to Central Pacific because of the separation does not include the net loss of tonnage that the Central Pacific lines would sustain by the diversion or re-routing of traffic within the Pacific states, nor does it "take account of the additional loss that would be sustained by the Central Pacific during the period of its temporary independence if the Union Pacific management should deem it advantageous to withdraw whatever preferential support it may now be giving to that line in the solicitation and routing of Central Northern California traffic in order to complete its impoverishment and facilitate its ultimate purchase on the bargain counter."

The witness noted that the Inter-state Commerce Commission has repeatedly recognized the fact that two line hauls justify a higher rate than one line haul and declared the tearing apart of the interwoven Central-Southern Pacific lines which have been under common control and operation as a single unit since 1870, would mean that "instead of having better service at lower cost, we will have poorer service at a higher cost."

An Integral Part of Southern Pacific System

Pointing out that the Central Pacific forms an integral part with the Southern Pacific of a transportation system extending 2622 miles from Portland, Oregon on the north to Tepic, Mexico on the south, linking the states of Oregon, California, Arizona, New Mexico, Mexico, Texas, Nevada and Utah, Mr. Spence testified that 76 per cent of the tonnage and 88 per cent of the passengers of the Central Pacific line are handled exclusively within the Pacific states west of Ogden, Utah, and El Paso, Texas and that of such traffic 6,334,848 tons, or 75 per cent was handled jointly by Central Pacific and other Southern Pacific lines.

After referring to the serious disruptions of traffic and higher costs that would result from the separation, Mr. Spence said: "Economy and efficiency have been promoted by the arrangement of freight and train schedules and the method of assembling and distributing freight which a unified system has made possible. The public fully shares the benefit. In like manner, a unified and interwoven passenger service over the Central Pacific lines and over lines of the Southern Pacific has been developed as the result of a lifetime study which cannot be disrupted without serious public inconvenience.

"The Southern Pacific would be in no way the beneficiary of conditions which, under separation, would produce an impoverished Central Pacific," said Mr. Spence, who noted that both roads' earnings and ability upon which good public service depends, largely rests upon their complementary relations.

"The investing public would suffer as a result of perplexing problems that would arise from the separation as a result of the complicated inter-financial relations between the Central and the rest of the Southern Pacific Systems," Mr. Spence said. In this connection he pointed out that the Southern Pacific with the approval of the government authorities guaranteed $58,000,000 of the Central Pacific debts and thus made it possible for the government to get the money due it after committees of Congress had reported that the property was unsufficient to pay the debt. Tracing the developments of the Southern Pacific System through acquisition of a number of separate lines, the witness showed that there is pledged, a security for a portion of the funded debt of the Central Pacific, stocks and bonds of the affiliated Southern Pacific companies, aggregating nearly $84,000,000."

Operating Effects of a Separation

According to the testimony of Mr. Burkhalter, assistant general manager of the Southern Pacific, with the use of these lines as interdependent and complementary parts of a single system trains are so routed as to bring about the maximum of efficiency and public convenience at minimum cost. These results he said, are due entirely to a complete disregard of corporate ownership in the routing of traffic and handling of trains. He continued: "The entire train service in central and northern California would be deranged as to both freight and passenger service by a termination of the present unified use. Existing routes and channels of trade, to which the public has become accustomed, would be destroyed, efficiency would be impaired and the cost of transportation substantially increased. The Central Pacific is deficient in equipment, depending upon the Southern Pacific in large measure for its equipment supply.

"The demand for additional locomotives and cars for the use of the Southern Pacific itself resulting from the rerouting of traffic on account of operation, would compel the Southern Pacific to withdraw locomotives and passenger cars now used by it, leaving the Central Pacific with a supply inadequate to enable it to provide the public with the service now furnishing. The Central Pacific is particularly deficient in freight cars. All Southern Pacific system cars are now pooled for the use of all system lines and distributed to best advantage. This flexibility in use would be destroyed and serious car shortages would be created to the detriment of Pacific Coast shippers.

"Under separate management we estimate that the increased operating expenses incident thereto, and without any improvement in service, would amount to approximately six and one-half million dollars a year and the additional capital expenditures required to provide facilities to take care of traffic as rerouted and under separate management would amount to upwards of $18,000,000, which would be wasted.

"The district affected is one of the most productive areas on the Pacific Coast, where the intricacies of train operation are greatest by reason of the large amount of gathering and delivery service involved. In this particular district the percentage of traffic requiring expedited service is probably greater than in any other portion of the United States and the impairment of service would be particularly disastrous to the public because of the interference with such expedited service under separation.

"Divisional organizations, the growth of 50 years of development in operating methods, would be disturbed, resulting in increased expense and in the unsettlement of conditions of employment for large numbers of men engaged in train service and also working in the shops. The principal shops of the system are today located at Sacramento and belong to the Central Pacific. Shop capacity at Sacramento is largely in excess of that which would be needed for the Central Pacific as an independent company. On the other hand, these shops would not be suitably located as general shops for what would remain of the Southern Pacific lines after separation from Central Pacific lines. The ultimate effect would therefore be the transfer of the shop operation of Southern Pacific to other places and leaving Central Pacific shops at Sacramento with a large surplus capacity unused. The number of employees that would be affected by separation aggregates approximately 18,000.

"The evil effects of separation from the standpoint of the public cannot be avoided by any species of joint use which is not an adequate substitute for unified use as interdependent parts of a single system and under a single management. Joint use if accompanied by competitive effort on the part of joint users necessarily results in wasteful duplication of service.

"The only way in which this waste could be avoided is

by a pooling of earnings and expenses which would in turn destroy the very competitive effort which is the only reason which has ever been assigned for the separation of these properties. Under the latter condition the result would be to restore a species of unified use but of a less efficient character, less responsive to the needs of the public and to the making of necessary improvements, because it would be a unified use dependent upon a double management by two companies whose interests would be conflicting instead of a unified use under the control of a single management all parts working in harmony with each other."

Mr. Kruttschnitt's Testimony

Julius Kruttschnitt, chairman of the Southern Pacific, said that the lines of the Southern Pacific and the Central Pacific are so interwoven in both construction and operation that it is almost impossible to separate them physically. While the title to some parts stands in the name of Central Pacific and to other parts in the name of Southern Pacific, the division is in name only. There are two names but only one railroad system, each part of which is dependent for its maximum usefulness upon some other part or parts. Mr. Kruttschnitt said in part:

Should our application be denied much expense and inconvenience to the public through changing existing routes and channels of traffic will ensue, which will prove to have been entirely unnecessary if the commission in its final consolidation plan should leave the existing relations of Southern Pacific and Central Pacific unchanged.

An analogous case would be that of a house ordered demolished because it did not conform to building regulations within fire limits. Because of a change in the law thereafter it is found to conform rigidly to them; what possible purpose could be served by insisting on its demolition because of infraction of the old law?

In the slow growth and development for over 50 years of Southern Pacific System, an efficiency of operation, implying a high excellence of service to the public, attained by careful adjustment of mileage of divisions, location of division terminals and freight train terminals, convenient to sources of water and fuel supply, arrangement of train service, location of shops, wood-preserving plants, fuel stations, all without regard to corporate ownership, has created an operating organization equalled by few and surpassed by none. The highly co-ordinated train service provided by Southern Pacific can be successfully operated only with terminals functioning with great efficiency. Through long years of training the superintendents and their staffs have attained a high degree of operating efficiency within the terminals along the line and with respect to co-ordinating operations with neighboring divisions and terminals. In assembling fruit and other freight, each terminal builds up its trains so as to minimize switching and insure prompt delivery at destination. A co-operative spirit is maintained between divisions, founded on the theory that each is working to a common end. Each division strives strenuously to increase its own efficiency, but is ready to surrender its individual advantage whenever necessary to improve the service as a whole.

Through a long period of years co-ordinated train service has grown up concurrently with traffic. Traffic is much heavier on some routes than others. Some terminals have become more important than others. As a consequence the various lines and terminals have capacities proportioned to their needs, including sidings and engine-houses, car repair yards and other facilities that must expand with volume of traffic. Important pieces of line have been double-tracked. The operating divisions, 11 in number (not including steamer division) have been established with territories and headquarters to best suit relations with patrons and shippers, and effectively supervise operations.

Central Pacific and other system lines are so interwoven and interdependent as to offer alternative routes for traffic at a very large number of points, a feature of great public convenience, because in case of accident or damage to permanent way by fire or washouts, detours are ready at hand whereby currents of passenger and freight traffic can be diverted and moved with negligible delay. Such abnormal as well as normal movement of traffic requires the indiscriminate use of both lines to complete delivery of freight at destination and to gather freight from origin and assemble it into solid trainloads. The flow of traffic in the main north-and-south commerce arteries between California and Oregon and between Northern and Southern California requires the use, part of Southern Pacific, then of Central Pacific, and finally again of Southern Pacific lines to complete delivery. Where alternative routes exist, train service has been arranged regardless of ownership of rails, so as to afford the best service to the public at the lowest practicable cost.

Joint Versus Unified Use

It has been conclusively shown that complete dismemberment is impracticable. In fact, every suggestion for a termination of the existing unified operation contemplates joint use of certain lines to a greater or less degree, itself conclusive evidence of the interdependence of these lines. Any species of joint use is therefore a mere makeshift to avoid the admitted evils of separation. If the commission denies this application, the district court has no power to authorize a continuance of such unified use of *all* lines. The most that it may do is to authorize a joint use of a part of such lines as compared with the present unified use of all such lines. The extent of such authority and the extent to which the interested carriers, independent of each other, would care to avail themselves of joint use is involved in great uncertainty. To whatever extent joint use may be employed it is not an adequate substitute for the existing unified use. There would be substituted either neutral management of all jointly used properties or management by the owning company with the other admitted as a tenant either with or without neutralization of station and certain other forces.

Increased Cost of Separate Operation

A careful estimate prepared by our operating officers shows that a separation of the properties, even with extensive joint use of tracks and terminals, will result in increased operating expenses for the two lines combined of approximately $6,557,000 per annum. All of this money, which is approximately 21 per cent of the entire net railway operating income of the Pacific System for the calendar year 1921, would be wasted each year during which the separation continues.

A careful estimate also shows that there would be imposed upon the Southern Pacific capital expenditures amounting to $2,676,000, mainly for enlarged facilities to take care of traffic now using Central Pacific tracks, while in order to make good its equipment deficiencies Central Pacific would be required to spend $1,840,000 for passenger locomotives and cars, $3,250,000 for freight locomotives, $10,000,000 for freight cars, to which expenditures should be added other scattering capital expenditures, making a total for the Central Pacific of $17,966,000, or for both lines of $20,642,000.

Central Pacific Without Credit

Whether unified control continues or ceases, capital expenditures should be made on the Central Pacific to provide increased facilities for the handling of traffic both as to second tracks and facilities at important traffic centers. Litigation of the past nine years has so clouded the title of Southern Pacific to Central Pacific that improvements of all kinds have been sparingly made; that is, hardly to the extent demanded by increased traffic. The general increase of traffic has made it imperative to undertake a number of improvements of a pressing nature at once, and Southern Pacific stands ready, if this application for temporary lease of Central Pacific be granted, to advance the money at once, as the Central Pacific itself, with its poor credit, cannot obtain it, in order to provide enlarged and more modern facilities at various points, including stations at Sacramento and Reno, whose requirements have outgrown existing ones; to establish enlarged terminals at Dunsmuir; substitute the most substantial ballast for that now under the ties on parts of the line where necessary; to start the construction of second tracks on parts of the Central Pacific line where such construction will facilitate the prompt movement of traffic such as certain sections of the tracks over the Sierra Nevada and in the territory where the meeting points of eastbound passenger trains out of San Francisco and westbound passenger trains into San Francisco are concentrated.

The Central Pacific as an independent company has no credit in the financial markets of the world. If separated from the Southern Pacific it could not raise the capital necessary for these improvements now needed, nor the huge additional amounts required solely on account of separation and which would otherwise be unnecessary.

Central Pacific contributes 25.4 per cent to the total income of the Southern Pacific System, that is, $9,143,251, out of $35,946,291. The Southern Pacific Company's net income is used for payment of fixed charges, additions and betterments, and for the payment of guarantees on bonds of its constituent or related companies. On July 31, 1922, the amount of such bonds guaranteed by it as to principal and interest was $401,000,000 and in addition $4,479,000 of outstanding bonds have been guaranteed as to interest only. The annual interest on these guaranteed bonds amounts to $17,400,000. It is patent, therefore, that if deprived of the net income contributed by the Central Pacific, the Southern Pacific Company would be in position where it might have to default on some of its obligations incurred in building up a transportation system designed to give to the public the most efficient possible service

Competition or Co-Operation with Motor Truck*

A Discussion of Its Possibilities as an Aid in the Solution of the Terminal Problem

By W. H. Lyford

Vice-president, Chicago & Eastern Illinois

THE TRANSPORTATION of goods is an absolutely essential requirement for the family, industrial and commercial life of a civilized people. The furnishing of transportation is sometimes considered a function of the government, but the people of the United States will not permit the government to perform transportation, except through the mail service and for packages weighing 70 lbs. or less. All other transportation of goods must be performed by the person requiring it, or by a carrier for hire.

Transportation is not complete until the goods are moved all the way from the premises of the shipper to the premises of the consignee, and, for brevity, we will call such movement "complete transportation." Also for brevity, we will use the British term "trader," which includes both shipper and consignee, or all persons for whom transportation of goods is furnished for hire.

The trader is concerned only with complete transportation. His greatest need is that complete transportation shall be furnished with regularity and within reasonable time. His secondary need is that the charges which he must pay for complete transportation shall not be more than the traffic will bear, without curtailing his profitable trade.

Complete transportation cannot be furnished regularly and promptly unless the charges of the carrier are high enough to pay all the expenses of carriage and a profit sufficient to warrant the investment of capital and energy in the installation of the transportation service and in increasing the service as traffic increases. In normal times, the volume of freight traffic in this country increases at a rate of not less than 6 per cent per year.

The trader is entitled to the best transportation service which can be furnished for the charges which he pays, and it is the duty of carriers who, singly or jointly, undertake to furnish complete transportation, to make their charges as low as is consistent with the maintenance of adequate, regular and prompt service.

We are accustomed to think of the transportation of goods as divided into four general classes: parcel post, express, less-than-carload or package freight (commonly called l. c. l.) and carload freight.

The Problem of Collection and Delivery

Whether the government, the express company or the railroad company undertakes to transport the goods, the railway actually performs the entire transportation service, except the movement between the premises of the traders and the stations of the railway companies. Such movement is called "collection and delivery." Parcel post is not collected, but it is delivered by the government. Express is collected and delivered by the express company. Freight is collected and delivered, not by the railway company, but by the trader or by the owner of trucks or teams, whom we will call "the trucker."

Because the railway does not furnish collection and delivery, and that service must be performed by or at the expense of the trader, the traders have located their industries as close as possible to railway stations. Consequently, the vicinity of the freight station is usually a congested district in any large city. If the railway furnished collection and delivery, the location of the freight stations would be immaterial to the trader. A distance of two miles between the locations of two stations in a large city may make a difference of 300 per cent. in the interest charges on the real estate occupied by the stations. In Chicago the interest charge alone on real estate at 12th street on which a freight station is located, is more than $2.30 per ton of freight handled through the station. If the station were located at 55rd street, such interest charge would be reduced to about 80 cents per ton. The amount of interest saved by moving the station to 55rd street would pay the cost of well organized cartage between the 55rd street station and the premises of the trader. The present cartage charges would be saved.

Outbound freight is moved to the station in whatever way and at whatever time the trader chooses, during the business day. Inbound freight is removed from the railway station in whatever way the trader chooses and, on the average, about three days after the freight arrives. Therefore, the station becomes a storage warehouse, congested with piled-up freight awaiting delivery to the trader, at his convenience. With collection and delivery service controlled by or in full co-operation with the railway, large freight stations with storage facilities would be unnecessary. A narrow platform, with a roof over it and with tracks on one side and a highway on the other, is all that would be required.

With very few exceptions, railway freight stations in large cities already are so congested that, unless we can find some way to pass more traffic through the existing facilities, or to keep on enlarging and multiplying them, by extravagant expenditures for additional real estate and track connections, the railways will not be able to handle the normal increase in freight traffic.

Railway companies are organized to furnish transportation. Storage is a separate field for enterprise. The public warehouse is needed and should be fostered because it can be operated at a profit. Storage in railway stations rarely is profitable to the railway company, and it seriously interferes with the legitimate function of the railway—to furnish transportation.

Competition Between Four Agencies

In this country, four different agencies are competing with each other for the transportation of the same goods: Parcel post, the express company, the railway and the trucker. While the parcel post and express are transported over railways, the government and the express company compete with each other, and with the railway for the carriage of packages weighing 70 lb. or less, and the trucker competes with the three other agencies.

Competition for the local carriage of goods within city and suburban areas ought to be welcomed by the railways, as they perform this service at an actual loss, while the trucker can perform it at a profit. On the other hand, competition with the railway for the carriage of goods through rural districts, along main lines of railway, is harmful to the railway and unprofitable to the trucker.

For parcel post there is complete co-operation between

*Abstracted from an address before the Second National Conference on Education for Highway Engineering and Highway Transport at Washington, D. C., on October 28.

railway and highway transportation, as the government has its own cartage system. There is like co-operation in the express business, as the express company operates its own trucks and wagons. For freight traffic, there is hardly any co-operation between the railway and the motor truck.

I have marshalled the foregoing facts with the idea that they might form a background for the statement: *That unless there is a radical change from present practices in railway transportation in the United States, our great transportation system, which is the wonder of the world, will become a hindrance to the further progressive development of this country.*

Five years ago, when our railway system was placed under federal control, its march of progress was halted, and it has never regained its stride. Its development has not kept pace with the industrial development of the country, because its revenues have not been sufficient to attract the additional capital necessary to finance the cost of normal additions and betterments to road and equipment.

The public is clamoring for lower rates, while existing rates are not high enough to produce the net railway operating income which, as determined by the Interstate Commerce Commission, the railways are entitled to earn. Still the tendency of the commission is to reduce rates and there is no reasonable hope of increasing them.

Disregarding the temporarily bad condition of railway equipment resulting from the existing strike of the shop crafts, the only limitation on the volume of traffic which the railroads can move is due to the railway terminal facilities, which are inadequate to take care of the traffic which easily could be transported over the main lines of railway.

Under existing rates, the line haul of freight would be highly profitable, if the revenue therefrom were not absorbed by constantly increasing terminal expenses. If the railways are to remain solvent and carry the traffic for which rail transportation is demanded, they must find a way, first, to reduce terminal expenses, and, second, either to enlarge their terminal facilities or to pass more traffic through the existing facilities. How to do these things is, in my opinion, the most important problem before the American people. I have devoted to it all the time I could spare from my regular duties during the past 15 years, and have arrived at the definite conclusion that the problem can be solved only by remedying the following evils:

First—Too low compensation paid to the railways for carrying parcel post and express on expensive passenger trains.

Second—Lack of organized collection and delivery service, which lack makes it necessary to furnish unreasonably large and expensive freight terminal facilities, and an unreasonably large supply of freight cars.

Third—The use of box cars for the transfer of l. c. l. freight between railway stations in large terminal areas. The trucker could perform that necessary service more quickly and economically. Thousands of box cars thereby would be released from an unprofitable service and would substantially increase the carrying capacity of the railway.

Fourth—The use of box cars as trap cars, for moving l. c. l. freight through terminal areas for industries which have rail connections, and the iniquitous absorption by the railways of trap-car, subway and lighterage expenses, which is equivalent to furnishing free cartage to the favored few large traders, in discrimination against the average trader, who is obliged to provide or pay for his own cartage.

Fifth—The operation of branch lines on which the traffic is too light to sustain railway transportation and which could be served better and at far less expense by the motor truck.

The most important field for co-operation between the railway and the truck is offered by the collection and delivery of l. c. l. freight in large cities. Comparatively few trucks are used in this service, first, because there is no co-operation between the truckers themselves, and, second, because there is no co-operation between the trucker and the railway. As the collection and delivery of l. c. l. freight in large cities is now conducted, the delays to trucks in reaching the station door and in loading and unloading the truck, make unprofitable the use of the truck in station service, so that by far the greater part of this service is performed by horse-drawn vehicles. Truck transportation is only profitable when the truck can be kept moving the greater part of the time.

Notable experiments have been tried in the United States for handling the collection and delivery of the freight of one railway company in a large city and, so far as I have been able to learn, none of them have been successful. No single railway company receives and delivers freight from and to every part of a large city in sufficient volume to make profitable the collection and delivery of such freight by a trucking organization. I am satisfied, however, that the combined l. c. l. freight of all the railways reaching a city could be collected and delivered by a properly equipped single trucking organization, working in full co-operation with the railways, at less cost than is now paid by the traders in that city for their cartage, and still yield a reasonable profit to the trucking organization.

For many years, the Canadian railways have furnished collection and delivery in the principal cities of Canada, under separate cartage tariffs. The president of one of the largest Canadian railways is my authority for the statement that his railway could not possibly handle its traffic through its present terminal facilities without well organized collection and delivery service.

British Operate Terminals Intensively

In England, Scotland and Wales, the railways are furnishing collection and delivery at practically all of their stations. Knowing this, I devoted a few days last year and several weeks this year to intensive study of the collection and delivery service in England and Scotland, principally in London, Manchester and Glasgow. I was given exceptional opportunities and assistance for the investigation at close range of the terminal operations of the principal English and Scotch railways. The several general managers with whom I discussed these problems in Great Britain were unanimous in expressing the following conclusions:

1. That the collection and delivery of freight, at terminal cities and in large industrial centers, by a single trucking organization, is absolutely essential to the most efficient operation of freight stations and that, with such a trucking organization co-operating with it, the railway company may control the time of collection and delivery of freight and is able to operate its stations throughout the 24-hour day if necessary, and to use the same platforms and forces for handling inbound and outbound freight.

2. That collection and delivery can be furnished under a separate tariff at rates high enough to produce an actual profit from the cartage operations, after paying all expenses, and low enough to induce 95 per cent of the traders to avail themselves of the organized collection and delivery service rather than to perform it themselves.

3. That in England, where the general conditions are substantially like those in New England, the railways and the traders have prospered under unified cartage systems, without any substantial additions to station facilities.

In all of these conclusions of the British railway managers I heartily concur and I believe they ought to be adopted by American railways.

Contrast the operations of a large terminal freight station in the United States with a typical British "goods" station. In this country, the inbound freight is handled over one set of platforms by one working force and the outbound freight is handled over another set of platforms by another

working force. Each set of platforms and each working force is operated through the entire business day as freight is taken away from the inbound stores and received at the outbound station during the entire day. The inbound platform is piled up with freight awaiting delivery, interfering with the movement of freight across the platform. When the inbound cars are unloaded, they must be pulled out of the station and set into the outbound station for loading the following day.

In a typical British station, the same platforms are used to handle not only the inbound and outbound traffic, but also a third class of traffic, and they are operated through the entire 24-hour day. When the day force goes on duty at 8 a. m., a line of cars loaded with inbound freight is standing on one side of the station platform and a continuous line of trucks or "lorries" are backed up to the other side of the platform. The city is divided into districts and the freight for one district is loaded into one or more lorries, there being more lorries at the platform than there are districts in the city. As soon as a lorry is fully loaded a driver is summoned by telephone from a nearby stable. He comes with a heavy Clydesdale horse and drives away with a 5 ton load to the proper district, where he makes delivery. When one lorry is loaded and driven away, another empty lorry is backed into its place, loaded and driven away.

Before noon, all the inbound freight has been removed from the cars and delivered by lorries. At 1 p. m. the station platform is clear and ready to receive the outbound freight, which is collected and delivered at the station by the same drivers who delivered the inbound freight in the forenoon. All of the outbound freight is collected before 5 p. m., loaded into cars and dispatched before midnight. The platform is again clear and ready to receive the heavy fish and vegetable traffic which begins to arrive at 1 a. m. and is delivered at the markets before 6 a. m. At 8 a. m., the platform is again clear and the empty lorries are standing at the platform ready for the inbound merchandise.

For collection and delivery in this country, demountable truck bodies, trailers, or semi-trailers doubtless would be used instead of the British lorries and gasoline or electric tractors would be substituted for Clydesdale horses. On our station platforms, we doubtless would use four-wheel trailer trucks drawn by electric tractors, instead of the old-fashioned two-wheel trucks which are used in Great Britain. In fact, I left that country with the firm conviction that, with our American methods applied to the British system of collection and delivery, much greater efficiency would be obtained and better service would be rendered than is now rendered in Great Britain.

Three of the great English railways have combined their collection and delivery service in London with most satisfactory results and I was assured by the manager of the combined service that, if all of the railways reaching London would join in the combination, he could affect even greater economies than he had already accomplished.

I am well aware that the average railway manager in this country fears to encourage the establishment of collection and delivery service, because of the danger that the railway will be required to pay the cost of the service and thereby increase the terminal expenses. I would not recommend that the collection and delivery service be forced upon the trader, but rather, that it be offered to him under separate cartage tariffs at rates which would be less than the trader's present cartage expenses. I believe that the result would be the same as it has been in Canada and Great Britain where the collection and delivery service has been accepted voluntarily by a large majority of the traders.

Collection and Delivery of Car-load Freight

There is a second field for co-operation between the motor truck and the railway, which would require a more radical departure from present methods than the one just mentioned, but which would produce even more beneficial results to all parties concerned. It is the organized delivery of carload freight from public team tracks in large terminal areas. As already stated, this freight is now loaded, unloaded, collected and delivered by the trader, or at his expense. In different cities the trader is allowed from two to five days within which to unload cars after he has received notice that they are ready to be unloaded.

Generally speaking, there is a shortage of team tracks in the central districts of large cities and it is next to impossible for the railroads to furnish additional team tracks. Cars must be held in the outer yards until there is room for them on the team tracks, and then they must be held on the team tracks until it is convenient for the trader, or his trucker, to unload them. The necessary consequence is that large terminal districts are full of idle cars, and I think it is safe to say that the average time that box cars are delayed at the port of New York and in the switching district of Chicago is 10 days per trip. If all of the freight cars which carry loads into the port of New York, the switching district of Chicago, and other large terminal areas, could be unloaded on the day of their arrival, they could be loaded out on the same day, or the following day, and the present freight car equipment of the railways would be sufficient to meet all transportation needs for several years to come.

Competition between the railways to outdo each other in affording privileges to the traders has brought about a situation which is crippling the freight car supply and thereby is injuring the trader more than he is benefited by the allowance of an unreasonable time within which to load and unload carload freight.

At the present time there is a serious shortage of freight car equipment, in all parts of the country. The railways, the commercial organizations and the public authorities are urging the traders everywhere promptly to load and unload cars in order to reduce the idle time of freight cars and supply the crying need for more cars to move accumulated freight. Notwithstanding these appeals, the car shortage is not being substantially remedied.

In my judgment, a new system of delivering carload freight must be adopted and it will require the co-operation not only of the railways and the truckers, but also of the traders, warehouse men, the Interstate Commerce Commission and the State Utilities Commissions. The rules relating to free time for holding loaded and empty cars, awaiting the convenience of the traders, should be so modified as to insure the unloading of cars within 24 hours after they are ready for unloading and the loading of cars within 24 hours after they are placed at the disposal of the trader.

I realize that this is a radical change and would deprive the trader of a substantial amount of free storage which he has always enjoyed and would require him to pay warehouse charges on such inbound freight as he is unable to receive on the day of its arrival. This apparent disadvantage, however, could be, to some extent, offset by cheaper cartage furnished by an organized collection and delivery service and the warehouse charges might be reduced substantially by co-operation between the railway, the trucker and the warehouse man.

Branch Line Service

The importance of cutting down the idle time of cars is shown by the fact, which I believe can be established, that the average time required by a freight car, in carload freight service, to make a round trip is about 20 days, and of that time, the car is actually moving in line haul, loaded or empty, only two and two-tenths days, and it is actually earning revenue only one and one-half days out of the 20 days required for the round trip.

Another field for the profitable use of the motor truck

is the transportation of freight between communities which are served by branch lines of railway, on which the traffic is too light to pay the expenses of any kind of railway transportation. Such branches are almost innumerable and are scattered over every part of the country. They were built before motor transportation was perfected and, undoubtedly, they have performed a necessary public service, but they have outlived their usefulness. The transportation furnished over such lines could be performed better and more cheaply by motor conveyances over the public highways. No more such branch lines ought to be or will be constructed, if the motor trucker will take over the field and occupy it intelligently and efficiently. In recent years, I have known of several cases where railways seriously have contemplated the construction of branch lines, to reach small cities and towns, and, on investigation, have found that they could better afford to establish their own truck service, and the proposed branches have not been built.

I will go further and state that I think that all such money-losing branch lines, along which transportation by truck over existing highways could be furnished at less expense, should be abandoned. The better and less expensive truck service should be substituted by the railroad company, if the trucker will not occupy the field.

Who Will Benefit Through These Changes

Five parties are interested in bringing about the changes we have outlined:

The whole public would be benefited in that the city streets would be relieved from the congestion caused by wagons and trucks carrying small lots of freight to and from the railway stations. The new rural highways would last longer, as the cooperation of railway and truck would put an end to long-distance trucking.

The trader would get better service at less cost.

The motor-truck industry and existing cartage companies and private truckers who would co-operate with the railways would vastly increase their field for profitable operation.

The warehouse man would profit by the additional storage now furnished by the railways.

The railways would cut down their terminal expenses and would increase their capacity for service.

The trucker has a distinct advantage over the railway, in that highways are constructed by the general public, through some form of taxation, while the railway is constructed at the private expense of the railroad company. In the early history of this country, public lands and moneys were contributed to a few railway companies, to induce them to build railways in territory which greatly needed transportation, but such donations have long since been repaid by the enhancement in the value of the taxable property, whose development has followed the railroad and would not have occurred without the railroad.

The railway, through taxation, pays a large share of the cost of constructing and maintaining highways, while the trucker pays no part of the cost of constructing or maintaining the railway. If the trucker is to compete with the railway, either he should pay a substantial part of the cost of constructing and maintaining the highway or the railway should be relieved of taxation for highway purposes.

If, however, the trucker, first, would perform that part of transportation furnished by the railway at an operating loss and on which the trucker could make a reasonable profit; second, would cease to compete with the railway for the traffic which the railway can carry at a profit and on which the profit of the trucker is very doubtful; and, third, would co-operate with the railway in handling traffic which requires transportation both by rail and highway; in other words, if the truck would supplement the railway service instead of competing with it, then it would be to the interest of the railway that the expenses of the trucker should be reduced to the lowest possible limit, and, in my judgment, the railway could well afford to pay substantial taxes for highway purposes and to make no objection to the free use of the highway by the trucker.

There is a steady and, for the trucker, an alarming growth of public sentiment in favor of imposing upon the trucker a more substantial part of the cost of maintaining and renewing public highways, which, it is claimed, are destroyed by heavy trucks almost as fast as the highways can be constructed. If the public were satisfied that the truck was only used as a common carrier where the railway could not furnish as good and as cheap service as the trucker furnishes, I believe, the public would cease demanding that greater burdens be placed upon the trucker, which would increase the cost of his service.

I believe that for every city there is a practical solution, which, with the full co-operation of railways and trucks would result in the movement of freight through the city stations as soon as it arrives there and would thus enable the railway to furnish much more transportation service without increasing its facilities and without increasing its charges for transportation.

Conclusion

The truck should supplement the railway and not compete with it. Wherever complete transportation can be furnished by the truck more efficiently and cheaply than by the railway, the truck should be used. Wherever the railway service is adequate and profitable and less expensive than truck service, the railway should perform the service. Where the best and cheapest service can be furnished profitably by the railroad and truck combined, the railway and the trucker should co-operate in furnishing that service.

Be Sure and Get It Back Together Again So It Will Run, Uncle

Roadmasters Hold Fortieth Annual Convention

Meeting at Cleveland Characterized by Large Attendance—Instructive Papers and Interesting Exhibits

THE FORTIETH annual convention of the Roadmasters and Maintenance of Way Association and the eleventh annual exhibit of the Track Supply Association were held at the Statler Hotel, Cleveland, Ohio, on November 21-23. In spite of the recent labor troubles, more than 400 members were present. The reports and papers presented were specially practical in character and brought active discussion.

The convention was called to order promptly at 10 o'clock Tuesday morning by L. M. Denny, president (supervisor, C. C. C. & St. L., Indianapolis, Ind.). C. E. Denny, vice-president and general manager, New York, Chicago & St. Louis, welcomed the association to Cleveland. After referring to the passenger terminal development now in progress in that city, he emphasized the importance of co-operation, illustrating his remarks by a description of a plan now in effect among the executives of the roads with terminals in Cleveland. These executives meet informally at a weekly luncheon to discuss local transportation problems and "iron out" difficulties. By this means, all congestion has been avoided and it has not been necessary to organize a car service committee. *He closed with the statement that no railroad can afford to retain a man in any responsible position who does not take part in association work and exchange views with those similarly employed.*

C. A. Paquette, chief engineer, C. C. C. & St. L., spoke on the necessity of the roadmasters giving more attention to the personnel of their forces. He said, in part: "To me the track is the most wonderful part of a railroad, because of the human element connected with it. The maintenance of equipment is performed at certain concentrated points, where it is subject to close supervision and direction, but maintenance-of-way work is performed on every foot of the railway with supervision which is of necessity more or less general in character. The big question confronting maintenance officers is that of securing efficiency from the forces.

"In recent years we have seen attempts of professional agitators to inoculate these men with the views of discontent and suspicion, but what attempts have we made to overcome this propaganda? The superintendent is too busy looking over reports and dictating mail to know his section forces. The division engineer who knows all of his track foremen is an exception.

"I have been more concerned over this situation with reference to the maintenance-of-way foreman than any other problem before me. We must find a way to regain his confidence, and his old time interest and pride in his work. I cannot believe that they have disappeared, but they are submerged for the time being. You men are the connecting link between the railways and their maintenance-of-way employees. Upon you rests the responsibility for the restoration of the former relations. Don't lose sight of the value of personal contact with your men. Don't widen the existing gap; close it."

In his presidential address, L. M. Denny reviewed the work of the association during the last year. He paid tribute particularly to the members of the committees who had carried on the work of the association.

Report on Section Gangs vs. Extra Gangs

The committee recommended that all regular routine track maintenance work such as detailed gage, line, surface and cross level maintenance, ordinary drainage, and tie renewals should be taken care of by regularly assigned section forces equipped with modern tools and suitable motor cars. The forces should be maintained at as nearly uniform strength as possible throughout the year, with slight seasonal additions during the heavy working season from April to November in the average American climate. This makes possible and encourages the employment of a better and more skilled class of labor than the great seasonal force variations sometimes practiced, where a bare skeleton organization is maintained through the winter and a large number of extra, and usually floating and poor quality laborers are added during the summer.

The heavy track replacement work such as continuous rail renewals, and heavy ballasting out of face should be taken care of by specially organized forces, housed in movable camp outfits. Extensive fence building or rebuilding and cut or bank widening can also best be taken care of by special forces. Such special forces become skilled in their work and reduce unit costs to a minimum. They should be required to leave their work in a completed condition, and not leave parts of it to be completed by section forces.

Between these classes of usual routine maintenance work and special heavy maintenance work, which should be taken care of by regular section forces and special extra gang forces, respectively, there are some kinds of special work of a lighter nature which can be handled economically by increasing the size of and, if necessary, doubling up the regular section forces. Such work includes scattered rail patching, curve worn rail renewals in short patches, and ballast cleaning and patching or light resurfacing in short stretches. No heavy ditching should be done by hand.

Frequently section and extra gang forces can be worked together advantageously where a large number of men are needed for a short period, but cannot be worked continuously to advantage. On one road extra and section forces are combined for rail renewals. The regular rail extra gang makes necessary preliminary preparations for renewing a stretch of rail, then the track is taken for a day and the rail gang, with the assistance of section forces brought in from 15 miles in either direction, will relay from two to three miles of rail in ten hours, while the trains are being handled over another track. After the rail is laid, the extra gang completes the work of cutting the old rail apart, loading it up, renewing ties and switch timbers under new rail as may be necessary, and other work incident to completing the job.

The same practice of doubling section forces for a short period may be followed advantageously in making short patches of curve rail renewals, or surfacing short stretches of track out of face where the work is too heavy to be handled by one average section force, but not great enough in extent to justify the moving in of an extra gang.

Ordinarily maintenance should be kept up currently so that the necessity of organizing large extra forces for heavy seasonal work may be reduced to a minimum. This can be done where reasonable section forces are maintained throughout the year. Routine fence repair work, for instance, can best be done by regular section forces in the late fall and winter after the undergrowth has disappeared.

(*R. H. Smith* (*chairman*), *assistant division superintendent, N. & W., Roanoke, Va.*)

Discussion

To secure the greatest return for money expended for labor, as well as to get much needed work done, P. J. McAndrews (C. & N. W.) stated that the railroads are now facing a very critical labor situation, since it is a serious question where the labor for the coming year will be secured from. Men, he thought, should not be laid off in the fall at the first sign of frost, for if they are not held it will not be possible to get them again in the spring. The ancient policy of laying off men who can be employed economically during the winter must be revised. On many roads the forces may be kept to a fairly even average throughout the year and to good advantage.

Where section forces are increased to do the work often assigned to extra gangs, there was a distinct handicap, according to T. Thompson (A. T. & S. F.), who said that only about 50 per cent of the section foremen are capable of taking a large body of men and doing construction work. Ordinary renewals, he believed, should be handled by the regular section forces and the heavy work by the extra gangs.

Along the same line J. B. Martin (N. Y. C.) stated that all of the track work could not be done by the section forces. Local conditions prevented the acquisition and holding of large numbers of men such as this plan would necessitate. Under present methods, it requires from 65 to 70 men to lay rail economically, and this would mean that fully one-half of a roadmaster's section forces would be required. The labor supply is a governing factor.

The big advantage of doubling up the forces, according to R. H. Smith (N. & W.) chairman, was that by the use of section and extra gangs it is possible to increase greatly the output, while at the same time there was an additional beneficial effect by thus securing a number of skilled men to balance up the forces.

Where section forces are increased, there are added duties for the section foremen, and in this respect T. F. Donahoe (B. & O.) said that, where this is done, the section foreman should be paid the increased rate for the extra gang foreman, since he must necessarily assume all of the responsibilities of the latter. In addition, another man should be selected to take charge of the section routine work.

F. H. Hansen (G. N.) stated that on some roads extra gangs are an absolute necessity, since winter conditions are so severe that the greater part of the track work must be done during a short working season. Naturally, only routine matters can be carried on during the cold weather and thus it does not seem reasonable to suggest that the railroads should keep men when no work can be done. If a section foreman does better work than an extra gang foreman, the roadmaster is at fault.

Report on Methods of Making Tie Renewals

The committee recommended that tie renewals should commence as early in the spring as possible. This gives the track foreman four months in which to get all of his ties in before hot weather, for in the opinion of many trackmen, if ties are put in in hot weather the chances for buckled track are increased. The most economical method of distribution is by the work train in the late fall or winter months. Ties unloaded from a work train should be piled in neat piles so as to prevent rot, permit seasoning and improve appearances along the right of way.

There is a difference of opinion as to whether ties should be spotted in starting at one end of the section and replacing the bad ties to the other end. Giving the track a general lift in most instances provides a better bearing for the ties and insures better riding track, affords a better opportunity for renewing anti creepers and tie plates and provides an accurate spacing of ties. As a general practice it is found to be a much more satisfactory method than spotting in.

In general, the most satisfactory results in renewing ties over a section are secured by giving the track a general lift over two or three miles each year, putting in ties and working the track thoroughly. This method establishes a cycle of three or four years.

The only feasible way of renewing ties at private and highway crossings, is out of face. Ties put in a spike high are not favored by the majority of roads. The largest number favor tamping solid.

For economical tie renewals, it is essential that the roadmaster or supervisor be notified of the number of ties he will be furnished. If this is not done, he cannot distribute them economically.

(*J. P. Davis (chairman), roadmaster, Central Indiana, Anderson, Ind.*)

Discussion

The part of the report dealing with the best methods and time for the distribution and renewal of ties aroused considerable comment. W. Shea (C. M. & St. P.) stated that it was the duty of every roadmaster to make each tie render the best service possible. This could not be done if ties were distributed in the fall and piled along the right-of-way according to needs, since a section foreman would use them as they were, rather than redistribute them to secure maximum service according to grade, etc. A detailed inspection of the track should be made and no ties distributed until spring, when the proper ties could be unloaded at the proper points. Furthermore, when ties are treated they are not received in large quantities at one time, but over a considerable period. These ties, treated as well as untreated, should be piled at convenient points, classified and sorted so that each requirement for track use in the following spring can be met quickly and economically.

Several members believed that such a plan was expensive in that it cost a certain amount of money each time a tie was handled and that the fewer rehandlings there were, the cheaper the cost of the work. In regard to the question of methods for renewal, J. B. Martin (N. Y. C.) said that, where stone ballast is used, the economical way to maintain track was to raise it out of face and renew ties at the same time. This was not necessary in gravel ballast or on light traffic lines.

R. G. Knight (N. P.) stated that the report dealt chiefly with dense traffic, rock ballasted track and was probably correct in reference to that class of road. It did not, however, cover the problems of the other roads. Thus, in reference to a cycle of track-raising, where track was put in good condition once every three or four years, it might be economical to renew ties which had more than one or two years' life. However, due consideration should be given to the gradually decreasing timber supply and an effort made to secure all possible service from a tie.

Training the Section Foreman

By D. C. Buell

Director, Railway Educational Bureau, Omaha, Neb.

It has come to be recognized by railroad officers generally that the trackman should no longer be considered a common laborer, but should be assisted in an educational way to become a skilled laborer. Labor conditions in this country have been such that it has been necessary to hire and use a great deal of rough labor on track work. Mexicans, Italians, Greeks, many of the Slavic races and even Japanese have been and are still being used in large numbers, in addition to the Negro labor of the south. It is by no means impractical to raise the standard of many of these classes of labor.

With the advent of heavier motive power, leading as

it has to the necessity for much more scientific track construction, the section foreman has come to occupy a position which has hardly any analogy in industry. The section foreman today must deal with engineering work of the highest order.

It is the writer's opinion that the next ten years will see a change in the track foreman's status, that he will be of necessity a better educated man; that he will have as an assistant foreman a younger man who will be training himself in a knowledge of the more technical phases of track work, and that this cycle of training of track assistants will provide the combination of practical and technical man that we are going to need in our track work in years to come.

This is going to be accomplished on some roads by school gangs made up of ambitious young men who want to follow railroad track work as a profession and who would be worked as a special gang under a competent instructing foreman so as to obtain the experience required. Where school gangs are not provided, the right kind of an assistant foreman can study by correspondence and get much of the training that he needs in that way, particularly if given the proper encouragement by his foreman and his higher supervising officers. In order to attract the right kind of young men for such work there must be some system of apprenticeship leading to the position of assistant foreman and foreman at a rate of pay sufficient to attract these men to the possibilities of the opportunity offered.

Every intelligent trackman who expects to follow track work should be urged to become a student of track work as an expected part of his training. Then, in step with the extended use of special track tools, power machines, the further development of signal circuits, the adoption of automatic train stops, and the extension of electrified districts, men will be developing who will be fully competent to give the more skilled supervision required for the proper maintenance of such track on our American railroads.

Report on the Non-Spacing of Joint Ties

The committee recommended the "non-spacing of joint ties and the non-slotting of joints." It is a known fact that the joint is the weakest point in railroad track. Every conceivable means has been applied to reinforce and strengthen it to make it equal in strength to the rail, but nothing that has yet been developed approaches this objective. Why, therefore, should we place an extra burden upon the joint by making it render service over and above the other portions of the rail by anchoring the track at this weak point by slotting the angle bars and spiking through the slots.

With non-slotted angle bars and with rail anchors placed on the intermediate portions of the rail, the joints are permitted to pass over the ties without disturbing them if the rail should creep, thereby eliminating the slewing of the ties and creating no cavities in which the water may accumulate about the joints any more than about any other tie under the rail. This preserves the angle bar and protects the bolts.

All ties should be spaced uniformly under the rail regardless of their position relative to the joint. To space ties uniformly under the joints and elsewhere throughout the length of the rail where the track is given a three-inch raise, pick tamped, will cost $840 per mile in stone ballast, while to give it a three-inch raise in stone ballast where ties are not spaced will cost only $690 per mile, a saving of $150 per mile by not spacing ties. To space ties uniformly throughout the length of the rail in gravel ballast where the track is given a three-inch raise, shovel tamped, will cost $700 per mile and where the ties are not spaced $570 per mile, a saving of $130 per mile by not spacing ties. These figures are based on $0.40 per hour for labor. It will cost $0.80 per joint to space the joint ties and shift the shoulder ties where necessary in stone ballast and $0.50 per joint in gravel ballast.

In spacing ties more or less damage is done which hastens the time of their removal. In spacing ties some of them are necessarily moved off their old bed, while others are not disturbed, which gives them an unequal bearing, however well they may be tamped, and requires more frequent surfacing to maintain the track at a true level.

(*F. L. McMillan (chairman), roadmaster, C. & A., Bloomington, Ill.*)

Discussion

The association voted to go on record in favor of non-slotting of joints; it also voted against the practice of uniform spacing of ties throughout the length of the rail.

Report on Labor-Saving Devices

The committee reported that labor-saving devices are being utilized more and more to speed up the renewing of rail and a great deal is saved by their use. Where long stretches of rail are to be renewed, locomotive cranes are coming into use to replace the tong gangs. The cost of renewing rail by the use of 2 cranes, 4 portable air compressors running 8 pneumatic machines, a work train with 4 double end rail loaders and 262 laborers and 26 foremen or assistant foremen was found, in one instance, to be as follows:

	Per ton	Per mile
Unloading 3,161.5 tons of new 107-lb. rail	$0.49	$82.39
Distributing angle bars, tie-plates, spike and other accessories	.34	57.17
Scoring ties and other preliminary work	.22	36.99
Taking out old 100-lb. rail and renewing with new 107-lb. rail, including picking up old rail and scrap	3.29	533.18
	$4.34	$729.73

The above included the cost of installing new tie-plates and rail anti-creepers, but not the renewing of turnouts. This work, as done in the past by hand and including the cost of closing in for trains, would aggregate approximately $12 per ton or $2,000 per mile.

Where only a few men are available the three-man track layer is a valuable asset, especially in laying rail in yards. These machines with 5 men will do the work of 15 men, assuming that they are used about 2 hours per day, for 60 days in the year.

With the increased weights of rails, frogs and switches, the necessity for unloading machines becomes more pronounced.

The utilization of locomotive cranes in connection with screens in cars for the cleaning of ballast has proved that much can be saved in this way.

The cost of cleaning switches of snow by hand will average 55 cents per switch at interlocking points as compared with 20 cents per switch by the use of hydro-carbon torches. At terminals a steam heating plant properly operated can be run with three laborers and a foreman, whereas it will take 25 men, a foreman and an assistant foreman to keep such a place open during a severe storm.

Investigation shows the cost of tamping ties with tie tamping machines to be little less than the cost of tamping by hand, the work done with these machines will hold up twice as long or more under favorable conditions.

The steam ditcher is one of the greatest labor-saving devices where heavy ditching is to be done. With an air dump car placed on each side in a work train, it will accomplish as much in one day as 30 men will do with flat cars in three days.

A spreader, when used with a work train, has performed the work of at least 20 men in disposing of material on a

fill and in ditching light cuts. This, on the basis of 150 working days, would be a saving of about $9,600 in the course of a year.

The use of weed killers should be extended and two applications made a season. The cost of each treatment, including work train service, is approximately $32 per mile. It would be impossible to perform this work as economically by hand.

Oiling appliances save a great deal of labor in oiling the roadbed and grade crossings. There are also attachments for these devices that can be used to oil track bolts and fastenings.

(*George W. Morrow (chairman), supervisor, N. Y. N. H. & H., New Haven, Conn.*)

Co-operation Between the Track and Signal Departments

By J. A. Peabody

Signal Engineer, Chicago & North Western, Chicago

The item of signaling, which brings the two forces together most often, and which is apt to cause the most trouble is the track circuit. If the track is on slag or coarse gravel and well drained, the foundation is still good when the water collects during the warm part of the day in the early spring, the signalman and trackman usually have a pleasant good morning for each other. But when the ballast is not of the best, when the cinders and sand are thick and not only bear against the base of the rail but perhaps a good ways upon it, their relations are often otherwise.

Instead of quarrelling, however, the signal supervisor should go to the roadmaster during the summer when forces are plentiful and they should go over the situation together. In one case the signalman shows the trackman where cleaning out around and underneath the rail will do everything that is necessary. In another case external drainage is required which the roadmaster has wanted for a long time and, with the help of the signalman, is able to get authority to put in. In a third case the trackman shows the signalman some track that he acknowledges is bad but which cannot be taken care of properly without an expense which both agree is out of the question. But as the signalman has wanted to shorten the track circuit at that particular place for a long time, he gets authority to do it with the trackman's help. Thus the weak parts of the foundations are strengthened, and when the thaws of March, the thunderstorms of July and the floods of any time of year come the foundation stands.

If this method is followed in the field, the supervisors and roadmasters as well as the signal maintainers and section foremen will get some knowledge of each other's work, and with that knowledge will come a better understanding and greater respect for each other.

The Essentials of Morale

By S. E. Shoup

Engineering Assistant to General Manager, Kansas City Southern, Kansas City, Mo.

Favoritism of certain kinds will inevitably weaken if not wholly destroy morale. If a man is favored because of superior energy, because of dependability or because of greater knowledge, there is no resultant weakening of morale. Favoritism of this kind may even strengthen morale and spur individual effort. The favoritism that is objectionable and which will ultimately play havoc is where one man is given all of the easy assignments for no other reason than that he is liked by his foreman or superior. This is frequently found and the effect upon other men who work hard and are not given the equivalent personal consideration and concessions is disastrous.

There is a certain type of man who can never build up a loyal or effective force. This type is conspicuously conscious of his own importance and authority. He is disliked by his subordinates and associates and is usually disgustingly obsequious in the presence of his own superior. It is his delight to humiliate and belittle his men by an offensive display and exercise of his authority. He never accords the benefit of the doubt and is never satisfied with any performance. He is a constant critic and can with unerring accuracy tell how resulting consequences could have been avoided after they materialize. This type is temperamentally unfit to be in charge of men, for he will not only destroy the morale of his own force but will weaken the morale of other gangs with which he comes in contact.

All men are human and it is impossible to discount or deny human traits. Yet we often see men in supervisory capacities unconsciously doing this by indulging in useless and constant criticism. This results in their subordinates believing them unappreciative. When this belief becomes fixed, it is difficult to obtain extra effort, even in emergency.

Another thing well calculated to weaken or even destroy morale is the ignoring of the formal channels of authority. This practice, which is all too freely indulged in, leads to at least one disastrous consequence. The slighted officer feels no responsibility for resulting complications or the carrying out of the project. This brings about lukewarm or even disinterested supervision, and if persisted in will do much to break down the morale of any organization.

And now we come to insincerity—the greatest obstacle to loyalty and as such an insuperable barrier to the building up of morale. Insincerity gives birth to sneers and engenders sarcasm. Insincerity breeds distrust and opens the way for serious breaches of faith. When a superior is insincere to his subordinates the subordinates are not long in finding it out. The inevitable consequence is the complete sacrifice of loyalty and loss of morale.

Conditions Strengthening Morale

Of first importance is the interest in the work to be performed. It is far more difficult to sustain interest than it is to create it. However, by proper methods and with the proper knowledge of men, interest may be successfully sustained. Probably the surest way of sustaining interest in subordinates is for the superiors to sustain their own interest. Interest creates interest, both in the individual who is interested and in those with whom he comes in contact. Enthusiasm is only interest compounded many times, and enthusiasm is irresistible.

Closely allied to the interest in the work is an understanding of the importance of that work. In emergency, when the importance of work is clearly understood by all those engaged in it, men can, for limited periods of time, put forth superhuman effort.

The understanding of men by their superiors is a necessary condition to the creation and sustaining of morale. Superiors should be able to appreciate the perspective of their men, and knowing this, they are in better position to guide and direct their thought along sound and conservative channels. Without this understanding superiors may offend without the slightest intention, or may even bring about a condition entirely opposite from that desired. One of the best recommendations a superior can have is the friendship and personal loyalty of his subordinates. This friendship and loyalty is not only an asset for the man himself; it is also an asset of his company.

Fair play also has an important bearing on morale. When men have confidence in getting fair play and such consideration as they deserve, the result is an extended and spontaneous strengthening of trust, which in turn is reflected in

their morale. Fair play and judicial consideration are of double benefit. First, the superior is allowed an intimate insight into the work, problems and troubles of his men, which would otherwise be withheld; and second, the men are in turn benefited by the broader advice and experience of their superior.

Education is the key and predominant note of the whole subject of morale—education both as concerns methods and ways of handling the daily task and the further broader education of elementary political economy. Knowledge of the handling of men and the performance of work is a prerequisite, but this knowledge may be indefinitely expanded and amplified by properly directed reading and thinking.

Report on Motor Cars

The committee recommended that to obtain maximum efficiency, the motor car must be of sturdy construction. This result is probably better obtained by a steel frame and this type should be specified. The weight of the car must depend largely on the size of the gang and the amount of material hauled and should not greatly exceed 1,200 lb., or if it is greater, some mechanical device such as a turntable or center jack should be carried to facilitate handling. One pair of wheels should be free, that is, have a differential action with the larger part of the dead load distributed to the opposite end so as to permit the turning of the car from the track at right angles.

In the use of a light car for inspection or signal service, the weight should be so distributed that an even torque is obtained in driving, and so balanced that the load will not tend to derailment. This can only be accomplished with the center-load car. Although certain advantages may be claimed for the so-called speeder type, they are largely visionary and the danger of operation overshadows them.

The motor car must have certain features of convenience and safety, which are largely left to the purchaser's discretion. First, adequate space must be provided for tools; this is important and also includes a safety consideration. Tool trays should be placed on each side of the seat platforms of sufficient depth to preclude the possibility of any tools slipping forward over the front of the car. Although most makes may be operated for short distances backward, the front and rear ends should be designated and the car operated accordingly. This will permit the installation of high pipe rails on the front and rear, securely fastened to the floor and connected by a longitudinal center rail. This safety rail arrangement facilitates mounting and prevents men falling from the car. A protecting screen should also be placed at the front end of the car to retain the load. A safety item of prime importance is the protection by shields of all moving parts of the power plant. This precaution will prevent injury to clothing and persons of employees, and also avoid the damage resulting from tools projecting into the working parts.

The factor of power is influenced by many considerations. Probably the greatest limitation is the grade encountered. It must be remembered that even a short distance is a ruling grade for the section car. After the horsepower is decided, care should be taken so that the dead load will not exceed 150 lb. per horsepower. Twenty miles per hour should be considered a maximum speed from a safety standpoint.

The four-cycle free running engine will give the best results for motor car use in railroad operation. The necessity of feeding a fixed amount of oil with the gasoline through the carburetor in order to provide the requisite lubricant for only favorable conditions, without being able to take care of this feature properly under high temperature, heavy load and grade conditions, renders the two-cycle type unfit for the miscellaneous class of work which a railroad motor car is called upon to do. The human coefficient of efficiency is not sufficiently stable, and never will be, to give the requisite amount of ordinary honest effort necessary to operate the two-cycle type under the favorable conditions for which this class was designed. In the four-cycle type, each substance necessary to its operation is separately confined and is applied automatically from separate reservoirs, by reason of which any man failure is easily apparent and the necessary corrective measures can be applied at once, which is an essential feature in securing long life from the car and lessening the maintenance cost.

The motor car for railroad use should be free driven, as the direct driven motor car is not as safe to operate, particularly under load and on grades. The free driven motor car, with friction disc and fibre friction driving wheel, seems to have given the best results with only a slight increase in the cost of the car. The free running belt driven motor car is effective and its first cost is less; it can be used, but the belt itself is adversely affected by weather conditions.

The economical advantages derived from the use of motor cars are (1) the actual transportation time saved, (2) arrival at the point of work without fatigue, resulting in greater efficiency and increased morale, and (3) decreased cost of supervision due to the extension of sections. It has frequently been proven in practice that the substitution of motor cars for hand cars allows the lengthening of sections, thus greatly reducing the expense for supervision. On four large western railroads the replacement of 3,220 hand cars by 2,812 motor cars has yielded a computed saving of $806,993 per annum.

There should be a road organization for making current motor car repairs.

(*J. H. Hartley (chairman), assistant division engineer, Penna., Pittsburgh, Pa.*)

Other Features

On Tuesday evening a program commemorating the fortieth anniversary of the association was presented, with talks by a number of the members. On Wednesday evening the Track Supply Association gave a dinner to the members of the Roadmasters' Association. Following adjournment on Thursday, the afternoon was spent in an inspection by special train of the Cleveland terminals.

The Track Supply Exhibit

Coincident with the Roadmasters' convention, the Track Supply Association held its eleventh annual exhibit of materials and appliances employed in the construction and maintenance of railway tracks in rooms adjacent to the convention hall. Fifty firms participated in the exhibit in addition to 12 firms having representatives in attendance without exhibits.

The officers of the Track Supply Association during the past year were: President, Herbert T. Potter, vice-president, Wyoming Shovel Works, Wyoming, Pa.; vice-president, F. M. Condit, railroad department, Fairbanks, Morse & Co., Chicago; secretary-treasurer, W. C. Kidd, Ramapo-Ajax Corporation, Hillburn, N. Y.; advisory directors, E. T. Howson, Western editor, *Railway Age*, Chicago, and R. A. Van Houten, vice-president, Sellers Manufacturing Company, Chicago; directors: Alex Chapman, Western sales manager, Rail Joint Company, Chicago; J. J. Cozzens, salesman, Union Switch & Signal Company, New York; A. H. Told, general manager, Positive Rail Anchor Com-

pany, Marion, Ind.; and K. J. Eklund, vice-president, Mudge & Co., Chicago; ex-officio, David T. Hallberg, general sales manager, P. & M. Company, Chicago.

The names of those firms exhibiting, with the nature of their exhibits and the names of their representatives follow:

Aeroil Burner Company, Inc., Union Hill, N. J.; oil burners, hand pumps and compressed air for thawing; J. L. Howland.
American Chain Company, Bridgeport, Conn.; rail clamps, replacers, one piece guard rail, compromise joints, rail benders; J. J. O'Connell.
American Hoist & Derrick Company, St. Paul, Minn.; photograph of ditchers; W. B. Maurer and Miss H. Holler.
American Valve & Meter Company, Cincinnati, Ohio; switch stands and track appliances; J. T. McGarry, F. C. Anderson and Dan J. Higgins.
Balkwill Manganese Crossing Company, Cleveland, Ohio; model of an articulated manganese steel crossing; S. Balkwill.
Bethlehem Steel Company, Bethlehem, Pa.; switch stands, guard rails, gage rods; Neil E. Salsich, E. H. Gumbart, J. F. Hennessy, G. Riddle, J. S. Clark, J. H. Richards, C. A. Alden and J. C. Chandler.
Buda Company, Chicago; section motor car, switch stand, track jack; J. E. Murray, F. T. Connor, A. L. Bliss and H. C. Beebe.
Chicago Malleable Casting Company, Chicago; rail anchor tie plate, tie plate with key, rail anchor tie plate with key, rail clips, Hercules and Little Giant hemping posts; Warren Oshorn.
Chipman Chemical Engineering Company, Inc., New York; photographs of track. M. McComb and A. H. Coldwell.
Craft Incorporated, New York; light inspection car with chemical fire fighting tank and acetylene cutting and welding outfit; Albert J. Leonard.
Crerar, Adams & Co., Chicago; bonding drill, track drill, rail saw, die starters, jacks, snow brooms, shovels, etc.; Russell Wallace, W. I. Clock and J. A. Martin.
Dayton Car Wrench Company, Dayton, Ohio; car wrench; H. L. Flack.
Doughtry Safety Guard Rail Lock, Chattanooga, Tenn.
Duff Manufacturing Company, Pittsburgh, Pa.; jacks; E. A. Johnson.
Eymon Crossing Company, Marion, Ohio; model of continuous crossing; Byron E. Wilson and A. C. Queen.
Fairbanks, Morse & Co., Chicago; literature; A. A. Taylor, E. C. Golladay, F. I. Lee, F. M. Condit, G. W. Lewis, H. L. Hilliary, D. K. Lee, J. L. Jones and E. J. Coverdale.
Fairmont Gas Engine & Railway Motor Car Company, Fairmont, Minn.; inspection car, section gang car; H. E. Wade, W. F. Kasper, W. D. Brooks and S. J. Gibson.
Hauck Manufacturing Company, New York; thawing outfits, kerosene torches, circular flame burners, blue flame oil burners and syphon type furnace burner; H. Vogelsong.
Hayes Track Appliance Company, Richmond, Ind.; derail and model showing a cross-section of actual operation; H. J. Mayer, S. W. Hayes, H. H. Jenkins and R. H. Gausepohl.
Headley Good Roads Company, Philadelphia, Pa.; bituminous railroad crossing; F. N. Kern and W. T. Gilbert.
Idol Track Lining Company, Chicago; track lines; F. R. Sinning.
Ingersoll-Rand Company, New York; pneumatic tie tamper, pneumatic rail drill, pneumatic nutting machine and pneumatic bonding drill; W. H. Armstrong, J. N. Thorp, Jr., and C. Dougherty.
Kalamazoo Railway Supply Company, Kalamazoo, Mich.; literature; J. J. McKinnon, F. E. McAllister and H. R. Miller.
Lundie Engineering Corporation, New York; rail anchor, tie plates; W. S. Boyce, W. Brooke Moore and L. B. Armstrong.
Maintenance Equipment Company, Chicago; friction car stop, steel fence post, blue flag derail, rail layer, ballast screen, switch point straightener, tie spacer; J. A. Roche and E. Overmier.
Mudge & Co., Chicago; railway motor car; Karl J. Eklund, John M. Mulholland and Burton Mudge.
National Lock Washer Company, Newark, N. J.; nut locks, lock washers; J. Howard Horn, R. L. Carneross, A. T. Thompson and S. H. Smith.
National Malleable Castings Co., Cleveland, Ohio; wrecking hook, malleable iron washers, rail braces and tie plate; E. V. Sikler.
Oxweld Railroad Service Company, Chicago; reclamation of track materials by the oxy-acetylene process; W. H. Kofmehl, F. J. Duffy and W. Rallen.
P. & M. Company, Chicago; anti-creepers; S. M. Clancey, D. T. Hallberg, L. S. Walker and F. N. Bayliss.
Pocket List of Railroad Officials, New York; copies of publication; Charles L. Dinsmore.
Positive Rail Anchor Company, Marion, Ind.; girder type guard rail, rail anchors, rail braces, guard rail plates and braces and tie plates; A. H. Todd and L. C. Ferguson.
Rail Joint Company, New York; insulated joints, compromise joints, standard joints and track liner, Charles Jenkinson, R. W. Payne, Alex Chapman, G. T. Willard, C. B. Griffin, J. N. Meade, W. F. Godd, M. Marsley and E. A. Condit.
Railroad Supply Company, Chicago; tie plates, G. W. Nibbe and H. G. Van Nostrand.
Railway Purchases and Stores, Chicago, copies of magazine, Edward Wray.
Railway Review, Chicago; copies of paper; W. M. Cam
Ramapo-Ajax Corporation, Hillburn, N. Y., automatic switch stand, double shoulder switch plate, manganese guard rail, guard rail clamp, adjustable rail brace, W. C. Kidd, R. J. Davidson, Jr., J. B. Snow, J. B. Strong, T. L. Akers and John V. Houston.
Reade Manufacturing Company, Jersey City, N. J.; model of chemical weed killing machine, R. H. Bogle, R. W. Pritchard and C. H. Reade.
Reliance Manufacturing Company, Massillon, Ohio; nut locks, H. J. McGinn, E. C. Gross, D. L. Robertson and H. K. Hanna.
Sellock Nut & Bolt Company, East Syracuse, N. Y., track bolts with sellock nut, M. F. Jennings, J. C. Woodward and F. W. Piche.
Sellers Manufacturing Company, Chicago; tie plates; G. M. Hogan and R. A. Van Houten.

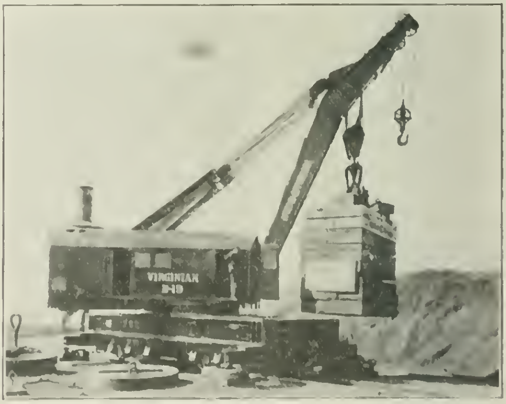
Simmons-Boardman Publishing Company, New York; samples of papers and cyclopedias; E. T. Howson, Milburn Moore, F. H. Thompson, F. C. Koch, B. J. Wilson, W. F. Rench.
Stevens Metal Products Company, Niles, Ohio; galvanized fence posts; S. H. Smith, G. J. Purcell, E. D. Thompson and E. L. Ruby.
Templeton Kenly & Co., Ltd., Chicago; track jacks, car jacks, pole jacks and emergency jacks; J. L. Crowley, G. L. Mayer and H. A. Walters.
Union Switch & Signal Company, Swissvale, Pa.; insulated rail joints; J. J. Cozzens.
Verona Tool Works, Pittsburgh, Pa.; railroad track tools, nut locks, track jacks and rail joint springs; E. Woodings, W. W. Glosser, J. S. Wincrantz and J. E. Hill.
Warren Tool & Forge Company, Warren, Ohio; sledges, hammers, spike mawls; G. F. Konold, H. C. Mull and G. H. Konold, Jr.
William Wharton, Jr., & Co., Inc., Easton, Pa.; manganese steel one-piece guard rail, gauge rod; Victor Angerer, W. H. Allen, H. F. Heyl, J. R. Smith and C. W. Smith.
Wood Shovel & Tool Company, Piqua, Ohio; shovels, spades and scoops; E. H. Hoge and C. L. Butts.
Woolery Machine Company, Minneapolis, Minn.; motor car; H. E. Woolery.
Wyoming Shovel Works, Wyoming, Pa.; track shovels, spades, scuffle hoes and picks; H. T. Potter, Stanley H. Smith, G. E. Geer, E. L. Ruby and A. W. Greetham.

NON-EXHIBITING MEMBERS

American Steel & Wire Company, Chicago.
Cleveland Frog & Crossing Company, Cleveland, Ohio.
Cleveland Railway Supply Co., Cleveland, Ohio.
Dilworth, Porter & Co., Pittsburgh, Pa.
Dressel Railway Lamp & Signal Co., New York.
Elliott Frog & Switch Company, East St. Louis, Mo.
Jordan Co., O. F., East Chicago, Ill.
Morden Frog & Crossing Works, Chicago.
Pettibone Mulliken Co., Chicago.
Q. & C. Company, New York.
St. Louis Frog & Switch Co., St. Louis, Mo.
Universal Crane Co., Cleveland, Ohio.

Virginian Places in Service Largest Wrecking Crane

The Virginian has recently placed in service for use on its lines a new wrecking crane which it is claimed has the distinction of being the largest machine of the kind ever built. Heretofore, as far as is known, the largest railroad wrecking crane was a 160-ton machine having a maximum capacity of 320,000 lb. with all out-riggers in service. As compared with this, the new crane has a capacity on the main hoist of 400,000 lb. at a 17-ft. 6-in. radius with all



The New Crane Has a Capacity of 400,000 lb.

out-riggers in service, a capacity of 200,000 lb. at the same radius with end out-riggers only in service and a capacity of 85,000 lb. at the same radius without the out-riggers. On the auxiliary hoist, the capacities are 90,000 lb. at 24 ft. to 30 ft. radii with the end out-riggers only, and 60,000 lb. at a 24-ft. radius without out-riggers.

In designing the crane, the main problem met was secur-

ing the 200-ton capacity required by the heavy rolling stock on the Virginian without exceeding railroad clearances and a maximum allowable axle load of 65,000 lb. on account of bridges. The crane in running order weighs 356,500 lb. and is mounted on special six-wheel trucks, the maximum axle load in running order being 64,000 lb. The car has a wheelbase of 26 ft. 2 in. and itself is 34 ft. long. The maximum height of the crane is 15 ft. 9 in. and the greatest width, 10 ft. 6 in.

The machine is equipped with a 12-in. by 12-in. engine operating on steam from a 65-in., 160-lb. A.S.M.E. boiler, and a Westinghouse air pump is provided, with clasp brakes on each of the 12 wheels. These brakes may be operated by the operator of the crane or by the engineman of the locomotive. All clutches are operated by air. The machine is a product of the Industrial Works, Bay City, Mich., and is said to have passed through all tests recently applied with ease and smoothness.

State Railway Commissioners Meet in Detroit

Co-operation with I. C. C. Urged—Public Ownership Theory Denounced—Motor Bus Problem Discussed

THE THIRTY-FOURTH annual convention of the National Association of Railway and Utilities Commissioners was held in Detroit, Mich., on November 14, 15, 16 and 17, with over 100 commissioners in attendance; this is said to be the largest convention roll call in the history of the organization. The opening address was made by Mayor James Couzens of Detroit, who after a few words of welcome, warmed to the subject of public ownership, telling the commissioners that within their jurisdiction rests the power to provide good public service to the American people at reasonable cost; that Detroit now has "on trial" the largest municipally owned and operated street railway system in the world, although so far as he is personally concerned, it is not a public ownership experiment, but a definite policy. He advocated the elimination of graft given in the form of unreasonably large salaries and other perquisites to the men who control public utilities. The Mayor said there is a prevailing and growing theory that all public utilities should cover merely operation—they should be operated for the service they give, and not for profits to private individuals. In this, he contended, lay the great advantage of public ownership.

The business of the convention was largely devoted to the reports of standing and special committees, addresses and discussions pertaining to railroad and other public utility regulation. The following officers have been elected for the ensuing year: President, Dwight N. Lewis of the Iowa Commission; first vice-president, Alexander Forward of Virginia; second vice-president, H. G. Taylor of Nebraska; secretary, James B. Walker of New York; assistant secretary, J. H. Corbitt of Tennessee, and general solicitor, J. E. Benton, Washington, D. C. Abstracts of the addresses and the committee reports follow.

Address of Retiring President

Carl D. Jackson, Wisconsin, the retiring president, said: The growing tendency toward centralization in government is not only paternalistic, it is paternalism at the expense of the state. Supervision of state activities, if continued, must mean the necessary taxes not only for the federal government but inexorably necessary taxes by the state governments, the proceeds of which are to be spent under regulation or supervision by the federal government. Taxation in this country has ceased to be a light matter. It will for years bear heavily on all classes of society. When inordinate and unnecessary activity becomes coupled with inordinate and unnecessary taxes, there is no reason to hope that the electorate will take an active interest in the matter and apply the necessary corrective."

Mr. Jackson attributed centralization to the outgrowth of unrest and stated that health, education and happiness has been gained only through the recognition of the individual and his property rights—not through socialism and communism. He spoke of the relations between the Interstate Commerce Commission and the commissions which compose the National Association, referring to the Transportation Act, which, with the amended Interstate Commerce Act, gives the federal commission control of railroad rates within a state when in conflict with interstate rates. He declared that the state commissioners will continue to resist the further encroachment of the federal power, but admitted that they had officially recognized the exercise of federal control to the extent necessary for the efficient exercise of undoubted national authority. As proof of this he cited the action of the association during the past year in agreeing with the Interstate Commerce Commission on a policy of co-operation.

Co-operation

By C. C. McChord

Chairman, Interstate Commerce Commission

Co-operation is potentially as broad in scope as the bounds of human relations. My present interest is in respect of its application in the field of transportation, where it should be practiced between carrier and carrier, between carrier and shipper, between carrier, shipper and the regulating authorities, and between the regulating authorities themselves, state and federal. It is rooted in the spirit of mutual forbearance, sometimes called the spirit of give-and-take, in which neither side seeks an unfair advantage.

The reconstruction and return of the railroads to their owners after the war was complicated by conditions that only time could adjust. In that situation the Transportation Act, 1920, was framed and placed upon the statute books. One of the outstanding features of that act, and one that I think is not generally fully appreciated, is that relating to car service. Under the present provisions the carriers are required to furnish safe and adequate car service and to establish, observe and enforce just and reasonable rules, regulations, and practices with respect to car service. Particular provision is also made with respect to the distribution of cars among coal mines; and thereby vicious discriminations practiced in former times have been curbed. The use, control, supply, movement, distribution, exchange, interchange, and return of locomotives, cars, and other vehicles used in the transportation of property are subject to our supervision and regulation. Whenever in the opinion of the Commission there is a shortage of equipment, congestion of traffic, or other emergency requiring immediate action in any part of the country, it has authority, either upon complaint or upon its own motion, to suspend for such times as may be determined the operation of any or all established rules,

regulations or practices relating to car service; to make such just and reasonable directions with respect to car service during the emergency, without reference to ownership of the motive power and other equipment, and to require such joint use of terminals, as will best promote the service in the interest of the public and the commerce of the people, upon appropriate terms; and to relieve against inadequate transportation service by particular carriers by prescribing the handling and routing of traffic. These provisions have in effect recreated the essence substance of federal control in respect of co-ordinated operation. For all practical purposes it is equivalent to unification of lines as far as the ultimate purpose of railroads is concerned, namely, the movement of traffic. Not only so, but it is in no wise inconsistent with the proposed voluntary consolidation of the railway properties of the continental United States into a limited number of systems.

On May 3, 1922, a joint committee composed of five members of the Interstate Commerce Commission and eight representatives of the state commissions, sitting at Washington, reported a tentative plan of co-operation through conferences and joint hearings. While experience probably will dictate some changes, such satisfactory progress has been made as to insure its ultimate success. For instance, a great opportunity for the practical co-operative plan—one readily adaptable to a completely successful issue—presents itself at this time. The Interstate Commerce Commission has entered upon a nation-wide investigation of the interstate express rates and charges. In that connection we have invited all the state commissions, through their Washington representative, to co-operate with us, not only in respect of the interstate rates but also in respect of all the intrastate rates. The express rates are founded upon a system designed for uniform application throughout the country, both interstate and intrastate. That they should be restored to a complete symmetry no one will deny, and the case peculiarly lends itself to a full justification of our co-operative plan. We hope to receive the necessary co-operation and to achieve a final result that will be above reproach. Unity of action can, of course, come only from unity of purpose, and that purpose must undeviatingly comprehend the good of the whole. We have laid the foundation. Our co-operative plan announces our purpose and marks the beginning of an epoch in railroad regulation.

Address by D. D. Conn

Manager, Public Relations Section, A. R. A.

There must be a public recognition of the fact that the railroads must enlarge their machine at least to keep apace with the progress in the development of agriculture and industry. Notwithstanding the effects of the shopmen's strike the railroads have been loading within a few hundred cars of the peak in car loading in the history of the railroads. Because of the shortage of equipment the railroads have not been able to load all the traffic offered and consequently agriculture and business has been held back by lack of adequate transportation facilities.

It is a fact that there are approximately 30,596,000 tons of freight constantly in transit, valued at approximately $1,503,000,000. If the average time in loading a car or unloading it or in its transportation can be reduced only one day, it will save an annual interest charge against the goods in transit of $18,042,000.

The transportation machine has not kept pace with the business of the country and there are three important economic necessities without which progress in industry and agriculture would be retarded: First, enlarge the transportation machine to the place where its development will again precede that of industry and agriculture; second, promote more efficient methods of distribution of the production of the country in order to narrow the spread between what the producer receives for his product and what the consumer finally pays for it; third, effect a correlation, based on scientific research and study, of our different modes of transportation.

There are many instances today of where we are building concrete highways paralleling rail transportation, but which create no new business and which mainly serve to divert it. The expenditure of this same money in building arterial highways from the farm to the railroad, plus the creation of a system for through movement of traffic via both mediums of transportation, will give each a chance to live.

The Railroad Labor Board

The Committee on Public Ownership and Operation, A. G. Patterson, Alabama, chairman, reported in substance as follows:

It is clearly apparent to all who have questioned the usefulness of the Railway Labor Board and have given the subject careful study that the existing dual system of control of the railroads of the country is a failure. The stystem is wrong in principle and has proved disastrous in practice, as evidenced by the recent nation-wide railroad strike, which was called by labor, in spite of all efforts of the Labor Board to prevent such action. This highly expensive experiment has shown conclusively that it is impracticable to have two separate, distinct and differently constituted governmental agencies endeavoring to regulate and control, in the public interest, the great transportation systems of the nation. Such a policy cannot possibly accomplish the results it was designed to accomplish. It is economically unsound and inherently inconsistent and unjust to have one government agency to fix the income and an incompatible agency to fix the major items of expense of any business institution. It would be just as consistent to have two boards of directors of a bank or of a railroad.

The Interstate Commerce Commission has been in existence for many years. Created by law, and charged with the responsible duty of regulating, in the public interest, the railroads of the country, in regard to their rates, charges and service, it has performed a wonderful service to the nation, and has always been able to enforce its orders and decrees. But not so with regard to the Labor Board. We can all see now that the creation of the Labor Board, charged by law with the impossible duty of settling disputes between railroad employer and employees, and without authority of law to enforce its orders and decrees, was a serious governmental mistake. The very manner in which the Labor Board was constituted as to its membership was wrong, and it has always seemed to be "as one born out of due season." The Labor Board is "a thorn in the side" to the railroads, and they have disregarded its orders and rulings whenever their interests suggested such action. It has been denounced by labor organizations, which have likewise refused to abide by its decisions, and it has been "a huge carbuncle upon the neck of the public," left powerless to relieve itself of its equally unsatisfactory decisions. The present administration has evidently realized that this unfortunate child must be expelled from the national household, judging from the speech of James J. Davis, Secretary of Labor, delivered at Athens, Ohio, on October 14, in which he denounced the Labor Board as being a failure and strongly advised that it be abolished. Secretary Davis, however, suggests as a substitute the creation of a "Board of Conciliation," to function through the Department of Labor, over which he presides as directing head.

If his suggestions were adopted he would soon find his department transformed into a hotbed of bitter factional partisans, each striving selfishly to gain an advantage over the other, in a somewhat similar manner as the Labor Board experiment. After deliberate consideration, it is the opinion

of this committee that the only logical, reasonable and practical solution of this perilous situation is to abolish the Railway Labor Board; transfer its functions to the Interstate Commerce Commission; enact a law "with teeth in it," which will enable the Commission to enforce its decrees and orders. In conclusion, we recommend the last situation herein dealt with, to the most serious and thoughtful consideration of every state commission. We believe that its proper solution will have a tremendous effect in retarding the sentiment favoring government ownership and operation of railroads and other public utilities, which sentiment, it must be admitted, is rapidly growing among certain classes and in certain sections of our nation, and which, if it should be adopted as a national policy, would prove to be a most destructive and disastrous government experiment.

Express and Other Contract Carriers by Rail

I Martin
of California, Chairman

Express service is purely an American institution. In no other country in the world is there a similar service. It has been demonstrated time and again that the express service of this country is a most popular service and has grown to be an absolute commercial necessity.

The state and interstate commissions and the public have not fully recognized the importance of this service.

The numerous changes in transportation rates brought about by the exigencies of war had a disastrous effect upon the express fabric throughout the country. This condition did not hold true of freight rates, for the reason that freight rates were established by various and devious methods, with a great variety of classifications governed by special conditions and disconnected relationship. The express rates, on the other hand, were upon a definite formula of universal application. So, when the horizontal increases in rates took effect and then pyramided, the result was a fabric of express rates without definite relationship, without consideration of traffic conditions, and productive of wide disparity between value of service and cost of service.

With the two increases, of 12.5 per cent and 13.5 per cent in 1920 by the Interstate Commerce Commission for interstate express rates, some of the states did not concur. A number allowed no increase of state rates whatever, and others only the first increase of 12.5 per cent, the result being that in some of the states the rates are on a lower basis for intrastate business than for interstate business. The express company has taken the matter to the Interstate Commerce Commission upon a complaint of alleged violation of the Interstate Commerce Act, claiming that a condition of undue prejudice to and interference with commerce has been created.

It is believed that a comprehensive investigation of the conditions under which express business is conducted at the present time will disclose a number of instances in which improvement of service can be effected under regulation. Revenue and operating expenses should be analyzed with a view of determining the correct basis, if any, for segregating the so-called non-profitable business.

In view of the practically 100 per cent monopoly of the American Railway Express, with the exception of the southeastern portion of the country, all of the good coming from competitive conditions has been eliminated, and the public suffers accordingly. While the operation of an express company as a monopoly may be more efficiently managed and at some less expense by eliminating the duplication of equipment, etc., at the same time we believe there should be competition at least in the matter of service.

It has been held by some that the railroads should operate their own express service, and we see no reason why an express service could not be operated by the railroad organizations just as easily as by an outside agency. Thousands of railway employees are handling express, some with additional compensation and many without. A segregation of express charges and revenues must be made in some manner so the express company may compensate the various rail carriers over which it operates in proportion to the extent each rail carrier participates in the carriage of express matter, and that could as easily be done by the railroads themselves.

The American Railway Express Company is held forever free from loss by its contract with rail carriers, under terms which provide that the express company must pay all of its expenses and from what is left it takes for itself 2½ per cent and the balance goes to the rail line, which furnishes practically all of the transportation equipment, in most cases including depot room, etc. The express company cannot lose. The present contract allows gross revenue from carload shipments on which the express company performs no other service than way-billing, delivery and accounting to be divided on the same basis as all other revenue—whereas no pickup, delivery or other terminal service is involved. Furthermore, the contract is apparently not strictly adhered to, for after the regular terms have been applied the records show certain deductions from gross, such as the $272,367.94 in the annual report of 1921. Since the 2½ per cent contract has been in effect, many economies have been worked out between the contracting parties, whereby railroad employees are being used more and more as joint employees, resulting in elimination of large expense and, many times, at the cost of inferior service to the public.

The express company has contended at various times that the Transportation Act, 1920, provides that it should receive the 5½ to 6 per cent allotted return. If that is a fact how could any regulating body prescribe rates that would assure any uniform return in face of a contract such as is now in force between the express company and the rail carriers? In some states motor truck competition, water competition and privately owned vehicle competition is most keen and the express company should be allowed to meet such competition, and in doing so be assured that such depressed rates would not be used where such competitive conditions are absent.

Motor Vehicle Transportation

E. V. Kuykendall
of Washington, Chairman

Many difficult problems are encountered in determining whether public convenience and necessity justifies the granting of certificates to stages and trucks operating in competition with railroads. It should be the purpose of all regulatory bodies to co-ordinate the various transportation systems of the country in such manner as to render the best service to the public with the least injury to established rail and boat transportation companies. It must be conceded that the country is dependent upon the rail lines for the transportation of passengers and heavy freight over long distances. It is also clear that auto truck transportation meets a public demand in the rapid transit of less-than-carload shipments, including the door-to-door delivery element which the railroads have thus far failed to furnish. The railroad companies have exhibited a degree of indifference or slowness bordering on stupidity in recognizing and meeting the demands of the public for quicker and more convenient movement of less-than-carload freight. Rather than provide light equipment and quick movement, they have relied too much upon securing protection from the regulatory bodies of the various states against truck competition. We believe it evident that if the rail carriers hope to retain their short haul freight traffic, it will be necessary for them to make radical changes, both in service and equipment. Trucks are now

rendering an astonishing service between shopping centers and outlying traffic points. Country merchants prefer direct truck service to the railroads even where the cost of the service is equal, for the reason that the trucks call at the wholesale house, receive the commodities desired and unload them at the store doors. This enables the country merchants to conduct business with a smaller stock of goods, for the reason that new supplies can be obtained conveniently and on short notice through truck service. Truck service is also preferable in the movement of household goods from one town or city to another, there being no need for crating.

It is impossible to lay down any general rules of much value to be observed by regulatory bodies in granting certificates of public convenience and necessity in competition with rail service. Each case must stand largely upon its own bottom. One element which might properly be considered in determining public convenience and necessity is the popular demand for particular service. If truck and stage service are ultimately to supplant short haul rail service, the process in the very nature of things must be slow and gradual. Oftentimes petitions signed by substantially the whole community are presented demanding the truck or stage service. While such petitions are of doubtful evidentiary value, for the reason that the average citizen will sign a petition without much thought or deliberation, they are usually received as having some bearing upon the question of public convenience and necessity. In cases where the demand for the truck or stage service is practically unanimous and insistent, the applications should ordinarily be granted, unless it would result to the detriment of the community by the curtailment or stoppage of train service. On the other hand, it sometimes occurs that the community where a stage or truck certificate is sought, is against the granting of the application and petitions opposing it are filed. In such cases the applications might properly be denied, for the reason that the regulatory body should not assume the attitude of imposing upon a community a service which is not desired. We do not wish to convey the impression, however, that stage or truck service should be permitted in every instance where popular sentiment seems to demand it. There may be other conditions which would outweigh the element of popular demand.

There is a general feeling, particularly in the western states, that motor transportation companies should be required to compensate the state in some way for the wear and tear of the highways over which they operate. In fact we feel that the tendency of the coming sessions of the legislature will be to go to extremes in this direction. Some persons have advocated a gross operating revenue tax, others a mileage tax, and still others various other modes of raising revenue, including the gasoline tax. If any scientific study or investigation has ever been made for the purpose of determining what would be a just form and amount of tax to impose upon motor transportation companies, we have no knowledge of it. We doubt very much if it would be possible to conduct an experiment or make a calculation that would be of much value to a legislature. The gasoline tax, in our opinion, is the most equitable method. It takes more gasoline to propel a 10-ton truck than a Ford. This tax is easily and cheaply administered.

Safety of Railroad Operation

C. C. McChord
of the I. C. C., Chairman

During the year just closed, a number of serious accidents occurred on the railroads of the United States, which again forcefully call attention to the necessity for extending the installation of preventative safety appliances. Probably the greatest number of serious accidents which occurred during the year from a single cause were those arising from the inherent weakness of the time-table and train-order system of operation, necessarily involving the fallibility of the human element. The most serious of these occurred on an important eastern railroad and resulted in the death of 27 and injury to 70 persons.

In previous reports the need for a systematic program for extension of the automatic-block-system has been pointed out. That need is of increasing importance. Statistics compiled by the Interstate Commerce Commission indicate that, during the year ended January 1, 1922, there was an increase of but 517.6 miles of road of automatic, and 66.5 miles of road of non-automatic-block-signal system in the United States. Considering the enormous mileage which still remains unequipped with the block system, these figures indicate that comparatively little progress along these lines is being made.

While the automatic-block-signal system has been perfected until a point has been reached where it affords a high degree of protection and the failures of its apparatus to function are extremely few, investigation has disclosed that accidents resulting from the failure of employees to observe, understand and obey the signal indications are numerous. Statistics gleaned from the accident reports show that from 1909 to 1917, both inclusive, there were 13,339 head-on and rear-end collisions, resulting in damage to railroad property alone of over $19,000,000. These collisions resulted in the death of 2,454 persons and injury of 37,724. In 1918, 220 of the 286 passengers killed met their death in collisions. A study of the accident investigation reports for the last three years, published in the annual reports of the Bureau of Safety of the Interstate Commerce Commission, discloses that during the year 1919, of the 53 collisions which were investigated, 18 were in automatic signal territory, and 10 were in manual block signal territory. During the year 1920, of the 58 collisions which were investigated, 20 were under automatic signal protection with 11 in manual block territory. And during the year 1921, of the 62 collisions which were investigated, 17 were in automatic signal territory and 9 under manual block signal protection.

This year, 1922, will be recorded as an epochal one in the field of automatic train control. In June last the Interstate Commerce Commission, acting under the authority conferred upon it by Section 26 of the Interstate Commerce Act, issued an order requiring each of 49 railroads to install on one passenger-engine division on a designated portion of its line on or before January 1, 1925, automatic train-stop or train-control devices applicable to its needs and according to the prescribed specifications and requirements. Automatic train-stop or train-control devices, as defined by the Commission's order, is a system or an installation so arranged that its operation will automatically result in either one or the other or both of the following conditions: First, automatic train stop; the application of the brakes until the train has been brought to a stop; second, automatic speed control; the application of the brakes when the speed of the train exceeds a prescribed rate and continued until the speed has been reduced to a predetermined and prescribed rate.

Owing to the increasing length of trains, increase of tonnage hauled and the high speed required, the question of providing and maintaining efficient power brakes in order to control the speed of trains, becomes a question of serious moment. Proper maintenance of the air brakes on all locomotives and cars should demand the closest attention of railway officials. There is a strong tendency on the part of some roads, operating in level territory, to pay little or no attention to the maintenance or conditions of the air brake systems on cars passing over their lines. The result is that the burden of maintenance falls upon roads having mountain grades, which are comparatively few in number, causing delay and congestion and, not infrequently, resulting in trains being operated with brakes in unsafe condition.

Car Service and Demurrage

Following the report of the Committee on Car Service and Demurrage, of which A. Forward, Virginia, is chairman, the following resolutions relating to car service were adopted by the convention:

(1) Whereas it is impracticable for the Interstate Commerce Commission to attempt to supervise the distribution of cars as between individual shippers throughout the United States, and

Whereas there should be some governmental authority within reasonable reach to which appeal can be made to require equitable distribution of cars without regard to whether the same are to be used for shipments interstate or intrastate.

Therefore, be it resolved; That we respectfully urge upon Congress the amendment of the Interstate Commerce Act in such way that the regulatory authorities of the states may make reasonable orders and regulations, not in conflict with federal law, or with lawful orders of the Interstate Commerce Commission, requiring cars within the respective borders of such states to be equitably distributed to shippers desiring the same, without regard to whether they are desired for use in shipments that are interstate or intrastate.

(2) Resolved, That we urge upon Congress the repeal of section 15a of the Interstate Commerce Act, as amended by the Esch-Cummins Act, and the making of such other amendments thereto as shall clearly limit and define the power of the Interstate Commerce Commission, and restore to the several states control over their intrastate traffic and the rates applicable to the same; and

(3) Resolved, further: That we endorse the amendments, to accomplish these purposes, presented to the house committee on interstate and foreign commerce, on March 17, 1922, on behalf of the legislative and executive committees of this association, and appearing on page 437 of the printed record of the hearing on H. R. 6861 and H. R. 8131, and that we respectfully urge their early enactment.

Service Accommodation and Claims

G. E. Erb

of Idaho, Chairman

Most commissions throughout the country have been called upon during the year last past to consider applications for permission to discontinue or curtail service heretofore afforded. Service once furnished for any considerable time tends to stimulate certain lines of activity, build up certain industries and results in certain investments. The discontinuance or serious curtailment of such service, after it has existed for any considerable time, results in killing these activities, destroying these industries and partially, at least, destroying the value of these investments and should only be permitted by a regulatory body after full notice to the public, full notice to the security holders, and full opportunity on the part of both public and security holders to be heard, and, after full investigation and unquestionable necessity therefor shown and only to the extent absolutely necessary to avoid confiscation of property. In a consideration of revenues derived from the operation of branch line service, it is erroneous and unjust to credit the branch line with only the revenue derived from the branch line mileage. Credit should be given for an equitable portion of the main line haul of business originating at or destined to points on the branch.

For several years past, sections of the country with heavy seasonal crops have suffered inconvenience and at times serious loss through inability to secure the movement of their products as desired. The energies, not only of the various state commissions, but of the Interstate Commerce Commission as well, should be directed toward the adoption and enforcement of a plan of co-operation in the distribution, and co-ordination with the carriers in the placing of surplus cars, to the end that perishable products, fuel, livestock, foodstuffs and other commercial freight should be served in a manner calculated to entail the least loss or damage possible to the various products and to the various sections.

The personal relationship of a carrier with its patrons is established quite generally and very largely through subordinate employees. The public generally does not come in contact with the general, executive or operating officials of the railway, but bases its judgment of the railway and its efficiency on experience gained through contact with station agents, station employees and trainmen. Unless discipline, relative to personal relationship with the public, is enforced among subordinate employees of the carrier, the business of the carrier will suffer and an advantage obtained by attractiveness of route, by hard work of solicitors or by expenditures in advertising may be entirely lost through the inattention or discourtesy of employees engaged in selling tickets, checking baggage and other subordinate details bringing them in actual contact with the traveling public.

It is safe to assert that of the vast amount paid for loss and damage claims by the carriers, fully 75 per cent is attributable to the carriers themselves and not to exceed 25 per cent to the shippers. The amount paid for loss and damage claims attributable to the carriers is the result of careless billing, rough package handling, rough car handling, defective equipment, defective ventilation, delay in transit, etc. The necessity of education of railway employees is further emphasized when it is considered that to this vast sum paid on account of loss and damage, must be added a still further sum aggregating about five per cent thereof to defray the actual cost of handling the loss and damage claims. The employees of the carriers must not only be taught what to do but how to do it, and further, that discipline will provide a penalty for non-performance.

Statistics and Accounts

B. H. Meyer

of the I. C. C., Chairman

During the year, the question has been raised whether the amount spent by railroads for clerical services is disproportionately large. A satisfactory statement of the growth in the number of clerks over a long period of years cannot be made owing to the radical changes in the classification of employees, but an inspection of current summaries of railroad employment shows that clerks play a large part in railroad operation at the present time. It has been determined that about one out of every eight railroad employees is a clerk.

Much expense and labor could be saved by a reduction in the number of primary accounts in the classification of operating expenses and the Railway Accounting Officers' Association, through its committee on general accounts, is now considering this subject. Individual expressions by a number of the chief accounting officers of railroads indicate considerable opposition to a radical reduction in the number of primary accounts and several have expressed their purpose of seeking permission to continue as sub-accounts the accounts now in use should the classification be materially abridged. Should action such as this be taken by any considerable number of carriers, it is apparent that no reduction in costs from this source would follow. Moreover, many contend that the number of primary accounts is an item of relatively small importance from the viewpoint of economy in management.

New occasions teach new duties. The determination of railroad wages has for many years been left to bargaining between the trade unions or brotherhoods and the railroad managements. Under the Transportation Act, 1920, such controversies are submitted to the Labor Board. These proceedings require more detailed wage statistics. Accordingly, in co-operation with the Labor Board, the Interstate Commerce Commission has prescribed much more detailed reports on this subject. These are published monthly. The number of classes is increased to 148, and the distinction between straight time and overtime is introduced in connection with the service and compensation of each class. Although the impairment of comparability with prior statistics may be

deplored. it was felt that the desire for continuous comparability should not stand in the way of real improvement in statistical data.

Under the Transportation Act, also, it becomes the duty of the Interstate Commerce Commission to pay greater attention to the question of whether carriers are economically managed. The monthly reports of operating statistics, which follow with some modifications those inaugurated by the United States Railroad Administration, afford the statistical basis for studying the economy of management. Monthly summaries based on these reports are forwarded regularly to the various state commissions.

Among the most useful of present-day railroad statistics are those published weekly by the Car Service Division of the American Railway Association. These show by districts the number of cars of revenue freight loaded, classified under the headings, grain and grain products, live stock, coal, coke, forest products, ore, merchandise, l. c. l., and miscellaneous. These reports afford a means of judging of the trend of railroad freight traffic considerably in advance of the reports based on freight revenue accounts.

This committee believes that loss and damage claims by commodities should be made the subject of a test or analysis, and that the ascertained damage rate per ton so found upon the commodities studied, taken in connection with the percentage which the tonnage of those commodities bear to the total tonnage, would determine a fair working unit of apportionment.

Other committee reports and business included that of Grade Crossings and Trespassing on Railroads; State and Federal Legislation; Publication of Decisions and Orders of the State Commissions; and Litigation.

It was voted to hold the next convention at Miami, Florida, on December 4, 1923.

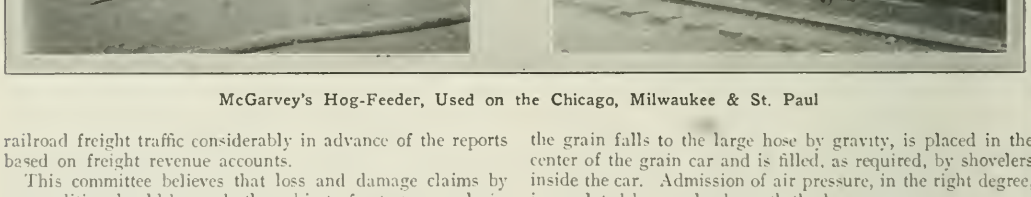
[*The report on Valuation by F. P. Woodruff of Iowa will appear in an early issue of the Railway Age.*]

THE THIRD ANNUAL INDOOR ATHLETIC CHAMPIONSHIPS of the Pennsylvania Railroad will be contested for on April 14, 1923. The city has not yet been selected but eliminations have already started throughout the System. In these approximately 25,000 employees are taking part. More than a thousand contestants will meet in the finals on April 14. The outdoor meet at Altoona, last fall, attracted about 40,000 of the P. R. R. family to that city.

McGarvey's Hog Feeder

JAMES MCGARVEY, of Malden, Wash., who attends to the feeding of train loads of live hogs for the Chicago, Milwaukee & St. Paul at that station, has so shortened the time for completing this task that the pneumatic apparatus with which he effects this economy is being called for at other places where the device has been heard of, and he has applied for a patent on it. Its construction and arrangement are illustrated in the photographs.

A car carrying a supply of corn with which the hogs are to be fed is pushed by a locomotive along a track adjacent to the standing stock train, and compressed air, for blowing the grain into the hog cars, is conveyed from the locomotive through the hose shown at the extreme right in the right-hand picture. The larger hose, with a flat nozzle which can be pushed between the slats of a stock car, is held by a man standing on a removable shelf or platform attached to the doorway of the grain car. The hopper, from which the grain falls to the large hose by gravity, is placed in the center of the grain car and is filled, as required, by shovelers inside the car. Admission of air pressure, in the right degree, is regulated by a valve beneath the hopper.



McGarvey's Hog-Feeder, Used on the Chicago, Milwaukee & St. Paul

The feed is scattered uniformly through the car of hogs, so as to give each animal the needed supply—a task which, with double deck cars, is anything but pleasant or expeditious when done by hand.

The hopper serves as a measure, and a decided saving in the amount of feed used, as compared with former practice, is reported. The grain car, pushed slowly along, is stopped, when at the right place, not by motioning or shouting to the engineman, but by starting the grain blower, which exhausts enough air from the train pipe to stop the locomotive—and the car.

This feeder has been in use at Malden eight months and at Deer Lodge, Mont., Miles City, Mont., and other places for shorter periods. Incidentally, it has been found useful on occasion to transfer a load of grain from a defective car, a job which is done in about one hour. A train load of hogs is fed in about one-third of the time formerly required, and the stock-car doors are not opened at all.

THE CONSOLIDATED PURCHASING AGENCY of the American Short Line Railroad Association will be moved from Washington, D. C., to Chicago on December 1.

Hill Roads Oppose I. C. C. Consolidation Plan

Object to Grouping of Great Northern with St. Paul and Ask That Present Combination Be Continued

WASHINGTON, D. C.

THE HEARING on that part of the Interstate Commerce Commission's tentative consolidation plan comprising Systems 14 and 15, the Northern Pacific Burlington and the Great Northern-St. Paul systems, at Washington on November 17-21 before Commissioner Hall and Examiner Healy, brought forth a vigorous objection to the proposed grouping on the part of the Hill roads, who made strong representations, supported by voluminous testimony and exhibits, in favor of putting the properties of these three companies, including the Colorado & Southern in the same system or group. If this cannot be done, however, the Great Northern asked that it be grouped with the Burlington.

In a preliminary statement, Commissioner Hall said that the commission's tentative plan, based on studies made for the commission by Prof. W. Z. Ripley, does not indicate any prejudging by the commission but was put forth rather for the purpose of eliciting thought and discussion to afford a starting point for the building up of a record on which the final plan will be based.

The commission had placed the Chicago, Burlington & Quincy and the Northern Pacific in System No. 14, together with the Chicago Great Western, Minneapolis & St. Louis, and possibly the Spokane, Portland & Seattle, although it had also suggested as an alternative that the latter be placed in System No. 15, comprising the Great Northern; Chicago, Milwaukee & St. Paul; Chicago, Terre Haute & Southeastern, and possibly the Duluth & Iron Range; Duluth, Missabe & Northern; Green Bay & Western, and Butte, Anaconda & Pacific. The Colorado & Southern was tentatively placed in the proposed Santa Fe system.

While the first part of the hearing was devoted to the presentation of arguments that the Hill roads should be consolidated, the Great Northern officers then took the stand and said that if the roads were to be separated the Great Northern rather than the Northern Pacific should be consolidated with the Burlington. The Northern Pacific offered no testimony on this point but it is expected that its officers will take occasion to reply at a later hearing to be held in the west. It is understood that if the commission had the power to put its tentative plan into effect the Northern Pacific would have nothing to say in opposition to the idea of combining with the Burlington instead of having only a half interest in it, but since there appears no way of compelling the Great Northern to give up its half interest, even if the commission should so provide in its plan, the Northern Pacific prefers to work for a practicable plan and, therefore, has joined with the other roads in asking that the three Hill lines be kept together.

President H. E. Byram of the Chicago, Milwaukee & St. Paul, who also testified, expressed no strong preference as to which of the Hill roads it should be grouped with. He also suggested a grouping with the Union Pacific. An outline of the testimony which was presented by the witnesses for the Hill roads in support of the contention that they should be placed in one system was given in an opening statement on behalf of the three companies by Walker D. Hines, counsel for the Great Northern. Mr. Hines said:

Hines Outlines Arguments for Consolidation of Hill Lines

We propose first to show that the present situation of the Burlington, Northern Pacific and Great Northern together with their interdependence and the further dependence of the Burlington upon its participation in traffic to and from the south is not only one of the great existing facts in the railroad situation of the country but it is a situation which has been the outgrowth of planning of the ablest pioneers in the railroad development of this country, and that the prosperity of the three companies has been due to the realization of this early planning and to the continued and consistent progress of the three companies in the direction of the realization of the great conceptions of these railroad builders who laid the foundations for the development of these roads to their present wonderful capacity for efficient public service.

In 1886 the Burlington was projected to St. Paul with the definite purpose of interchanging with the Northern Pacific which already reached the Pacific coast and with the Great Northern, which was in course of construction to the Pacific coast, and from that day until the present time the Burlington has used the Great Northern freight facilities at St. Paul, the Great Northern passenger and freight facilities at Minneapolis, and trackage over the Great Northern between St. Paul and Minneapolis.

In 1894 the Burlington was built to a connection with the Northern Pacific at Billings, for the purpose of sharing in the business between and through the then Burlington territory and the Pacific coast, and extensive use has been made by the Burlington of Northern Pacific facilities at and near Billings from that time to the present. It will also appear that the Burlington's construction to Billings was simply a substitute for the Burlington itself constructing its own line to the Pacific coast. The Burlington seriously considered such construction, made extensive surveys and examinations with that in view, and further seriously considered in 1895 the acquisition of the Oregon Railroad & Navigation Company, which was subsequently acquired by the Union Pacific. It will further appear that about the same time the Burlington also contemplated constructing its line to a point of connection with the Great Northern in the Great Falls district in Montana, but that at that time J. J. Hill, of the Great Northern, was not sympathetic with the idea of such construction and it did not take place, but that on the other hand within a few years after the purchase of the Burlington stock by the two Northern companies, the Great Northern itself began the construction of a line to connect with the Burlington at Billings, this line being completed in 1908.

It will thus be disclosed that the purchase by the two Northern lines of the Burlington stock in 1901 was simply a further step in the realization of the idea of handling through traffic by these lines which had been in the minds of these great railroad pioneers long before and which had been partially realized by them at early dates.

The vision of the builders of the Burlington was not turned solely towards the north and northwest, but that they equally realized the vital importance of adequate establishment of the Burlington as a line participating in the movement of traffic to and from points west of Denver and to and from points in the southwest and that in consequence of these farseeing views extensive investigations were made with a view to constructing or acquiring railroads west of Denver, railroads into the southwest from Denver, and railroads into the south from Kansas City. It will appear that the Burlington eventually carried out these conceptions directly in the matter of a line from Denver to the southwest through the acquisition of a controlling interest in the Colorado & Southern, and that its interest in the other directions were adequately protected by establishing interchanges of traffic with railroads whose motives to interchange traffic are likely to be largely destroyed if the grouping proposed by the commission should become effective.

We will further show the large expenditures which have been made by all three companies, each seeking to promote this essential development of interchange traffic and bringing about that intensive improvement of these three railroads, and that the result has been that each of the northern lines has become more and more dependent upon the Burlington and the Burlington has become more and more dependent upon each of the northern lines in order that the great facilities which have been created for the public service may be adequately and profitably employed.

We shall then show, through President Holden of the Burlington, the physical and traffic situation of the Burlington, its relation to the Northern Pacific and Great Northern, its dependence upon interchange traffic, the injurious effects which would follow if the tentative grouping of the western roads should become

effective in fact, and the beneficial results if the Burlington, Northern Pacific and Great Northern were grouped together.

It will appear that since the purchase of the Burlington by the two northern lines in 1901, a period of intensive development of the Burlington began so as to equip it for the efficient handling of the growing interchange between the three companies, and that since the purchase by the Burlington of a controlling interest in the Colorado & Southern in 1908, that property has been progressively developed so as to enable it to handle business interchanged not only with the Burlington but through it with the two northern lines.

Regions Served Supplementary

We shall show that the characteristics of the regions served by the Burlington and the northern lines respectively are such that these regions are supplementary to each other so that the free interchange of products between them is of the highest importance, as, for example, the movement of lumber from the northern lines to the Burlington, and that the Burlington has been developed in order to effect this interchange via each of the northern lines, and that each of the northern lines has likewise been developed with a view to this interchange with the Burlington, with the result that the Burlington needs both of the northern lines, and that each of them needs the Burlington.

We shall further show that a highly important part of the strength of the Burlington is due to its interchange at Kansas City and St. Louis of traffic moving between the southwest and Chicago and east, and that the tentative plan of the commission will, if made effective in fact, seriously handicap the Burlington in further participation in that business, because each of the southwestern lines which heretofore have ended at Kansas City or St. Louis and have, therefore, had an important interchange with the Burlington, will be provided with its own line to Chicago, so that its future interest would be to hold this business for its own rails and terminate the interchange with the Burlington. In other words, the tentative plan gives the southwestern lines an outlet to Chicago but gives the Burlington no inlet into the southwest.

It will also be shown that the interchange from the western end of the Burlington into the southwest via the Colorado & Southern is of growing importance, and that this likewise promises to be largely defeated by the tentative plan which takes the Colorado & Southern away from the Burlington.

It will appear that 52.5 per cent of the tonnage handled by the Burlington and 54.9 per cent of the revenue derived by the Burlington is from interchange business and that the loss of interchange with the Great Northern, with connections at Kansas City and St. Louis, and with the Colorado & Southern, involved in the commission's tentative plan would, if the plan should actually be realized, make a serious modification in the standing and prosperity of the Burlington and would so impair its strength as to make it much less able to take care of weak lines to be provided for in the consolidation plan than has been assumed. In fact, the manner in which the Burlington has been dealt with tends largely to destroy the Burlington's strength, which has been a moving factor in the making up of the tentative plan.

It will necessarily appear that such menaces to the prosperity of the Burlington and, therefore, to the two northern lines which own it, will inevitably deprive the Great Northern of any motive whatever to voluntary action which would be necessary to bring about the realization in fact of the existing tentative plan, and since the statute is framed solely on the idea that no consolidations are to take place except by voluntary action of the owners of the properties, it will become evident that the dispositions made by the plan are of such a character as to create insuperable obstacles to its realization, and in this respect also the method in which the properties of the Burlington, Northern Pacific and Great Northern are dealt with constitutes a striking exception to the general policy of the plan which in nearly all other principal aspects is of such a character as not to create new motives adverse to its realization.

A Trade Route Through the Twin Cities

Vice-president Martin of the Great Northern will show that the tentative plan fails to preserve existing routes and channels of trade and commerce as required by the statute, but instead disrupts such routes and channels to a much greater extent than in any other grouping proposed by the tentative plan. He will show that the tentative plan disrupts a route of trade and commerce of very great importance through the Twin Cities, being that over which a great volume of traffic has moved between the Great Northern and the Burlington, such interchange having its beginnings at the time the Burlington was constructed to St. Paul in 1886 and being one of the important purposes of such construction.

It will appear that this interchange has been greatly increased in importance because of the policy which the two northern lines and the Burlington have put into effect since the purchase of the Burlington stock in 1901 to develop a great movement of coal from southern Illinois to points in Minnesota and North and South Dakota, and it will appear that there is a highly important movement of such coal for locomotive use by the two northern companies in addition to the ordinary commercial movement. If this movement to points on the Great Northern and for the Great Northern's own use should be discontinued a serious interference with existing channels of trade would result, not only to the detriment of the Burlington, but to the detriment of the coal mines on the Burlington.

The total interchange between the Burlington and the Great Northern at the Twin Cities has averaged over 900,000 tons per year for the last 20 years and in a recent year has reached as much as 2,000,000 tons.

It will further appear that in order to provide for the direct interchange of traffic between the Burlington and the Twin Cities via the Great Northern a line of 108 miles in length was constructed in 1906 by the Great Northern from Sioux City southwardly to connect with the Burlington and was transferred to the Burlington a little later. This established an important direct channel of trade between the Burlington territory and the Twin Cities, and both the Great Northern's line down to Sioux City and the Burlington's line up to Sioux City are dependent upon this interchange. The tentative plan would disrupt this route. The average tonnage interchanged between these lines for the last 14 years has been over 400,000 tons per year, and this increased to 540,000 tons in 1921.

It will further appear that in 1908 the Great Northern constructed a line 194 miles in length at a cost of $12,300,000 to connect with the Burlington near Billings, Montana, and that the Burlington, partly on account of its Billings interchange with the Northern Pacific existing since 1894 and partly on account of its more recent interchange with the Great Northern, constructed a low grade line to Billings as an alternative to its older line with heavier grades, such new line costing $17,000,000. The interchange between the Burlington and the Great Northern via Billings has averaged over 500,000 tons per year for the last 14 years and reached 890,000 tons in 1921. The maintenance of this route is vital to the success of the Great Northern's connecting line of 194 miles in length, is an important element in the success of the Great Northern as a whole and also in the success of the Burlington. This route will be disrupted by the tentative plan.

It will also appear that in 1909 the Northern Pacific and Great Northern joined in the construction of the Spokane, Portland & Seattle Railway, a low grade railroad from East Washington to the Pacific with a total mileage, including branches, of 885 miles at a cost of over $97,000,000. This line gets a much larger share of westbound business to Portland territory than the two northern lines could otherwise obtain, and this has a highly important effect upon the ability of the two lines to get eastbound traffic. It will be obvious that this line is of the greatest importance to both the northern lines and ought not to be separated from either of them, and that it is also highly important to the Burlington to be able to participate in the business which each of the northern lines is able to handle by reason of its one-half ownership in the Spokane, Portland & Seattle.

Benefits the Public

Mr. Martin will further be able to show the striking benefits to the public which have flowed from the equal ownership by the two northern lines of the Burlington stock and the consequent intensive development of the three lines for the purpose of building up the interchange between each of the northern lines and the Burlington. He will show that since the purchase the three lines have expended for extensions, additions and betterments, including equipment, over $900,000,000. He will show that whereas the three lines had altogether about 18,600 miles of road in 1901, the date of the purchase, they have since that time constructed 5,500 miles of new road. He will show that they have increased their locomotives by 97 per cent and their freight car capacity by 176 per cent. He will show marked increases in efficiency of operation, and will show that in the year 1917 the traffic of the three roads increased 245 per cent over the traffic in the year preceding the purchase. He will show the great increase in productivity of the territory served by these lines.

It will appear that the Burlington stock owned by each of the northern companies is pledged under the respective mortgages of the latter to secure mortgage debts which were incurred with the approval of the commission, so that both the mortgage creditors and the stockholders of the two northern companies are vitally interested in preserving the existing situation, and certainly the stockholders of the Great Northern have no motive for substituting a new condition which would be distinctly injurious to their manifestly legitimate interests.

The statute obviously contemplates that no consolidation plan can be effected without the elimination of some competition, and we shall contend that the competition which could be eliminated by putting the lines of the three companies in the same group

would be so small that the statutory policy would be fully maintained even in its most technical aspect, and that the broad purposes of the act would undoubtedly be promoted by putting the three lines in the same group.

We shall contend that the purpose of the statute would be defeated and not promoted by placing any one of the northern lines in a different group from that containing the other northern line and the Burlington. This would be true because the public interest will be promoted by putting the three lines in the same group and further because the inescapable facts are such as to destroy any motive for voluntary action on the part of the Great Northern to carry into effect the tentative plan for voluntary consolidations, the only sort contemplated by the act. We shall contend that the affiliation existing between these three lines for over 20 years has been preeminently in the public interest, and that it represents a long step in the direction of simplification and increased efficiency of the railroads of the country through a scheme of consolidation, the thing sought by the Transportation Act. There is not another situation in the country where consolidation would be more logical or more in the public interest, and there is no other situation where consolidation could so readily be brought about. We shall earnestly urge that this important reality ought not to be thrown away for the purpose of trying to accomplish some theoretical consolidations much less in the public interest, and which after all cannot be accomplished because the facts we have shown preclude the arising of any motive which could bring them about.

We realize that one important problem which confronts the commission is to provide a satisfactory grouping for the Chicago, Milwaukee & St. Paul. Upon that point our position will be that the existence of that problem can in no event constitute a justification for attempting to dismember the existing affiliation between either of the two northern lines and the Burlington, and furthermore that the mere theoretical placing of the St. Paul road in a group with one of the northern lines will not in practice accomplish the result, because no motive can exist on the part of the Great Northern to take voluntary action, the only sort contemplated by the statute, for the consolidation with the St. Paul when such action would impair the Great Northern's own manifest interests through disrupting the financial and traffic relations with the Burlington. We shall point out that, generally speaking, the commission's tentative plan preserved existing relationships and ownerships in other parts of the country, even though a dismemberment of such affiliations might theoretically have facilitated satisfactory disposition of other lines, and we shall urge that the same principle should be applied in this instance, and that this treatment is called for by public considerations of paramount importance.

But it will further appear in the course of the commission's hearings on its tentative plan that other solutions of the St. Paul problem are practicable and which are indeed more satisfactory than the solutions which the commission's tentative plan adopted in other parts of the country where problems somewhat similar have arisen.

The testimony of the railroad officers who appeared as witnesses, went into great detail in developing the points mentioned by Mr. Hines.

Testimony of Hale Holden

Hale Holden, president of the Chicago, Burlington & Quincy and Colorado & Southern, was the first witness. He produced numerous exhibits of growth in mileage, improvement and enlargements of yards and terminals, second and third track and increases in number of locomotives and cars in support of his testimony, showing the intensive development of these system lines since they became closely associated in 1901, and pointed out the disorganization which would follow from an attempt now to disturb the channels of trade and commerce which have naturally been established in the development of this strong combination of western railroads.

Mr. Holden pointed out that Burlington is in no way competitive with either Northern Pacific or Great Northern. He further showed by careful analysis of tonnage figures that more than 98 per cent of all the freight handled by the Northern Pacific and Great Northern is competitive with other lines, such as the Chicago, Milwaukee & St. Paul, Soo Line, Chicago & North Western systems and Union Pacific System, so that by consolidating the Northern Pacific and Great Northern with the Burlington all practical competition was still to be protected while at the same time the long-standing close alliance between the Burlington, Northern Pacific and Great Northern would be improved and substantial economies in cost would be accomplished.

The Colorado & Southern line from Wendover, Wyo., to Denver is now a part of the Burlington line between Denver and the Northwest, and the proposal of the commission to turn the Colorado & Southern over to the Santa Fe will not only destroy this through line, he said, but also destroy the important north and south route between Galveston and Texas points, Denver and the great Northwest which the Burlington with the Northern Pacific and Great Northern have been interested in building up by the ownership of the Colorado & Southern.

Mr. Holden criticized the whole plan of the commission as based too largely upon east and west traffic instead of also giving consideration to the importance of north and south traffic; he pointed out the growth of the great north and south lanes of traffic; and predicted that the Denver gateway would increase in importance as the center of another large flow of north and south traffic whereby the market for the products of the Northwest, and principally lumber, would increase throughout the central and southwestern states and the volume of fruits, vegetables and other products from the south would increase in volume in the opposite direction into the Northwest.

Four Western Systems Proposed

After reading his prepared statement Mr. Holden said that the western mileage might be grouped into four systems and by way of reply to the argument that such systems would be too big he gave figures showing one-fourth of the business, mileage, revenues, equipment, etc., of the western roads as contrasted with the similar figures for the New York Central and Pennsylvania systems to show that in practically each item they would be smaller but the net revenues would be greater. The former Harriman system or the present Santa Fe system, he said, would also be comparable. Prof. Ripley asked if Mr. Holden's logic was not based mainly on the fact that the tentative grouping would take something away from the present Hill system and that the present arrangement ought not to be disturbed. Mr. Holden replied that in the main that was the basis of his argument, that it would disrupt the results of years of work. "We would be willing to take our share of the weak lines," he said, "but we mustn't have the blood let out of our veins first. Let's take what we have and build up upon that rather than tear it down and begin all over."

When Prof. Ripley asked whether the Northern Securities decision is to be considered, Mr. Holden said that the status of the Burlington itself was not involved in that case, also that the St. Paul's new line to the Pacific coast had created a new condition and that in view of the new law, the application of the Sherman act to the situation seems obsolete. With reference to Mr. Holden's argument about closing gateways to the Burlington, Prof. Ripley asked if that were not the necessary effect of any consolidation; if the purchase of the Burlington by the northern lines had not caused a dwindling of some of the interchange with other roads at St. Paul and if the question did not resolve itself into one of whose traffic was to be dried up. Mr. Holden said that the St. Paul gateway is wide open because the interests of the Great Northern and Northern Pacific require them to maintain an extensive interchange with other roads than the Burlington. Mr. Hines then interposed to say that at the proper time for arguing law questions he was prepared to show that the Northern Securities case has no bearing if the commission should decide that the three roads should be put into one system, also that the present interchanges referred to, constitute the channels of trade which the law says are to be preserved rather than those which may have dried up in the past.

Prof. Ripley expressed considerable interest in Mr.

Holden's suggestion that the western mileage be divided into four systems, but asked if that would not operate to close gateways in the same way that Mr. Holden had opposed. Mr. Holden said that if each system were given a line to the Southwest and the Gulf and an opportunity to build as it might see fit it could look after its own long hauls and would not expect so much in the way of interchange, but that each system must have either its own through line or an open gateway. Prof. Ripley said that one difficulty about giving each system a north and south line was that there was no line so direct as the Colorado & Southern. "That is one reason," Mr. Holden said, "why we are a little cautious about giving it up," but he pointed out that other systems have lines toward the Gulf and said that by watching the map he could see that it was perfectly obvious that the Santa Fe was developing a line to the Southeast. Prof. Ripley then asked why the western lines could not help the commission in developing a practicable plan. He said: "We are breaking our hearts in the commission trying to develop such a plan and not merely an academic one." Mr. Holden said that he has been giving very careful consideration to the subject for 18 months and although he did not want to get ahead of the views of other western railroad executives, he thought they should all get around a table and try to develop something that will help the commission. Prof. Ripley asked if each system should also be given a line to Seattle. Mr. Holden said it isn't possible to give each large system the same location, but that he had suggested that each be given access to the Pacific coast. Prof Ripley said that he had proposed giving the Burlington the Western Pacific as a line to San Francisco and asked what Mr. Holden thought of this proposal. Mr. Holden said he was not prepared to express his opinion at this time. With regard to the placing of the Chicago Great Western in the system of the Burlington and the Northern Pacific, Mr. Holden said: "Well, we haven't been trying to buy it," and when questioned similarly regarding the Minneapolis & St. Louis, he merely stated that the Burlington had a line of its own to the Twin Cities.

Statistical testimony was presented by G. R. Martin, vice-president of the Great Northern, along the lines indicated in Mr Hines' opening statement.

Howard Elliott Outlines Historical Development

Howard Elliott, chairman of the Northern Pacific, testified on November 18 regarding the history of the Burlington and the Northern Pacific and the reasons that led up to the purchase of the Burlington by the two northern companies in 1901, making an arrangement which he said "seemed to me a wise one at that time, that has been a wise one for the last 21 years and is a wise one now—and one that should not be disturbed." He showed that the Burlington had long planned its own line to the Pacific coast but that in 1894 an agreement was made with the Northern Pacific which opened the territory of each road to the other at the Billings gateway and that this was one of the fundamental elements in the development of the situation that resulted finally in the purchase of the Burlington after the Burlington had built its line to the Twin Cities.

The statements of Mr Perkins made in 1901 show that he had regarded the combination made with the two northern companies as to the culmination of the efforts to secure the best results for the Burlington property and the states served by it—the full and final justification for building to St. Paul in 1886 and to Billings in 1894, Mr. Elliott said, and the Burlington has retained and increased its financial strength, because it did not have to spend, as the St. Paul did, the large sums necessary for a new line to the coast. As shown by Mr Martin, the interchange of business between the Burlington and Northern Pacific since 1896 was 34,258,267 tons, and between the Burlington and Great Northern 32,105,506 tons.

"My own views, after having been closely associated with the Burlington and Northern Pacific since 1880, and having a pretty good knowledge of the western country and of its railroad development," Mr. Elliott said, "are:

"That it would be a mistake from the standpoint of the public to separate the C. B. & Q., N. P. and G. N. systems. That permission should be given by the commission to still further unify the three roads, for such unification would permit the maximum development of the properties and the greatest service to the public. That separation of the three roads would not 'maintain' long established, much less 'existing channels of trade and commerce,' would do harm to many engaged in business of all kinds who have established their business based on the present railroad arrangements, and would retard the growth of the country served.

"The next 25 years will show a much greater growth in the United States and in the western country than the last 20. The country needs big tools of every kind for its development, particularly big transportation machines that can furnish the service needed. These three roads will form such a machine. They have done fine work in the last 21 years and can do even better. If consolidation, or the creation of big tools of commerce, is a wise national policy here is practical consolidation that can be made effective. To separate either the Northern Pacific or the Great Northern from the Burlington would introduce a new financial problem of magnitude and create a feeling of uncertainty which would do no good but would check the progress of the railroads in reaching a more stable basis, in overcoming the difficult condition resulting from the war and federal control and in developing their properties so as to give the best service to the public."

Great Northern Wants to Keep Burlington Anyway

Ralph Budd, president of the Great Northern, said he felt the public interest would be best served by placing the three lines in one system but that if that could not be done and the choice had to be made, the Great Northern and the Burlington should be kept together. He went into a detailed explanation of the traffic relations and facilities of the roads in support of that contention.

Mr. Budd said the Northern Pacific had only two principal points of contact with the Burlington, at the Twin Cities and Billings, while the Great Northern had three, the third being at Sioux City. James J. Hill, he said, had much to do with bringing the Burlington to the Twin Cities in 1886 and had allowed it to use the Great Northern terminals. The Great Northern had also built a line to meet the Burlington at Sioux City in 1906. If the Burlington and the Great Northern were made competitors, the Great Northern would not be willing to give the Burlington joint use of its facilities at the Twin Cities, and the separation would otherwise break up interchange between the lines. He said he knew of no place in the United States where a breaking up of existing systems would cause more disruption of the channels of traffic than a separation of the Great Northern and the Burlington. Mr. Budd also said the Great Northern, if separated from other parts of the system, would have weaknesses similar to those which have caused the "well known financial situation of the St. Paul," for example, he said, neither line would have enough transcontinental business to utilize fully its facilities because the Great Northern would lose business which has been coming to it from the Burlington.

Mr. Budd also pointed out that the Northern Pacific has extensive facilities at Duluth which the Great Northern uses and that at Minneapolis the only two passenger stations are those owned by the St. Paul and Great Northern. A grouping of the St. Paul and the Great Northern, Mr. Budd said, would be very impracticable and whereas the officers of the Hill roads have worked together harmoniously and efficiently he feared that placing the roads in different groups would tend to cause discord. He also pointed out that the Great

Northern territory needs many new lines, the construction of which has been delayed by the war and the period of depression and that the Great Northern-St. Paul combination would be too weak to finance the proper development of the territory. He gave the figures showing the amount of bonds of the several companies maturing between now and 1940 to show that the combination of the St Paul and Great Northern would produce the greatest amount of maturities, a total of $404,000,000, as against only $259,000,000 were the Great Northern and Burlington combined That alone, he said, would make the consolidation of the St. Paul and Great Northern practically prohibitive.

Mr. Budd testified that the competitive situation is no argument in favor of selecting the Great Northern as the road to be divorced from the Burlington for the purpose of being grouped with the St Paul. He explained that the erroneous impression that there is much greater competition between the Northern Pacific and St. Paul rests upon the fact that they parallel each other for long distances through the state of Montana. He offered in evidence a relief map to bring out the fact that where these roads parallel each other the country is exceedingly mountainous and the relative amount of traffic is small He stated that on the contrary the Great Northern and St. Paul were in competition in the Great Falls district, which is much more open country with extensive copper and other industries and agricultural interests, and he stated that on the whole there is distinctly more competition between the Great Northern and the St. Paul in Montana than between the Northern Pacific and the St. Paul.

Taking the whole territory, he said, there is no competitive reason for selecting the Great Northern instead of the Northern Pacific for grouping with the St. Paul, and that every other consideration indicates that the Northern Pacific ought to be selected for this purpose if the commission reaches the conclusion that either the Northern Pacific or the Great Northern must be separated from the Burlington in order to be grouped with the St. Paul.

Mr. Budd said that Professor Ripley had proposed to take the Great Northern instead of the Northern Pacific away from the Burlington to be grouped with the St. Paul in order to avoid elimination of competition, and yet for the purpose of adequately strengthening the Great Northern-St. Paul group had proposed the addition to that group of the Duluth, Missabe & Northern and Duluth & Iron Range. He said that these two railroads and the Great Northern were the railroads which handled the immense Missabe iron ore traffic, and that the result was that Professor Ripley's plan contemplates the elimination of a great deal more competition than the amount in question between the Northern Pacific and the St. Paul.

Louis W. Hill, chairman of the Great Northern, outlined some of the early history of that road and the Burlington to show that they had worked together and that J. J. Hill and his associates had an interest in the company which built the Burlington line to St. Paul while the Forbes interests in the Burlington had a one-tenth interest in the St. Paul, Minneapolis & Manitoba, the predecessor of the Great Northern, before the purchase of the Burlington by the two northern companies. The Burlington route had always been a preferred connection of the Great Northern at the Twin Cities, he said, and after J. J. Hill and his associates had bought into the Northern Pacific and were considering the purchase of a line to the south Mr. Hill had considered the Burlington as the logical road for this purpose because it promised the largest interchange of the kind of traffic which the northern companies desired. Some of the Northern Pacific people had preferred the St. Paul and there was some discussion of a purchase of that company. He said that the elder Hill was not influenced by fear that the Burlington would invade the Great Northern territory but felt that the two roads were naturally supplementary and feeders. He said it was the opinion of all the Great Northern directors that the true solution is to place all three companies in one system.

H. E. Byram, president of the Chicago, Milwaukee & St. Paul, had a prepared statement based on the commission's tentative plan pointing out ways in which a combination of the St. Paul with the Great Northern would be advantageous. He said the St. Paul would strengthen the Great Northern in the east and the Great Northern the St. Paul in the west, and that many operating economies could be effected. However, in view of what had been said by representatives of the Great Northern at the hearing, Mr. Byram said that in many ways the same advantages would result from a combination of the St. Paul with the Northern Pacific.

In reply to questions by Professor Ripley as to why the St. Paul is not earning so much in proportion to its value as other lines, Mr. Byram said that is largely due to the lower density of traffic, particularly west of the Missouri, because the St. Paul is the new line in that territory. He said the economies resulting from electrification had not yet been fully realized but that the lines were so separated that he did not think enough Great Northern traffic could be routed over the electrified line to greatly increase its density.

Byram Suggests Union Pacific-St. Paul Combine

Mr. Byram then suggested that an alliance of the St. Paul and the Union Pacific would do away with many of the difficulties which had been mentioned as likely to result from a merger of the St. Paul and the Great Northern. He said the Union Pacific has no lines east of the Missouri while the St. Paul has no lines west of the Missouri, exclusive of the coast line, and that the St. Paul's line to Omaha was double-tracked for the express purpose of the Union Pacific interchange business. Such a combination, he said, would do away with the problem of what to do with the third north coast line and that if the Hill combination were left intact, there would be two systems to the north coast.

Mr. Byram pointed out that the St. Paul has contact with the Union Pacific at Omaha, Kansas City, Butte, Spokane and Seattle. Such a combination would not make an excessive mileage, he said, about 20,000 miles. He thought there would be advantages to the Union Pacific in being linked with the St. Paul, provided the commission is going to require the Union Pacific to have an eastern connection. He said undoubtedly if the commission were not going to require the Union Pacific to have an eastern connection, it would prefer to remain as it is, because it has the advantage of many roads gathering at Omaha.

Mr. Byram said the two roads already use the same facilities at Spokane, Seattle and Omaha.

Professor Ripley said Mr. Byram had made a very interesting suggestion but asked what he would do with the North Western. The witness said that if the Great Northern and the Northern Pacific were separated the North Western might be combined with one of those lines.

Steel Roads Oppose Merger

W. A. McGonagle, president of the Duluth, Missabe & Northern, testified on November 21 in opposition to the inclusion of that road and of the Duluth & Iron Range, which are controlled by the United States Steel Corporation, in the system with the Great Northern and St. Paul. The objections were based, he said, upon the history, character and location of the roads, the kind of service rendered by them, their unique position among the carriers of the country, their competitive relation to the Great Northern, and the fact that they would add neither financial strength nor increased facilities to any other system. From their inception, he said, the railroads have been purely ore-carrying roads and have formed the inseparable part in a mining venture of the Vermilion and the Messaba iron ranges.

Light Weight Gasoline Car for Heavy Grade Line

THE HETCH-HETCHY RAILROAD is a 68-mile line built by the City of San Francisco to transport material for the Hetch-Hetchy water supply project. The road passes through a rugged and sparsely settled country and is built with maximum grades of four per cent. The character of the traffic is well suited for motor car operation and this type of equipment has been used for several years.

A gasoline-driven passenger car, which is of special interest because of the unique features included in the design, has recently been delivered to the Hetch-Hetchy Railroad. The most striking feature of the construction is the location of the gasoline engine, which is placed at the rear of the body behind the driving wheels. The motor is suspended on coil springs directly over the rear axle on one end of a sub-frame to the main frame. The sub-frame forms one-half of a complete truck and has a swivel bolster built in the main frame so that it will turn at curves, thus reducing flange wear and relieving side thrust.

This unique construction has numerous advantages. Since there are no revolving parts in front of the rear axle, a very low-hung body can be used. A considerable increase in seating capacity is also obtained without lengthening the wheel base of the car. Vibration is minimized and motor noises, smoke, or gasoline odors are kept away from the car body.

The car seats 30 passengers weighs but 10,400 lb. complete and makes 8 miles per gallon of gasoline. It is stated that it makes the 12-mile 3.4 per cent grade on the Hetch-Hetchy at a speed of 27 miles per hour. This car is probably the lightest in proportion to its seating capacity that has yet been built, weighing only 347 lb. per passenger. It was built by the A. Meister Sons Co., Sacramento, Cal.

The Location of the Engine at the Rear of the Body Is a Distinctive Feature of This Car

A Sixty-Car Coal Train on the Pittsburg & Shawmut

Each Car Loaded to Capacity—Gross Weight of Train 1,710 Tons, Pulled by Two Mikados, Each Having a Weight of 180,000 lbs. on Drivers

A Multiple Unit Train on the New York Westchester & Boston

Some Service Records of Electric Equipment

A List of Unusual Things Accomplished by Railroads with Electric Motive Power

By Homer K. Smith
Railway Engineer, Westinghouse Electric & Manufacturing Company

The Long Island was the first steam railroad in the United States to substitute electric for steam power on a large scale, the change being made on this road in 1905. Multiple unit cars with two 600-volt d.c. motors and a third-rail contact system were adopted. Since electrification this road's passenger traffic has increased nearly 400 per cent. The freight traffic has increased nearly 200 per cent, and the earnings have increased approximately 200 per cent. There are 220 miles of electrified track and over 700 cars, of which approximately 80 per cent are motor cars, now in operation. The annual passenger traffic is over 600,000,000 passenger miles. Some idea of the dependability of these large motor cars is shown by the fact that during certain hours the schedules call for over 95 per cent of the equipment.

New York, New Haven & Hartford

The New York, New Haven & Hartford, with approximately 550 miles of electrified track, has more connected electrified trackage than any other system in the world. In 1918 the passenger traffic density on this road was second only to that of the Long Island. Single phase electric locomotives are used for the through fast passenger and some of the local passenger service, for the fast freight service and for switching service. Multiple unit cars are used for some of the local passenger service.

In 1921 the electric passenger locomotive averaged 33,000 miles per locomotive failure and the average detention per failure was 18 minutes. The mileage per locomotive was nearly 69,000. During the same year, with a comparatively light freight traffic, the freight locomotive mileage per locomotive failure was approximately 22,500. These locomotives frequently made two round trips between the Harlem river and New Haven in 24 hours. This represents a mileage of 272. Under steam operation in this section the daily locomotive mileage was from 100 to 120.

The New Haven has in operation 16 electric switching locomotives. For a period of seven years—1915 to 1921 inclusive—these locomotives were in actual service over 70 per cent of the total time and during 1916 they were in actual service over 77 per cent of the time. These locomotives are operated 24 hours per day and they consistently make 140 miles a day (based on 6 miles an hour). It is a matter of record that the use of these electric locomotives has resulted in a coal saving of 65 per cent of that required for steam operation of this service and they have replaced steam locomotives in the ratio of 2 to 1.

A striking illustration of the adaptability, flexibility and reliability of the New Haven electrification for meeting heavy traffic emergences was demonstrated on November 20, 1920, this being the occasion of the annual Yale-Harvard football game. From 8:00 a.m. until 11:00 a.m. 44 special trains were dispatched from New York to New Haven in addition to the regular trains. During this period trains were dispatched from the Grand Central Terminal at intervals of 10 minutes. The same day 45 extra trains were operated in the opposite direction. The 89 extra trains carried approximately 70,000 passengers, and all of these trains departed and arrived practically on schedule.

Pennsylvania, New York Terminal

In 1910 the Pennsylvania Railroad placed in service on its electrified extension into the New York terminal 31, 600-volt third rail locomotives. These handle all of the main line passenger traffic into and out of New York terminal, and from November, 1910, to 1918 they made a total of 9,508,765 miles with a total of 121 engine failures, or an average of 78,600 miles per detention on account of locomotive trouble. During one year there was a total train delay due to failure of motive power of only 55 minutes. These locomotives are now averaging about 4,500 miles per month and their maintenance is extremely low.

Norfolk & Western

The Norfolk & Western electrification represents the most severe requirements that electrification has yet been called

upon to perform. This road was the first to substitute electric for Mallet locomotives for mountain grade service when its electrification extending from Bluefield to Vivian, a route distance of 30 miles, was put into operation in 1914. The electrification zone has since been extended west approximately eight miles to Farm. This line is double tracked throughout except for the 3,000 ft. Elkhorn tunnel. There is a considerable mileage of third track, side and yard tracks and various branch or spur tracks to numerous coal mines along this section.

With steam operation, trains of approximately 3,250 tons were hauled up the Elkhorn grade with three most modern Mallet locomotives at a speed of seven miles an hour. Two 300-ton electric locomotives haul the same trains on this grade at a speed of 14 miles an hour. Twelve electric locomotives were purchased to replace 24 Mallets but by the time electric operation was started traffic had increased so that 33 Mallets would have been required. Since electrification was inaugurated the volume of traffic has increased enormously but the twelve original electric locomotives handle the service.

In a service where the average main line haul is short and where there is considerable coal mine setting out and gathering service, as well as pusher service, these electric locomotives consistently do more than 100 miles per day. During the year 1920 they made an average mileage of 37,820. Because of there being so much switching service, the actual mileage was undoubtedly more than shown by the above record. The steam locomotives formerly used in this service averaged approximately 60 miles per day.

The increased train speed and reduction in road delays obtained with the electric locomotives has, of course, greatly increased the track capacity. It has been stated by Norfolk & Western officials that this electrification has at least doubled the track capacity—as compared to steam operation.

A recent notable achievement on this electrification was the handling of 90,000 tons of freight eastbound over the Elkhorn grade, and through the single track tunnel at the summit of this grade, in a single day.

New York, Westchester & Boston

An example of the successful application of heavy alternating current motor cars to dense traffic in exacting suburban service is that of the New York, Westchester & Boston; local and express service from the Harlem river station of the New York, New Haven & Hartford trains make a schedule of 22 miles per hour with a stop every mile. The express train schedule speed is 37 miles an hour with an average distance of 2½ miles between stops.

These equipments have proven their reliability in all kinds of weather. During the heavy snow storms of 1919-20, when the service on many steam roads was seriously demoralized, the operation of the suburban service on this road was 100 per cent perfect. In 1919 the average mileage per car was over 42,000 and the average car mileage per minute of delay was over 2,700.

Pennsylvania, Philadelphia Suburban Service

The Pennsylvania suburban service from the Broad street terminal in Philadelphia to Paoli and Chestnut Hill represents what is undoubtedly the most severe, congested traffic problem in modern railroading. The Broad Street terminal is of the stub-end type. There are 16 tracks in the train shed, but at the interlocking tower controlling the entrance to this terminal, there are only six tracks.

In 1915 this terminal had reached the limit of its capacity of 160 trains per day with steam operation. The physical conditions were such that it was almost impossible to enlarge the terminal, and to increase its capacity electric operation of much of the suburban service with multiple unit cars was inaugurated. All cars are equipped with two alternating current motors on one truck and trains are made up of from three to eight cars. The time required to bring a motor car train into the station and get it out again—including unloading and loading—is approximately one-third of the time required with steam operation. The track movements per train turn-around have been reduced from six to two.

Through the six-track bottle neck at the interlocking tower, approximately 600 trains per day are now operated. Between 5:00 p. m. and 6:00 p. m. 50 trains pass this tower and during one 17-minute period of this hour there is a train movement every minute. This terminal had a capacity of only 160 trains per day with steam motive power.

With electric operation the running time from Broad Street to Paoli—20 miles—has been reduced 10 minutes. With steam operation 82 per cent of the suburban trains were on time while with electric operation the corresponding figure is 94 per cent. During the year 1919 a total of over 2,883,000 car miles were operated with an average of over 48,000 car miles per detention. During one month of this year a total of 252,200 car miles were operated with five detentions, totaling 14 minutes.

Chicago, Milwaukee & St. Paul

The Chicago, Milwaukee & St. Paul electrification is the only example of an extensive single track electrification of a transcontinental railroad. The original installation covered 440 miles from Harlowton, Montana, to Avery, Idaho. On this section the Big Belt, Rocky and Bitter Root mountain ranges are crossed. With steam operation there were four engine districts on this section. The second installation extends from Othello to Seattle, Washington—a distance of 220 miles—and this section crosses the Cascade mountains. Passenger service is handled by the most powerful passenger locomotives in the world, and these locomotives are making mileage far in excess of any previous records. They have ample capacity to haul a 13-car all-steel train over the entire electrified zone without helper.

Soon after these locomotives were placed in service it was decided to run them through the entire 440 miles without turning in at Deer Lodge shops—near the middle of the electrification zone—for a general inspection as had been the previous practice. This was a radical step but the results obtained have justified this plan of operation. The locomotives are given a light inspection at the end of the 440-mile run and are sent to the main shops at Deer Lodge for a general inspection on a mileage basis of from 3,000 to 5,000. Two men at each terminus of electrification—Avery and Harlowton—take care of the light inspection of the equipment.

Individual locomotives in this service have made as much as 12,000 miles in one month. They have made the through run of 440 miles per day for 12 consecutive days during the most severe winter months. On the occasion of schedule derangement on the steam-operated sections of the road, these electric locomotives have been kept in continuous road service as much as 30 hours and have made over 750 miles in a 24-hour period.

The substitution of electric for steam motive power on the Chicago, Milwaukee & St. Paul has made it feasible to greatly simplify the operating organization. The 440-mile section is now in charge of one superintendent with two sets of train dispatchers, whereas with steam operation there were two division superintendents and four sets of dispatchers. Eliminating intermediate engine terminals has, of course, simplified the mechanical department organization also.

There are many other noteworthy railroad electrifications. Those mentioned, however, represent all classes of heavy traction service which electrification will be called upon to perform.

General News Department

The name of the Bureau of Service, National Park and Resorts, maintained by the Chicago & North Western and Union Pacific, will be changed to Department of Tours, effective January 1. This was the name of that department prior to the railroad administration.

A bill was introduced in Congress at the opening of the new session on November 20 by Representative Zihlman authorizing the Interstate Commerce Commission to order priorities in car service and embargoes and to take other necessary steps to secure equitable distribution of building materials.

The American Association of Ticket Agents held its fourth annual convention at Savannah, Ga., beginning on November 13. The attendance numbered about 600. The address of welcome was given by Col. A. R. Lawton, vice-president of the Central of Georgia, and the principal addresses were by Charles A. Cairns, passenger traffic manager of the Chicago & North Western, and Frank W. Connor, passenger traffic manager of the Central Region of the Pennsylvania.

Supreme Court to Review Pennsylvania-Labor Board Case

The United States Supreme Court on November 20 granted a writ of certiorari on the application of the Pennsylvania Railroad providing for a review of the decision of the court of appeals in the controversy as to the authority of the Railroad Labor Board to issue orders governing the method of employee representation on committees formed for the purpose of conferring with the management on questions pertaining to rules and working conditions.

A Break in the Ranks of the "Big Four"

The open break in the ranks of the "Big Four" brotherhood, which has been brewing for some time, is more or less confirmed by recent circulars issued by Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers, appealing to his members to assist T. C. Cashen, president of the Switchmen's Union of North America, in inducing switchmen who are now members of the Brotherhood of Railway Trainmen, headed by W. G. Lee, to leave that organization and enter Mr. Cashen's union. Reports from Cleveland, the headquarters of the majority of the train service brotherhoods, indicate that the Brotherhood of Locomotive Firemen and Enginemen, headed by D. B. Robertson, will be aligned with Mr. Stone, while L. E. Shepard, President of the Order of Railway Conductors, will side with Mr. Lee as he has in previous disagreements among the "Big Four."

D. T. & I. Proposes Employees' Investment Plan

The Detroit, Toledo & Ironton, Henry Ford's railroad, has filed an application with the Interstate Commerce Commission for authority to issue to its employees investment certificates of indebtedness to an amount not exceeding $1,000,000. The certificates are to be issued in denominations of $1,000, $500 and $100 and to be delivered to employees of the railroad for deposits in cash which will be received by ticket agents or other agents of the company. These certificates will bear no definite rate of interest, but a rate will be paid upon them to be determined annually by the board of directors to be derived from a fund set aside from the net earnings of the company after the reserve for the government has been set aside (in case the company has earnings in excess of 6 per cent, as provided in the transportation act), such fund not to exceed 25 per cent of the final net earnings computed semi-annually. It is stated that all expenses in connection with the maintenance of the plan will be paid from the fund and will not be charged against the operations of the railroad. The railroad may use any part or all of the sums so invested by the employees for additions and betterments or for any other expenses in connection with the operation of the railroad or the funds may be invested outside of the railroad.

E. J. Liebold, vice-president of the company, says that his experience indicates that about 50 per cent of the employees will make investments in this way to the amount of 5 per cent of the annual pay roll, and the company has 2,225 employees, earning approximately $185 a month. It is stated that the certificates are to be issued "in order to promulgate a feeling of participation in the earnings of the company, that the employees will gain a spirit of interest in the well-being of the company . . . . . which will result in a more efficient and loyal service. . . . . ." The uses to which the funds deposited with the company by the employees are to be put are to be determined by the board of directors.

Railway Business Association Appointments

Alba B. Johnson, who was re-elected president of the Railway Business Association on November 9, has announced the acceptance of appointment by four new executive members. They are B. L. Winchell, president of the Remington Typewriter Co., who during federal control was Southern regional director; Alexander Brown, president of the Brown Hoisting Machinery Company, and president in 1921 of the Cleveland Chamber of Commerce; E. M. Zehnder, president of the Scranton Bolt & Nut Company, and F. N. Bard, president of the Barco Manufacturing Company, Chicago, chairman for several years of the association's committee on consolidation of exhibits.

W. W. Salmon and W. W. Willets, retiring vice-presidents, have been appointed executive members. Reappointed upon expiration of their three-year terms are J. C. Bradley, Buffalo; S. P. Bush, Columbus; R. P. Lamont, Chicago; Frank J. Lanahan, Pittsburgh; A. H. Mulliken, Chicago, and H. H. Westinghouse, New York.

Four executive members were elected vice-presidents at the annual meeting: J. G. Platt, Boston; F. A. Poor, Chicago; William E. Sharp, Chicago, and S. L. Smith, Cleveland.

The president, seven vice-presidents and 27 executive members constitute the general executive committee.

The treasurer, P. Harvey Middleton, was re-elected and he is also assistant to the secretary, Frank W. Noxon.

Pacific Railway Club Admits Supplymen to Membership

The Pacific Railway Club, the only railway club in the country that has not admitted supplymen to membership, amended its constitution at its November meeting and supplymen will hereafter be admitted to associate membership upon the same basis as they are admitted to other clubs. Supplymen will pay the same dues as other members, $3 a year, but may not vote or hold office. There is no initiation fee.

Heretofore the club has only admitted to membership men actually employed by railroads, those in the service of railroad regulatory bodies, and faculty members of universities. It has an active membership of nearly 400.

The section added to the club's constitution under which supplymen will be admitted reads: An associate member shall be a person not eligible for active membership but who is actively engaged in some occupation where he co-operates with men in railroad service for the advancement of the science of railroading and the best interests of the railroad profession. Manufacturers and dealers in railway equipment, material, and supplies, their salesmen and representatives, are eligible to membership under this section.

William S. Wollner of the Northwestern Pacific is the club's secretary, his address being 64 Pine street, San Francisco, Cal.

Operating Statistics of Large Steam Roads—Selected Items for the Month of September, 1922,

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross. Excluding locomotive and tender	Ton-miles (thousands): Net. Revenue and non-revenue	Average number of locomotives on line daily: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:												
Boston & Albany 1922	394	255,448	270,172	27,154	5,063	76.0	242,765	100,655	106	35	24.9	...
1921	394	222,944	243,619	31,104	4,355	68.8	217,599	87,374	123	28	18.8	...
Boston & Maine 1922	2,455	551,437	618,187	59,338	12,751	76.0	609,236	255,461	308	139	31.1	22
1921	2,469	509,592	568,885	48,773	11,634	73.0	570,463	235,666	336	123	26.8	42
N. Y., N. H. & Hartford 1922	1,959	427,879	467,476	28,808	11,691	76.7	554,800	244,331	244	98	28.6	4
1921	1,960	409,359	444,155	29,366	10,322	71.4	507,400	215,823	307	75	19.6	44
Great Lakes Region:												
Delaware & Hudson 1922	887	301,828	402,487	37,910	8,583	74.6	505,888	265,873	251	60	19.1	101
1921	880	316,197	415,561	31,014	8,213	64.3	525,997	261,416	275	39	12.3	121
Del., Lack. & Western 1922	994	426,794	528,385	108,658	13,891	73.6	710,837	315,844	266	100	27.4	10
1921	995	508,856	629,732	119,170	15,688	68.7	854,488	393,090	298	56	15.8	45
Erie (inc. Chic. & Erie) 1922	2,309	751,106	835,068	62,275	27,040	74.2	1,474,504	675,835	430	316	42.3	8
1921	2,259	1,019,253	1,156,496	65,233	33,911	66.1	2,001,461	889,240	560	178	24.1	35
Lehigh Valley 1922	1,317	481,745	534,225	65,030	13,376	72.1	745,915	357,597	347	207	37.3	52
1921	1,316	582,490	640,254	61,403	16,635	63.9	1,009,738	471,334	423	120	22.0	121
Michigan Central 1922	1,827	516,249	521,551	23,744	18,016	73.5	881,658	361,923	293	106	26.6	42
1921	1,829	444,683	452,525	17,742	13,846	66.9	729,114	285,753	327	86	20.8	106
New York Central 1922	5,675	1,785,640	2,018,655	168,491	69,603	73.2	3,841,005	1,772,354	883	694	44.0	16
1921	5,655	1,679,163	1,860,340	134,651	60,063	65.1	3,406,024	1,461,923	1,015	605	37.4	233
N. Y., Chic. & St. L. 1922	1,225	492,753	498,019	2,583	14,034	77.1	684,594	293,632	151	70	31.6	19
1921	1,225	432,236	435,048	1,589	12,382	68.4	636,340	256,534	180	59	24.6	49
Pere Marquette 1922	2,182	311,024	315,988	6,122	8,434	75.8	425,611	198,714	146	62	29.7	1
1921	2,196	350,212	360,485	6,652	8,788	67.8	488,415	220,577	162	42	20.5	12
Pitts. & Lake Erie 1922	228	149,040	153,857	833	5,388	67.9	382,014	228,802	55	24	30.3	...
1921	228	74,487	78,523	1,066	2,547	64.6	176,853	101,283	54	32	37.1	13
Wabash 1922	2,418	477,577	495,118	5,506	15,184	79.5	754,952	353,656	248	97	28.0	5
1921	2,418	574,617	604,735	8,797	16,307	71.0	855,519	370,177	280	67	19.4	44
Ohio-Indiana-Allegheny Region:												
Baltimore & Ohio 1922	5,235	1,248,156	1,426,124	98,790	32,152	66.9	2,033,459	1,068,357	784	551	41.3	2
1921	5,185	1,610,416	1,728,245	131,716	41,319	64.2	2,597,692	1,287,832	1,023	368	26.5	222
Central R. R. of N. J. 1922	692	267,840	294,658	35,881	6,110	67.4	363,715	180,030	205	54	20.9	15
1921	679	272,477	303,625	39,842	6,142	61.0	389,338	195,970	204	56	21.6	14
Chicago & Eastern Ill. 1922	945	218,373	225,605	4,850	5,681	75.5	321,922	175,062	86	73	46.1	11
1921	1,131	234,017	237,042	3,721	5,643	62.3	346,012	173,044	125	48	27.8	42
Clev., Cin., Chic. & St. L. 1922	2,378	590,328	614,666	7,299	20,151	71.0	1,158,607	575,268	227	226	49.9	...
1921	2,382	628,210	651,146	3,000	17,513	60.2	1,076,625	514,993	302	143	32.2	33
Elgin, Joliet & Eastern 1922	459	94,435	97,324	1,157	2,487	62.1	218,604	119,627	86	20	19.0	21
1921	456	89,389	97,057	5,044	2,737	65.7	203,086	109,370	99	9	8.2	40
Long Island 1922	394	42,702	44,617	6,340	559	62.7	31,717	12,272	35	11	23.9	...
1921	395	43,726	48,480	8,211	553	60.0	31,387	12,299	36	11	23.6	1
Pennsylvania System 1922	10,903	4,884,720	5,360,353	407,107	143,354	71.8	8,756,113	4,530,122	2,478	896	26.5	42
1921	10,877	3,898,149	4,230,611	306,502	102,248	64.6	6,790,417	3,405,133	2,628	851	24.5	691
Philadelphia & Reading 1922	1,119	558,848	625,681	73,554	13,785	69.5	882,157	478,836	382	77	16.7	152
1921	1,120	513,295	574,749	66,531	12,837	63.8	848,505	442,946	374	79	17.5	163
Pocahontas Region:												
Chesapeake & Ohio 1922	2,551	542,530	608,565	13,422	16,698	64.6	1,216,301	684,428	337	199	37.2	19
1921	2,548	633,978	697,906	20,164	17,846	57.3	1,396,955	745,595	458	105	18.7	124
Norfolk & Western 1922	2,228	746,718	913,043	38,711	10,875	63.9	1,523,510	844,259	528	197	27.2	78
1921	2,222	663,538	817,266	27,787	18,249	59.7	1,368,066	739,914	618	92	13.0	203
Southern Region:												
Atlantic Coast Line 1922	4,926	615,431	618,792	9,843	15,245	75.7	734,999	325,388	321	109	25.3	21
1921	4,886	475,893	480,905	6,127	10,521	68.3	525,020	212,006	297	123	29.1	72
Central of Georgia 1922	1,907	268,037	269,802	3,911	5,588	77.9	281,900	133,620	117	16	12.3	...
1921	1,899	204,668	205,531	2,304	4,547	73.7	220,072	98,136	115	20	14.5	25
I. Cent. (inc. Y. & M. V.) 1922	6,135	2,015,151	2,038,932	50,922	59,470	71.0	3,498,863	1,690,775	752	92	10.9	6
1921	6,151	1,520,231	1,527,024	31,219	41,849	65.8	2,544,299	1,156,839	717	94	11.6	11
Louisville & Nashville 1922	5,021	1,344,251	1,437,903	57,241	24,131	69.5	1,429,453	710,026	597	97	14.0	...
1921	5,020	1,466,213	1,571,063	55,472	25,895	61.1	1,678,923	800,196	558	96	14.6	37
Seaboard Air Line 1922	3,537	445,153	450,144	12,593	9,957	78.7	483,137	218,874	161	114	41.5	...
1921	3,537	360,279	371,693	7,211	7,796	75.3	376,768	161,069	170	91	34.9	4
Southern Ry. 1922	6,942	1,148,202	1,176,649	38,774	24,586	79.2	1,202,578	556,925	742	300	28.8	1
1921	6,942	1,165,697	1,186,721	27,886	25,969	71.1	1,315,603	560,426	897	229	20.3	64
Northwestern Region:												
Chic. & N. Wn. 1922	8,427	1,471,210	1,536,309	19,959	34,107	69.7	1,925,185	866,089	656	376	36.4	2
1921	8,342	1,606,528	1,658,635	24,916	34,360	62.1	2,005,483	820,553	790	181	26.2	28
Chic., Milwaukee & St. P. 1922	11,027	1,712,124	1,755,125	75,159	44,269	71.5	2,411,565	1,169,680	761	301	28.3	49
1921	10,992	1,605,995	1,649,635	63,233	38,629	62.5	2,212,998	982,685	860	213	19.8	132
Chic., St. P., Minneap. & Om. 1922	1,726	330,863	351,208	15,253	6,418	77.5	328,652	150,963	142	73	33.8	11
1921	1,726	325,402	341,803	14,208	6,373	72.3	334,575	146,995	151	61	28.9	18
Great Northern 1922	8,255	1,101,143	1,130,306	44,051	32,542	65.0	1,990,164	990,188	548	205	27.2	33
1921	8,163	936,678	960,266	31,793	26,134	63.4	1,577,562	745,549	590	198	25.1	166
M., St. P. & S. Ste. M. 1922	4,355	687,347	695,352	12,796	16,592	73.3	841,854	415,910	346	58	14.3	2
1921	4,359	495,685	527,098	8,101	11,298	69.0	589,968	267,936	345	59	14.5	16
Northern Pacific 1922	6,388	981,958	1,024,108	50,007	27,334	72.4	1,525,124	740,603	577	147	20.3	69
1921	6,408	908,277	954,811	60,223	25,395	64.2	1,590,234	657,601	567	160	22.0	82
Oreg.-Wash. R. R. & Nav. 1922	2,143	246,585	274,293	33,839	6,088	73.4	348,732	173,823	134	38	22.3	4
1921	2,205	238,900	265,017	34,203	5,754	70.2	347,282	172,763	126	31	19.9	..
Central Western Region:												
Atch., Top. & S. Fe 1922	9,798	2,036,387	2,170,934	141,557	59,278	69.4	3,238,314	1,187,366	754	210	21.8	29
1921	9,762	1,739,403	1,858,809	94,273	47,213	63.2	2,740,450	979,648	762	210	21.6	82
Chicago & Alton[1] 1922	1,010	220,288	222,879	6,173	5,157	71.3	297,535	107,712	76	67	46.8	3
1921	1,010	359,557	366,791	5,208	7,864	62.5	170,827	104,249	133	35	20.9	17
Chic., Burl. & Quincy 1922	9,326	1,726,775	1,795,863	91,135	49,797	68.6	2,906,506	1,432,776	733	254	25.7	6
1921	9,326	1,573,667	1,653,347	77,736	41,334	63.6	2,482,580	1,180,249	677	266	28.2	73
Chic., Rock I. & Pac. 1922	7,662	1,702,166	1,817,794	17,274	29,020	75.7	1,473,098	677,473	527	211	28.5	28
1921	7,661	1,432,117	1,463,060	12,960	30,835	68.8	1,717,448	792,187	306	165	21.7	19
Denver & R. G. Wn. 1922	2,593	[illegible]	376,137	70,276	6,756	66.0	404,986	187,171	220	105	32.3	4
1921	2,593	307,679	381,563	70,177	6,655	63.9	397,848	175,957	39	65	21.4	0
Oreg. Short Line 1922	2,365	453,782	472,360	31,191	9,780	64.8	607,311	276,171	175	64	26.7	17
1921	2,359	433,907	445,705	24,959	10,196	61.0	653,071	284,372	167	44	20.9	29
Southern Pacific 1922	6,982	1,281,217	1,443,525	254,237	36,009	68.0	2,022,665	823,626	622	205	24.8	8
1921	6,975	1,156,802	1,307,818	237,028	32,514	68.5	1,840,508	759,045	582	186	24.2	18
Union Pacific 1922	3,707	1,332,677	1,347,032	93,474	38,554	70.1	2,073,295	819,095	420	128	23.3	59
1921	3,615	1,383,661	1,397,535	65,153	39,092	63.0	2,283,759	849,077	416	116	21.8	26
Southwestern Region:												
Gulf, Colo. & Santa Fe 1922	1,895	233,575	238,297	5,133	6,234	71.8	333,230	149,829	109	41	27.5	7
1921	1,895	286,141	293,624	7,346	6,862	66.2	407,707	192,445	133	36	21.1	16
Mo., Kans. & Tex. 1922	1,658	275,759	276,230	6,449	7,786	67.7	423,217	181,938	103	89	46.4	22
1921	1,709	253,129	253,290	6,675	6,735	61.0	380,756	152,656	138	42	23.4	49
Mo., Kans. & Tex. of Tex. 1922	1,738	200,932	206,667	3,452	4,103	71.9	211,336	92,633	77	67	46.7	9
1921	1,740	232,611	237,715	2,660	4,448	62.3	259,758	109,050	94	41	30.2	16
Missouri Pacific 1922	7,112	962,390	971,409	36,397	22,531	71.8	1,240,225	569,105	376	225	37.5	...
1921	7,261	1,187,097	1,197,006	34,856	28,251	67.8	1,595,140	712,336	408	153	27.3	1
St. Louis-San Francisco 1922	4,683	685,098	691,210	14,089	11,753	70.1	643,250	292,552	290	155	34.8	...
1921	4,683	750,131	761,038	10,807	13,667	67.1	767,701	337,413	344	97	22.0	26
Southern Pacific Lines in Texas and La.)[1] 1922	3,710	599,578	604,076	4,612	12,895	67.3	739,107	330,470	181	106	36.5	3
1921	3,647	514,537	516,863	4,143	10,319	63.8	628,257	268,110	172	116	40.3	4
Texas & Pacific 1922	1,953	234,984	234,984	4,792	5,995	70.3	317,097	131,965	91	105	53.4	8
1921	1,953	239,324	239,324	1,147	5,653	68.3	296,449	115,842	121	71	36.9	28

[1] No passenger train service.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

Compared with September, 1921, for Roads with Annual Operating Revenues above $25,000,000

Region, road and year	Average number of freight cars on line daily: Home	Foreign	Total	Per cent unserviceable	Stored	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car-miles per car-day	Net ton miles per mile of road per day	Pounds of coal per 1,000 gross ton miles, including locomotive and tender	Passenger service: Train miles	Passenger-train car-miles
New England Region														
Boston & Albany	1922 2,141	6,055	8,198	4.8	....	950	394	19.9	409	27.1	8,517	219	3[illegible],992	2,409,502
	1921 3,187	4,[illegible]	7,295	7.9	....	976	392	20.1	400	28.9	7,393	206	382,876	2,092,453
Boston & Maine	1922 14,[illegible]	17,491	31,[illegible]	16.4	356	1,195	463	20.0	266	17.5	3,468	157	87,[illegible]46	5,003,979
	1921 17,649	13,[illegible]82	31,031	20.9	1,744	1,119	462	20.3	253	17.1	3,136	144	990,[illegible]35	5,134,820
N. Y., N. H. & Hartf	1922 20,851	21,[illegible]15	43,[illegible]66	21.9	668	1,297	571	20.9	185	11.5	4,15[illegible]	156	1,061,975	6,960,659
	1921 24,401	14,241	38,642	25.9	1,480	1,239	527	20.9	186	12.5	3,671	156	1,08[illegible],745	7,197,994
Great Lakes Region														
Delaware & Hudson	1922 10,732	7,176	17,908	7.3	2,698	1,676	881	31.0	495	21.4	9,992	200	199,009	1,150,103
	1921 10,521	5,239	15,760	13.5	324	1,664	887	31.8	553	27.0	9,898	182	197,626	1,103,353
Del., Lack. & Western	1922 12,718	12,[illegible]09	25,[illegible]27	7.7	92	1,666	740	29.7	421	25.1	10,591	211	4[illegible],628	3,529,466
	1921 17,459	8,362	25,821	15.7	....	1,679	772	28.1	507	29.5	13,174	164	501,387	3,791,663
Erie (inc. Chic. & Erie)	1922 27,331	31,841	59,[illegible]73	13.7	7,057	1,963	900	25.0	382	20.6	9,755	149	1,[illegible]15	8,502,177
	1921 37,013	16,591	53,[illegible]64	21.4	4,484	1,694	872	26.2	553	31.9	13,123	137	679,477	5,093,716
Lehigh Valley	1922 27,065	16,462	43,[illegible]27	9.3	894	1,548	742	26.7	274	14.2	9,052	203	249,547	2,706,813
	1921 30,669	8,666	39,355	15.1	1,918	1,733	809	28.3	399	22.0	11,936	155	354,474	2,804,360
Michigan Central	1922 9,735	19,865	29,600	12.3	....	1,708	701	20.1	408	27.6	6,605	117	564,828	5,266,167
	1921 18,772	14,[illegible]60	33,041	22.4	165	1,640	643	20.6	288	20.9	5,207	118	589,613	5,694,157
New York Central	1922 56,740	70,942	127,682	11.4	889	2,151	993	25.5	463	25.2	10,410	129	2,398,204	20,087,491
	1921 88,974	49,286	130,260	20.3	6,283	2,028	871	24.3	374	23.6	8,617	116	2,405,706	20,556,392
N. Y., Chic. & St. L.	1922 3,432	10,274	13,706	15.3	....	1,389	596	20.9	714	44.3	7,987	122	148,437	217,566
	1921 6,[illegible]9	7,861	14,852	20.5	571	1,472	594	20.7	576	40.6	6,978	113	149,681	256,639
Pere Marquette	1922 7,[illegible]	15,497	22,887	13.4	....	1,368	639	23.6	289	16.2	3,036	132	225,682	1,385,471
	1921 11,087	12,[illegible]	23,138	18.2	200	1,395	630	25.1	318	18.7	3,348	134	319,448	1,659,013
Pitts & Lake Erie	1922 13,46[illegible]	10,[illegible]77	24,346	36.6	250	2,563	1,535	42.5	313	10.9	33,462	75	111,764	586,367
	1921 19,5[illegible]	7,866	27,387	38.6	1,199	2,374	1,360	39.8	123	4.8	14,813	85	100,842	551,679
Wabash	1922 8,338	14,740	23,078	9.8	....	1,581	741	23.3	511	27.6	4,876	144	364,233	2,401,921
	1921 12,[illegible]21	11,348	23,569	11.5	618	1,489	644	22.7	524	32.5	5,104	148	512,784	2,841,856
Ohio-Indiana Allegheny Region														
Baltimore & Ohio	1922 56,0[illegible]	47,638	103,658	14.0	771	1,629	856	33.2	344	15.4	6,803	210	1,176,272	7,647,797
	1921 67,6[illegible]	31,097	99,792	11.7	3,471	1,613	800	31.2	430	21.5	8,280	176	1,382,663	8,971,358
Central R. R. of N. J.	1922 15,[illegible]88	11,408	26,596	6.1	4,941	1,358	672	29.5	226	11.4	8,676	190	374,408	1,839,241
	1921 19,[illegible]47	8,075	27,502	18.3	4,198	1,429	719	31.9	238	12.2	9,627	164	362,925	1,822,833
Chicago & Eastern Ill.	1922 10,16[illegible]	5,236	15,398	19.6	....	1,474	802	30.8	379	16.3	6,174	170	181,451	1,263,076
	1921 13,851	3,955	17,806	13.7	1,200	1,479	739	30.7	324	16.9	5,100	153	216,957	1,450,218
Clev., Cin., Chic. & St. L.	1922 11,469	26,405	37,874	13.5	313	1,963	974	28.5	506	25.0	8,064	130	632,196	3,927,291
	1921 16,279	16,601	32,880	12.4	262	1,714	829	29.4	522	29.5	7,206	128	683,622	4,278,836
Elgin, Joliet & Ea.	1922 8,940	5,505	14,445	17.8	....	2,315	1,267	48.1	276	9.2	8,685	83	(1)	(1)
	1921 10,398	2,951	13,349	7.7	938	2,272	1,224	40.0	273	10.4	7,989	114	(1)	(1)
Long Island	1922 1,961	3,488	3,449	4.8	....	743	287	22.0	75	5.5	1,038	318	220,062	1,368,668
	1921 1,997	3,576	5,573	4.5	166	718	281	22.2	74	5.5	1,039	315	222,991	1,341,050
Pennsylvania System	1922 164,435	134,724	299,159	11.4	3,581	1,793	927	31.6	505	22.3	13,850	148	5,133,858	35,585,787
	1921 215,613	69,040	284,653	15.4	50,417	1,742	874	33.3	399	18.5	10,435	135	5,144,772	34,715,229
Philadelphia & Reading	1922 15,609	15,347	30,956	5.0	743	1,579	857	34.7	516	21.4	14,269	182	499,571	2,368,125
	1921 26,228	11,387	37,615	5.8	7,273	1,653	863	34.5	393	17.8	13,188	179	490,351	2,249,731
Pocahontas Region														
Chesapeake & Ohio	1922 30,157	19,681	49,841	13.8	....	2,242	1,262	41.0	458	17.3	8,944	130	431,458	2,383,533
	1921 39,774	10,549	50,323	10.3	800	2,204	1,176	41.8	494	20.6	9,753	125	436,313	2,503,426
Norfolk & Western	1922 26,135	14,769	40,904	6.1	....	2,040	1,131	42.5	688	25.3	12,632	190	384,390	2,446,078
	1921 33,616	5,784	39,400	9.5	3,850	2,062	1,115	40.5	626	25.9	11,102	163	399,796	2,634,346
Southern Region														
Atlantic Coast Line	1922 11,819	12,301	24,120	17.3	....	1,194	529	21.3	450	27.8	2,202	124	675,565	4,002,959
	1921 21,671	6,400	28,071	23.6	....	1,104	445	20.2	252	18.3	1,446	132	672,594	3,989,392
Central of Georgia	1922 1,710	5,184	6,894	12.1	....	1,052	499	23.9	646	34.7	2,336	170	317,334	1,531,533
	1921 4,369	3,167	7,536	14.3	....	1,075	479	21.6	434	27.3	1,714	151	303,987	1,447,230
I. Cent. (inc. Y. & M. V.)	1922 26,177	38,009	64,186	7.5	1,187	1,736	839	28.4	878	43.5	9,187	139	1,[illegible]44,269	8,290,412
	1921 42,759	20,083	62,842	11.7	2,980	1,674	761	27.6	614	33.7	6,269	126	1,397,642	8,079,178
Louisville & Nashville	1922 22,978	21,635	44,613	12.7	69	1,063	528	29.4	531	26.0	4,714	186	983,076	5,815,252
	1921 30,536	15,894	55,450	28.2	91	1,145	546	30.9	481	25.5	5,313	158	911,889	5,348,161
Seaboard Air Line	1922 10,517	13,001	23,518	34.9	....	1,085	492	22.0	310	17.9	2,063	174	436,390	2,783,090
	1921 11,943	6,867	18,810	30.8	....	1,046	447	20.7	285	18.4	1,518	183	538,269	3,097,280
Southern Ry.	1922 27,591	43,914	71,505	15.4	....	1,047	485	22.7	260	14.5	2,674	212	1,210,524	7,005,521
	1921 38,512	19,730	58,242	13.1	1,108	1,129	481	21.6	321	20.9	2,691	197	1,283,469	7,651,453
Northwestern Region														
Chic. & N. Western	1922 38,456	41,178	79,634	8.4	....	1,309	589	25.4	363	20.5	3,426	164	1,289,360	8,653,212
	1921 47,977	26,601	74,578	9.3	....	1,248	511	23.9	367	24.7	3,279	160	1,600,517	10,375,509
Chic., Milwaukee & St. P.	1922 42,180	33,036	75,216	17.6	....	1,409	683	26.4	518	27.4	3,536	148	1,438,042	9,120,819
	1921 48,508	27,912	76,420	18.2	1,555	1,378	612	25.4	429	27.0	2,980	153	1,492,184	9,496,437
Chic., St. P., Minn. & Om.	1922 3,307	9,462	12,769	14.5	48	993	456	23.5	394	21.6	2,916	151	258,846	1,677,985
	1921 4,079	12,293	16,372	13.3	942	1,028	452	23.1	299	18.0	2,838	157	309,681	1,843,066
Great Northern	1922 43,059	12,486	55,545	8.2	....	1,807	999	30.4	594	30.1	3,998	140	881,489	5,725,466
	1921 45,946	7,880	53,829	11.8	....	1,684	796	28.5	462	25.5	3,045	149	974,346	6,022,613
Minn., St. P. & S. Ste. M.	1922 17,242	7,596	24,838	7.3	1,262	1,225	605	25.1	558	30.4	3,183	104	407,240	2,625,558
	1921 20,646	5,692	26,338	12.1	4,419	1,172	541	23.7	339	20.7	2,049	124	436,146	2,728,109
Northern Pacific	1922 29,862	11,324	41,186	14.6	....	1,553	754	27.1	599	30.6	3,864	120	730,454	5,286,631
	1921 36,297	8,805	45,102	16.0	1,388	1,641	724	25.9	486	29.2	3,421	125	836,669	5,856,361
Oreg.-Wash. R. R. & Nav.	1922 5,727	3,926	9,653	2.3	....	1,414	705	28.6	600	28.7	2,704	214	251,811	1,786,378
	1921 7,500	3,639	11,139	2.9	778	1,454	723	30.0	517	24.5	2,611	216	250,639	1,772,123
Central Western Region														
Atch., Top. & S. Fe	1922 39,662	25,353	65,015	6.2	1,255	1,590	583	20.0	509	43.8	4,040	138	1,573,400	12,771,467
	1921 48,112	12,799	60,911	10.5	4,827	1,576	563	20.7	536	40.9	3,345	138	1,558,855	11,938,863
Chicago & Alton	1922 6,934	6,184	13,118	6.9	....	1,351	489	20.9	265	17.8	3,439	181	237,680	1,534,797
	1921 9,823	5,323	15,146	3.7	100	1,309	540	24.7	428	27.7	6,409	171	286,846	1,674,213
Chic., Burl. & Quincy	1922 38,669	33,623	72,292	8.0	....	1,683	830	28.8	661	33.3	5,121	147	1,489,388	10,301,473
	1921 47,078	21,350	68,428	13.0	....	1,578	750	28.6	575	31.6	4,219	147	1,501,944	10,297,086
Chic., Rock I. & Pac.	1922 24,403	21,471	45,874	15.6	300	1,226	564	23.3	492	27.9	2,947	167	1,265,865	7,424,657
	1921 28,641	21,842	50,483	12.1	1,895	1,199	553	25.7	523	29.6	3,447	163	1,311,742	7,765,011
Denver & R. G. Western	1922 10,859	5,610	16,469	10.4	592	1,295	598	27.7	379	20.7	2,406	224	253,464	1,912,636
	1921 12,532	5,715	18,247	9.9	1,150	1,293	572	26.4	321	19.0	2,262	205	247,153	1,872,284
Oreg. Short Line	1922 6,155	4,315	10,470	4.8	....	1,338	609	28.2	879	48.1	3,893	140	287,506	2,112,477
	1921 7,009	4,913	11,922	3.8	486	1,505	655	27.9	795	46.8	4,018	144	288,883	2,108,210
Southern Pacific	1922 21,936	19,877	41,813	7.7	....	1,579	643	22.9	657	42.0	3,932	150	1,331,694	11,169,074
	1921 24,598	18,938	43,536	8.1	995	1,591	656	23.1	581	36.2	3,627	147	1,305,182	10,638,606
Union Pacific	1922 11,688	11,449	23,137	6.9	348	1,556	615	21.2	1,180	79.3	7,365	147	869,204	7,314,959
	1921 16,135	11,133	27,268	10.0	1,129	1,651	614	21.7	1,038	75.9	7,830	152	870,687	7,361,024
Southwestern Region														
Gulf, Colo. & S. Fe	1922 5,199	5,389	10,588	4.1	203	1,427	641	24.0	472	27.3	2,636	145	191,220	1,125,636
	1921 8,073	4,663	12,736	4.9	198	1,423	672	28.0	504	27.1	3,386	134	185,797	1,079,701
Mo., Kans. & Tex.	1922 7,661	8,561	16,222	7.6	....	1,535	660	23.4	371	23.6	3,657	140	225,415	1,869,153
	1921 7,651	5,855	13,506	7.2	1,130	1,504	601	22.6	375	27.2	2,965	134	263,721	1,934,706
Mo., Kans & Tex. of Tex.	1922 [illegible]27	11,448	11,675	6.6	....	1,052	461	22.6	264	16.3	1,777	180	186,935	1,354,993
	1921 [illegible]77	12,748	13,025	4.9	....	1,117	469	24.5	279	18.3	2,089	153	258,764	1,573,144
Missouri Pacific	1922 21,606	28,093	49,699	11.3	....	1,280	610	25.3	382	21.0	2,667	160	724,218	4,640,558
	1921 30,895	23,725	54,620	8.4	1,019	1,314	600	25.2	435	25.4	3,269	154	903,081	5,490,233
St. Louis-San Francisco	1922 16,307	22,793	39,100	8.3	....	940	427	24.9	249	14.3	2,082	211	740,993	3,633,969
	1921 20,500	11,094	31,594	6.5	....	1,024	450	24.7	356	21.5	2,402	181	752,454	4,314,360
Southern Pacific Lines (in Texas and La.)[2]	1922 5,615	15,164	20,779	6.7	353	1,233	551	25.6	530	30.7	2,969	132	529,234	3,421,627
	1921 8,477	14,534	23,011	10.8	1,188	1,221	521	25.9	388	23.8	2,450	126	512,141	3,258,041
Texas & Pacific	1922 3,951	8,781	12,732	15.2	....	1,353	562	22.0	345	22.3	2,253	155	223,023	1,531,772
	1921 5,407	3,996	9,493	26.7	....	1,239	484	20.5	407	29.1	1,977	143	294,209	1,906,489

[1]Includes figures for August 31, 1922.
[2]Includes Galveston, Harrisburg & San Antonio, Houston & Shreveport, Houston & Texas Central, Houston East & West Texas, Iberia & Vermilion, Lake Charles & Northern, Louisiana Western, Morgan's La. & Tex. R. R. & S. S. Co., and Texas & New Orleans.

Heavy Loading of Steel Products

The National Tube Company, Pittsburgh, Pa., in a letter addressed to the traffic department of the principal railroads, has recently given out interesting statistics showing the great increase in car loading by the United States Steel Corporation companies in general and especially by the National Tube Company during the last 20 years. The record of the average outbound car load traffic of the United States Steel Corporation subsidiary companies from 1911 to 1920 increased from 69,200 lb. per car to 94,352 lb. per car, thereby effecting a saving of 356,070 cars in the 10-year period.

The National Tube Company's record of average carload of wrought iron pipe between 1901 and 1920 increased from 38,500 lb. per car to 80,700 lb. per car, effecting a saving of 41,437 cars in the 20-year period. There were 916,904 more tons of wrought pipe shipped in the year 1920 than during 1901 and only 6,194 more cars used. The heavier loading of this traffic effected a saving of 52.3 per cent in equipment.

Attention is called to the fact that the increase in the average car load of wrought pipe was not entirely due to the campaign for intensive loading. In 1911 the question of obtaining suitable cars for wrought pipe was taken up by the trunk lines and in that year 1,000 gondola cars with an inside length of 46 ft. were built. At present there are in service or under construction about 30,000 gondolas 36 ft. or more in length inside.

The new tube works of the National Tube Company now being built at Gary, Ind., will produce wrought pipe and tubular goods up to a diameter of 20 in. and a maximum length of 24 ft. In order to provide for loading two lengths of these larger sizes in a car, the National Tube Company has suggested that future gondola cars be made 48 ft. 6 in. long inside and that flat cars be built the same length.

A Busy Commission

The Interstate Commerce Commission is always busy, but judging by the outward and visible signs it is just now unusually busy. On one day last week nine hearings were being held by members of the commission or by examiners, in Washington, to say nothing of those being held in other cities. On Monday of this week there were six hearings and on Tuesday seven, including several of major importance either from the standpoint of the issues involved or of the number of witnesses heard and time consumed. On Wednesday, although the consolidation hearing had been concluded, there were nine hearings. Last week there was the hearing before Commissioner Hall on the consolidation of western railroads, in which the executive officers of half a dozen big roads have taken part and which was also continued this week; the hearing before Commissioner Aitchison on coal car distribution rules, also continued this week; the Boston port differential case on which hearings also have been and will be held in other cities; the air brake investigation in which there have already been several weeks of testimony; and several hearings on the rate, valuation and finance dockets. On Monday, hearings were begun in the general express rate investigation. There was also argument before the commission involving practically all the sugar rates in the United States, and the consolidation and coal car hearings were continued. On Tuesday a hearing was also begun, to continue for several days, on the application of the Southern Pacific to retain control of the Central Pacific. Not only the members of the commission, but also some of the lawyers who have numerous clients, and the railroad lawyers whose companies are concerned with numerous of these cases, have had difficulty in trying to be at two places at the same time, and not only have some of the commission's hearing rooms proved too small to accommodate those who appeared to hear the testimony and to assist the lawyers and witnesses, but it has been necessary to hold hearings in other buildings, including those of the Interior Department and even the hotel across the street.

The activities of the commission are also indicated by the great number of orders, opinions, reports, statistical statements, notices to the press, etc., which are given out at the secretary's office daily and the number of petitions, applications, complaints and briefs filed by railroads, shippers and others. All these are placed on the press table in the secretary's office each day.

Traffic News

The New England Governors' committee on the railroad situation held hearings last week in Worcester, Springfield and other places, and this week is again in Boston. A number of railroad officers are to be heard. The committee has established at Boston a staff of statisticians headed by Howard G. Kelley, former president of the Grand Trunk Railway. Associated with Mr. Kelley are J. L. White, formerly on the Union Pacific, and Frank C. Wright, vice-president of the Bangor & Aroostook.

Commission Suspends Coal Priority Order as to Southern Roads

The Interstate Commerce Commission on November 18 issued an amendment to its Service Order No. 25 which gave priority in the use of open top cars to coal shipments, suspending the priority provisions of the order effective on November 20 as to lines and portions of lines situated south of the Ohio and Potomac rivers except the Baltimore & Ohio. It is stated that this order will not operate to suspend or vacate directions for special priority heretofore given under the provisions of Paragraph 7 of the order which have not been fully executed and such directions will continue in effect until fully executed.

Express Rates Under Inquiry

A general investigation of express rates throughout the United States was begun by the Interstate Commerce Commission at a hearing this week before Examiners Barclay and Mullen, for the purpose of determining whether the rates are unreasonable or otherwise in contravention of the provisions of the interstate commerce act. The investigation was given a new turn, however, by the recent filing of the application by the American Railway Express Company for permission to make a general increase in express rates for the benefit both of the express company and of the railroads. C. A. Lutz, vice-president of the American Railway Express Company, the first witness, produced statistical evidence regarding the earnings and expenses of the company and stated that during the first six months of 1922 approximately $308,000 had been paid to railroads by the express company as a voluntary contribution because of complaints by railroads that they were not receiving a sufficient return under the new contract. The presentation of the request of the railroads that express rates be increased so as to increase the proportion of express revenue which accrues to the railroads was begun by L. E. Wettling, statistician for the railroads, who presented exhibits showing that in 1921 the railroads had conducted their part of the express business at a loss of over $40,000,000, and that there were prospects for a large deficit for 1922.

Box Car Orders Modified

The Car Service Division of the American Railway Association on November 20 issued modifications of its previous orders directing the return movement of box cars of western line ownership, which were intended to relieve the car shortage on western railroads, to provide that such western cars may be loaded west from certain points instead of being moved empty. The order to trunk line roads provides that in all territory east of Grand Rapids, Detroit, Toledo, Cleveland, Youngstown, Pittsburgh and Wheeling, box cars, except automobile cars of western ownership may be loaded to any point west of the line from Grand Rapids to Wheeling, inclusive, in the direction of the home road. In the territory west of that line box cars of western ownership may be loaded to or beyond Chicago, Peoria, St. Louis or other western junction points. This modification makes no change in the number of empty cars previously specified to be delivered at Chicago. The provisions of the order are also to be applied to Wabash box cars. The orders to the Norfolk & Western, Bessemer & Lake Erie, Detroit & Mackinac, Lake Erie & Western, Toledo, St Louis & Western, permit loading to any point beyond their lines in home direction, while the order to

the Chesapeake & Ohio permits loading to or west of Cincinnati. At points west of Cincinnati western cars may be loaded to or beyond Chicago, Peoria, St. Louis or other western junctions.

Coal Production

Preliminary estimates on coal production during the week of November 6-11, as revised by later reports to the Geological Survey reflecting the curtailed output because of Election Day and Armistice Day, put the total coal raised at 11,939,000 net tons. Early returns on car loadings at mines for last week, November 13-18, indicate 13,200,000 net tons, 11,100,000 tons soft coal and 2,100,000 tons anthracite. This approximates the record for a week made just before the coal strike of 1919.

The estimated cumulative production of bituminous coal this year to November 11, inclusive, stands at 332,668,000 tons, which is 21,541,000 tons, or 6 per cent less than in the corresponding period of 1921.

The production of anthracite in the week ended November 11 is estimated at 1,863,000 net tons, a small increase over the output for the week preceding. The rate of loading on other days indicates a loss of about 300,000 tons, on account of Election Day and Armistice Day. The last week is expected to show an output of more than 2,100,000 tons.

The outstanding feature of the mine reports for the week ended November 4 was a gradual but general improvement in traffic conditions. Only in Somerset County, Pennsylvania, Cumberland-Piedmont, Pocahontas, Southern Appalachian, and the states of Montana and Wyoming was the car supply not equal to that during the preceding week.

Labor has practically ceased to be a factor limiting production, except in Connellsville and Cumberland-Piedmont in the Kanawha districts. The labor supply at the mines reporting in Westmoreland and Somerset counties, Pennsylvania, that have been working shorthanded for many weeks, has now become practically normal.

Anthracite shipments from Buffalo, as reported by the collector of customs for that port, amounted to 109,750 net tons in the week ended November 14; 112,700 tons in the week preceding, and 94,200 tons in the week before that. According to the Ore and Coal Exchange, the total soft coal handled at Lake Erie piers during the week ended November 12, decreased to 987,430 tons, as compared with 1,088,104 tons in the week preceding.

Warfield Again Proposes Remedy for Car Shortage

Complaints of inaction in respect to determining underlying causes for the existing car shortage and in making investigation of the proposals of the National Association of Owners of Railroad Securities to permanently relieve car shortage through pooling of cars, are made in a letter addressed to Commissioner Aitchison of the Interstate Commerce Commission by S. Davies Warfield, president of the association.

The letter says that the Union Pacific on November 11 asked that the commission use the emergency powers granted in the Transportation Act in order that the U. P. may be supplied with cars commensurate with its ownership, to relieve the serious shortage; that it was foreseen early in 1922 that at the present period shippers would be left without cars. It is stated that "adequate service cannot be supplied without a definite central agency with power to utilize the services of any of the forces or agencies of the railroads in investigations with the effect of adopting the most effective method for the acquisition, standardization, rebuilding and selection of classes of interchange freight cars to give best results by pooling and provide a definite distribution system. . . ."

Mr. Warfield says that while the railroads are complaining of over regulation, they at the same time call on the commission to further regulate them by relocating cars on their lines, because of the failure of their present car service association to perform this service for them, the most recent illustration being the application of the Union Pacific.

The association long ago presented proposals, he said; in fact as early as 1919, for an adequate supply and a more extended and economical distribution of freight cars through pooling; and, "in the opinion of many, this would have overcome the condition now confronting the railroads, the country and the commission. . . . How long existing conditions can continue without action to correct them, remains to be seen. Until they are corrected, private operation of the railroads is in danger."

Commission and Court News

Interstate Commerce Commission

The Interstate Commerce Commission has issued a decision finding not justified the $10 per car rental charge proposed by various refrigerator car lines to be applied on their cars when used in so-called local service from Pittsburgh to destinations in Central Freight Association territory.

Personnel of Commissions

B. A. Bridges, a member of the Louisiana Public Service Commission from 1912 to 1918, died at Baton Rouge, La., on Oct. 23.

R. A. Allen has been appointed state engineer of Nevada and ex-officio member of the Nevada Public Service Commission to complete the unexpired term of J. G. Scrugham, who was appointed for a four-year term in 1919, but who resigned recently upon accepting the Democratic party's nomination for governor.

Court News

Negligence in Sudden Stoppage of Train Must be Proved

The Minnesota Supreme Court holds that negligence cannot be established in an injury case by showing that the forward motion of a freight train was suddenly and violently checked and the cars jerked, without also showing that it was due to some negligent act or omission of the trainmen—Perkins v. Great Northern (Minn.) 188 N. W. 564.

United States Supreme Court

Combination of Interstate and Local Rates Cannot Be Used to Defeat Through Rates

The Baltimore & Ohio Southwestern has freight stations at Oakley and at Madisonville, both in Cincinnati, and has published interstate rates on lumber from southern points to both. Those to Madisonville (beyond Oakley) are higher than those to Oakley plus the local rate from Oakley to Madisonville. A lumber dealer at Madisonville had lumber shipped from the south to Oakley; paid the freight to that point; and without unloading the cars, reshipped them within a few days to Madisonville, paying the local freight rate. When shipped, and continuously thereafter, the intention was that the cars should go to Madisonville. They were billed to Oakley to get the benefit of the lower freight charges resulting from the combination of rates. The railroad claimed the through rate and sued for the difference. The Circuit Court of Appeals for the Sixth Circuit affirmed a judgment for the shippers (272 Fed. 675). This judgment is reversed by the Supreme Court of the United States, which holds that "the movement had been divided by the shippers into two stages because they believed that by so doing they could secure transportation to Madisonville at less than the through interstate rate," and whether under the Act to Regulate Commerce lower intermediate rates can be so used in combination was the precise question for decision. The important fact in the case was that the shippers admitted that shipment to the ultimate destination had at all times been intended.

The Supreme Court said, in part: "Through rates are, ordinarily, made lower than the sum of the intermediate rates, but there may be commercial conditions which justify giving exceptionally low rates to movements which are intermediate. The mere existence of such intermediate rates confers no right upon the shipper to use them in combination to defeat the applicable through rate. The interstate rates from the southern points to Madisonville were the only lawful rates. To permit the applicable through interstate rate to be defeated by use of a combination of intermediate rates would open wide the door to unjust discrimination." Judgment for defendants reversed. Baltimore & Ohio Southwestern v. Settle. Opinion by Mr. Justice Brandeis. Mr. Justice McReynolds dissented. Decided November 13, 1922.

Foreign Railway News

Commission Recommends State Ownership of Irish Railways

The commission appointed by the Irish provisional government to inquire into the position of the Irish railways has issued today a majority report recommending state ownership, with an independent board of management. It admits certain objections to nationalization, but says that the advantages to be reaped from unification would outweigh the disadvantages.

Well Known British Railway Journalist Dies

Edwin A. Pratt, a well-known writer on railway subjects, died at Esher, Surrey, England, on October 27. Mr. Pratt was born in 1854 and began his career in journalism at an early age. For ten years he was a sub-editor on the Times (London), and served on the staff of a number of other journals, including the Railway Gazette (London). Mr. Pratt traveled extensively in Europe and America. Some of his better-known works are Rise of Rail Power in War and Conquest, British Railways and the Great War, Railways and Their Rates, State Railways, Railways and Nationalization, etc.

Consolidation Completed on Northeastern Group of Railways in Britain

The consolidation of the railways of the Northeastern group in Great Britain has been completed, to take effect January 1, 1923, and the new company will be known as the London & North Eastern Railway. The principal companies which have been merged to form this road are the North Eastern, the Great Central, the Great Eastern, the Great Northern, the Hull & Barnsley, the North British and the Great North of Scotland.

All the railways of Great Britain will on January 1 be merged into four regional systems. Details of the organization of the Northwestern, Western and Southern groups have not, however, advanced as far as have those concerning the Northeastern.

R. L. Wedgwood, at present general manager of the North Eastern Railway, will be general manager of the new company. Mr. Wedgwood was born in 1874 and was educated at Cambridge University. He entered railway service in 1896 with the North Eastern and served in various official positions in the operating department until 1905, when he became goods manager of the Northern division, with headquarters at Newcastle. In 1911 he became assistant goods manager and, shortly thereafter, chief goods manager. In 1914 he also took over the management of passenger traffic. He occupied a prominent transport position in the British army during the war, and when he returned to the North Eastern in 1919 became chief goods manager, passenger manager and deputy general manager. On January 1 of this year he became general manager.

Railroad Auditors at salaries from $2,500 to $3,600 are wanted by the United States Civil Service Commission for positions in the Bureau of Internal Revenue, to audit and verify income and excess profits tax returns of consolidated railroad companies. Applications must be made on Forms 1312 and 2386 and must be sent in by December 15. Applicants must have had five years' experience. The required experience is defined in the notice in considerable detail; and it is also stated that experience with the Shipping Board or the Railroad Administration or the Interstate Commerce Commission will not be acceptable. Applicants must be between 25 and 50 years old. Employees of the income tax unit have the privilege of attending lectures in the evenings, and are encouraged to engage in study as a supplement to the experience which they gain in their work. If an applicant is appointed, and is satisfactory, the government desires to have him remain at least one year.

Equipment and Supplies

Locomotives

The Fonda, Johnstown & Gloversville is inquiring for 1, 8-wheel switching locomotive.

The Aluminum Company of America is inquiring for 2, 8-wheel switching locomotives.

The Calumet & Arizona Mining Company is inquiring for 3, 6-wheel switching locomotives.

The Wisconsin & Michigan has ordered 2, 4-6-0 type locomotives from the Baldwin Locomotive Works.

The Pittsburgh Steel Company has ordered 1 switching locomotive from the Baldwin Locomotive Works.

The Detroit & Toledo Shore Line has ordered 2 switching locomotives from the Baldwin Locomotive Works.

The Toledo, St. Louis & Western has ordered 2 switching locomotives from the Baldwin Locomotive Works.

The Delaware, Lackawanna & Western has ordered 5 Pacific type locomotives from the American Locomotive Company.

The Chicago, Milwaukee & St. Paul, reported in the *Railway Age* of October 28 as inquiring for 100 locomotives, has ordered 50 Mikado type locomotives from the Baldwin Locomotive Works.

The Duluth & Iron Range, reported in the *Railway Age* of September 16 as inquiring for 8 Mikado type locomotives, has ordered 3 Mikado type locomotives from the Baldwin Locomotive Works.

The Richmond Fredericksburg & Potomac, reported in the *Railway Age* of October 21 as inquiring for 2 locomotives, has ordered 1, 8-wheel switching locomotive and 1, 6-wheel switching locomotive from the American Locomotive Company.

Freight Cars

The Louisville & Nashville is inquiring for bids for the repairing of 250 hopper cars.

The Pacific Fruit Express contemplates asking for bids soon for about 5,000 refrigerator cars.

The Gulf Refining Company, Pittsburgh, Pa., has ordered 150 tank cars from the Standard Steel Car Company.

The Atlanta & West Point and Western Railway of Alabama are inquiring for 150 hopper cars of 50 tons' capacity.

The Baltimore & Ohio is inquiring for 1,000 low side gondola cars of 70 tons' capacity. This company was reported in the *Railway Age* of November 18 as also inquiring for 2,000 hopper cars.

Passenger Cars

The Atlanta & West Point is inquiring for two 70-ft. steel baggage cars.

The Chicago, Rock Island & Pacific, reported in the *Railway Age* of October 14 as inquiring for 50, 70-ft. steel suburban cars, has ordered this equipment from the Standard Steel Car Company.

Iron and Steel

The Southern is inquiring for 200 tons of steel for bridges.

The Louisville & Nashville is inquiring for 2,000 tons of tank plates.

The Chesapeake & Ohio is inquiring for 500 tons of steel for bridges.

The Florida East Coast is inquiring for 200 tons of steel for bridges.

The St. Louis-San Francisco has ordered 118 tons of structural steel from the American Bridge Company to be used in strengthening bridges.

The Missouri Pacific has ordered 201 tons of structural steel from the Mississippi Valley Structural Steel Company, to be used in the construction of additional shop facilities at St. Louis, Mo.

The Kansas City Southern has ordered 540 tons of structural steel from the Kansas City Structural Steel Company, the material to be used in the extension of the company's shops at Pittsburg, Kan.

Machinery and Tools

The Southern Pacific has ordered a Niles end-driven axle lathe from the Niles-Bement-Pond Company

The Norfolk & Western has ordered from the Niles-Bement-Pond Company two right line 8-ft. radial drills.

The Missouri, Kansas & Texas has ordered a 10-ft. full pneumatic plate flanging clamp from the Niles-Bement-Pond Company.

Miscellaneous

The Chilean State Railways will receive public tenders on January 15, 1923, for materials for a telephone selector system for 800 miles of line. Bids are to be opened in Santiago, Chile, at the offices of the Chilean State Railways. The system desired is the Western Electric Company's alternating current type or its equivalent. Public tenders will also be received on February 15, 1923, for material for a signal system for 240 miles of railroad. The bids are to be opened in Santiago, Chile, at the offices of the Chilean State Railways. The Chilean State Railways office at 141 Broadway, New York City, is furnishing specifications and drawings for these bids.

Signaling

The New York Central has ordered from the Federal Signal Company 33 Type 4 automatic signals for use on its Lines West of Buffalo.

The Missouri Pacific has placed orders with the Federal Signal Company for 6 low-voltage switch layouts together with necessary signals, controlling devices and outlying switch locks.

The Chicago, Burlington and Quincy has placed orders with the Federal Signal Company for switch mechanisms, signals and controlling devices necessary for 9 low-voltage switch layouts.

Secretary Denby of the Navy has written to the Interstate Commerce Commission, recommending that the names of towns be painted in large letters on the roofs of railroad stations for the guidance of aviators. They are obliged frequently to fly very low for the purpose of ascertaining the names of the towns over which they pass.

Seven Years and Ten Months was the sentence of imprisonment imposed by the state court at Wilmington, Del., on November 13, on Daniel Befany, one of five men found guilty of attempting to burn a bridge of the Pennsylvania railroad in Wilmington on August 31. The sentences of the others were seven years, seven years, six years, six years.

The American Railway Association announces that, by vote of the Board of Directors, the Association decides to make no contribution of funds to the investigation of the teredo in piling along the Atlantic and Pacific coasts. It is expected that railroads having terminals at tidewater will each for itself decide to what extent to participate in this work.

Supply Trade News

The Hardwood Manufacturers' Institute reports the appointment of R. H. Jones as assistant to the secretary-manager.

R. C. Jerome, vice-president and general manager of the Jerome-Edwards Metallic Packing Company, Chicago, has left the service of that organization.

The Foamite Firefoam Company, of 200 Fifth avenue and 151 Fifth avenue, New York City, has been consolidated with the O. J. Childs Company, Utica, N. Y., under the name of the Foamite-Childs Corporation, Utica.

The Gibb Instrument Co., Detroit, Mich., makers of electric welding equipment, on December 1, will remove its plant and offices to Bay City, Mich. The purpose of this move is to provide increased manufacturing facilities.

D. S. Hutchcraft, formerly vice-president of the Indiana Air Pump Company, Indianapolis, Ind., has been appointed district manager in charge of the Chicago Pneumatic Tool Company's recently established branch office at Tulsa, Okla.

The Minnesota Supply Company with offices in the Pioneer building, St. Paul, Minn., has been appointed northwestern representative for the Flannery Bolt Company, Pittsburgh, Pa. Blake C. Hopper, formerly with the American Steel Foundries, has been elected secretary-treasurer of the Minnesota Supply Company.

E. G. Buckwell, secretary and sales manager of the Cleveland Twist Company, Cleveland, Ohio, retired on November 1. Mr. Buckwell remains a director of the company. W. E. Caldwell, assistant sales manager, has been appointed sales manager. Mr. Caldwell has served in the company's sales department for 21 years.

The Richards Train Control Corporation of Baltimore, Md., has recently been incorporated under the laws of Maryland with a capitalization of $2,000,000 for the manufacture and installation of automatic train control apparatus. This represents a reorganization of the Richards-Ford Train Control Company which was incorporated in 1917.

The Electric Material Company, San Francisco, Cal., with branch office at Los Angeles, has been appointed agent in the State of Washington and parts of Oregon and Idaho for the Roller-Smith Company, New York. The Electric Material Company recently opened an office in the Hinckley building, Seattle, in charge of R. F. Robinson.

The Industrial Works, Bay City, Mich., has built a special crane for the Virginian Railway, which is said to be one of the largest of its kind in the world. It is known as a type Z and its capacity with outriggers extended is 400,000 lb. at a radius of 17½ ft. Without the use of jack beams, the main hoist will lift 85,000 lb., while the auxiliary hoist will lift 60,000 lb. at a radius of 24 ft.

Obituary

F. W. Doty, Pacific Coast representative of the railroad and government department of Johns-Manville, Incorporated, New York, died at San Francisco on November 9.

Prizes for Essays by school pupils on making the highways safe, offered in a contest which is being conducted by the Highway Education Board, Washington, D. C., are the subject of a circular which has been issued by C. I. Leiper, general superintendent of the Pennsylvania Railroad, for the encouragement of school children in the state of New Jersey, particularly children of railroad employees. The announcement has been posted at all passenger stations on the line of that road in New Jersey, and the railroad will supplement the prizes offered from Washington by gifts of books and gold medals. Essays must be of 500 words or less, by school pupils 14 years old and under, and the contest closes on December 4.

Railway Construction

CHICAGO, ROCK ISLAND & PACIFIC.—In announcing the awarding of a contract to the Railroad Water & Coal Handling Company, Chicago, for the construction of a water treating plant at Manly, Iowa, in the issue of November 18, the statement was made that the Minneapolis & St. Louis had awarded the contract. This statement was in error in that the Chicago, Rock Island & Pacific had awarded a contract for the work.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has awarded a contract to the T. S. Leake Construction Company, Chicago, for a one-story addition, 40 ft. by 275 ft., to its machine shop and for the construction of a woodworking mill, 60 ft. by 128 ft., at Cedar Rapids, Iowa.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—This company has awarded a contract to the Ogle Construction Company, Chicago, for a 150-ton frame coaling station at Emerson, Neb.

ILLINOIS CENTRAL.—This company, which was reported in the *Railway Age* of September 23 as intending to improve its coal handling facilities at Macomb, Miss., has awarded a contract to the Railroad Water & Coal Handling Company, Chicago, for a 300-ton coaling station.

ILLINOIS CENTRAL.—This company, which was reported in the *Railway Age* of November 18, page, 964, as intending to improve its water facilities at Calumet, Iowa, has awarded a contract to W. J. Zitterel & Company, Webster City, Iowa, for the construction of a water station.

LOUISVILLE & NASHVILLE.—This company will construct a steel bridge 4,595 ft. in length near New Orleans, La., also double track lines on the Cumberland division from Hiedrick to Pinesville, Ky., a distance of 15 miles, to cost $2,000,000.

MISSOURI PACIFIC.—This company will accept bids until November 27 for the construction of a passenger station at Harrison, Ill.

NEW YORK, NEW HAVEN & HARTFORD.—This company will install a new turbine generator in its Cos Cob power station to take care of an increased load due to the placing in service of 12 new high speed passenger locomotives. The new generator is a 9,000 kw., single phase, 25-cycle unit.

PENNSYLVANIA.—This company is elevating the tracks of its Atlantic division between Whitman street, Camden, N. J., and a point a quarter of a mile south of White Horse pike, involving the elimination of two highway grade crossings.

SOUTHERN PACIFIC.—This company has awarded a contract to the Utah Construction Company, Ogden, Utah, for the construction of a single track, concrete lined tunnel, 1,200 ft. in length, on its Coast division, 155 miles south of San Francisco, Cal. This tunnel is being constructed in connection with the revision of the line to eliminate several sharp curves. This company also contemplates the expenditure of $250,000 in shop buildings and machinery at El Paso, Tex.

ST. LOUIS-SAN FRANCISCO.—This company, which was reported in the *Railway Age* of November 18, page 964, as closing bids on November 13 for a 300-ton concrete coaling station at Ft. Smith, Ark., has awarded the contract to Roberts & Schaefer Company, Chicago.

TEXAS & PACIFIC.—This company, in conjunction with the Missouri Pacific, will construct a reservoir which will provide adequate water supply for the two companies at Texarkana, Ark., at an approximate cost of $150,000.

UNION RAILROAD.—This company, which is an affiliated line of the United States Steel Corporation, has awarded a contract to the Roberts & Schaefer Company, engineers and contractors, Chicago, for a 100-ton capacity, two-track, reinforced concrete, automatic electric, Simplex roller skip type coaling and sanding plant, at Bessemer, Pa.

Railway Financial News

Revenues and Expenses for September—a Correction

In the table of Revenues and Expenses of Railways for September and the nine months' period which appeared on page 954 of last week's *Railway Age*, the figures for the roads—Grand Trunk Western to Lehigh & New England—were incorrectly shown. The reason lies in a printer's error whereby the figures to the right of maintenance expenses were inserted as the nine months' figures for the Lehigh & New England instead of in their correct position as the September figures for the Grand Trunk Western. To read the table correctly the figures for the roads Grand Trunk Western to Lehigh & New England to the right of maintenance expenses should be each dropped one line with the exception of the nine months' figures for the Lehigh & New England which should have appeared as the first line on the page. Thus for a number of typical roads the correct figures should be:

Name of road		Operating ratio	Net from railway operation	Net after rentals	Net after rentals, 1921
Grand Trunk Western	Sept.	78.00	318,222	141,887	—97,257
	9 mos.	77.80	2,686,409	475,562	—853,297
Great Northern	Sept.	76.10	2,666,889	1,836,120	3,218,755
	9 mos.	78.80	15,456,331	10,084,242	4,212,635
Gulf Coast Lines	Sept.	63.40	319,146	285,812	343,036
	9 mos.	67.40	2,462,862	2,023,354	2,493,306
Hocking Valley	Sept.	84.30	313,370	147,257	296,942
	9 mos.	73.50	2,561,948	1,854,329	313,952
Illinois Central	Sept.	76.80	3,417,412	2,480,288	1,490,926
	9 mos.	76.80	25,586,704	17,623,366	13,685,148
International & Gt. Northern	Sept.	76.20	357,063	245,453	75,457
	9 mos.	83.00	1,764,444	988,747	—214,549
Kansas City Southern	Sept.	76.60	373,290	231,971	332,718
	9 mos.	75.30	3,125,450	2,103,847	3,189,419

ALABAMA GREAT SOUTHERN.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority nominally to issue $500,000 of first consolidated mortgage 5 per cent gold bonds to be held in the treasury.

BALTIMORE & OHIO.—*New Directors.*—At the annual meeting of the stockholders held in Baltimore, Md., on November 20, Henry Ruhlender and Richard H. Williams, both of New York, were elected directors to succeed James Speyer and L. F. Loree, who declined re-election because they could not consistently serve on the Baltimore & Ohio board under the provisions of the Interstate Commerce Act.

Operating Results in 1922.—President Daniel Willard presented a summary of the company's condition from the first of this year up to the present time and the prospects for the future. He said in part:

> At the beginning of the present year 1922, a budget for the year was prepared, based upon an assumed business 5 per cent in excess of the business handled in 1921, and also assuming a reduction in freight rates of 10 per cent, with the continuance of the then existing rates of pay. The budget prepared at the beginning of the year contemplated a net railway operating income of $32,000,000 at the end of the year, which with other income would have provided, after deducting fixed charges, $6,000,000 or $7,000,000 surplus applicable to the common stock after paying the preferred dividend and providing for the $3,500,000 sinking fund.
>
> Notwithstanding the fact that more than three-fourths of all the coal mines located on the Baltimore & Ohio ceased production April 1, due to the coal strike, which of course affected very seriously the business of the company, we were able to show at the end of the first six months' period net operating revenue of more than $2,000,000 in excess of the amount set up in the budget for the same period, and there is every reason to believe that if conditions had continued as they then were, the company would have had not less than $8,000,000 surplus at the end of this year applicable to the common stock.
>
> The total number of men employed in the maintenance of equipment department on June 30, 1922, was 21,150, of which 17,500 left the service, leaving about 3,500 at work. During the period of the strike 1,322 of the men who had left the service returned. On September 15, when the settlement was reached, the Baltimore & Ohio had about 17,000 men working in its mechanical department, 4,634 being old employees of the company, and 12,158 new men who had been hired. There were no unsettled matters of controversy between the Baltimore & Ohio and its men who went on strike on the first of July, and when the settlement was made it was on the basis of the men returning to work under the same rules and working conditions, and at the same rate of wages, that were in effect on the date they stopped work.
>
> The result of the strike bore very heavily upon the Baltimore & Ohio. During the month of June, 1922, the net operating income of the company was $2,666,000 and during the month of October it was $3,000,000. Assuming, which may fairly be done, that the net operating income of July, August and September would have been equal to the average earned in the two months above mentioned, it seems clear that but for the strike the company would have earned during those months a net operating income of more than $8,000,000. On the contrary, however, because of reduced

[illegible] and [illegible] expenses, the [illegible] three months' period [illegible] a net deficit of more than $2,000,000, [illegible] a year's loss to the company, in anticipated income during the three months mentioned, of between $10,000,000 and $11,000,000. This, of course, has very seriously affected the outlook for the company during the present year.

There has been a very steady improvement in the condition of the company's property since the settlement of the strike, with a corresponding increase of business. This is quite clearly shown by the loaded car movement. During the first fifteen days of September the average daily loaded movement by the Baltimore & Ohio was approximately 18,000, while the average daily loaded movement for the first ten days of the present month has been over 34,000, and in some daily instances has nearly reached 40,000. We are today handling practically as heavy a business as we ever handled at this time of the year, and we hope to have our power in condition to meet the seasonable requirements of the situation during the winter months.

The present outlook for business is encouraging, and while the results from this year's operation will be disappointing for the reasons which I have already mentioned, if conditions remain something like normal during the next twelve months—and by normal I do not mean the same degree of industrial activity that exists today, because we are probably above normal at the present time, but with a condition that might fairly be assumed to be normal, and with rates and wages remaining substantially as they now are—I feel confident that the result of next year's operations should be much more gratifying to the holders of our common shares.

CHESAPEAKE & OHIO.—*Initial Preferred Dividend.*—The directors have declared an initial dividend of $1.62½ a share on the company's new issue of $12,558,500 preferred stock. They also declared the regular semi-annual dividend of $2 a share on the common stock. Both dividends are payable January 1 to stockholders of record December 1. The dividend on the preferred stock covers the quarter ended January 1. The directors declared their intention to pay the dividend on the new 6½ per cent preferred stock semi-annually in the future.

CHICAGO GREAT WESTERN.—*Authorized to Issue Notes.*—This company has been authorized by the Interstate Commerce Commission to issue $906,573 of promissory notes to the Pullman Company in connection with the purchase of equipment.

CINCINNATI, INDIANAPOLIS & WESTERN.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to enter into an equipment trust agreement for the issue of certificates to the amount of $300,000.

ERIE.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to guarantee the payment of $2,800,000 of equipment trust certificates.

SOUTHERN.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority nominally to issue $5,000,000 of its development and general mortgage 4 per cent gold bonds, payable April 1, 1956, to be held in the treasury.

Tentative Valuations

The Interstate Commerce Commission has issued tentative valuation reports in which it states the final value of the properties owned and used as follows:

	Owned	Used
Lake Tahoe Railway & Transportation Company, 1917	$365,453	$178,400
Virginia & Southwestern, 1916	11,947,564	12,197,864

Dividends Declared

Boston & Albany—2½ per cent, quarterly, payable December 30 to holders of record November 30.

Boston & Providence—2½ per cent, quarterly, payable January 1 to holders of record December 20.

Chesapeake & Ohio—Common, $2.00, semi-annually; preferred, $1.62½, initial quarterly, both payable January 1 to holders of record December 1.

Cincinnati, New Orleans & Texas Pacific—Common, 3 per cent, semi-annually; common, 3½ per cent, extra, both payable December 26 to holders of record December 5; preferred, 1¾ per cent, quarterly, payable December 1 to holders of record November 25.

New Orleans, Texas & Mexico—1½ per cent, quarterly, payable December 1 to holders of record November 24.

Pittsburgh, Youngstown & Ashtabula—1¾ per cent, quarterly, payable December 1 to holders of record November 20.

Trend of Railway Stock and Bond Prices

	Nov. 21	Last Week	Last Year
Average price of 20 representative railway stocks	66.67	66.27	56.76
Average price of 20 representative railway bonds	85.29	85.64	80.04

Railway Officers

Executive

L. E. Martin and **A. H. Jones**, assistants to the vice-president of the St. Louis Southwestern, with headquarters at St. Louis, Mo., and **M. M. Sisson**, vice-president and general superintendent of the Ft. Worth and Rio Grande, with headquarters at Ft. Worth, Tex., have been appointed assistants to the president of the St. Louis Southwestern, with headquarters at St. Louis, Mo., and the office of assistant to the vice-president has been abolished. **O. H. McCarty** will succeed Mr. Sisson.

Financial, Legal and Accounting

W. H. Brahany has been appointed auditor of the Detroit, Bay City & Western and the Port Huron & Detroit, succeeding L. C. Van Laan, resigned to accept service with another company.

Henry Wolf Bikle has been appointed general attorney of the Pennsylvania. **E. N. Davis** has been appointed assistant general solicitor with headquarters at Pittsburgh, Pa. **G. R. Allen** has been appointed assistant general counsel with headquarters at Philadelphia, Pa., all effective December 1.

Operating

W. J. Carr has been appointed assistant trainmaster of the New York, New Haven & Hartford to act as office trainmaster at New London, Conn. **W. J. Smith** has been appointed trainmaster with jurisdiction between Waterford, Conn., and Auburn. **A. O. Whitford**, assistant trainmaster at New London, has retired after 40 years' service on account of ill health.

Robert E. Woodruff has been appointed superintendent of the Buffalo division of the Erie, succeeding **Edmund I. Bowen** who has been transferred in a similar capacity to the Rochester division, succeeding A. B. Caldwell, assigned to other duties. The Kent division of the Erie has been extended to include the Marion Terminal and Cincinnati division. **H. R. Adams** is superintendent with headquarters at Marion, Ohio.

Traffic

J. Lever, traveling agent of the Chicago & North Western, with headquarters at Casper, Wyo., has been promoted to division freight and passenger agent, with the same headquarters.

J. A. Behrle, assistant general freight agent of the Chicago & Alton, with headquarters at Chicago, has been appointed general freight agent, with headquarters at Bloomington, Ill., succeeding E. L. Carr, resigned.

F. D. Gahagan, chief clerk to the division freight agent of the Atchison, Topeka & Santa Fe with headquarters at Denver, Colo., has been promoted to division freight agent at Pueblo, Colo., succeeding **G. W. Smith**, who has been transferred to Oklahoma City, Okla., to succeed M. C. Burton, promoted.

W. D. McVey, assistant general freight agent of the Michigan Central, with headquarters at Buffalo, N. Y., has been transferred to Detroit to succeed **E. W. Brunck** who will take over the duties of F. R. Newman, with the same title and headquarters, resigned. **S. W. Carder** has been promoted to assistant general freight agent at Buffalo to succeed Mr. McVey.

J. A. Behrle, assistant general freight agent of the Chicago & Alton, with headquarters at Chicago, who has been promoted to general freight agent with the same headquarters,

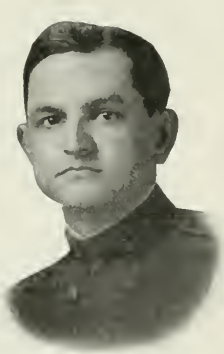
succeeding E. L. Carr, resigned, was born on September 1, 1887, at Chicago, Ill., and entered railway service as a clerk in the traffic department of the Chicago & Alton on August 6, 1903. In 1910 he was promoted to chief clerk to the assistant general freight agent and on September 1, 1912, was promoted to assistant general freight agent, which position he was holding at the time of his recent promotion. During the period of federal control he also had jurisdiction over the Chicago, Peoria & St. Louis.

G. H. Wilcox, assistant to the freight traffic manager of the Southern, with headquarters at Washington, D. C., has been promoted to assistant freight traffic manager, with headquarters at Birmingham, Ala., succeeding **R. L. Simpson**, who has been transferred to Washington, D. C. **W. T. Turner**, division freight agent, with headquarters at Greensboro, N. C., has been appointed assistant to the freight traffic manager at Washington, D. C., succeeding Mr. Wilcox. **C. C. Elder**, division freight agent at Columbia, S. C., has been transferred to Greensboro in place of Mr. Turner. **G. M. Nolen** has been promoted to division freight agent at Columbia, S. C., succeeding Mr. Elder. **H. V. Gardner** has been appointed commercial agent, with headquarters at Los Angeles, Cal.

G. W. Sloan, whose promotion to assistant general freight agent of the Nashville, Chattanooga & St. Louis, with headquarters at Nashville, Tenn., was reported in the *Railway Age* of November 18 (page 965), was born on October 21, 1883, at Nashville, Tenn. He entered railway service on August 23, 1901, as a messenger in the correspondence department of the general freight office of the Nashville, Chattanooga & St. Louis, and during the following six years held various correspondence and rate department positions. In November, 1907, he was promoted to chief clerk to the commercial agent at Nashville, Tenn., and on January 1, 1915, he was appointed chief rate clerk in the general office. On March 1, 1920, he was promoted to chief clerk, which position he was holding at the time of his recent promotion.

Engineering, Maintenance of Way and Signaling

W. G. Arn, assistant engineer of maintenance of way of the Illinois Central and the Yazoo & Mississippi Valley, with headquarters at Chicago, has been promoted to assistant chief engineer of the Chicago Terminal Improvement of the Illinois Central, with the same headquarters. Mr. Arn was born on February 7, 1877, at Terre Haute, Ind., and was graduated from the Rose Polytechnic Institute in 1897. He entered railway service as a rodman on the Louisville & Nashville, September, 1897, and was promoted to masonry inspector in October, 1898, which position he held until 1899, when he was appointed building inspector. In November, 1900, he was promoted to assistant engineer, which position he held until April, 1905, when he was promoted to roadmaster. He left the employ of the Louisville & Nashville in March, 1906, to become superintendent and engineer of the Southern Bitulithic Company at Nashville, Tenn., which position he held until October, 1906, when he became assistant engineer of the Missouri Pacific, with headquarters at St. Louis, Mo., where he remained until March, 1907. On the latter date he entered the service of the Illinois Central as assistant engineer in charge of the construction of the Birmingham terminal at Birmingham, Ala., which position he held until April, 1908, when he was promoted to assistant engineer of the Birmingham division, with headquarters at Corinth, Miss. In September, 1909, he was appointed assistant engineer in charge of the reconstruction of the passenger terminal at Louisville, Ky., and in June of the following year he was appointed assistant engineer in the general office at Chicago, where he was assigned to special work, including valuation. In August, 1912, he was appointed assistant engineer in charge of the construction of the new passenger terminal and subway at Memphis, Tenn., which position he held until November, 1914, when he was appointed roadmaster with headquarters at Mattoon, Ill. In June, 1916, he was promoted to assistant engineer of maintenance of way on the Illinois Central and Yazoo & Mississippi Valley, with headquarters at Chicago, which position he was holding at the time of his recent promotion. Mr. Arn enlisted in the United States Army in February, 1917, and in May of the same year became captain of the 13th Engineers. While in France he was promoted to major and later to lieutenant colonel and was discharged in June, 1919, when he resumed his duties with the Illinois Central.



Col. W. G. Arn

Mechanical

E. H. McFadden, assistant superintendent of shops of the St. Louis Southwestern at Pine Bluff, Ark., has been promoted to master mechanic, with the same headquarters, succeeding J. W. Blakeburn, deceased. **A. Townsend**, road foreman of engines, with headquarters at Pine Bluff, has succeeded Mr. McFadden, and he will be succeeded by **W. H. Graves**, locomotive engineer.

Special

Dr. Heman Humphrey has been appointed chief surgeon of the Kentucky & Indiana Terminal.

Charles E. Hill has been appointed general safety agent of the New York Central Lines with headquarters at New York City, succeeding Marcus A. Dow, who resigned on November 15, to become executive secretary of the Bureau of Safety of New York City, under Special Deputy Police Commissioner Barron G. Collier. Mr. Hill is 46 years old; a native of Illinois. He received his early education in the public schools of that state and taught school for a few years. Later he was graduated from the Southern Illinois College at Enfield. He was for several years clerk of a district court in Illinois. He entered railroad service as claim agent for the Cleveland, Cincinnati, Chicago & St. Louis in September, 1906, was promoted to district claim agent at Paris, Ill., in 1911, and in June, 1914, his territory was enlarged to include Indianapolis. In October, 1916, he was transferred to the Cleveland district and continued to fill this position until he became general safety agent. He has for a number of years been an ex-officio member of the safety committees of the districts in which he was located.

Obiuary

Dr. E. C. Underwood, chief surgeon of the Kentucky & Indiana Terminal, died recently.

E. B. Taylor, who retired two years ago as vice-president of the Pennsylvania, Lines West, died on November 8 at Pittsburgh. Mr. Taylor was born at Riverton, N. Y., in 1850 and was graduated from Haverford College in 1869. The following year he received a degree in civil engineering from the Polytechnic College of Pennsylvania and immediately entered the service of the Pennsylvania Railroad as a clerk in the superintendent's office at Harrisburg. Two years later he was promoted to supervisor and, shortly thereafter, to assistant engineer of the Middle division. Later he was transferred in a similar capacity to the Pittsburgh division and later was promoted to superintendent of the Lewistown division. He was then transferred in a similar capacity to the West Penn division. He then went to the Pittsburgh, Cincinnati, Chicago & St. Louis in a similar capacity and subsequently was promoted to general superintendent, Northwest system. In 1890 he became general superintendent of transportation of all the Pennsylvania, Lines West. The following year he was elected fourth vice-president and was later advanced to third, and then second vice-president in charge of accounting and treasury. Mr. Taylor was 72 years of age at the time of his death.

EDITORIAL
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EDITORIAL

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Radicalism More Dangerous to Public Than to Railroads

Both the shipping and producing public and the railroads may well feel alarmed at the results of the recent election. In the opinion of the *Railway Age*, however, the owners of railway securities and the managers of railways are manifesting more fear than is justified, while the producing and shipping public is showing a much smaller degree of concern than it should.

The recent election will send more extreme radicals to Congress than any election in many years. Indications are that they will hold the balance of power. They seem practically unanimous in favor of repeal of all provisions of the Transportation Act which were intended by its authors to be constructive and to cause an adequate revival of the expansion of railroad facilities. It appears by no means improbable that the Transportation Act will be seriously emasculated when the recently elected Congress meets.

In a speech in the Senate on November 23 Senator Arthur Capper of Kansas, in referring to a recent editorial in the *Railway Age*, said: "The opinion held by the *Railway Age* is not shared by the stock market nor the 'ticker' news. The discussion in regard to lower railroad rates has been going on for more than a year, and some reductions have been made; yet in Wall Street railroad stocks have risen something like 50 per cent within 12 months."

Since Senator Capper has selected the prices of railroad stocks as the barometer of expert opinion regarding the future of the railways we suggest that he include in his comparison the changes in the prices of railroad stocks which have occurred since November 4, three days before the election. In the first place it is not true as Senator Capper stated that railroad stocks have risen something like 50 per cent within 12 months. There were 34 railroad common stocks which were quoted in the stock market reports on November 5, 1921, November 4, 1922, and November 27, 1922. The average price of these stocks on November 5, 1921, was $48.12½ and on November 4, 1922, it was $61.50, an average increase of $13.37½ a share, or about 27½ per cent. The average price of these stocks on November 27, 1922, was $54.75, a reduction since November 4 of $6.62½ a share. Thus in three weeks after the election the decline in the average price of railway stocks wiped out one-half of all the advance in price that had occurred in the preceding year. The declines have ranged from less than $2 to $21.50 a share.

This is the answer made by the stock market to Senator Capper's claim that in spite of the agitation for further reductions of freight rates the prices of railway securities have been advancing. The results of the election have been interpreted as converting what had been an agitation for lower rates into a direct threat of the adoption of a worse policy of railway regulation than the country ever had before.

There is, however, a consideration of the greatest importance with which owners of railway securities and managers of railways may comfort themselves. This is that while a radical Congress can destroy the constructive provisions of the Transportation Act it cannot repeal the Constitution of the United States. Regardless of what may be done to the Transportation Act, the constitutional provisions which prohibit confiscation of property, and which protect the property of a railroad the same as all other property, will still remain in effect. Now, the fact is that the very narrowest possible interpretation of these constitutional provisions would not under present conditions warrant any general reduction of railway rates.

An argument made a year ago for general reductions was that the rates were so high the traffic could not move under them. This argument was based upon the fact that there had been an enormous decline of business since the rates were made. This argument, however, cannot now be used, because during the last eight weeks for which statistics are available the amount of freight that actually has moved on the present rates has been larger than the amount ever before moved on any rates in any eight weeks in history.

The right of the railways to earn a "fair return" upon their valuation, so long as their rates are not excessive *per se*, was not created by the Transportation Act, but by the Constitution as interpreted by the courts. The Interstate Commerce Commission has held that a "fair return" on the valuation of the railways under present conditions would be 5¾ per cent. In view of all past decisions it is most doubtful whether any federal court would hold that the railways could constitutionally be restricted to a smaller return than this. It also seems most doubtful whether the courts would hold excessive the valuation made by the Interstate Commerce Commission for any group of carriers. In the first nine months of the present year the railways earned a net operating income of only $529,400,000, or but 3.96 per cent upon their valuation. Under the ruling of the commission the railways were entitled to earn during this period a net operating income of $770,000,000, or 45 per cent more than they did earn.

The only logical conclusion is that the railways, not merely under the provisions of the Transportation Act, but under the provisions of the Constitution itself, are entitled to earn a larger return than they have been earning, and that if the state commissions, or the Interstate Commerce Commission, or Congress itself should attempt to make reductions of rates which would reduce, or even prevent an

increase of the present net return, the railways probably could defeat this effort by appealing to the courts. The present operating expenses of the railways, owing to the shop employees' strike and the high price of coal resulting from the coal strike, are abnormally high, and should decline and present indications are that traffic will continue to be heavy. Therefore, an increase of railway net operating income seems probable in spite of all the efforts which may be made by the radicals to compel unwarranted reductions of rates.

There is, however, a real danger in the situation. Until the Transportation Act was passed the policy of regulation systematically pursued was that of restricting the net return earned by the railways to the lowest point that would not result in actual confiscation. Under this policy the expansion of railroad facilities steadily declined. The result is that at present the railways are wholly unable to handle the traffic offered to them, and that as the country's production and commerce try to increase the inadequacy of transportation becomes constantly more acute. The adoption of the provisions of the Transportation Act represented an effort by Congress to establish a policy of regulation which would cause an adequate revival of railroad expansion. The repeal of these provisions would result in a return to the restrictive, "near-confiscation" policy of regulation which prevailed before government control and would inevitably prevent the revival of railroad expansion which is essential to enabling the railways to handle the country's commerce. The adoption of such a policy probably would not prevent the railroads from maintaining and substantially increasing the net return now being earned by them, but it would prevent them from making the increases in their facilities essential to enabling them to handle the country's commerce.

If the radicals who have been elected to Congress succeed in carrying out the program of railroad legislation they favor it will not in the long run make the financial situation of the railways any worse than it is now, or even prevent it from improving, but it will make the situation of producers and shippers constantly worse and worse. There are constitutional provisions which can be invoked to prevent general reductions of rates until the railways as a whole are earning larger returns. But there are no constitutional provisions which can be invoked to save farmers, manufacturers and other producers from the enormous losses which they will be caused if transportation continues to become more inadequate.

The radicals who have been elected to Congress are a menace to the railroads; but they are a far greater menace to the prosperity of those who elected them.

The Opportunity of the Mechanical Division

Less than a month has passed since the Mechanical Division of the American Railway Association announced its decision to hold only a business meeting in 1923. In that short time, however, conditions on the railroads have changed so greatly that it is certain if the Executive Committee were to meet now it would have far less reason for calling off next year's convention. Weekly car loadings have now decreased 50,000 cars from the high point reported three weeks ago. Bad order equipment has been rapidly reduced and the roads are entering the winter in much better circumstances than could be anticipated even at the beginning of last month.

This indicates that the handicap under which the mechanical department has been working, is being overcome and the officers will soon be able to give more time to their committee work. It would, of course, be difficult to make up for postponed committee meetings, but the value of reports does not depend so much on the number of meetings a committee holds, or the length of time it deliberates as on the ability and experience of its members. Individual papers on many subjects may be more valuable than the findings of an unwieldy committee. If the subjects which are of the greatest importance at this time could be referred to some of the leading mechanical officers, very valuable papers could be presented when the division meets next June.

In recent issues the *Railway Age* has called attention to the opportunity which the present railway situation offers for constructive work by the Mechanical Division. The problems that might be discussed are so numerous that it should be easy to arrange a program that would appeal to every railroad officer and to every road. The subjects that have been mentioned in previous editorials by no means exhaust the topics as is evident to anyone who comes in contact with the important every-day problems of the mechanical department.

For example, the American Society for Testing Materials has been exposing various kinds of iron and steel sheets to determine the relative corrosion of different materials. Where some of the common types of steel failed completely in sixteen to twenty-two months, sheets of different composition were all sound after forty-six months and 63 per cent were sound after sixty-four months. These results have such an important relation to selection of sheets for freight cars that the railroads should make tests to determine as quickly as possible whether the same decrease in corrosion will be obtained in equipment under actual service conditions.

Long locomotive runs as a means of getting increased utilization from equipment is another important subject in which the railroads are vitally interested. Some roads apparently are getting good results from increasing the length of runs; others have tried this practice and have given it up.

The railroads that are still waiting to experiment with long runs would benefit greatly if they could learn what factors have influenced the success or the failure of this practice where it has already been tried.

There is probably no road in the country which is not anxious to learn the results obtained with new types of locomotives now in service. What effect have radical innovations in design had on the cost of operation? What savings in fuel and in wages of train crews have been affected? What is the cost of maintenance and what monthly mileage can reasonably be obtained from these locomotives? The

Mechanical Division can perform an important service to the roads by presenting information on these matters.

Many roads have now and will have for some time to come large numbers of bad order freight cars. In some cases entire classes require extensive repairs or rebuilding. Methods of scheduling and systematizing this work have proved very effective in reducing costs. The Mechanical Division Committee on Scheduling and Routing Systems could make its report extremely valuable by outlining the best practices and showing the results that have been obtained from centralizing and systematizing car repairs.

It is of the greatest importance that these matters should be discussed before the Mechanical Division by the men who have the most thorough knowledge of the subject. It is immaterial whether committee reports or individual papers are submitted. The important point is that the Mechanical Division has an unusual opportunity to build up a program for its Chicago meeting that will be so constructive that it will give a new impetus to the annual gathering of the mechanical department officers.

The "Veri-Direct" Method of Loading Freight

"Very Correct" would seem to be a suitable designation for the new plan for checking the loading of freight into cars from freight houses, illustrated in an article on another page, which is in use on the Erie Railroad in Ohio. This plan has been described to us by C. G. Johnson, of Youngstown, whose name will be recalled as that of the author of an interesting prize article on loading freight which was printed in the *Railway Age* of November 26, 1915. Mr. Johnson's plan certainly seems calculated to call the blunderer to account, not only at every turn, but at numerous points between turns. The salient point in his story is that he is extending the use of his plan because it is profitable, and proves its profitableness.

Care Needed in Buying Used Machinery

As a rule it is doubtful economy for railroads to purchase second-hand machine tools. Almost certain loss will result if these tools are bought without extremely careful investigation and inspection. The truth of this statement is indicated by the experience of a railroad which was in the market recently for two turret lathes. An order was placed with a prominent manufacturer, but later cancelled when a dealer offered two second-hand machines at a considerably reduced price. The manufacturer was naturally desirous of holding the business, and looked up the serial number of the two turret lathes. It was discovered that the lathes had been working on three eight-hour shifts in a Canadian shell plant since 1914, and were decidedly the worse for wear. On learning this fact the railroad reinstated its order for two new machines, thereby displaying sound judgment. There is enough worn-out machinery in the average railroad shop without installing additional machines which have already given their best service. The difficulty with second-hand machinery is in detecting worn parts and determining how much usefulness may still remain. A reliable opinion cannot be formed without disassembling and inspecting practically every vital part of the machine, and even then, competent inspectors sometimes overlook serious flaws. Machine castings frequently warp in aging, so that the ways and other guiding surfaces get out of alinement. In other cases, machines are used in repetition work in which certain gears or parts are subject to undue wear, whereas the rest of the machine is practically new. Large industrial manufacturers do not consider it safe or a good investment to buy second-hand machinery unless they know all about it, and the railroads should be equally cautious, bearing in mind that "First use is best use."

Employees and the Public

Improved employee relations is intimately associated with improved public relations of the railroads. Indifferent employees, not properly trained and inspired, cause needless irritation and even anger on the part of patrons of a railroad. It is doubtless, also, one of several things that result in keeping the possible traffic of the roads as a whole to a minimum. This is emphasized in an article elsewhere in this issue, entitled, "Do American Railways Lack the Selling Sense?" Indifference and ignorance on the part of employees is directly chargeable to the managements. It cannot be corrected unless those in authority fully appreciate the fact that the directing of men is a highly specialized problem—the greatest problem confronting American railroads and industries today. Conditions change steadily and rapidly in this old world of ours and men cannot be handled today as they were even a decade ago. No field of endeavor presents greater possibilities than this. Changing an organization from a spirit of ordinary or average interest, or from a spirit of indifference, to one of intense loyalty and enthusiasm, has tremendous possibilities. What could not American railroads do today if this condition could be brought about? It can be done!

What Is the Future of Apprenticeship?

Industrial conditions are constantly undergoing change. This is a fact so obvious that its statement in the abstract seems hardly worthy of attention, and yet when its specific application close at home suddenly forces itself on the attention, its recognition comes with something of a shock. It is becoming evident that the conditions affecting apprenticeship in railway shops are no exception to this rule. Considerably less than a generation ago applicants for apprenticeship were so numerous that considerable selection was possible. As a result it became an established rule that sons of employees be given preference and the fear of an over-supply of mechanics led the labor organizations to take an active interest in limiting the number of apprentices. In the national agreement negotiated with the United States Railroad Administration these organizations succeeded in limiting the number to one for each five mechanics. But now it is becoming evident in many cases that there is no occasion for the application either of the rule giving preference to the sons of employees or that limiting the number of apprentices, for the reason that the sons of employees apparently do not consider the opportunities of apprenticeship attractive and other applicants do not present themselves in sufficient numbers to keep up the one to five ratio. This tendency is reflected in the increasing age limits for regular apprentices in newly negotiated agreements and in the complete removal of the upper limit in the case of helper apprentices. A number of questions are suggested by this situation that are worthy of the thoughtful attention of railway executives. Are the highly specialized processes of modern industry, paying comparatively high wages after short periods of training, more attractive to young men than the future offered by the railroad shops after a long period of training? If so, can the railroads successfully depend on the promoted helper and handyman for their future supply of mechanics? If not, how shall they modify

the conditions of railway shop employment to compete successfully with other occupations? Will it be possible to depend more and more on the specialist and less and less on the all-around mechanic? Answers to these questions are necessary before the railroads can formulate comprehensive plans for satisfactory shop conditions in the future.

Earnings in October

In September the Class I railroads reported a net railway operating income of $58,457,464. This compared with $87,606,375 in September, 1921. In other words, there was a decrease of $29,148,911 or 33.2 per cent. The reason for the decrease in net was an increase in operating expenses, shown by the size of the increase in expenses for maintenance of equipment—$16,262,268 or 15.7 per cent—to have been due to the cost of the shopmen's strike. Such of the monthly earnings for October as have been given out up to the present indicate that the October figures will show a considerable improvement over those for September but, on the other hand, it is rather unlikely that the October net railway operating income will come anywhere near equalling the October, 1921, figure which totaled about $90,000,000. Earnings for a number of typical roads follow:

NET RAILWAY OPERATING INCOME

Road	Oct., 1922	Inc. or Dec. compared with Oct., 1921	Ten mos., 1922	Inc. or Dec. compared last year
Baltimore & Ohio	$3,081,157	—$341,340	$15,572,377	—$3,121,317
Boston & Maine	624,244	—205,102	5,749,109	7,126,462
Chicago, Milwaukee & St. Paul	2,224,314	— 285,833	10,205,385	5,124,491
Gulf Coast Lines	294,568	84,274	2,317,922	554,126
Illinois Central	3,204,458	900,506	21,176,121	5,051,505
Lehigh Valley	Def.635,865	—1,746,799	104,967	— 3,719,266
Maine Central	162,150	—30,323	2,030,695	2,307,752
New York Central	5,362,344	—655,858	39,997,455	129,744
New York, New Haven & Hartford	1,121,631	—364,320	10,982,099	12,515,327
Pennsylvania Railroad	4,190,096	—1,964,140	61,245,197	31,615,398
Union Pacific System	5,406,573	—1,048,023	25,285,815	—4,690,288

Railway stocks have recently experienced some rather trying vicissitudes on the stock exchange. The *Railway Age's* average of 20 representative railway stocks was reported in last week's issue as being on November 21 at 66.67, or approximately 7½ points below the peak of 74.16 which was reached on September 12. Of course, rail stocks have not been the only ones which have suffered a decline in the past two months. The decline has been a general one. The rail shares seem, nevertheless, to have suffered a loss of some of their late popularity. This may be partly due to the fear of adverse legislation but there can be no question that the decline in their value and the drag on the recovery of that value on the exchange has been due primarily to the expected effect of the strike on earnings. It is unfortunate that the carriers—as in 1920—have been unable to realize more adequately on the peak business in October.

Utilize the Traffic Man

There is now more freight awaiting movement than the railways are able to handle. With the car shortage already the largest in history, the indications are that it will continue to increase as we enter the winter. With this condition there is now no necessity for the solicitation of additional immediate business and the best argument with which to solicit future traffic is to render the best possible service now. This suggests the importance of the employees of the freight traffic department concentrating their activities on the promotion of freight movement. Much can be done by personal calls on shippers to enlist their co-operation in loading cars to capacity and in releasing them, loaded or empty, in the shortest possible time. In many instances the traffic representatives can aid in devising ways of loading cars more nearly to capacity or more quickly. The problem of car movement is primarily that of keeping the individual car in motion. This requires intensive supervision of industry tracks, team tracks, side tracks and yards. Where the forces of the operating department are insufficient to provide this intensive supervision, traffic employees may be utilized to good advantage. They can aid the car-distributor. The public is now demanding that the railways move a traffic in excess of their capacity and the interests of all departments should be subordinated to the one objective of meeting this demand as fully as may be physically possible.

Facts on the Economics of Signaling

Some railway managements have been doubtful of the possibilities of effecting economies in operating costs by the installation of signaling equipment. The report of the committee on Economics of Railway Signaling, of the Signal Section of the A.R.A., abstracted in the *Railway Age* of November 25, page 983, contains facts worthy of careful consideration by such roads. For example, a study of 71 different distant control electric switch machine installations for the operation of outlying switches showed an annual saving of from $2,500 to $8,700 for each location, while one road saved $5,000 in operating costs each year from a $2,000 installation of automatic interlocking control apparatus. The report is so full of such data regarding the savings effected by automatic signals, automatic highway crossing protection and combined interlocking facilities, that railway officers confronted with the problem of increasing the capacity of certain lines may well give these figures serious attention. Better yet, a committee consisting of a signaling and an operating officer should be directed to make an extensive investigation of the possibilities of automatic signals, interlockers and outlying switch machines on congested divisions and the increase in track capacity that can be expected. As shown by this report it is possible to secure tangible evidence of the economies produced by signaling, and in view of the comparatively small cost of such studies it would appear advisable for the railroads to undertake such investigations as soon as possible while the recent congestion is still fresh in their minds.

Showing Equipment Rents

In last week's issue of the *Railway Age* some figures were given which showed that Mr. Ford's railroad, the Detroit, Toledo & Ironton, had for the nine months ended September 30, 1922, a net after taxes of $1,016,301, but for the same period, a net after rents of only $5,650. The September figure showed a deficit after taxes of $233,982. Net after rents for the month, through a typographical error, was shown as a net of $383,097. It should have been shown with a minus sign and as a deficit, which would, in addition, show that Mr. Ford's payments for equipment and joint facility rents ran in September at about $150,000. The editorial in which these figures appeared was not intended so much to point out the principal reason why Mr. Ford has thus far been unable to make his D. T. & I. property show the wonderful net earnings which we were all led to expect—because of the unusual amount of publicity which surrounded his purchase of the road—were going to be realized. They did point out the reason, to be sure, and in somewhat unmistakable terms, the reason being, of course, that the D. T. & I. is something of a slacker when it comes to having an adequate car supply. The intent of the note, however, was to

point out how much more adequate net earnings of a railroad can be shown if they are carried down as far as net after rents, or net railway operating income, instead of only down as far as net after taxes or railway operating income. In the D. T. & I. we have an extreme example to prove this contention. It should not be thought, however, that because it is such an extreme case it is not a proper one to use. It would be easy to quote figures of other and more typical roads which would bring out a similar relationship. Students of railway figures have been somewhat reticent in recognizing the effect that hire of equipment and joint facility rents may have on railway net. They should realize that these items may in cases be as important indexes as the operating ratio or other of the various figures which are usually given leading importance. All of which is further argument in favor of the railways reporting the net after rents figure in their monthly and annual statements.

The "Peak Load" and Capital Expenditures

THE CRUCIAL TEST of the capacity and efficiency of a railroad's plant and organization is applied when it handles the largest traffic which it can move. This tests the amount of business that, under the conditions existing, the railroad can handle. It also tests the economy with which under the conditions existing, the railroad can operate. Therefore, when a railroad has just handled the peak load of business is the best possible time thoroughly to study its plant and organization and locate the limiting factors in the plant and the weak spots in the organization. Of course, what has been said applies to any business concern or man. The real test of a man comes when he is called upon to meet the greatest demands on his talents and character.

The railways of the United States recently have had offered to them the largest freight business in history. The peak load of their annual business usually comes in the fall. In the eight weeks ended on November 11 they handled a slightly larger freight business than in any previous year. The total carloads of freight loaded and moved in the eight weeks ended November 11, 1920, was 7,863,858, while in the eight weeks ended November 11, 1922, it was 7,880,286. The inequality between the total demand for and the supply of transportation was, however, greater than ever before. Some railways could have handled more traffic, but a large majority moved all the freight they could and still fell far short of meeting the demands. Some railways earned more net operating income while handling the peak load this year than ever before. A large majority fell far short of equalling their best net earning records of previous years. The principal explanation of these facts is that some railways have made relatively greater improvements in their plants and organizations within recent years than others.

All indications are that for some time to come the demands upon the railways for the movement of freight will be extraordinarily large. The seasonal decline of business has come, but it has come later than at any time in recent years, and the decline has thus far been less than in any recent year. Now that on most lines the peak load has passed for a while, it behooves the management of every railroad to make a careful survey of its physical property and organization to determine, as indicated by the way the peak load has been handled, exactly what are the conditions on the physical property and in the organization which have most seriously interfered with the handling of the traffic, and handling it with the greatest practicable economy.

If the limiting factors have been conditions of the physical property, plans for capital expenditures should be so made as to remedy, first, the particular conditions of plant which have interfered most with handling the business, or handling it with maximum economy. Some railways have available only very small amounts of money for physical improvements. Others have available relatively large amounts. Experience shows however that the way in which new capital is invested is almost, if not quite, as important as the amount invested. Nobody can study the capital expenditures made and the operating and financial results obtained by different railways within the last ten years without concluding that some railways have secured much larger results in the form of net earnings from given amounts of capital expenditures than others. An eminent American economist has said that the ability to make investments wisely is the rarest form of business ability. The present earning capacity of most railways has been very largely determined, and their future earning capacity will be very largely determined, by the judgment shown in making capital expenditures.

Has the handling of the peak load this fall shown that the principal limiting factor in a railroad's capacity and operating efficiency has been inadequacy of equipment, or inadequacy of tracks, terminals, roundhouses and shops? There should be a steady increase in ton-miles for each locomotive actually in service, and this increase should be at least proportionate to the increase in tractive power. Do the statistics of a railroad show that in handling the peak load the increase in the ton-mileage per locomotive was not proportionate to the increase in average tractive power per locomotive within, say, the last five or ten years? If not, was this due to the condition of the locomotives, or to the fact that the improvements which have been made in track capacity or engine terminal facilities or in signaling or in operating methods have not been sufficient to make it possible fully to utilize the increased tractive power? If permanent structures and operating methods have not been so improved as to make possible full utilization of increased tractive power, it is evident that what is needed are improvements in other facilities and operating methods. Many railways in the past have acquired better and more powerful locomotives faster than they have improved the facilities and operating methods for utilizing them, and in consequence part of the increased power has been wasted. The conditions on such railways obviously suggest the need for capital expenditures and operating improvements which will give the locomotives an opportunity to do all the work for which they were bought.

A shortage of transportation is always reflected in the form of what is called a "shortage of cars." But is your railroad really short of cars? Do the statistics show an increase in average miles per car per day and in average tons per loaded car within recent years? The real test of freight car efficiency is the average number of ton-miles per car per day when the peak of the business is being handled. Any railway whose statistics do not show an increase in ton-miles per car per day for cars in serviceable condition in a period of maximum traffic is not increasing its operating efficiency as much as is practicable. This may be due to inadequacy of power, to inadequacy of terminals, to failure to induce shippers to increase the loading of cars and expedite loading and unloading, or to lack of supervision which will keep every car moving.

Investigation may show that the capacity of an entire division of a railroad, or even of the entire railroad is limited by congestion upon a particular part of the line. This congestion may be due to the existence of a stretch of single track the demands upon which exceed its capacity. If this is the case, should this part of the line be equipped with automatic block signals or double tracked? Often the installation of an automatic block system on a single track line will so increase its capacity as to postpone the need for the

larger capital expenditure that would be required to double track it.

Perhaps the limiting factor in both capacity and economy of operation is a grade the reduction of which would make it possible to handle longer trains over an entire freight division. Of all the improvements which have been made in the railways of the United States, none have contributed so much toward enabling them to increase their capacity with a minimum increase of both capital and operating costs as those which have enabled them to handle more tons per train. There have been great differences in the extent to which different railways have made such improvements. Statements are often made to the contrary, but nobody with a knowledge of the underlying facts can study the statistics of the various railways and escape the conviction that there are still many railways which could largely increase their capacity and reduce their operating expenses by concentrating their efforts more upon improvements in their physical plants and operating methods which are needed to increase the average train load.

The railways in 1922 have made much larger capital expenditures for equipment and additions and betterments than they did in 1921. Information which the *Railway Age* is gathering and which will be published in a later issue shows that they are planning to make relatively large capital expenditures in 1923. The traffic demands, however, are so great as to make it evident that no amount of capital expenditures which can be made will put them abreast of the demands of commerce and of the necessity for more economical operation for years to come, unless capital expenditures shall be made only after the most careful study to determine where the investment of a given amount of money will produce the very greatest possible result. This means that it is almost as important as it was during the war to restrict to the lowest practicable minimum the investment made in improvements which will not increase capacity or reduce the cost of operation, and to study with the utmost thoroughness the experience recently gained in handling the peak load so as to determine as accurately as is humanly possible just what improvements will yield the greatest results. Each individual railroad is an enormous existing property with an enormous existing investment. The vital problem to be solved is what particular improvements will have the greatest effect in increasing the capacity of the property already in existence and in increasing the net return earned upon the existing investment.

Under such conditions as have prevailed in the railroad business for the last ten years it has required not only rare knowledge and judgment to determine the exact places where capital expenditures should be made, but unusual moral courage to make them. There is always real danger that a costly improvement will not produce the effect expected upon the net return earned. Examples might be cited of large investments which have been made in individual railways within the last ten years which have not increased their ability to earn net return as was expected, and which have so increased fixed charges that they have almost ruined the railroads making them. But in a country such as the United States where conditions change and production and commerce increase with great rapidity, it is even more dangerous for a railroad management to lack the courage to make capital expenditures which are needed and which it is financially able to make, as to make them and take the risk that they will not turn out well. There are few railroads so poor that they cannot raise some capital to invest in improvements. In many cases poor railroads have slowly but surely become rich because their managements have shown rare wisdom in selecting the exact improvements which would pay the best, and courage to go ahead and make them as rapidly as they could.

The greatest increases in capacity and economy of operation always have been and always will be mainly due to wise and courageous investment of capital, and the experience of recent months should be the best possible aid to each management in determining where, and in what facilities, such capital as is available should be invested.

Don't Wait Until Spring

If present indications form any index of what may be expected next year, the railways in common with other large employers are facing a shortage of labor. At the same time many roads are planning large programs of improvement work for next season which will make their requirements for labor greater than in the year now closing. This condition points to the necessity of reducing next summer's peak demands for labor to the minimum. This can be accomplished by doing as much work as possible during the winter and by starting that which cannot be done during this season as early in the spring as possible.

With reference to the first suggestion, the railways are the victims of a long-established, self-imposed habit of reducing their forces to the minimum during the winter and of crowding all but the routine patrol into a summer peak load.

When there was a large surplus of labor this was the easy and perhaps the economical thing to do, but as this surplus has disappeared and maintenance-of-way work has become more complicated, this economy has vanished. Much maintenance work is admittedly seasonal in character and can be done only when the frost is out of the ground, but those roads which have really studied the problem have found that more work can be done during the winter than is commonly performed. Furthermore, much of this can be done with little or no addition to the forces and thereby constitutes a clear gain. In view of the indications that the railways will not be able to secure all of the labor necessary for their improvement programs next spring, and the further indications that the traffic and the earnings will continue at a high point throughout the winter, it would seem the prudent course to make a survey of that work which can be done as economically now as in the summer and get it out of the way in order that forces which are thus productively employed throughout the winter may be diverted to the strictly seasonal work at the first approach of spring weather.

The second suggestion, that of starting the seasonal work at the earliest opportunity, may at first seem premature at this time, but unless plans are initiated promptly the program will not be perfected and materials and forces assembled at the appointed date of starting. Some railways already have their plans for next year's work well in hand with the intention of launching them as early as possible, and thereby securing their quota of men and materials. In times of shortage of labor other roads, must of necessity, take what is left, to their disadvantage.

Many railways have suffered in recent weeks from a lack of facilities which have not only limited the amount of traffic which they could handle but have increased their operating costs. Much construction work of necessity interferes to a greater or less extent with operation and the longer the period over which this work can be distributed, the less is the seriousness of this interference. The policy of starting maintenance-of-way work early is therefore not alone one of economy affecting the maintenance-of-way department, but it is likewise to the interest of the operating department that this work shall be so handled as to decrease the interference with traffic to the minimum and to bring the improvements to completion at the earliest possible date in order that they may be utilized.

Letters to the Editor

[The Railway Age welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

The Car Distributor

[illegible], Mo.

To the Editor:

I have had a number of letters from readers of the *Railway Age* relating to my communication entitled, "Get Better Service from Freight Cars," which appeared in your issue of September 9, page 458. You may be interested in having some additional information which is suggested by questions which have been propounded to me.

Any railroad employee or officer who is in the operating department knows full well that car distribution everywhere is a feature of railroading which is given very little attention, as it is supposed to be a side line of dispatching trains; a duty divided between yardmasters, trainmasters, agents, yard clerks and others. When a car shortage occurs these people are appealed to to get busy and keep cars moving, and to unload; but you very seldom hear any one say anything about distribution, and what relation it has to the shortages, movements and release.

From ten years' actual experience and experiments on the Chicago, Burlington & Quincy and from observations on about all the important railroads in the United States during my several years as inspector for the A. R. A., I found that the thing uppermost in the mind of everybody was to hurry release of cars, obey car service rules when practicable, and to hurry movement; but never was anything said about the distribution.

The car distributor is like the army officer in the field. If he is competent, he distributes his soldiers where he will get 100 per cent service out of them; the same with a car distributor. If he is a competent, experienced man he will get 100 per cent service out of the cars. Please bear in mind that if a car is delayed at a station; if two cars are furnished on an order for one, or a car furnished where one is made empty or none furnished because the yardmaster failed to switch it out; or a coal car not moved because the local would not take it, or an empty delayed on a blind siding because no one knew it was there, or a man received two cars and another none when they had ordered the cars at the same time, it is not the fault of the yard clerk, or of the local train crew; nor of the agent or any other man who is usually blamed for such errors or mishandling of cars; it can be traced back to the man behind the gun, the car distributor.

A car distributor who is burdened with a lot of clerical duties which have nothing to do with the distribution of cars, is like a race horse trying to run a race with a load of coal hitched on behind. It can't be done.

Unshackle the car distributors. Give them a chance to distribute cars and watch moving trains and to take advantage of all means available to know of every car on their division and to keep informed of all the orders; then you will have 100 per cent service, and not before.

There are several ways of distributing cars, but the best way is by dividing the cars into seven classes, and then to follow up each class incessantly. The classes are: (A) Box cars; (B) coal cars; (C) stock cars; (D) flat cars; (E) furniture and automobile cars; (F) all foreign cars when not pooled with system; (G) miscellaneous cars. The tide of each class should be handled separately to avoid repetition when changing or canceling or modifying the tide on one class of cars.

The car distributors should be high class, well educated men with several years of practical experience.

A competent car distributor may handle 10,000 cars a day and distribute and fill orders for a thousand cars to load; but often the record is far below that, and as a rule, it will be found that he has numerous other duties to perform so that he is not able to do justice to the work. Each railroad has a different way of distributing and most of them have long cumbersome, old-fashioned reports calling for a lot of unnecessary information, entailing much unnecessary clerical work. With competent distribution will come less delay and less trouble for demurrage bureaus. By having one man responsible it will take a big load off the division and general officers and do away with the present custom of "passing the buck."

H. B. Dreyer.

The Service of Supply

Portsmouth, Va.

To the Editor:

The possibilities of enormous savings to be made by a properly organized supply department on railroads are thoroughly outlined in H. C. Pearce's article on "Functions of Departments of Purchases and Stores," published in your issue of September 15.

The simple statement that stock has been reduced eight and one-half millions of dollars may not astonish a railroad executive, but to a business man or to a banker to whom I showed this article, a saving of this kind is astonishing, and savings of this kind are what many of the railroads in the United States need most. Interest on eight and one-half million dollars is $500,000 a year. The reduction in stock means that this amount does not have to be handled, saving another half-million, as the handling charges on most roads are more than six per cent. The loss through deterioration, material becoming obsolete, etc., can only be approximated, but it can be safely stated that the C. & O., or any other railroad reducing stock eight and one-half million dollars will save one and one-half million dollars a year.

During the 20 years I was with railroads, from clerk to general storekeeper, pay-roll comparison, more than anything else, stunted and handicapped those railroads whose executives did not have the vision to know what a properly organized supply department could accomplish. Some roads never had a chance properly to organize for this reason. When reductions are made in stock, and the supply department is not properly organized and strengthened, storekeepers, as well as other officials, know serious delays are to be encountered, and storekeepers dread the criticism of being out of material and delaying the work. They know they cannot make an intelligent reduction of stock and still give service. If properly organized, with stock books properly kept, and given increased supervision, which is absolutely necessary with decreased stock, there is no reason for any complaint about shortage of material. Executives do not appear to realize that it takes money properly to operate their stores to secure economical reductions in stock.

A bank will take every precaution on a loan or investment, yet time and again I have known thousands of dollars to be invested in special materials on railroads without mature deliberation, and this material lay on hand for years and was eventually scrapped. There is need for strong and able men in your supply departments.

The principles in this article, and various other articles written by Mr. Pearce are not visionary, but entirely prac-

tical. There is nothing visionary about Mr. Pearce. He is deadly in earnest at all times. He talks and writes straight from the shoulder. Twenty years ago he went to the Southern Pacific, and these same ideas and principles were put in use. Anyone who has worked under or knows Mr. Pearce, knows that this meant that the smallest detail was carried out to the letter. That is the way he has things done. The things that some supply men consider theory are practical to Mr. Pearce's organization.

When railroads consider, as other corporations do, that every dollar invested in material that is not necessary is tied up capital, they will then have reached a common business understanding. Material is cash, but few railroads regard or control it as such.

D. D. CAIN,
Southern Brass Works, Inc.

Who Are the Employees' Leaders?

ITHACA, N. Y.

TO THE EDITOR:

I was in a prayer meeting once, and one of the striking things that I heard was the advice of an old saint to the younger ones to take care, in confessing their sins, to seek diligently to confess the right ones—the real sins. "We are very likely," said he, "to confess something which we class as needing confession, but which after all is not the great fault which God is requiring us to correct." I thought of this as I read your brilliant editorial of November 4 on dealing with the labor problem. You will perhaps say that this is not a fair criticism; for you do, in the last two columns of that article, confess (for the railroads) such grave sins that one can only wish that the editorial, in double leaded type and red border, could go to every railroad director in the land.

The thought that you had omitted to put your finger on the spot most needing attention came to mind in connection with the paragraph on letting the employees organize their "company unions" without being dictated to.

But what will the men do when not dictated to?

The crucial problem is the choice of leaders. Taking warning from innumerable past mistakes, one must feel impelled to warn every group of employees to select as leaders those of their comrades whom they have known for a long time, who have worked for the road a long time and who are well known generally for their integrity, fairness and conservatism.

In thus warning against giving preferment to the short-sighted, the inexperienced and the loud-mouthed, I may perhaps lay myself open to the accusation of squealing before I am hurt; but it is so easy to be fooled by men whose chief qualification is their gift of gab, and it is so difficult to get modest and solid men to do the work, sometimes unpleasant, connected with leadership, that I cannot believe my fears are wholly groundless.

Every division superintendent has a duty to keep as closely as possible in touch with his employees, of different classes, to see how they use their new-found freedom. He is, indeed, debarred from dictating to them; but he must, of course, have an intense interest in seeing that the best and most experienced of his men are at all times fully alive to their duty to guide the younger ones, and the newcomers, in every situation where there is a liability to go wrong. About 99 per cent of our labor difficulties are due to the carelessness with which the rank and file have selected the wrong men for leaders. Let every man do his own thinking!

The fully alert railroad president will, *of course*, see that no superintendent, or other officer negotiating with employees, ever allows the employees' spokesmen to outdo him in courtesy, fairness or patience. R. R. S.

Train Order Form 19

SAN FRANCISCO, CALIF.

TO THE EDITOR:

I am much interested in the article in the *Railway Age* of September 23, page 553, on "Train Orders by Signal Indications," by A. R. Fugina, but I cannot quite agree with Mr. Fugina in his last two paragraphs, where he says that the "19" order for restricting the rights of trains represents one of the greatest advantages of an automatic signal system. The use of the "19" order for restricting trains does not represent "one of the greatest advantages of an automatic signal system." This form may be used with equal safety without such a system. On January 1, 1923, one of the largest railway systems in the United States will, under its new rules, permit the use of the 19 form for the restriction of trains on every mile of its track, outside as well as inside the automatic signal system. There will be a clearance check restriction, and a few minor restrictions; but these will not require the use of Form 31 for more than three per cent of the orders. The *unrestricted* use of the 19 order on single track is unsafe and dangerous.

The movement of trains by train order and time-table is entirely independent of the automatic signal system. All the automatic signal system ever did to extend the use of the 19 train order was to put some additional marrow in the backbone of some who did not understand the real difference between the two forms for restricting purposes.

I am a firm believer in the system of train operation by signals if there are adequate signals and provided some means can be arranged for eliminating the equality between a fast passenger train and a 75-car freight.

With the train-announcing scheme referred to by Mr. Fugina the operator and dispatcher must see the actual movement of the trains, or the result will soon be a blockade. Wireless communication between dispatchers and train crews would be of great value in preventing blockades.

How about permitting trains to do station work, or work extras to work under protection of a flag without holding an opposing extra or other train at the next station (absolute permissive system) or at the home signal intermediate between stations (positive system)? It sounds nice to say that trains will be equipped with portable telephones, but when it becomes necessary to have quick action in case of unexpected delays by a leaky engine or a slippery rail, and the trainmen have what they think is a reasonable excuse for not hooking up a portable set, I am afraid some of our non-operating friends are going to be disappointed.

The trouble with the train order system on some roads has been in overloading a first-class dispatcher with entirely too much territory and requiring him to do routine train sheet work for the benefit of the clerical force.

There is nothing wonderful in the operation of trains by signals alone on double track, as there are comparatively few train orders necessary and train dispatching is a joke.

WM. NICHOLS.

[The large railway system referred to by Mr. Nichols is, no doubt, the Southern Pacific. The rules defining the restrictions on the use of Form 19 which that company proposes to put into effect on January 1 are as follows:

The "19" train order must not be used in the following cases:

When a train order restricting the superiority of a train is issued for it at the point outside of block signal limits where such superiority is restricted, unless it be its initial station.

For a train order to be delivered to a train at a point not a train-order office, or at one at which the office is closed, the superiority of which is thereby restricted (See Rule 217); or for restricting orders sent direct to train and enginemen by telephone.

To restrict a train which has been cleared or the engine of which has passed the train-order signal (See Rule 219).

Where it is necessary for train dispatcher to know before authorizing its use by an inferior train, that the order has been delivered to the superior train.

When it is apparent that train orders are to be received without stopping, train order offices must be passed at a moderate rate of speed.

Transportation Department at Syracuse

Syracuse, N. Y.

To the Editor:

Your editorial in the *Railway Age*, November 4, page 827, which commented upon the recent appointment of John S. Worley as professor of transportation in railway engineering in the University of Michigan and the establishment of a Transportation Department, has been noted and is commended.

For your information, in addition to the Chair of Transportation at Harvard University made possible by James J. Hill, there was also established in 1920 in the College of Business Administration, Syracuse University, a Chair of Transportation made possible by a gift from H. H. Franklin, the Syracuse automobile manufacturer. This chair is filled by Dean Charles Lee Raper, who has built up 11 courses dealing with the economics of transportation. The aim of this specialized work is to furnish men with the economic background necessary in order that they may later deal with transportation problems intelligently.

From your editorial we gained the impression that this school might have been overlooked.

Wayne E. Butterbaugh,
Associate Professor of Transportation.

Why Not Employee Relations Departments Too?

New York.

To the Editor:

The inauguration of special departments to assist the patrons of a railroad is concrete evidence of the railroads' efforts to render intelligent and effective first-aid to those in difficulties—perhaps in locating a lost shipment, or in obtaining settlement of a claim, or possibly in appeasing a passenger who feels that the attitude of a ticket-seller or trainman, or the service in the diner is not all that might be desired. Briefly, it is a centralization into one department of all complaints and dissatisfactions.

Now let us go behind the scenes, as it were, and consider the reason for establishing such bureaus. If the service rendered were all that could be desired, would it be necessary to maintain such organizations? May not public relations work on the railroads be boiled down to the axiom, "If our employees fail you, tell us about it." Going to the heart of the situation, and treating the cause rather than the effect it is first of all necessary to restore the loyalty which was once so conspicuous on practically every railroad. By this statement, we are not attempting to disparage in any sense the great majority of railroad men. On the other hand, it does not require a very long conversation with the average railroad worker of the strictly union class, and especially among the shop and track laborers, to receive the information that "the presidents and directors are a lyin', thievin' bunch of grafters," or "the railroads are rich, why shouldn't we take all we can grab." Again, "what do I care for the company, so long as I get all that's comin' to me," and "why should I work my head off when the big bosses spend their time in a private car ridin' to Chicago to cut my pay still lower?"

It is hard to counteract such a line of thought. Publicity through the daily press will accomplish little. In fact, every editorial and news-dispatch at all critical of the unions merely serves to further antagonize these men, and to deepen their belief that "the executives, through the bankers and newspapers are tryin' to bust the unions." Obviously, the trend of thought above depicted is encouraged, and in fact originated by the labor union periodicals, with their insidious editorials and vulgar cartoons portraying labor as the "martyrs" who wealth," or words which convey such an expression to their unthinking readers. It is sometimes amazing to understand how apparently self-reliant American men can "fall" for such stuff, and yet the fact remains that they have fallen, are falling, and will continue to fall for it unless the companies take some active steps to counteract the influences swaying them. Fortunately the sentiment indicated by the above quotations are probably not typical of the great majority of railroad employees. Yet, a few men with such feelings can do a lot of damage. It is easier to drag a man down than up, and the effect of such language on the auditors is not helpful, to say the least.

What are the railroads doing individually to correct these growing symptoms of disinterest in the company's welfare?

We know of one fairly important system where a truly remarkable example of loyalty is displayed by the shop foremen and higher officers of the motive-power department. the company's shops to be repaired by employees during working hours with company tools and equipment. An amusing incident in this connection occurred a short time ago. A bicycle was brought in by a certain officer, who instructed a mechanic to make a new part to replace a worn-out one. While the job was not a particularly difficult one, it would have consumed over two hours time, so the employee stepped up town, purchased the necessary part for 30 cents and returned to the shop. Placing it on the wheel, he returned the bicycle to the official later in the morning, saying nothing These men bring their motor-cars and children's bicycles to slave that the "capitalists may increase their ill-gotten about what he had done. It is not the purpose of this article, however, to analyze the reason for the man's action—whether he was too honorable to steal the necessary material, or too lazy to make the required part himself. If such instances occur at one point, it is not unreasonable to assume that similar happenings are practiced elsewhere.

We have pointed out, first, that the attitude of the employees in general is not all that it should and could be; and second, that the sense of duty may not be as strongly stressed by those in authority as it might be.

What means are available for correcting such conditions?

Some time ago, we mentioned in an article in the *Railway Age*, the desirability of a closer co-operation between management and employees, with committees which would gather periodically merely for a "get-together" to discuss affairs. The advantages would be far-reaching. A closer association between management and employees (and by employees, we do not mean national unions) would seem to be the first and most effective step, toward improving the esprit de corps.

But of all the opportunities afforded the railroads for improving morale, none is greater than the employees magazine. It is surprising that so few companies, comparatively, have thus far taken advantage of this admirable agent. The value of these periodicals is inestimable. There are many arguments in their favor, of which it may not be amiss to summarize the following.

(1) Improves morale. (2) Provides a point of contact between management and employees. (3) Instructs employees in the importance of their duties, and the relationship thereof to the work of other departments. (4) Offers an opportunity for the real men to express themselves and make known their ability (not necessarily as writers, but as thinkers). (5) Affords a clearing-house for worthy suggestions, by which the employee may benefit himself, as well as the company. (6) Allows the company a means of contradicting the misstatements in the union publications. (7) Makes possible a means for disseminating publicity favorable to the railroads, as such a magazine would be read by the newspaper editors along the line. (8) Pays its own way (by advertisements). (9) Saves money for the company and earns money, by encouraging from employees (a) pep, (b) ideas, (c) loyalty, (d) interest, (e) economy. (10) Keeps readers (officials and

men alike) in touch with what is being accomplished by the company.

Recently, another step has been taken by several roads, in an effort to keep in closer touch with their employees, in the creation of personnel managers, or any of the several titles which cover a similar range of duties.

To every official is offered the opportunity of doing his bit, however, in the way of increasing the initiative of those under his supervision. It is reasonable to assume that many employees could, if properly encouraged, offer some broad, constructive suggestions in the interests of the company. The story goes that an employee of a certain system offered several thoughts toward improving the road's service, and increasing revenues in some obviously possible ways, but was met by a rebuke from the vice-president, that such suggestions were only acceptable when advanced by officials of the road, and that this was the first time in the recollection of the officer in question that any employee had ever taken such a liberty upon himself. There is no doubt but that many employees have originality, plus ambition, and that only the proper encouragement is necessary to apply this to the company's advantage. The B. R. & P. has shown its progressiveness by offering cash prizes for the best suggestions.

FRANKLIN SNOW.

Echoes of the Recent Strike

CHICAGO.

TO THE EDITOR:

As the echoes from the recent strike of the shopmen and allied crafts are reverberating, I am wondering if any good will result from the struggle or if the losses to both sides will be in vain. Is it possible to make an entry on the profit side of the ledger.

In dollars and cents, there cannot be. Even by working overtime and on holidays at time-and-one-half, the men cannot regain the stupendous losses in wages as a result of their self-imposed idleness. Neither can the railroads recoup their losses sustained through idle equipment, destruction of property and the inefficiency of a great majority of those who took the places of the strikers. Nor can the public, the innocent third party, regain the drainage on its resources through the inability of the railroads to transport the commerce of the nation promptly from the producer to the consumer, thus resulting in the loss of millions to the producer for products unsold and to the consumer in higher prices for the products consumed. Consequently there seems to be no immediate or concurrent good resulting from the strike.

Without thought or reasoning man is very little above the level of the brute. The swine feasts upon the acorns beneath the oak tree but never looks up to see whence they came or whether there be any more to fall. The stampeded herd follows its leader over the precipice to destruction on the rocks below. The man who does not think for himself is contented as long as the physical nature is satisfied but is as easily stampeded and led to his destruction as the beasts of the field.

I was a striker once myself and have been the third party in other strikes, and it is my opinion, based on actual experience as well as observation, that only a small minority of those involved in any strike really and truly desire one or have a real plausible excuse, from a personal standpoint, to go on strike. Then why does the vote usually show an overwhelming majority for a strike? Simply for the reason the men do not think for themselves or weigh the cost but follow the universal feeling or impulse that to vote negatively is an evidence of weakness and cowardice and liable to subject them to ridicule by their fellow men. The emotions of the herd become predominant over the reasoning faculties of the individual and the stampede is on.

Labor has always maintained that its right to strike against unfair wages and unjust working conditions is inalienable. But let us analyze the meaning of the phrase and see if this is true. As strikes have been conducted in the past, they mean more than the peaceable cessation of work when wages and working conditions are unsatisfactory. No one will deny the worker the right to quit work, in a peaceable manner, when he feels that he is not obtaining the pay that he considers his labor worth or that his environment is not as pleasant as he would desire; but when he enters into an agreement, or legally speaking, a conspiracy, with other co-laborers that all will cease work at a given moment, he is then beginning to infringe upon the rights of others and thus puts himself in opposition to the principles of our government. If the concerted movement would stop with the cessation of work he might still be within his rights to a certain extent, but they do not stop there. The striker, in leaving his work, does not renounce his claim to the position he leaves, but, calling it his own job, uses every means in his possession, even resorting to violence in many cases, to prevent another from doing the work he said by his actions in quitting that he would not do. Thus the rights of the public to an uninterrupted production or distribution and the right of a man to work where he wills are infringed upon and there is where the government steps in and calls a halt.

This to my mind is the reason for the failure of almost every strike of any magnitude. Our government would cease to exist did it not protect the rights of one against the encroachments of another.

Ask those who have gone through a strike, remaining idle for weeks and sometimes for months, their savings, accumulated by thrift and self denial, exhausted, if strikes pay, if they would be willing to go through another for the same cause, and quicker than they voted "yes" before they will say "no." Circumstances have caused them to do some thinking for themselves and they will think more for themselves in the future than they have allowed others to think for them before.

Railroad labor had been led to believe, through agitation and propaganda from those in authority in each craft and through repeated failures of local strikes, that more could be accomplished through a nation-wide strike, but it is fortunate for the country and labor itself that the shopmen's strike did not include all classes of railroad labor. It is true that our transportation system would have been paralyzed temporarily, but the ultimate result would have been the same, the triumph of our government. The end of the shopmen's strike was not the triumph of the railroads but of the government, and while the losses have been shared alike by the strikers, the railroads and the public all have gained in the awaking of a new consciousness and we find labor coming to its senses and the shadow of an impending national paralysis of our transportation system that has been hovering over the country since 1916 is being dissipated by the return of reason to her throne and the banishment of radicalism from the assembly hall. No stronger indication of this state of mind can be found than in the action of President Lee of the trainmen in declaring that henceforth his organization would stand aloof from all entangling alliances with other organizations and fight its own fight alone.

If then, the strike has taught men to think for themselves and to appreciate the fact that our government exists of, by and for the people, that each has rights upon which the other cannot encroach and that reason, aided by the golden rule, is the best arbiter of all differences, the losses sustained through the strike will be as "bread cast upon the waters."

AN EX-RAILROAD EMPLOYEE.

A General View of the Structure from the South Side

Philadelphia & Reading Builds 46-Arch Bridge

Steel Centers Shifted by Floating Adjustable Traveller at Susquehanna River Crossing at Harrisburg, Pa.

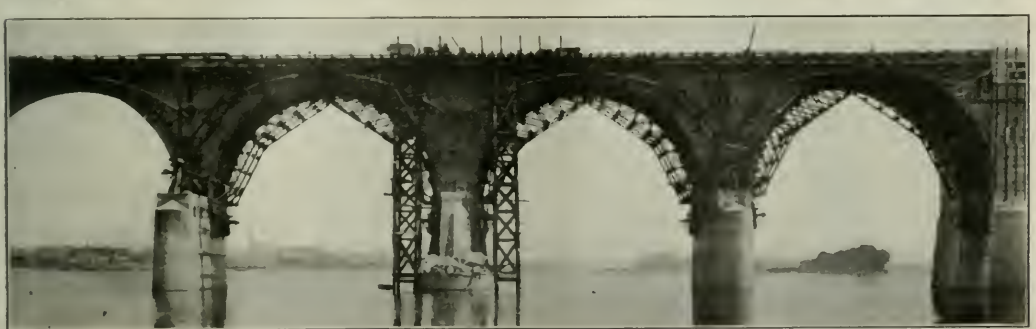
By Charles H. Hitchcock
Assistant Engineer, Philadelphia & Reading, Harrisburg, Pa.

THE PHILADELPHIA & READING'S new arch bridge over the Susquehanna river at Harrisburg, Pa., has reached its second and final stage of construction, traffic having been transferred to the completed southern half on July 11 of this year. The bridge is located on the Philadelphia, Harrisburg and Pittsburgh branch of the Philadelphia & Reading connecting the Lebanon Valley branch at Harrisburg with the Western Maryland at Shippensburg, Pa. An article on the traffic conditions necessitating this change and also descriptive of the design, etc., appeared on page 869 of the November 19, 1920, issue of the *Railway Age*.

The new bridge replaces the original single track 23-span wrought-iron, deck truss bridge built in 1890-1891 by Coffrod & Saylor, its total weight being 5,551,000 lb. The pier masonry of double track was built by Nolan Brothers, Reading, Pa. The original truss spans were 149 ft. 4 in. center to center of end pins, 24 ft. 9 in. center to center of upper and lower chords, and 9 ft. 9 in. center to center, provision having been made for a third truss for double tracking although this was never constructed.

New Structure Has 46 Arches

Bridge No. 8, as the river bridge is designated, will be a double-track, reinforced concrete structure, 3,507 ft. 9 in. long and consists of 46 semi-circular arches with a clear span of 66 ft., and a width between railing panels of 31 ft. 6 in. The bridge, which is constructed on the existing alinement and grade, is 54.65 ft. above water level at the eastern pier and 79.15 ft. at the western pier with a gradient of 0.7 ft. per 100 ft. The old piers were encased in concrete and were 152 ft. 6 in. center to center, the encasement being not less than 18 in., giving a thickness at the springing line of 11 ft. 6 in. These old piers were built in range work from foundation to coping of Clearfield County sand stone laid with cement.



Method of Supporting Upper Chord of Old Trusses to Allow Placing of Centers

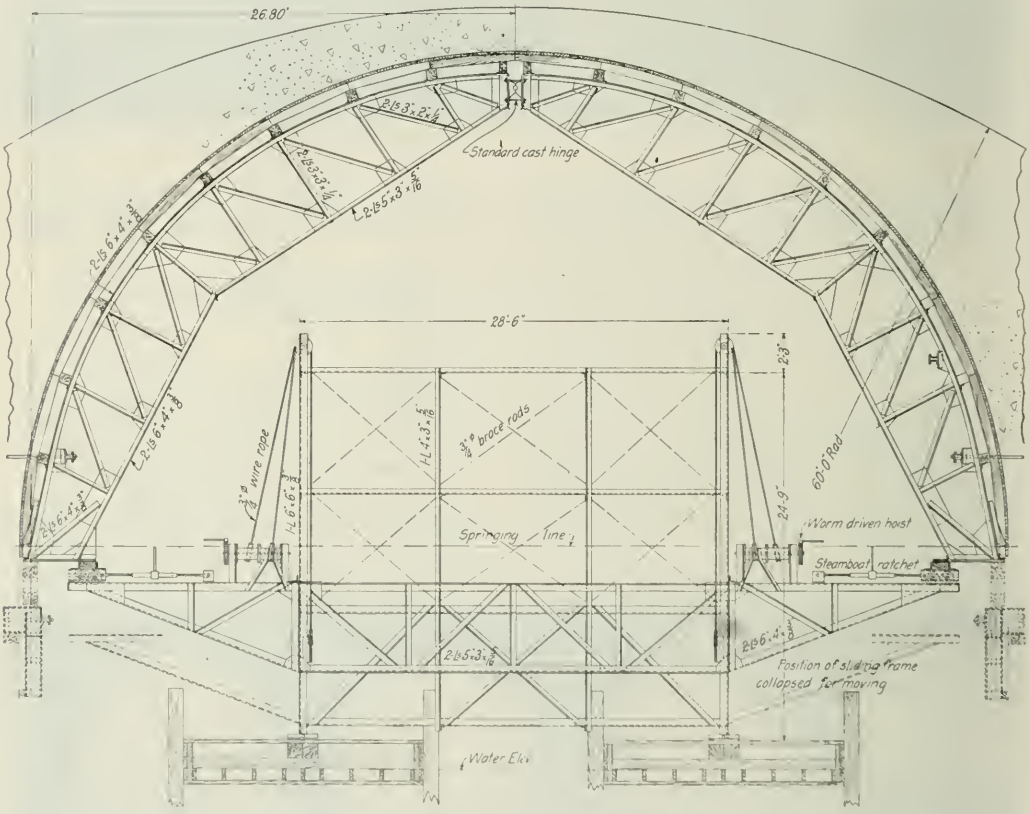
The encasement is thoroughly reinforced and anchored to

the old masonry by means of bolts 3 ft. 6 in. long with 4-in. by 4-in. by ¼-in. plate washers, set in the masonry about two feet. New intermediate concrete piers were constructed between the old piers, making the spans 76 ft. 9 in. center to center, with a thickness of 9 ft. at the springing line. All of the piers in the river have semi-circular noses on both ends with a batter of ½ in. per ft. on the downstream end and 1 in. on the upstream end. The sides have batters of from ½ in. to 1 in. per ft. and were constructed with six recesses on each face to carry supporting brackets for the centering. All the piers were completed for the full length with the exception of Nos. 21 and 23, the northern half of which are now under construction upwards from a point about six feet above water level.

Cofferdams of steel frames with two lines of light Lackawanna steel sheeting about 18 in. apart enclosing a puddle wall were used in constructing the foundations, the depth of water varying from 2 ft. to 8 ft. 6 in. These dams were found to be satisfactory except when fissures in the rock were encountered within the dams making unwatering difficult and requiring considerable more puddle with a layer over the surface outside the dams.

Unique System of Centering is Devised

In order to eliminate falsework, the use of which would have been necessary in the 46 spans at two separate periods,



A Cross Section of the Arch Rib Traveler

Old Trusses Continued in Service During Construction

The springing line of the new arches is 40 ft. below the base of rail and 12 ft. below the tops of the old piers, enabling the contractor to build for the full length and height without interference from the old trusses. Above the springing line the work was divided into two sections, the southern half being constructed with traffic on the old trusses.

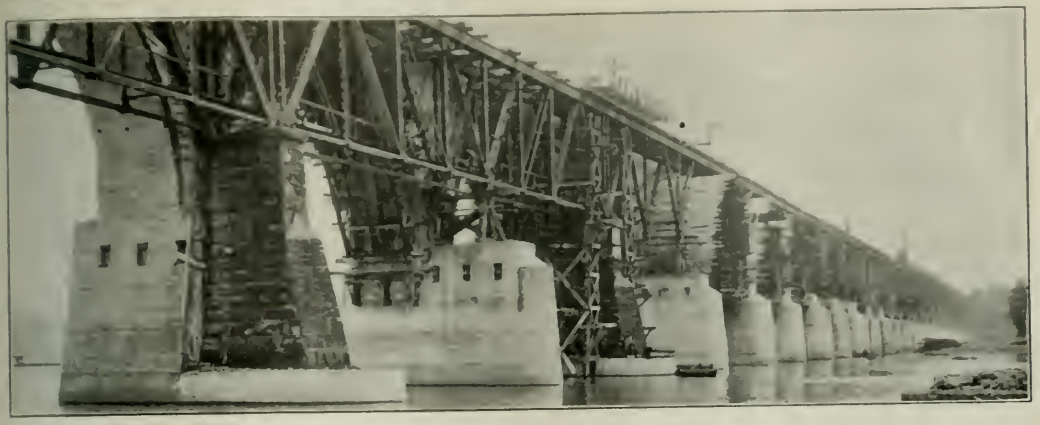
The majority of the old piers were built upon bed rock, in some cases upon gravel overlying the rock. All of the new piers with the encasement of the old were built upon rock with the exception of about ten piers located about midway of the structure.

With all but two spans over water, 10 sets of steel centers made by the Blaw-Knox Company were provided for the arch ring construction. These consisted of three steel arch ribs hinged at the crown and resting on steel brackets set in recesses in the piers, of which there were three in each half of each pier. These centers with the lagging intact were moved from span to span by means of a pontoon traveller constructed and furnished by the same company. The traveller was built of steel and rested on a pontoon of three decked scows built by the masonry contractor. The scows were about 16 ft. wide, 60 ft. long and shallow on account of the depth of water.

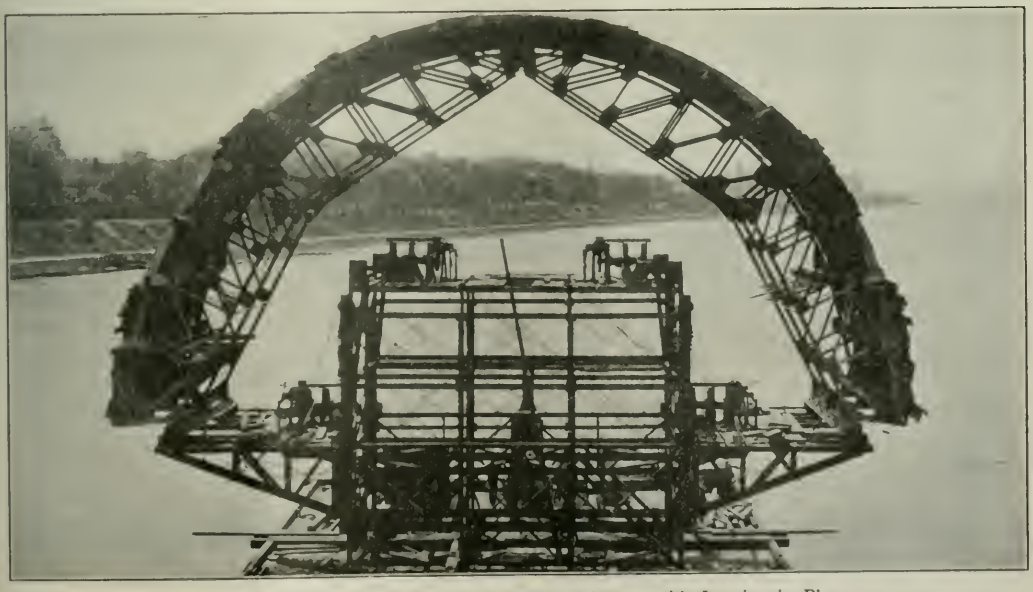
Since there were 44 arches over water in the construction of which it was intended to use 10 centers necessitating about 88 moves, the bridge being constructed in two sec-

tions, it was necessary to devise some method whereby the centers could be raised or lowered on the pontoon to overcome the difference in elevation between arches. The maximum difference in elevation between extremes was about 24 ft. This was accomplished by constructing the traveller so that one section of the steel framework could be raised or lowered on a fixed section made a part of the pontoon, while to cover the maximum difference in elevation, additions were made to the fixed section as required. The movement of this sliding or movable section was controlled by a series of hand power, worm-driven, drum hoists. The center itself rested upon two hand-controlled "roller" type bearings which are moved in or out from the center line of the framework upon a steel section made a part of the upper or sliding section and cantilevered out beyond it on two opposite sides as shown in the illustrations. The clearance of the framework, and thus the center when in position for raising or lowering is about three feet, at the spring line. This arrangement for handling the centers was entirely satisfactory and was found to be a material factor in the saving of time and expense.

The concrete was moved from mixing plants situated on either side of the river by means of a 24-in. gage track built upon 6-in. by 10-in. timbers spaced between the ties and extending sufficiently to give a side clearance of 9 ft. 6 in. from center to center of tracks on the north side of the bridge with passing sidings at both terminals. The train consisted of side dump cars with a 3-ton gasoline engine. Construction was started at both ends of the bridge, spans 20 to 30 being the final location of the centers for the first half section.



Showing a Number of Stages of the Construction



Adjustable Traveler Used to Place the Steel Centers with Lagging in Place

The contract for the removal of the old truss spans was

awarded to the contractor constructing the new bridge. At the time of this writing considerable work has been accomplished in connection with the dismantling, together with the resumption of work on the north half of the new structure. After traffic was transferred to the finished southern half of the new bridge, the old structure was vacated and turned over to the contractor for dismantling.

Floor System of Old Trusses Used for Construction Track

In order to provide means of moving the concrete from the plant on the west side of the river to the location of the centers left in place between Piers 20 to 30, it was decided to make use of the floor of the existing trusses to carry the narrow gage construction track. Trestle bents were constructed on the intermediate piers supporting the center post and the diagonal members on either side of the pier were reinforced with timber compression members. In this way the span of the top chord was reduced sufficiently to permit the removal of the balance of the truss, and resulted in sufficient clearance to permit the shifting of the steel centers to their position under the north half of the new work. When the centers were placed in position and to the proper elevation for the arch ring concrete, the end posts and temporary diagonal members were replaced by batter bents supporting the top chord on the centers. This provided an open and clear space for pouring the umbrella section, when supports were again rearranged, making use of the concrete in the umbrella, after which the other sections of the arch ring were completed.

The pouring of the arch ring will be followed in order by the spandrel walls, waterproofing, protection coat and dry stone packing, until all arches from No. 20 westward are completed. The removal of the upper chord and deck of the old truss will follow in order, after which work will be started on dismantling the old bridge and the construction of the new from Pier No. 20 eastward.

The concrete in the structure is a 1-2-4 mixture with 1½-in. stone for foundations, neat work, arch ring, spandrel walls, center wall copings and railing posts, with ⅜-in. graded stone for railing panels, with some imbedded stone in piers to springing line. The sand being used is crushed silica rock principally from Mt. Holly, Pa., and the stone is lime stone rock from nearby quarries.

The waterproofing is two layers of asphalt saturated fabric protected with a 2½-in. course of concrete reinforced with electrically welded wire cloth 4-in. by 4-in. mesh, No. 12 gage, and fibrous cement in all joints. All overhead wires are removed and placed in a 4 multiple terra cotta duct in the coping on both sides of the bridge with hand holes located at every third pier.

The following are the approximate quantities in the finished bridge:

Excavation	7,000 cu. yd.
Concrete	45,500 cu. yd.
Piles	35,000 lin. ft
Reinforcement	1,300,000 lb.
Waterproofing	153,000 sq. ft
Wire cloth	130,000 sq. ft
Terra cotta conduit	7,000 lin. ft.

The structure was designed by and is now being constructed under the direction of the engineering department of the Philadelphia & Reading, Samuel T. Wagner, chief engineer, Clark Dillenbeck, assistant chief engineer and P. S. Baker, engineer of bridges and buildings. The field work is in charge of the writer until recently associated with Edwin Chamberlain, assistant engineer, now deceased. The contractors on the work are the James McGraw Company, Philadelphia, Pa., T. L. Eyre, Philadelphia, to whom the foundation excavation was sublet and the Minwax Company, New York, for the water-proofing.

New Haven Valuation Report Issued

WASHINGTON, D. C.

THE INTERSTATE COMMERCE COMMISSION on November 28 made public its tentative valuation report in which the common carrier property used by the New York, New Haven & Hartford and its leased lines is given a "final value" of $382,797,066, or at the rate of $194,000 per mile of line, as of June 30, 1915. The property which is given this valuation covers 1,966 miles of main line (4,405 miles of all tracks), including 751 miles of main track, or 1,800 miles of all tracks, of lines leased by the New Haven, valued at $121,927,724, and 35 miles of main line (90 miles of all tracks) owned by the New Haven but leased to the Central New England and the Boston & Maine, valued at $3,251,800. The final value of the common carrier property wholly owned and used by the New Haven is given as $260,869,342, or $208,000 per mile of line. The total outstanding capitalization of the New Haven was $373,861,350, of which $157,117,900 was stock and $216,743,450 was funded debt. This capitalization covers the New Haven's investment in its leased lines, but not their entire capitalization. It also covers $227,399,330 of investments in the securities of other companies having a book value of $227,399,330, the actual value of which, the commission's report says, is not known. It also covers investments in miscellaneous physical property not included in the commission's valuation, but stated on the books of the carrier as $5,357,414 and 5,851 acres of non-carrier lands of which with the structures, the commission gives the "present value" as $13,466,313. The company's investment in road and equipment as stated on its books was $195,505,843, which the commission readjusts to $193,417,165. The cost of reproduction new of the common carrier property owned is reported as $244,901,542 and of the property used as $338,856,084, while the cost of reproduction less depreciation is given as $187,528,798 for the property owned by the company and $263,759,083 for the property used.

The original cost to date of the common carrier property cannot be obtained, the report says, for the reason that the records are not obtainable.

The final values of the leased properties are given as follows:

Old Colony	$49,002,100
Boston & Providence (Mass.)	16,250,000
Boston & Providence (R. I.)	5,000,000
Providence, Warren & Bristol	2,000,000
Harlem River & Portchester	30,245,500
Holyoke & Westfield	1,750,000
Providence & Worcester	10,350,000
Chatham	150,000
Norwich & Worcester	6,250,000
City of New York	620,000
Ireland Real Estate Co.	286,000
Private Parties	18,887
West End	5,237

The book value of the investments in securities of other companies is classified as follows:

Boston & Maine	$29,017,616
Railroads	86,027,209
Trolley Lines, Water Transportation and public utilities	98,230,766
Other investments	14,133,737

In an appendix the report gives a voluminous history of the development of the physical property of the New Haven system and of its complicated corporate financing, as well as an analysis of its investments in other companies.

APPLES EXPORTED from Halifax, Nova Scotia, up to the end of September amounted to a total of 134,839 barrels, all going to the markets of the United Kingdom. This is double the shipments for the same period a year ago. This year the early apple crops in both the United States and western Canada were good, so that the Nova Scotian exporters only had the English market to supply

Do American Railways Lack the Selling Sense?

Great Possibilities Lie Dormant Which Would Make for Greater Business and Good Will

By a Former Railroad Man

I REMEMBER reading, when I was a small boy, about a surly passenger on a Pennsylvania train, who when the conductor asked him for his ticket, threw the pasteboard on the floor. The story made a great impression on my mind. For the suave and self-possessed conductor said not a word, but stooped, picked up the ticket, punched it and laid it back on the floor.

I was a schoolboy then, and I rode on the Pennsylvania every day. We schoolboys were pretty noisy on the train. But there was one particular train on which we were careful to behave pretty well. The conductor was a stately and white-haired man who stood very straight in his irreproachable uniform, and who wore gold eyeglasses. I used to wonder if he was the one in the story who had met rowdyism with the retort courteous. It was a pleasant feeling to travel with a man of that kind. Some of the conductors used to have more or less trouble with the boys. But the stately old gentleman never did. He carried what we would today call an atmosphere.

There has been a great deal of that kind of influence exerted in America by railroad men. Some of them have been railroad presidents, and some of them of much humbler rank. Some have dominated their communities, and could carry their ward—and others have made more enemies than you could dream of.

Spreading a Trail of Discontent

One day this summer I was riding up in the anthracite regions, where there are many branch lines and changes of cars. The coach in which I traveled was crowded with travelers to the summer resorts. They were just plain folks—not the kind that ride in parlor cars and feel sure of themselves—and they were anxious, disturbed, confused by a transfer we had just made. The conductor was working his way down the aisle. He hadn't gone far until he was scolding an old couple and telling them they were on the wrong train. He grabbed at passengers' tickets as if he suspected the holders of having stolen them. He gave instructions and answered questions in a tone that could not be more than half understood. He spread a broad trail of unrest and discontent.

As I watched him, I told myself that the whole trouble with the railroads is that they lack selling sense—that they've forgotten the cordial courtesy of former days. I told myself that you can buy tickets from them if you insist, but that they're the only people in this whole United States who had no idea of how to *sell*.

There's much talk about railroad ailments, and whether it be right or wrong, a mountain of ill feeling and complaints. These range all the way from the average politician's patter to the grouch a passenger gets in the dining car. And most of them are groundless. We all know American railroads are managed extremely well. Under great difficulties they have functioned and are still functioning steadily as the arteries of our national life. I am inclined to think that their one big failure is the one I've just been telling about.

Is This Typical?

To be sure, the conductor wasn't supposed to be a salesman, and you buy your tickets before you get on the train. But isn't that begging the question? Customers must come back again. I wonder sometimes what the railroads would do if we all quit coming back?

I live in a prosperous suburb of a big town. A weary little woman walked up to the ticket window the other day while I was there.

"What will a ticket to Denver cost?" she asked.

"Denver, Colorado?" replied the clerk, as if correcting her.

She was a timid little thing. "Why, I s'pose so," she began. And then the words began to fall over one another as she told her tale. "My sister's sick," she said breathlessly, "and they sent me a telegram, an' I run right over here quick, an'—"

He turned to a tariff with an air of boredom, jotted down a figure or two, turned halfway back to his desk, called over his shoulder "Fifty-one dollars and eighty cents," and sat down again to the work he had in hand.

She stood reluctant. She wondered whether he meant one way or round trip—how long it would take her to get there and when the train would start. She wondered if she dared to inquire. But the atmosphere was too forbidding—the little woman turned slowly away.

The Banker as a Salesman

The other morning my wife and I were walking up the street when we met the president of our new suburban bank. He was all attention and smiles.

"I certainly do wish you'd come down to the bank and call on us now and then," he said to my wife. "Come in when you're down our way. I counted 63 ladies in our bank the other morning between nine-thirty and twelve—we're getting to be almost as much a social center as the Cash-and-Carry store."

And we all laughed, for the line of limousines that draws up every morning at the Cash-and-Carry store is a rather notable array.

So the banker was trying to sell his banking facilities to my wife. He wanted to see if he could be as successful at it as the grocery man. And he has opened 500 new checking accounts in 60 days.

I wonder why the railroads don't quit scolding, and solicit business that way? For the banker didn't go at it at all like a railroad man—he didn't tell my wife about his capital stock; he didn't grumble about the small dividends banks are able to earn; he didn't once mention the unfairness of the banking laws, or the trouble he is having with labor, or how heavy his taxes are—he just tried to sell her the fact that they were human folks and would be glad to have her stop in. And his banking rooms are cozy. For the ladies there are desks and easy chairs. There is an air of cordial hospitality, and everything is quiet and clean.

Experience in a City Ticket Office

I went into one of the big city ticket offices not long ago. The place was jammed. Customers stood at the long counter two and three deep. I wondered how long I would have to wait. Ticket clerks were hurrying up and down, jostling one another, spending long periods at the telephone, asking one another where to find this or that—a handsome picture of how it should not be done. There was no quiet, no desks, no easy chairs for the customer who had the

temerity to sit. And yet I am told that it is one of the best appointed ticket offices in the world. They employ 16 high-class ticket clerks during the summer rush—men who know routes and rates and are technically equipped to issue you a ticket round the world. The demands upon them are intricate. *But I understand that not one of them ever has heard a talk or read a book on salesmanship.*

I asked one of the road's officials why it was. Here was a great opportunity to sell transportation. But nobody thought of selling anything. I told him that no merchant would dare treat cash customers as they were treating them. He looked at me pityingly. I told him that he was looking for trade, just like the rest of us—or at least he should be.

"And competition," I said.

That was something he could understand. "I don't think we have much," he said complacently.

I led him up a broad and boulevarded street. We went into an automobile place. A brass-buttoned servitor opened the door for us. A courteous attendant asked whom we would like to see. A great leather-covered divan invited us to sit and loaf. We sat idly lookingly at a car that was fit for a king.

"Here is your real competition," I said to the railroad man. "Here's where they're taking money away from you. Down at the big department stores they are taking still more. The shoe man, the jeweler, clothing man—all of them are busy selling goods.

"You railroad men are a decade behind the times. You should think as these merchants think, in terms of customers and sales. If they found themselves confronted with your case—the getting of all these vacation people out of town—they would know what ought to be done. I think I can see their full-page announcements, and their care to stimulate more trade, and I can see the crowds hurrying in their doors. And comfort and promptness and courtesy. People would begin to talk about what a fine thing travel is.

"Shall I open a department store?" he asked. "Job lots of tickets? With signs on the counter, 'Odds and Ends $1.98' and 'Damaged by Fire, Closing Out at Half-Price'?"

I smiled. "I'd just mix in a little selling sense," I said.

I spoke to him about the ticket clerk who had laid down his pipe to tell the old lady what the rate to Denver was. I said I thought that such things were pretty rank.

"You're picking out an exceptional case," he said. "Some of these out-of-the-way stations where we can't always be on the watch."

I smiled at him in a superior way.

"Let me tell you, old man," said I, "that was nothing less than on your own great and most splendidly run road. And it was not at an out-of-the-way station. At least one of your directors uses it regularly to commute. Pretty bad, let me say, when it's done under the official nose."

No Trained Salesmen

And I find it about the same everywhere I go. In the first place, there are no trained selling men. And if there were, there is no proper or adequate physical plant in most stations for selling tickets. There is a dingy and dusty room in which stands a ticket case. It is a crowded little room, and nine times out of ten the light is poor. The agent won't smile at you. And he won't be very polite. He will be crusty if you give him half a chance. And he will not volunteer to do, say, or help in any way if you are in a predicament. As to establishing a relationship with you for his road, or asking if you are going to want any transportation to Florida this winter, or inquiring if he can be of any help when your two girls get ready to start back to school—as to *selling* transportation—it simply isn't being done.

I hear the railroad men jump up to state exceptions. Well, there are exceptions. But they are in spite of the system and dependent on the man. But the dingy surroundings in which he is expected to work out his sales are always the same.

Think them over as your eye glances over the country. The dingy, grimy station at—What town shall we say? They are much alike. The little old wickieup station, and the little window before which you plead. It may be in the northern hills. It may be at a southern winter resort. It may be on the western plains. In Ohio, Michigan, Iowa, you meet the railways through their untrained men.

It is hard to get the right man! We all know that. We have the same difficulty in every business, no matter what it is. I remember it was in that selfsame state of Iowa that the noble-minded agent burned down the station in which he lived so that he could get the insurance on his household goods, to repay his company shortage and die an honest man. They're hard to handle, I'll agree. But can they be handled? And is any organized and adequate means to train the railways' salesmen in salesmanship being pursued? And if not, is it agreed that we are not going to sell transportation at all?

The average merchant or manufacturer succeeds only because he sells. He sells so well that he can say, usually, that his turnover is three or more times his investment per year. If he has a million-dollar plant or stock of goods, he must sell a million dollars' worth of his product every four months. I am not laying down an invariable law; but I am stating an average case.

Are the Railroads Different?

But there is not a single railroad in the United States that makes even one turnover a year. And when you talk about it to railroad men they look at you in surprise. And when you tell them about it, they say that the railroads are different. In what are they different? In that they have put selling effort behind them? The executives of a railroad, like those of a manufacturing plant, divide sharply into production and sales. The railroad man will tell you that he uses no such terms. That is true. But he has operation and traffic, which amount to the same thing.

When the government took over the railroads, the traffic man almost fell dead. His operating colleague had been waiting for that for many years. And now it looked as if his time had come—as if, like the man in the book, he would, officially speaking, die and go to his place.

It was accepted, in other words, as a fundamental fact, that the railways of this country were to be operated solely as a means to carry the maximum of goods that had to be moved. There was no question of creating traffic. There was too much of it at best. The roads no longer solicited trade. The freight solicitor who had run up and down the land taking tonnage from his competitor, but never creating an additional ton of it, was to be made extinct. The passenger solicitor, who wasn't much more useful than he, was to be called in. Most of them have now passed into the great unknown. The officials in charge found that it was a most tempting opportunity to clean house.

But are their successors a different breed? The old men dropped out for the reason that they had never been trained to *sell*. They were former clerks or rate men, grown up by seniority from the lowest ranks. Their capacity was small. They belonged to that era when there was a general passenger agent, who went about the country tacking up posters and cards; and a general ticket agent, who spent his time in trying to see that the road he represented got the big end of the split-up when the revenue came in. It was largely an atmosphere of rates and pro-rates, differentials, arbitraries and rebates, and no fit place for an executive to learn his trade.

That and one or two other considerations explain largely why the railroads today are where they are. It is a de-

batable question whether a man brought up from boyhood, perhaps, in this kind of an atmosphere, can rise to the question of how to teach the spirit of salesmanship, or inspire a body of men with the genius of how to secure the good will of large numbers of our body politic. It is pretty hard to do.

Some years ago Edward Hungerford wrote in the *Saturday Evening Post* that "The primary schools of railroading are the little red and yellow and gray station buildings that one finds up and down the steel highways of the nation, dotting big lines and small." But I venture to say that if you were going to pick out your future big transportation men the average group of station agents wouldn't interest you very much. For this school is a poor one, crowded with unprofitable tasks—shipments of live stock, telegrams, train orders, the collection of freight bills and mending the station stove. The station agent is faithful and hard-worked. But he is far from being an active selling force.

And let me quote further from Mr. Hungerford. "You find at least one of them in each town in America that thinks itself worthy to be called a town. To the railroad their importance can hardly be minimized. They are its tentacles, the high spots and the low, where it touches its territory and its patrons." Therein, I am sure you will agree with him most heartily. They are, as you might say, the dealers who handle the railroad's goods. But the goods are not always well sold. And I am arguing that these dealers should be shown how to sell.

Some years ago, Marvin Hughitt, who had been a station agent's helper himself, once upon a time, said to a recently elected governor of a western state, "Governor, I think I should be entitled to citizenship in your commonwealth."

The governor hadn't been governor very long, and I think he was flattered as the veteran railroader talked with him. "How's that?" he inquired. "I am sure we would all of us welcome you." Which of course they would not, for they were gunning, politically, for all railroad people in those days.

Mr. Hughitt drew himself up a little and looked the governor in the eye. "I have slept," he said, "on the bare ground and under the open skies in every county of the state of which you are now the head. Don't you think that should entitle me to citizenship?"

I think the governor saw the point. He was by way of being something of a pioneer himself. And a pioneer is pretty nearly a patriot. The state need fear no harm from the man who has slept on the ground and under the stars, helping to bring civilization into the wilderness. Many of our railroad men are of the Hughitt type. They have helped to make our cities and our farming communities what they are today. They feel a pride in having been a part of it all. They don't propose that any harm shall fall upon the country they have helped to form. That isn't highbrow, and it isn't altruism—it is just plain human nature, working its own will.

The railroads are in the hands of such men as these today. And it is possible that the roads are just emerging, if I mistake not, from that period of strong personal control. A new type of man will follow where Hughitt and Hill and Ripley once led. The public sees no one of commanding figure to step in when Elliott and Rea, Willard and Atterbury step down. Perhaps, before they go, now would be a good time in which to begin a new line of policy. Perhaps now, when the railroad heads no longer sleep with their engineers on the open ground, it is time for the railroads to turn to the question of salesmanship, so that they may once more come into their own.

How About Advertising?

Our civilization is getting pretty complex. We as a people are no longer pioneers. We are no longer poor. We spend money freely. The railroads cannot be prosperous so long as they do not get their share. And they are not getting it. It becomes a grave question, then, to traffic men, whether they're using all the methods of modern selling power that are available. Many are quite ready to admit that they are not. Selling power, as an example, includes salesmanship-in-print. The railroads are not keeping pace with the manufacturers in the use of this necessary and effective merchandising weapon. Advertisers, in 1921, spent $95,439,236 in nationally circulated periodicals. This included seven of the larger farm papers. But the railroads used only $169,926, and over one-fourth of that was from the three Canadian lines. In newspapers, from the nature of the case, the roads spent more. But much of it was spent with one eye upon the editorial attitude, which is a mistaken point of view.

I doubt if many railroad men have posted themselves fully about the problems and the richly generous results that come from the correct use of the printed page. It presents to the business man a mighty forum wherein to preach profitably the merits of his wares. But in it the voice of the railroad man is seldom heard.

It has become, the railroad people agree, a recognized fact that the day when the merchant could stand in his shop door and solicit trade is past. They agree that the town crier is a municipal institution now wholly of the past. But they haven't learned that the seller must communicate with the buyer in larger ways.

So, if you will examine the difficult case of the railroads, you will find, largely, I believe, because of this, the old question of turnover is constantly bobbing up. It is sure to appear in any business where selling forces are not properly applied. It is, in a way, the old question of grass blades. Is there no practical answer to the belief that two grass blades can be fostered where only one once grew? The whole history of the railroads refutes such a claim. Of course they can be made to grow. But should the railroads continue to wait until some one shows them how?

Short on Good Will

One of the great returns from advertising is good will. The railroads are certainly short on that commodity. And yet there need be no dearth of it. Business men know all about how to secure it, and they use the way to its doors over and over again. The name of it is selling. And in order that selling may be *en masse*, and that big results may be secured in a minimum of time, it takes money, and science, and experience, and brains.

My friend Mr. M. has a plant that is capable of producing a million tons a year. He could put on a night shift and make it two million if only—But his men tell him the public is using all of it that they know how to use. Here not good will, but increased earnings are at stake. There's no market, Mr. M. is told, for his product's greater use. No need to make two millions when only half of it will be absorbed. How like the condition of every railroad in the country today. What road wouldn't be able to handle twice the passenger traffic if it were offered them?

Offered is right. Some of them print a few dodgers to advertise a dollar excursion and think they've done a wonderful thing. Have they talked transportation and sold transportation, until they have stirred the body politic—until the idea of travel occurs constantly in pleasing colors to you and me? I am told it cannot be done. That we know when we want to ship freight and when we want to ride, and that nothing will move us beyond that.

But that is fallacious, and dangerous too. Of course it can be done. The formula therefor is scientifically exact. The manufacturer who decides to put up his volume 20 per cent finds there are three things to do. First he must see that his product is right—that it meets the public idea of

what the public wants. Then he must clean up his organization. He must key every man in it up to the new conception of how much goods he must sell. And then he looks over his finances and costs. He puts down so much for materials, and so much for labor, and so much for selling. And then he goes to it.

A Selling Goal

He will spend for advertising, we will say, on an average of 2½ per cent. Not, mind you, to hold his volume where it is, but to attain a goal—an increase of 10, 20, 30 per cent. Do the railroads need to do something like this? Have any of them ever been known to set for themselves a selling goal? To the business man who does it, the results come so surely that, barring unreasonable folly, he invariably builds up his sales.

Should the railroads do it? Only five American roads so much as used a line of advertising space in the 36 principal national magazines last year. Only a dozen or so spent so much as a hundred thousand dollars in advertising last year. And that for the most part isn't real advertising. I know a road that conducts a great suburban service—three hundred suburban trains in and out of their terminal every day—three magnificent groups of suburban communities to be served. Three high-class experts work incessantly in checking up schedules of these trains. From this checking, the customary pocket time cards for commuters are produced. They are an expensive thing, these little cards. But they are no more advertising than the coal by which the trains are run. Yet their cost is charged that way, along with a hundred other things. There is no way to avoid that. But I mention it because for real advertising, such as influences and creates, there is very little money spent indeed.

The railroad dollar for 1921 was spent as follows: Wages, 46.9 cents; materials and supplies, 26.3 cents; locomotive fuel, 9.5 cents; taxes, 5 cents; rentals and hire of equipment, 1.4 cents, leaving 10.9 cents for fixed charges, improvements, and surplus, if any such there be. For the first six months of 1922 the latter grew to 13.4 cents. Suppose a cent of it was set aside for selling costs—on some of the roads it would amount to several million dollars a year. Suppose it were cut to five mills. That would, in proportion, be less than a tenth of what the average manufacturer pays. And suppose when that were done, the whole thing were spent for actual selling work—that timetable folders and charity donations and subscriptions to the Firemen's Ball were not counted in, and that this great arterial life passage were left open to really vital blood currents. Can some railroad executive get a fleeting vision of what would occur?

"Un-Management"

It is quite likely that there is the very trouble with the whole thing. It is strange indeed how hard it is to make them see. I remember that A. D. Lasker, long before he had tasted the futility of showing the nation how to operate its ships, once said that he knew of no business in which there was so much *un-management* as in the railways. You will note that he didn't say *mis-management*. And I think he was thinking largely of their failure from the standpoint of sales effort. For with all the admirable qualities of our railroad management there is without doubt a spirit of dazed *un-management* in that particular that overlooks a lot of things which the average business man could not overlook for a moment without courting disaster.

How can we get rid of it? It is a strangely tenacious legacy from the days when railroading was more or less backed up by the doubled fist. That is all past long ago. But it seems to have left an inability to do what some one has aptly termed the ability to "think advertisingly," with the result that the roads are failing lamentably properly to advertise their own good qualities. And that is possibly the one big trouble with the roads today. Passenger traffic could be increased, freight movements controlled, general good will, above all else, could be sought and found if only the roads could understand.

The late war taught us that we have to accept great principles daily where formerly a smaller and more restricted view would carry us along. That is true in railroading. There is a tendency to speak of a railroad career today as if it were something that a man should shun. Among railroad executives there is a very general tendency to say that it is a pity that a good man should find himself cast as a railroad man—that the big days for such a career are past. It is doubtful if our best blood—the young men from our universities—are joining the railroad ranks. But it is all based on fallacy. Never in the history of the world has a great nation depended so wholly for its life blood upon one specific thing. Rome could live without her provinces, Greece without her culture, Italy without the Renaissance, and Britain without her far-flung dominions, far more easily than America could do without these arteries of her life.

There will come a big man some day who will see the need of making and binding these arterial interests closer to us—who will stir within us a pride in them that will carry with it justice, and that will interest us in making a greater and broader use of them. He will see from the selling standpoint. He will show us how they are a friendly part of our existence, and how we can put our money into the greater use of them. He will sell us the transportation that nowadays we have to work so hard to persuade the railroads to let us buy.

Utilities' Commissioners' Views on Valuation*

THE COMMITTEE believes that the carriers are endeavoring to establish valuations far in excess of what can fairly be considered reasonable; that the valuation cases—each involving, as it does, millions of dollars—are of very great importance to the country as a whole, as undoubtedly the valuation fixed by the Interstate Commerce Commission will be used as a basis in measuring the rates to be charged.

The Chicago, Rock Island & Pacific case is the first of the large systems to be heard, and it is of the utmost importance that all the elements of value should be well considered and weighed, and ample preparation had so that the principles and rules adopted in the case shall be right, when followed in the other cases so far as applicable. In this Rock Island case, begun and only partially heard, there is an example of what co-ordinated effort will do, as made by the state commissions in the Central Western group. That group was organized for the direct purpose of co-operating in the protection of the public's interests in the case of the Chicago, Rock Island & Pacific and its associated lines. Several conferences were held, and a committee of three commissioners and of engineers was appointed to direct the work and furnish mutual aid and counsel. When the hearing came on at Washington on May 25, this group was represented by counsel, engineers, and other experts, and it is believed that the appearance of these representatives of the states was a very valuable service in that hearing, and will be of more value when we get the other states to join in the further hearing, now only scarcely begun. The states should

* The report of the committee on valuation of the National Association of Railway and Utilities Commissioners at the convention at Detroit on November 14-17, F. P. Woodruff of Iowa, chairman. Other papers and reports of this convention appeared in the *Railway Age* of November 25, page 1001.

be grouped in the different sections and the work together should be done at once, and no effort or expense within the means of the several state commissions should be spared in this work. The tentative value served in accordance with the law should be thoroughly studied by the engineers and statisticians of the various commissions and comparisons of data made—all to be used as a test of the efficiency and correctness of the tentative valuation of such railroad, and evidence should be prepared that could be used as rebuttal to the evidence introduced by the railroads to substantiate the exaggerated claims made in their protest. By the united efforts facts could be produced and shown in each group or for each railroad, that will show the unreliability of many of the facts shown in the evidence given by the carriers in their attempt to get a high valuation.

What may be called the first part of the work of the commission, so far as steam railroad carriers are concerned, has been well advanced toward completion. The accumulation of data from which tentative valuations may be prepared has been substantially completed for the entire country; and the preparation and service of tentative valuations are now going forward with fair rapidity. By September 1, 1922, the number of tentative valuations served upon carriers had reached 258, covering in the aggregate 360 railroad properties, with 37,048 miles of road and 52,045 of track. While any estimate now made may ultimately be found to fall wide of the mark, it would seem probable that tentative valuations covering all the properties of rail carriers may be completed and served within the next two years.

We find that the second part of the commission's work has as yet scarcely begun. The commission has made three so-called final valuations in contested cases: Texas Midland, Winston-Salem Southbound, and Kansas City Southern. While these valuations, however, were styled final valuations, they were incomplete in that they contained no statement of final value.

The third part of the commission's valuation work is the accumulation of data as to changes in condition or value of carrier properties, and the making of appropriate resulting changes in the valuations covering such properties. This is a most important part of the original scheme of the Valuation Act. What the commission is doing towards it is therefore of great interest. The carriers are required to keep a record by valuation sections of changes in their roadway property through additions or retirement. This record is to show the units of property added or retired and the cost, and the carriers are required to tabulate and file this information with the commission "when directed." The carriers are also required to file "annually" statements showing for each valuation section "the charges for property placed in operation and the credits for property retired from operation that have affected the investment in road and equipment."

The committee concluded in its report that the state commissions have a triple duty to perform:

First, in the application of the guiding principles whereby the underlying facts upon which the values rest were to be determined, errors may have been made. To the extent that such errors have been made, and that the state commissions in their respective states are able by checking the work to demonstrate this, protests should be filed, and evidence offered thereon, so that the errors may be verified by the commission and corrected.

Second, with respect to unit prices applied, and other matters involving the exercise of expert opinion, the carriers are seeking to break down the work of the commission. We have explained that the commission's expert forces are now largely disbanded. The reduction of appropriations as the field work approached completion has made this unavoidable. It is the opinion of this committee that the state commissions should not allow unjust criticism of the commission's work to be made without meeting it to the extent that their limited means will enable them to lend support to it by the evidence of their own experts.

Third, and finally, as the values which have been placed upon carrier properties are reviewed by the commission, the state commissions can, by continuing their efforts, serve the public interest by protesting against the inclusion of elements which appear to be unjust and which unduly swell those values.

The committee recommended that the president-elect appoint a special committee of technical men to make a thorough study of the rules and methods of the I. C. C. for keeping its valuations current; and that the states traversed by the lines of the Chicago, Rock Island & Pacific contribute $500 to a common fund for the payment of assistance in presenting the evidence in writing and printing briefs in that case.

A resolution was adopted by the convention that the states having membership in this association be placed in six groups as follows:

(1) The New England states.

(2) New York, New Jersey, Maryland, West Virginia, Ohio, Indiana, Michigan and Illinois.

(3) The states south of the Potomac and east of the Mississippi, not including Louisiana.

(4) Wisconsin, Minnesota, the Dakotas, Montana, Idaho and Washington.

(5) Iowa, Montana, Kansas, Nebraska, Colorado, Wyoming, Utah, Nevada and Oregon.

(6) Arkansas, Louisiana, Oklahoma, Texas, New Mexico, Arizona and California.

(Second) That the Valuation Committee of the Association be composed of one member of each of the above named groups. The appointment of the committee to be made by the president-elect of the National Association during the current session of the convention.

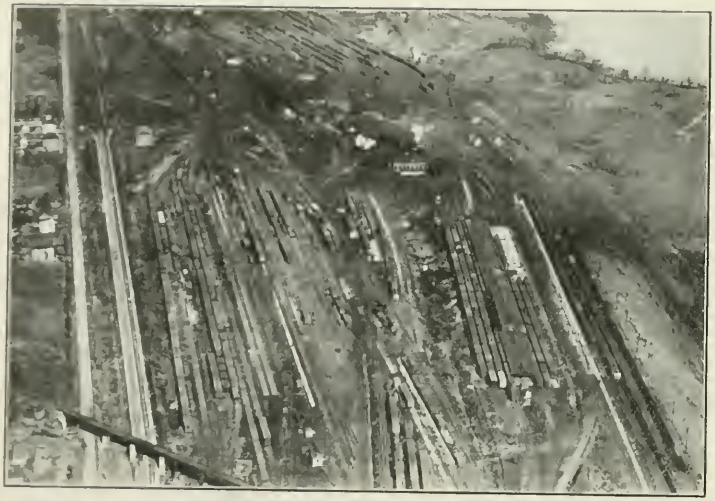
(Third) That one commissioner from each state be appointed to form a group committee on valuation to conduct the group activities, the chairman of such group committee to be a member of the National Committee on Valuation.

(Fourth) That within 30 days from date of appointment, the chairman of each group call a conference of engineers and commissioners and adopt specific plans for immediate work and make a report of the proceedings of said conference to the chairman of the Valuation Committee of the National Association.

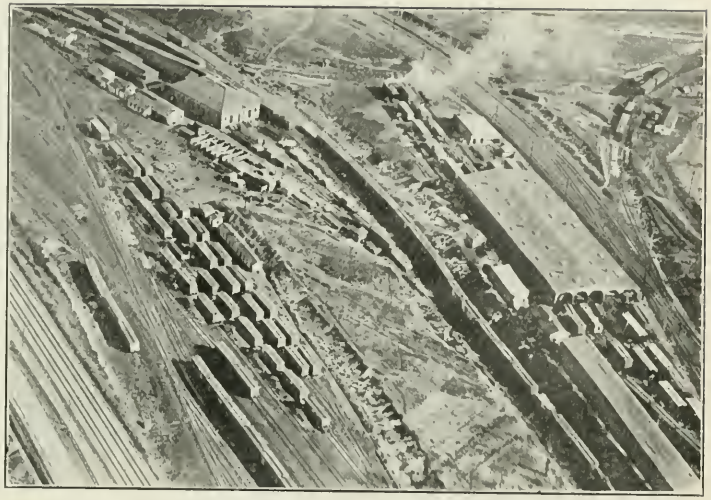
(Fifth) That each group chairman shall report at least once each month the program of the group activities to the chairman of the National Association.

The new Valuation Committee is: Chairman, F. P. Woodruff, Iowa; (group 1) T. W. D. Worthen, New Hampshire; (group 2) E. D. Lewis, West Virginia; (group 3) A. G. Patterson, Alabama; (group 4) L. E. Gettle, Wisconsin; (group 5) H. G. Taylor, Nebraska; (group 6) H. W. Brundige, California.

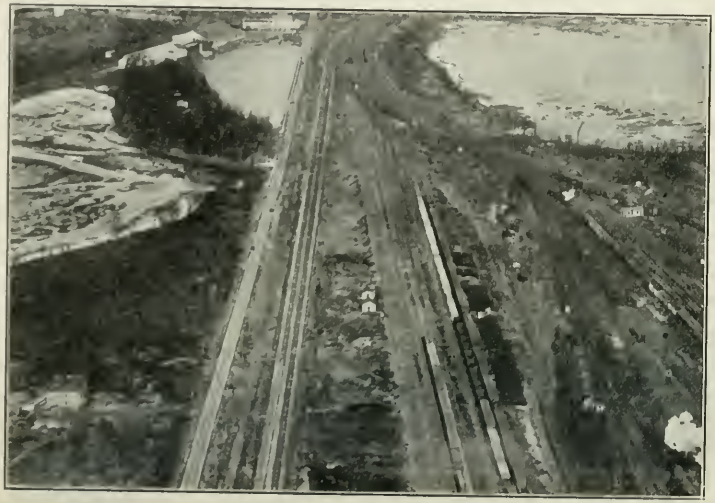
Loyalty Begets Loyalty.—This is the theme of a letter in the Southern Pacific Bulletin from F. J. Bailey, of Houston, Tex., a conductor. The most striking development in this direction during the past few years, says Mr. Bailey, has been the remarkable change in the attitude of the switchmen as a class. Switchmen were formerly ready, apparently, at anytime, to respond to a call to throw up their jobs, and their strike activities made tremendous difficulties for the railroads. "Now all is changed. They are among the most contented and loyal employees on the railroad. This change in attitude dates from the inauguration of the eight-hour day, and the switchmen's acceptance of it in letter and in spirit. If the train service brotherhoods had been equally loyal to the spirit of this reform and not disloyal to the eight-hour principle through the abnormal mileage still made by some, on the claim of seniority, it would have been better for the railroads, the men and the public."



Entrance from the South



Transfer and Southbound Classification Yard



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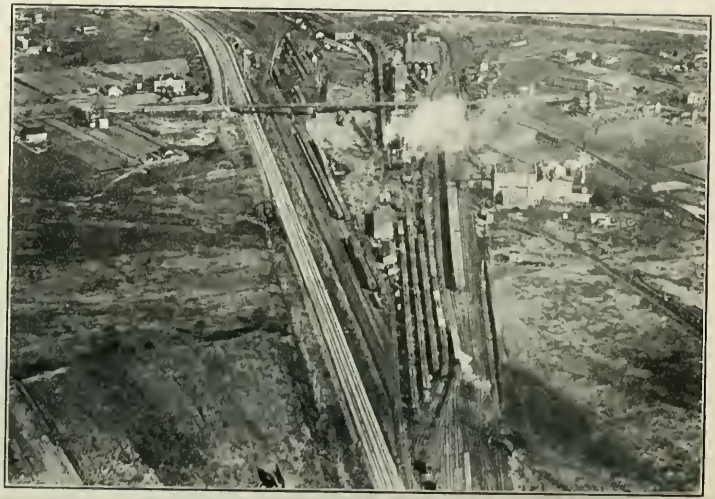


Heavy Repair Yards—F. G. E. Shops—Icing Station

Bridge Across the James River Connecting with the Atlantic Coast Line

Perishable Freight Service Specialty of R. F. & P.

Miles per Train Hour in 1921 Averaged 19.2. Car Miles per Day 44.2. Earned Three Times Standard Return

The Richmond, Fredericksburg & Potomac operates only 117 miles of line. In reality, it consists of only a single freight district. On this district, however, it is doing some things in railway operation that are of more than ordinary interest. This is evidenced by the fact that in 1921 its train speed or miles per train hour averaged 19.2 as against the country's average of 11.5. Its car miles per day averaged 44.2. Because of the interesting manner in which locomotives are doubled over the division daily and the method followed in returning crews to their home terminal at the end of their day's work, the road succeeded in arriving at a figure of 88.9 locomotive miles per locomotive day, which figure was nearly double that for the railroads of the country as a whole.

Earned Nearly Three Times Its Standard Return

The Richmond, Fredericksburg & Potomac is a consistent money maker; so much so, that Moody's Analyses of Railroad Investments gives all its bonds a rating of Aaa, and its stock a rating of Aa. During federal control the property earned nearly three times its standard return.

The road derives its importance because it is a connecting link between the southeastern lines and the lines to the north. It operates a double track railroad of high standards between Richmond and Washington, in addition to which it owns and operates Potomac Yard, one of the most important freight facilities in the country. The company is controlled by six railroads. This control is carried out through ownership by the Richmond-Washington Company of a majority of the "voting" common stock. The Richmond-Washington Company, in turn, is owned equally by the Pennsylvania Railroad, the Baltimore & Ohio, the Atlantic Coast Line, the Southern, the Seaboard Air Line and the Chesapeake & Ohio. The Atlantic Coast Line and the Seaboard Air Line connect with the Richmond, Fredericksburg & Potomac at Richmond, and from there north the business moves as R. F. & P. business.

Interchange of through freight traffic is made with the Pennsylvania and Baltimore & Ohio at Potomac Yard and of passenger traffic with the same roads at Washington.

The Southern railway connects with the Richmond, Fredericksburg & Potomac just south of Alexandria, and has trackage rights over the R. F. & P. to the Potomac river. The Southern's interest is primarily its interest as a tenant line at Potomac Yard. The Chesapeake & Ohio is in a similar position; it uses the Southern Railway from Orange north and reaches the Richmond, Fredericksburg & Potomac in that manner. Some business also is interchanged at Doswell. The Pennsylvania and Baltimore & Ohio are also interested because of their being tenants at Potomac Yard.

Bearing in mind that the Richmond, Fredericksburg & Potomac consists of a double track line between Richmond and Washington, at the northern end of which link is the important interchange freight facility at Potomac Yard, one must, in studying the operations of this road, divide the analysis into two parts; one relating to the main line operations and one to those at Potomac Yard. Attention will be paid first to the main line operations.

A Prosperous Appearing Property

In riding over the Richmond, Fredericksburg & Potomac one is impressed by the prosperous appearance of the property as a whole. The line is laid with 100 lb. rail and is well maintained. It is ballasted with a high grade of washed gravel. The ballast is lined, the banks and ditches are clean-cut and neat, the road is block-signalled with upper quadrant, three-position signals, and stations and signs are well painted and clean in appearance. White oak ties are standard. Tie plates are used on curves, although there are also 60 miles of tangent track laid to the high standard of tie plates on oak ties. The road, incidentally, at the present time is relaying most of its rail. In 1921 it laid about 60 miles and the program called for new rail entirely at the end of about three years.

It is rather difficult to speak of the Richmond, Fredericksburg & Potomac without referring at length to its ballast. This road was one of the first to use washed gravel ballast and because of its having accessible at Fredericksburg an unusually hard gravel, the use of this ballast has been

extremely successful; so much so, that it has attracted much attention from other railroads. The illustrations which appear in this article give a clear idea of the manner in which the gravel is used and the good roadbed which it produces.

As to signals, attention should be paid to the interlocking towers which exist at nearly every passing track. The railroad further than that makes full use of its signals, and it relies on these signals as much as possible in operation. The tendency is to use messages instead of train orders wherever possible and, in addition, the road has installed take-siding signals which have proved of material assistance to efficient operation. The road uses telephone dispatching and in general follows the modern idea of using the telephone to the largest possible extent.

Road's Specialty Is Perishables

Naturally, under the conditions, the traffic of the line is rather diversified. In 1921 products of agriculture made up 23.5 per cent; products of animals, 1.35 per cent; products of mines, 17.4 per cent; products of forests, 24.2 per cent; manufacturers and miscellaneous, 2.52 per cent. The road's specialty is perishables. In 1921, of the total tonnage carried 12.3 per cent was citrous fruits and other fresh fruits; 6.3 per cent potatoes and other fresh vegetables. Cotton supplies only 0.4 per cent of the total tonnage but the Richmond, Fredericksburg & Potomac like most of the roads to the south of it, depends upon the welfare of the cotton industry considerably more than its proportion of tonnage in cotton would indicate. The reason is that cotton represents such a large proportion of the purchasing power of the South.

The citrous fruit traffic is naturally northbound. The manufactured products represent the southbound traffic and the volume of these manufactured products depends upon the prosperity of the Southeast. The relative importance of perishable freight to the R. F. & P. was indicated rather pointedly in 1921. The road in that year had the largest perishable movement in its history, but the lowest of all other freight for some years. The perishable freight, in other words, saved the day. The road expects that the 1922 movement will even exceed the record-breaking figures for 1921 of 49,361 cars.

The large volume of perishable traffic explains in no small measure the average of 19.2 miles per train hour. The Atlantic Coast Line and the Seaboard Air Line are two of the leading carriers of perishable commodities in the United States because they serve the agricultural communities of Florida and the vegetable and fruit area extending northward along the Atlantic seaboard. These commodities move in fast trains to Richmond. They are turned over to the Richmond, Fredericksburg & Potomac at Acca, the yard adjacent to the Richmond passenger terminal, and they move over the Richmond, Fredericksburg & Potomac at a speed but slightly slower than that of the passenger trains. After their arrival at Potomac Yard they are forwarded under fast schedules to the consuming centers of Baltimore, Philadelphia, New York, Boston, etc. The standard freight locomotives are Pacifics with a tractive effort of from 26,000 lb to 47,320 lb. Because of the high speeds maintained, the average train load is not high. In 1921 the road had a net tons per train, including revenue and non-revenue freight, of 339. This average, incidentally was lowered considerably by the small amount of southbound business which was carried during the year. The average train load in 1920 was 445.

Freight Movement Not Materially Slower Than Passenger

The statement was made above that freight movement over the Richmond, Fredericksburg & Potomac is not materially slower than that of the passenger trains. Of the 34 scheduled passenger trains 20 are operated in connection with the Atlantic Coast Line and Seaboard Air Line. In other words, the statement compares the operation of freight trains with an important and fast passenger service. From Acca to Potomac Yard is 104 miles. The average time of freight trains for this distance is usually kept below five hours. The average crew time, including terminal time at Acca and Potomac Yard is usually kept at approximately 7 hours. June, 1921, was an exceptionally good month in this respect. During that month the crews averaged 6 hr. 28 min.; divided terminal time at Acca, 1 hr. 10 min.; road time, 4 hr. 15 min; at Potomac Yard, 53 min.

The railroad has also compiled some interesting figures relative to the average time which a car of perishable freight spends on Richmond, Fredericksburg & Potomac rails. In May, 1921, which presumably is an average month, this figure was 6 hr. 39 min. from the time the car was turned over to the Richmond, Fredericksburg & Potomac at Acca to the time it was delivered at Potomac Yard. The average included 1 hr. 7 min., representing the time from delivery to the Richmond, Fredericksburg & Potomac at Acca until it left that yard. The road time from Acca to the interlocking tower at Potomac Yard was 4 hr. 34 min. The movement to the receiving yard at Potomac Yard required 58 additional minutes. An analysis of this kind should also include the time the cars were kept in Potomac Yard before delivery to the Pennsylvania or Baltimore & Ohio, but because of the large number of cars held for reconsignment at the yard, as will be explained below, this particular figure would not prove of great value in this connection.

The road does, of course, make some distinction as between perishable and other freight, the perishable in all cases being given preferred attention, but the policy as a whole is to move all trains at high speed. The road, in other words, does not draw the sharp line of demarcation between perishable or manifest and ordinary drag freight, as is the rule on most roads. This is made possible on account of the small proportion of slow freight handled.

These conditions permit the road to avail itself of a number of interesting and unusual methods of operation. For one thing, it is the policy to have all the crew layovers at the home terminal. All of the road's freight crews have Richmond as their home terminal. A crew is called for a run from Richmond to Potomac Yard and after a short layover at the latter point returns to Richmond. The locomotives are pooled. This method has been found very successful and there can be no question but that it is much more satisfactory from the point of view of the crews who have the advantage of being able to get back to the home terminal at the end of their day's work, and besides having their sleep at home are not subjected to additional expenses because of being away from home.

To secure an average of 19.2 miles per train hour requires a high grade roadbed and the use of every facility to keep the trains in motion. These points have been brought out above because mention has been made of the high grade double track line, the completeness of the interlocking system and the use of automatic signals. As a matter of fact, the road normally succeeds in operating a freight train from Richmond to Potomac Yard going into a passing track but once. The automatic signals and interlocking facilitate this movement and keep the time required at a minimum.

Potomac Yard

Potomac Yard is in Virginia and lies about four and one-half miles south of Washington. It was formerly operated by the Washington Southern which was merged with the R. F. & P. in 1920. As already noted, there are five railroads that operate jointly into the terminal; namely, the R. F. & P., the Chesapeake & Ohio, the Southern, the Pennsylvania Railroad and the Baltimore & Ohio. Potomac Yard is not new. It has been described in this paper and elsewhere but not a great deal has been said concerning the

manner of its operation. The following description and details have been supplied by an R. F. & P. officer.

The Facilities at Potomac Yard

Potomac Yard has about 8.5 miles of trackage. There are two receiving yards, one northbound and one southbound. The northbound receiving yard consists of 11 tracks, including two tracks for re-icing purposes which can accommodate 32 cars each, or a total set-up of 64 cars for re-icing at one time. The 11 receiving tracks range in length from 38 to 72 cars each, or a total capacity of 509 cars. The southbound receiving yard consists of eight tracks ranging from 55 to 65 cars in length with a total capacity of 498 cars.

There are two classification yards, the northbound yard consisting of 30 tracks ranging in length from 21 to 60 cars each, or a total capacity of 1,142 cars, while the southbound classification yard consists of 27 tracks ranging in length from 19 to 54 cars each, or a total capacity of 1,053 cars.

R. F. & P. Track is Well Maintained

Both yards are hump yards, the northbound yard being equipped with a system of electric switch control. In addition to the above, there are two advance yards, one northbound and one southbound, consisting of three tracks each, which are used to take care of the overflow from the classification tracks. It frequently occurs that trains are dispatched from the advance yards, although the greater number are made up and dispatched from the classification tracks, providing power is available. At present work is in progress looking to the expansion of the northbound classification yard by the addition of several tracks and the lengthening of existing tracks.

To care for bad-order cars there are two yards for light repairs and one yard for heavy repairs, having a total of 13 tracks with a standing capacity of 327 cars. There is also what is termed a bulk transfer yard consisting of six tracks in groups of two tracks each having a total capacity of 61 cars, the loading track elevated about six inches above the track on which the empty cars are placed for receiving the loads. Potomac Yard gateway being the interchange point between the southern and northern lines, a great number of cars are received from the south which will not pass the clearances of the northern connections. This yard is used for such transfer exclusively.

The L.C.L. transfer consists of a platform about 1,100 ft. in length. There are eight tracks, four on either side of the platform, with a total capacity of 158 cars placed in working position. An average of 120 loads of L.C.L. freight is handled daily, classified into 45 classifications northbound and 48 classifications southbound, an imaginary line about the center of the platform dividing the northbound from the southbound business.

The icing facilities are modern. The ice house has a capacity of about 130 tons per day with a storage capacity of 12,000 tons. The factory is adjacent to the platform where the re-icing service is performed, the ice being stored as near as possible on a level with the incline from the ice factory to a point near the top of the cars where it is automatically lowered to a platform on a level with the top of the cars.

The enginehouse facilities consist of a 12-stall enginehouse with an 80-ft. turntable, three ash pit tracks and a power plant for heating and lighting purposes. An additional turntable is now being installed. One of the tenant lines, the Southern Railway, does not use the enginehouse facilities, as it has its own in Alexandria.

The stock pen facilities consist of 32 livestock pens used for the unloading, feeding, watering and resting of livestock in transit. New and modern pens are now under construction in a new location. No deliveries are made at the yard of any class of freight, except company materials.

Method of Operation

Upon arrival of trains from the tenant lines the waybills are delivered to the yardmaster for booking and record purposes, after which they are passed through the hands of the agent and the revision bureau, an auxiliary department to

the general auditor's office, for the purpose of revising the waybills for routes, rates and revenue. This operation means considerable delay to the movement of trains from the receiving yard to the classification yard; but, during the interval in which the waybills are being revised it is the custom to re-ice, inspect and make running repairs while trains are in the receiving yard. Upon the return of the waybills to the yardmaster the trains are considered as being delivered to connections. They are then passed over the humps into the various classification tracks.

Classifications and Scheduled Trains—Northbound

There are 17 classifications made for the Pennsylvania Railroad and six for the Baltimore & Ohio. Perishable freight via the P. R. R. is classified to move in solid trains for New York, Philadelphia, Baltimore, New England points and points west and north of Harrisburg, Pa. Two com- consisting of citrus and the other, high class perishable. modity classifications are made for New York alone, one In the case of the Baltimore & Ohio, perishable classifications are made for New York, Philadelphia and Baltimore, and one for the west.

As a rule, there is a total of eight northbound perishable trains leaving Potomac Yard daily between the hours of midnight and 7:00 a. m. Three of these trains are for New York and Jersey City via the P. R. R., known as MD-2 (symbol), scheduled to leave Potomac Yard at 4:30 a. m. for next morning market delivery. This train is limited to 45 cars.

Symbol train MD-6 has cars for New England points only and is scheduled to leave Potomac Yard at 6:00 a. m., with a limit of 45 cars, for second morning market delivery. It frequently occurs that these trains are run in sections.

Symbol train MD-18 has cars for Baltimore, Md., and is scheduled to leave Potomac Yard at 7:15 a. m., daily. It also has perishable freight for Harrisburg, Pa., and points north and west, making second day's delivery for points such as Pittsburgh, Erie, Buffalo, Syracuse, Rochester, etc., and also points in the New England territory via the Wilkes-Barre gateway.

B. & O. train No. 92 scheduled to leave Potomac Yard at 3:00 a. m., handles perishable and high class freight for Philadelphia and intermediate points, as well as perishable and high class freight for points on the Philadelphia & Reading and the Jersey Central.

B. & O. No. 97 scheduled to leave at 3:15 a. m., daily moves perishable and high class freight for points west via the B. & O.

Classifications and Scheduled Trains—Southbound

Southbound trains are handled in exactly the same manner as northbound insofar as waybills, inspection, etc., are concerned, excepting that in the case of trains arriving southbound with cars to be re-iced, it is necessary to handle such cars from the southward classification yard to the re-icing station which is located in the northbound yard.

The Richmond, Fredericksburg & Potomac is the connecting line with the Atlantic Coast Line and Seaboard Air Line, and necessarily at Potomac Yard separate classifications are made for those lines to avoid switching at the Richmond terminal.

The Richmond, Fredericksburg & Potomac has three arranged schedules from Potomac Yard, 3:30 a. m., 5:15 p. m. and 11:30 p. m. The latter train handles perishable and high class freight loaded in Baltimore and Washington for delivery in Richmond the following morning, and perishable and high class freight for connections at Richmond. By reason of the heavy northbound movement the R. F. & P. at all times has sufficient power to keep the southbound freight moving currently.

The Southern Railway has four scheduled trains from Potomac Yard daily. Train No. 85, scheduled to leave at 9:00 a. m., handles perishable and high class freight for points between Potomac Yard and Charlotte and west of Asheville, N. C. Train No. 53 scheduled to leave at 11:00 p. m., daily, has perishable and high class freight for Columbia, S. C., Atlanta, Ga., and points beyond. The other two are local connections, one scheduled to leave at 1:30 a.m., and the other at 1:30 p. m., daily, and both handling cars for points between Potomac Yard and Charlottesville on the main line, and branch lines.

The Chesapeake & Ohio has one scheduled train from Potomac Yard, daily, at 11:30 p. m., covering perishable and high class freight for Charlottesville, Va., and points west.

70,920 Cars of Perishables in 1921

During the year 1921 a total of 70,920 cars of perishables, exclusive of livestock, passed through Potomac Yard for

Airplane View of Broad Street Station, Richmond, Va.

northern and western markets. Of this number, 6,440 cars were peaches from the southern peach territory. Of these 2,321 were destined to New York City, 919 to Boston and other New England points, 670 to Philadelphia, 668 to Jersey City, while the balance moved to miscellaneous destinations. Of the 2,321 cars destined to New York City, only 64 failed to make the market for which they were intended, due to engine and equipment failures as well as improper classification, etc.; at the same time, only 20 cars of the above number were received late from southern connections.

The daily movement of cars handled through Potomac Yard averages 3,000, although a maximum of 4,600 cars has been reached. There are 21 crews in service, normally, to handle the business, which number is increased with the heavy movement.

During the peach season all records so far as re-icing and dispatching cars are concerned were broken. On July 5, 1921, 490 cars were re-iced within a 24-hour period, consuming 1,132,566 lb. of ice in the performance; this, of course, included cars held at Potomac Yard for reconsignment or diversion purposes.

One of Potomac Yard's Problems Is Reconsignment and Diversion

The privilege has been extended to the Produce Dealers' Association, through permission from the Interstate Commerce Commission, to make this a holding yard for reconsignment and diversion of perishable freight. The result is that cars are billed from the south as well as the north to Potomac Yard with a privilege of reconsigning them to a point beyond for the purposes of controlling or meeting the

various markets. It is stated by representatives of the Produce Dealers' Association that without this privelege the markets would be glutted causing a loss of considerable perishable freight. This terminal, considered the principal gateway between the north and the south, has within recent years been claimed by the perishable produce dealers to be the most important distributing point in the eastern country. It frequently occurs during the perishable season that as many as 250 to 400 cars of perishable freight of all kinds are held at this point for reconsignment or diversion orders. The usual practice is for the produce dealers to have local representatives in Washington, D. C., or Alexandria, Va., who are advised concerning the perishable freight moving or which is held at Potomac Yard for inspection. These representatives report details to the various produce dealers in the large cities and the cars are sold by market transaction from the Yard.

R. F. & P. Supervision and Statistics

The Richmond, Fredericksburg & Potomac is a small road, so supervision of its operations does not become as difficult a factor as might be the case on a larger and more complicated system. This does not prevent the road, however, from issuing each month some very adequate statistics of earnings and operations. The monthly report gives complete details of operating income and expenses by primary accounts with comparisons with the same month last year and accumulated for the present year. Similarly a detailed analysis is shown of train and car miles, locomotive miles,

Another View of Broad Street Station, Richmond, Showing the Platforms and Loop Tracks

etc., locomotive hours, the latter under 12 items; tons of coal per locomotive mile and locomotive hour, etc.

One notices on the railroad an unusual spirit of loyalty. The section labor, to take one example, is practically entirely native labor. The officers and men seem to be extremely proud of their railroad and seem to be helping in every way to make it show the best results possible.

The Richmond shops are old and considerable money will have to be spent in the near future on both buildings and equipment. This, however, the road has in mind and a site has been chosen for an entirely new installation of engine terminal and shop facilities. The equipment is maintained in good order. The high percentage of superheated steam locomotives is especially noticeable.

The earning of nearly three times its standard return is the Richmond, Fredericksburg & Potomac's record during the period of federal control. This was the largest percentage of standard return earned we believe by any property operated by the government. The reason for the favorable operating results was due primarily to its strategic position as the link between the north and south carriers which has been emphasized in the foregoing paragraphs. The road carried supplies to the southern camps and it was used as part of the routing to the embarkation port at Norfolk and Newport News. Further than that it had a large troop movement both to and from camps and to the transports at Hampton Roads. In view of the earnings during the period of federal control, the road naturally did not decide to accept the guaranty, for the six months of the guaranty period and it earned $500,000 over what its guaranty would have been.

Since the return to private control, the road has not been doing quite so well because of the falling off in business. This is shown by the figures of net railway operating income. The standard return for the property, including the Washington Southern, which was merged in 1920, was $1,604,204. In 1918 the road had a net railway operating income, including as before the Washington Southern, of $4,761,617. In 1919 it earned $4,639,053. In 1920 the net railway operating income had fallen to $1,766,089 and the figure for 1921 fell still further to $1,275,457.

The total tons of revenue freight carried in 1921 were 3,363,411. The revenue ton-miles were 298,386,813, a decrease of 24 per cent from 1920. The average haul was 90.5 miles, this being nearly the entire length of the road. An interesting feature of the operating figures is, as is to be expected from the conditions, the large percentage of traffic received from connections. In 1921 the road handled 3,337,874 tons of freight of which it originated 564,150 tons and received from connections 2,773,724 tons. The number of tons freight carried per mile of road totaled 2,837,846.

In addition to its freight traffic, the Richmond, Fredericksburg & Potomac carries a sizeable passenger business. For the year 1921 the number of passengers carried totaled 1,443,924, the passenger miles totaling 98,498,452, which was a decrease of 23 per cent from 1920. The passenger business is primarily that received from connecting lines. In other words, the road handles between Washington and Richmond the through trains of the Atlantic Coast Line and the Seaboard Air Line. The Richmond passenger terminal, known as Broad Street Station, is owned jointly by the Richmond, Fredericksburg & Potomac and the Atlantic Coast Line. The Seaboard Air Line trains, however, use the Main Street Station in another part of the city.

One of the interesting features of the Richmond terminal is the fact that all of its tracks are on loops. Every train, whether northbound or southbound, goes through the station in the same direction and the arrangement of the facilities is such that the road succeeds in having its locomotives spend but 8 minutes on the average after being uncoupled before reaching the roundhouse. A complete description of the Broad Street Station will be found in the *Railway Age* of February 14, 1919, page 401.

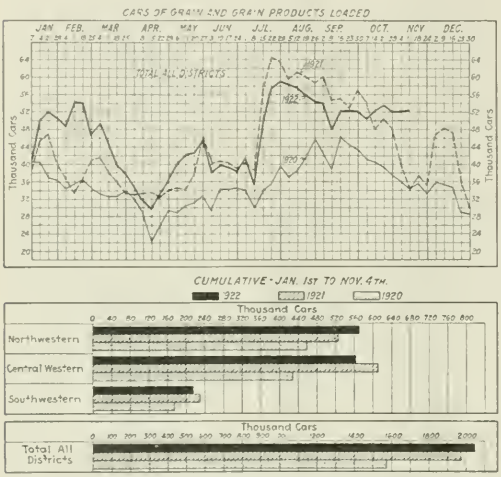
The outstanding funded debt of the Richmond, Fredericksburg & Potomac amounts to $8,491,800 including $1,311,800 of equipment notes. The stock totals $9,417,400, including $1,316,900, "voting" common stock; $481,100, guaranteed 7 per cent stock; $19,300, guaranteed 6 per cent stock; $3,600,100, non-voting dividend obligations and $4,000,000, 6 per cent, non-voting, common stock. The Richmond-Washington Company which is jointly controlled by six roads owns $947,200 of the voting common stock. The 6 per cent, non-voting common stock is entitled to receive the same dividends as may be declared upon the common voting stock but not over 6 per cent. In 1920 and 1921 all of the shares except this issue received 9 per cent.

A large number of the shares of the road are owned by the state of Virginia. It is interesting in this connection to learn that the state of Virginia is using the proceeds on some of this stock in the sinking fund of one of its bond issues. In other words, the bonds are being carried and retired by means of ownership of the stock.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading increased during the week ended November 18 to 969,094 cars, the preceding week having included the partial holidays on election day and armistice day. This was also an increase as compared with the corresponding week of last year of 178,731 cars and as compared with the corresponding week of 1920 of 79,956 cars. Increases as compared with 1920 were shown in the loading of grain and grain products, livestock, forest products, merchandise and miscellaneous freight and in all



districts except the Pocahontas and Southwestern. As compared with last year increases were shown in all classes of commodities except l.c.l. merchandise. The largest increase as compared with last year was in miscellaneous freight, of which 77,384 cars more were loaded. Coal loading was the largest it has been since the strike, 205,024, an increase as compared with last year of 36,586 cars, but 11,298 cars less than the corresponding week of 1920. This represents the fourth consecutive week of loading in excess of 1920.

The freight car shortage showed a further reduction during the period from November 8 to 15 to 158,236, while for the same period there were surpluses amounting to 4,945. The shortage included 82,533 box cars and 42,827 coal cars.

Labor Board Approves Piece Work

THE PIECE-WORK SYSTEM as established in the Elkhart, Ind., locomotive shops of the New York Central some time ago has been definitely approved by the Railroad Labor Board in a decision handed down last week because the installation of this system "was in accordance with the expressed wishes of a majority of the employees at that point, and in conformity with the agreement between the duly authorized representatives." The testimony in this case showed that a substantial majority of the Elkhart shop employees expressed a desire to work under a piece-work system. Following conferences between the vice-president of that road and the authorized representatives of the unions, it was agreed that the matter should be placed before the employees in an open meeting and the decision whether or not to establish piece-work be decided in this manner. This meeting was held but representatives of the employees later took the position that the Elkhart shopmen had been coerced by officers of the company. As a result it was proposed to take a secret ballot at Elkhart again placing the proposition before the men. This proposal was turned down by the system shop-craft leaders and the matter came before the Railroad Labor Board.

The Board's decision holds that the evidence submitted in the case did not prove coercion and that inasmuch as the agreement was made between the duly authorized representatives of the men and the carriers the result of this agreement should stand.

A seventeen page dissenting opinion was appended to the decision by A. O. Wharton and Albert Phillips, members of the labor group on the Board, who reiterated a great deal of the testimony introduced in this case by the employees, drawing the conclusion that "the outstanding indisputable facts are that the method adopted by the carrier were not in accord with any recognized principle of justice and fair play, both of which it is assumed were the guarantees accruing to railroad employees under the provisions of the Transportation Act and the decisions of the Labor Board."

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, NOVEMBER 18, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Misc. L.C.L.	Miscellaneous	Total revenue freight loaded: This year	Corresponding year 1921	Corresponding year 1920
Eastern	1922	12,440	4,231	67,561	2,517	5,903	4,412	64,662	91,617	253,343	.....	.....
	1921	9,415	4,054	38,182	1,809	4,330	2,073	63,960	69,450	.....	202,912	209,029
Allegheny	1922	3,755	3,868	58,178	5,948	3,607	7,767	46,861	74,177	204,151	.....	.....
	1921	2,372	3,488	47,983	2,891	2,938	3,373	47,520	53,366	.....	163,931	185,006
Pocahontas	1922	254	120	18,498	527	1,601	100	5,594	3,765	30,509	.....	.....
	1921	112	111	20,781	168	1,275	3	5,656	3,115	.....	31,391	32,135
Southern	1922	3,849	2,596	33,387	1,306	21,085	1,267	38,502	44,312	136,214	.....	.....
	1921	2,951	1,803	29,395	513	16,763	479	38,065	36,545	.....	117,561	128,412
Northwestern	1922	16,658	11,411	10,224	1,640	15,233	16,495	26,653	36,003	134,317	.....	.....
	1921	11,194	9,373	8,758	810	11,444	877	27,136	28,334	.....	96,926	128,759
Central Western	1922	11,511	15,142	1,471	279	6,733	2,186	30,972	52,872	142,769	.....	.....
	1921	9,588	11,488	18,420	138	6,570	757	31,082	37,849	.....	116,892	134,086
Southwestern	1922	5,157	3,157	5,705	171	7,241	553	15,658	29,843	67,791	.....	.....
	1921	3,479	2,987	3,919	105	7,165	773	15,879	26,552	.....	60,750	68,711
Total Western districts	1922	34,936	33,010	35,400	2,083	29,207	19,234	73,283	118,724	344,877	.....	.....
	1921	23,861	24,733	31,097	1,053	25,179	2,407	74,097	92,735	.....	274,568	331,556
Total, all roads	1922	55,201	40,735	205,024	12,431	61,403	32,780	228,922	339,595	969,094	.....	.....
	1921	37,841	31,292	168,438	6,464	50,475	8,335	229,307	255,211	.....	790,363	.....
	1920	35,753	40,579	216,322	13,625	53,934	32,674	202,554	288,697	.....	.....	889,138
Increase compared	1921	17,363	6,443	36,586	5,967	10,928	24,445	.....	77,384	178,731	.....	.....
Decrease compared	1921	.....	.....	.....	.....	.....	.....	385	.....	.....	.....	.....
Increase compared	1920	19,451	156	.....	.....	7,469	.....	26,368	43,898	79,956	.....	.....
Decrease compared	1920	.....	.....	11,298	1,194	.....	4,891	.....	.....	.....	.....	.....
November 18	1922	55,201	40,735	205,024	12,431	61,403	32,780	228,922	332,595	969,894	790,363	889,138
November 11	1922	52,501	38,001	188,311	12,273	60,392	39,383	228,050	334,997	953,909	755,777	927,586
November 4	1922	51,912	39,731	194,077	11,641	60,011	47,046	234,737	355,670	994,827	837,576	915,615
October 28	1922	51,913	42,644	197,928	11,388	60,584	48,005	233,680	368,338	1,014,480	951,384	981,242
October 21	1922	53,680	40,473	196,771	10,631	60,344	45,468	231,797	364,595	1,003,759	964,811	1,008,818

Compiled by the Car Service Division of the American Railway Association.

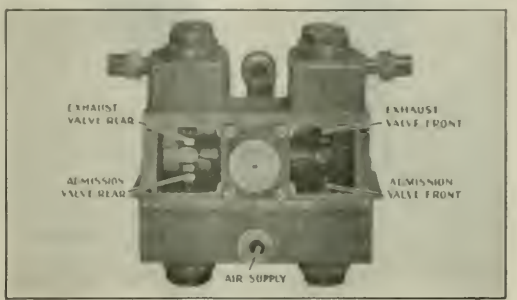
All-Service Locomotive Power Reverse Gear

New Non-Creeping Power Reverse Gear Equally Adapted to Passenger, Freight or Switching Service

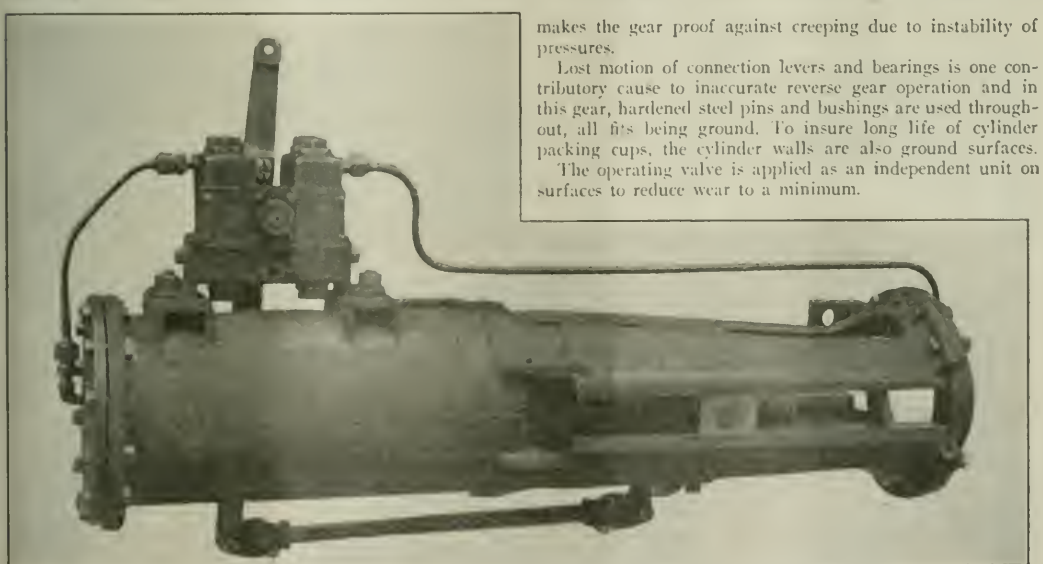
THE ALL-SERVICE power reverse gear is the result of developments extending over a period of about four years, during which the designers, the Transportation Devices Corporation, Indianapolis, Ind., carried on an extensive investigation covering all phases of the reverse gear problem. The concrete result has been the incorporation in this gear of certain features, the value of which has been amply demonstrated.

Desirable features of construction and operation claimed for the All-Service reverse gear include equal adaptability to passenger, freight or switching service, interchangeability with the majority of reverse gears now in service, and positive prevention of creeping. Fine adjustment, air cushioning is provided for passenger and freight service, and quick reverse, easy handling for switching service. In addition, stuffing boxes and glands are eliminated, and the operating valve is readily removable for repairs without removing the entire gear from the locomotive. Many of the parts subject to wear can be obtained from standard stock always carried by the railroads. The provisions made for lubrication are such that in this respect the gears require no attention from the enginemen.

To obtain the above features, the body of the gear is made an integral casting, embodying the cylinder and guides, one



The Operating Valve Is an Independent Unit with Micrometer Adjustments for the Four Poppet Valves



All-Service Power Reverse Gear with Cylinder and Guides on Integral Casting

of the gear. This permits employing the same methods and materials in successful use for years in packing air brake cylinders; cylinder leakage is reduced to the minimum; and there is no possibility of air leaking from one pressure chamber to the other. Furthermore, the absence of any piston rod or stuffing box as a contributory cause for leakage makes the gear proof against creeping due to instability of pressures.

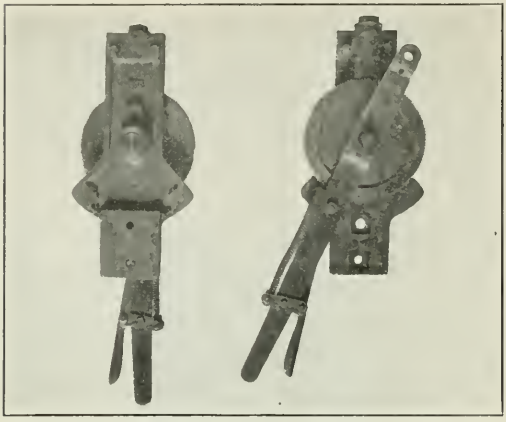
Lost motion of connection levers and bearings is one contributory cause to inaccurate reverse gear operation and in this gear, hardened steel pins and bushings are used throughout, all fits being ground. To insure long life of cylinder packing cups, the cylinder walls are also ground surfaces.

The operating valve is applied as an independent unit on surfaces to reduce wear to a minimum.

cylinder head and bolted joint being thus eliminated. Any load on the gear is supported between the points of attachment to the locomotive, and the cylinder itself takes no load other than internal pressure. A floating cylinder, moving within the main body cylinder, and a fixed piston head are provided, thus eliminating the usual piston rod, crosshead, stuffing box and packing. By this construction the packing rings, or sealing medium, are subjected to air pressure in one direction only for each of the air pressure chambers

The operating valve is applied as an independent unit on the gear, performing the same function as the triple valve with respect to the brake cylinder or reservoir. The four-poppet valve principle is employed to give long life to valves and allow separate adjustments of exhausts and admissions for each of the two air chambers. Micrometer adjustments are provided for each poppet valve to allow of independent clearance, or no clearance at all, and to make the gear sensitive to any adjustments that may be required, either because

of the gear moving itself, or being moved by the engineman. It is apparent from the illustrations that this valve can be readily removed and taken to a bench for repairs, another



Reverse Lever with Fine Tooth Circular Quadrant

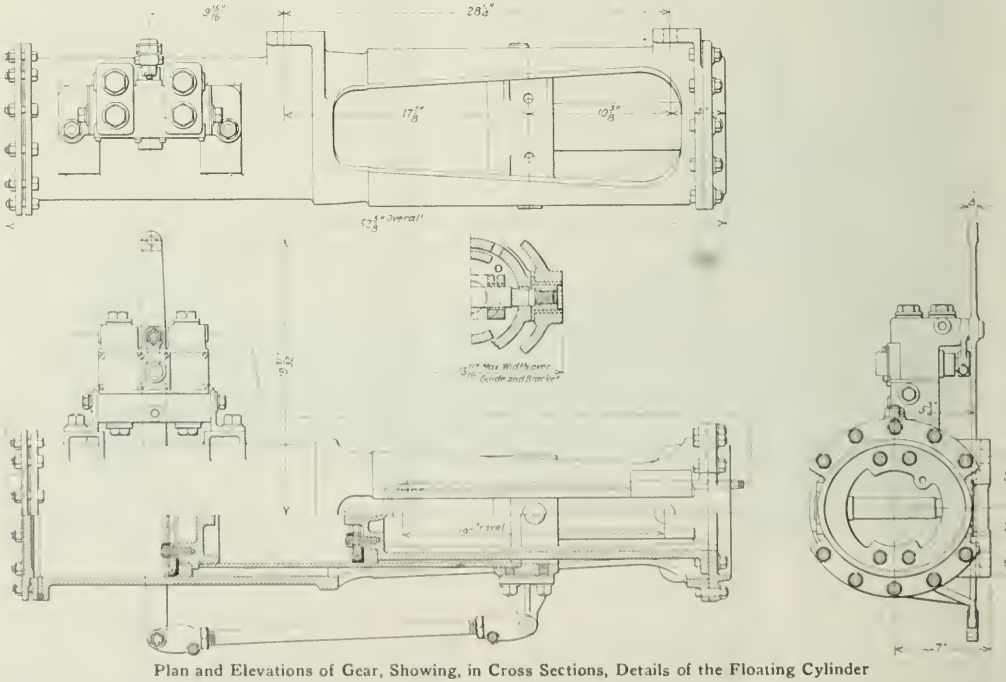
valve being applied in the meantime without disturbing the gear or unduly delaying the locomotive.

Some unusual features are included in the reverse lever and especially the quadrant. A circular quadrant without stops is used to insure full travel of the level. The wear of the quadrant teeth with corresponding lost motion of the lever is compensated for in revolving a new set of teeth to the operating arc of the lever. V-notched teeth are used to make available a large number of adjustments. The notches and quadrant latch are so designed that the reverse lever can be placed in any cut-off position desired. The fineness of adjustment is determined by the fineness of the engineman's movement of the lever.

The valve and lever construction is such that the speed of the reverse gear crosshead is proportionally the same as the reverse lever, preventing "slamming" in reversing and "surging" when the slack is taken up. The pull on the reverse lever need be no greater than can be exerted by one hand, sufficient to open the valves, the power of the gear moving the lever. The air consumption is reduced to that required to fill the increment of volume from which the gear is adjusted. This reverse gear can be readily applied to locomotives with either high or low-hung reach rods, and it is especially designed to work with automatic control of cut-off.

Continuous service for three years without attention of any kind is the record established by one installation of All-Service gear. This gear is in service on high-speed Atlantic type passenger locomotives where convenience of adjustment and stability of cut-off are particularly essential. Several gears have been in use a shorter period and as yet have required no adjustments.

THE FERRYBOAT "BUFFALO," a new vessel of the Delaware, Lackawanna & Western, was launched on November 22 at Elizabethport, N. J. The new vessel is 221 feet long with a carrying capacity of 1,000 passengers; and is to be used between New York and Hoboken. The Philadelphia & Reading has just ordered two new ferryboats for use between Phila-



Plan and Elevations of Gear, Showing, in Cross Sections, Details of the Floating Cylinder

delphia, Pa., and Camden, N. J., where, within the last two years, the movement of vehicles by ferry has increased about 50 per cent. The new boats will be built by Pusey & Jones, Wilmington, Del., and will be 200 feet long by 55 feet wide.

The "Veri-Direct" Method of Handling L.C.L. Freight

To Prevent Wrong Loading, Wrong Way-Billing and Wrong Mailing of Way-Bills—Economy Proved

THE VERI DIRECT METHOD of loading freight from freight houses into cars, which is here described has been in use in the Ohio Region of the Erie Railroad for over a year, and it has reduced the errors and losses due to wrong loading about 70 per cent as compared with former conditions. A very complete checking for errors is regularly made and the system is such that every bill of lading and every way bill must be accounted for. This method was introduced early in 1921 and is now in use at nine stations; and C. G. Johnson, superintendent of station service, has given us a description of it substantially as follows:

From the arrival of a shipment of goods on the consignor's dray to the sending out of the way bill seven blank forms are required. These are:

1. Shipping order (transcript of bill of lading) on which are entered the "flag number" and location number of the car into which the freight is to be loaded; the veri-check progressive number, the rate, the extension and the waybill number.

2. A "veri-check ballot" which is filled out with a description of the car: the flag and location number, the veri-check number, the number of pieces in shipment, the number of pieces on the truck, the checker's number; also the stower's signature and a rubber stamp impression (put on by him) of the flag number.

3. Freight house veri-check record No. 1, one for each day. This shows the arbitrary progressive numbers of the ballots used.

4. Freight house veri-check record No. 2; one each day, showing the veri-check progressive number and the number of pieces of freight on each bill of lading. The difference between record No. 1 and record No. 2 is that No. 1 merely shows what ballots are made, while No. 2 shows, under the head of each car, what ballots were sent to that car.

5. Original waybill, one sheet 8½ in. x 11 in., for each shipment originating at the station.

6. Loading schedule (layout or spot sheet). See illustration. Copies of this are used by the flag clerk, the typist, the way-bill mailing clerk, and all concerned.

7. Combination invoice and veri-check record, used in the main office. This is sent out with the waybills; it is a waybill of waybills.

When the Shipper Comes

When the bills of lading are tendered, the representative of the shipper is sent to the central flagging office, where the bills of lading are routed, and the shipping order separated from the other portions. The clerk here stamps on the shipping order the flag number which indicates the car into which the freight is to be loaded, and the spot number showing where the car is to be found. (Permanent spot or location boards are placed opposite each line of cars, and flagboards within the cars).

The flag clerk has a master flag book showing all the stations on the Erie Railroad, in alphabetical arrangement, and those on connecting lines moving via Erie junctions, together with the flag number and symbol letter; and the shipping orders are "flagged" with this book as his guide.

The clerk places a number on each shipping order, by the use of a consecutive numbering machine, commencing with No. 1 on the first day of every week. This number is used as an identification of the shipment throughout. A record is made of the numbers of all shipping orders so that the shipper can be quickly identified in case a shipping order should be lost. For example: "Progressive Numbers 599 to 604—The May Company." This done, the bills of lading are returned to the shipper's representative and by him tendered to the receiving clerk for the handling of the goods. The check clerk receiving the freight arranges the shipping order portions in alphabetical order as to the destination stations, for convenient checking.

The Check Clerk, the Caller and the Stowman

A caller calls the consignee, the destination marks, the commodity, the case or bale number, or other identification marks shown on the package, and the checker checks against the shipping order.

The freight is placed on a truck and the checker calls the flag and location number, which has been written on the shipping order and the caller writes these numbers on the top of one of the packages. The two numbers are separated by a horizontal line, the flag number being shown above and the spot or location below; example:

$$\frac{66}{503}$$

The veri-check ballot, prepared by the check clerk, shows the flag number and the location number of the car; the veri-check progressive number, the number of pieces in the shipment and on that particular truck, and the checker's number. This ballot is handed to the caller, who deposits it in a receptacle on the side of the truck; and the truck is shoved to the opposite side of the freight house by the caller, and there dropped. Motor tractor or hand power then moves the truck to a point near the location board shown.

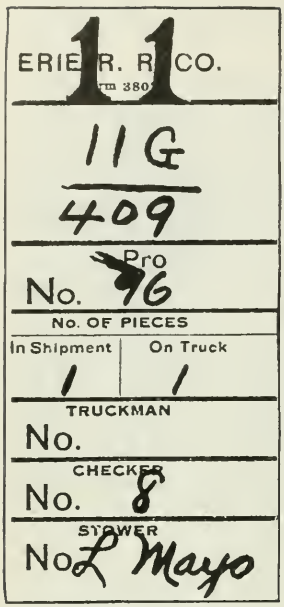
Regular stowmen are assigned to each line of cars, one stowman stowing four or five cars. These stowmen are responsible for the opening of the cars at the beginning of the day's business, the placing of the gang planks, the sweeping of the car floors, the pulling of the nails from the sides and floors of the cars, and the general preparation of cars for the receipt of freight. They are required to place the flag boards inside the car at the right of the door opposite the entrance to the car, in plain view from the platform.

No truckmen or other employes, except the stowmen, are allowed to enter the car except upon the authority of the foreman or assistant foreman.

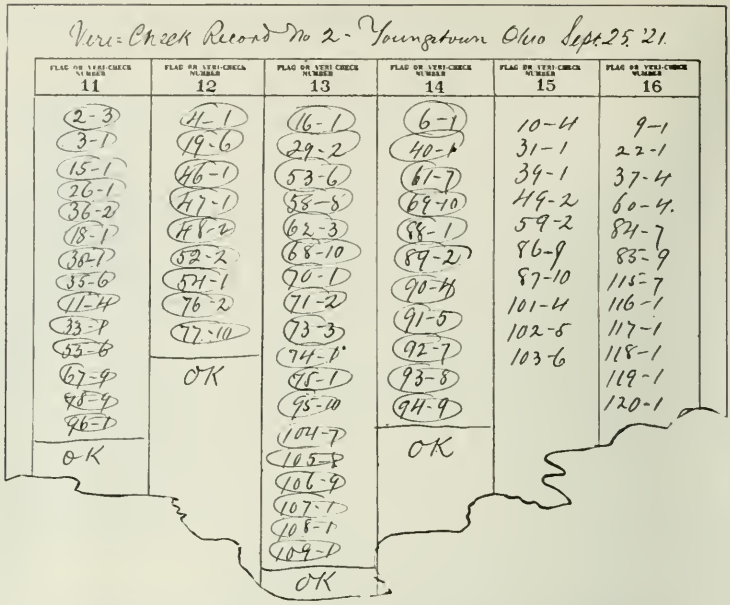
The stowman stows all of the freight. He notes the flag number as shown on one of the packages and moves the freight into the car according to this number. He then removes the veri-check ballot from the receptacle on the truck and compares the flag number on the ballot with the flag number on the flag board within the car. He then counts the number of pieces on the truck and compares that number with the number shown on the ballot. If the number of pieces on the truck is right the stowman places the ballot in the small pocket of his jacket and unloads the freight, observing the destination marks on the packages.

If he has any doubt about the loading he can refer to a book which he carries in his pocket. This book shows all the stations on the Erie Railroad for which freight may be loaded into a particular car. The cars are arranged in this book according to the flag number, in consecutive order. All destinations which may be loaded into a particular car are shown under the flag number of that car, in alphabetical arrangement.

Symbol letters are used for places off the Erie Railroad.



A Veri-Check Ballot



Copy of a Portion of Veri-Check Record No. 2, for September 25, 1921

This record is made in pencil on sheets 16 in. wide and 14 in. in height. This engraving shows a half of one sheet, reduced about two-thirds in width and height. The checking, indicated by a circle around the number, has been completed to the end of the fourth column, as shown by the "O. K."

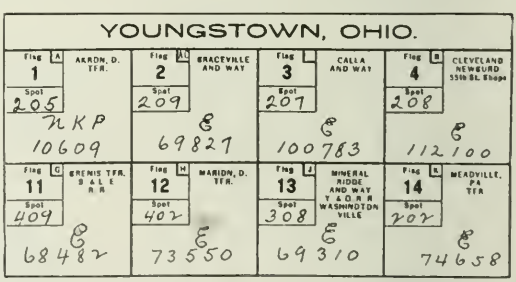
VERI-CHECK RECORD NO. 1—SEPTEMBER 25, 1921

Vericheck No. 6	*Vericheck No. 7*	*Vericheck No. 8*	*Vericheck No. 9*	*Vericheck No. 0*
(6)	(7)	(8)	(9)	(10)
(16)	(17)	(18)	(19)	(20)
(26)	(27)	(28)	(29)	(30)
(36)	37*	(38)	(39)	(40)
(46)	(47)	(48)	(49)	(50)
(56)	(57)	(58)	(59)	(60)
(66)	(67)	(68)	(69)	(70)
(76)	(77)	(78)	(79)	(80)
(86)	(87)	(88)	(89)	(90)
(96)	(97)	(98)	(99)	(100)
(106)	(107)	(108)	(109)	(110)
(116)	(117)	(118)	(119)	(120)

*Cancelled.

The above is a reproduction of half (the right-hand half) of Veri-Check Record No. 1. It is reduced about one-half in width and height. Parentheses indicate that the number has been used this day. Assuming that 120 is the last number used, the clerk makes a notation on the sheet to that effect. It may be assumed that "37" represents a shipment to be held over until the next day.

In the next column is a transcript of an invoice covering 14 way bills. The invoice sheet is 5½ in. wide and has 44 numbered lines, being 17 in. in height. The carbon copy, retained in the sending office is on a wider sheet having three additional columns for (a) the veri-check number (b) the number of packages and (c) initial of the clerk who makes final check of ballots against way bills.



Part of a Daily Loading Schedule—Reduced

A daily loading Schedule for 40 cars fills a sheet 17 in. wide and 8 in. high Numbers 21, 31, etc., would come directly under No. 11; and 22, 32, etc., under No. 12.

ERIE RAILROAD COMPANY

INVOICE FOR WAY-BILLS FORWARDED

Youngstown, Ohio, September 26, 1921.

Flag No. 11
Agent at *Shenango, Pa.* Train No. 77
Waybills for *Erie* Car 68482 Enclosed herewith

Billed from	Billed to	Date	Number	Weight
Youngstown, O.	Bessemer	9-25	698	310
Youngstown, O.	Bessemer		699	400
Youngstown, O.	Bessemer		703	100
Youngstown, O.	Bessemer		711	115
Youngstown, O.	Bessemer		712	210
Youngstown, O.	Bessemer		714	100
Youngstown, O.	Bessemer		716	400
Youngstown, O.	Bessemer		717	635
Youngstown, O.	Bessemer		718	1,190
Niles, O.	Girard, Pa.		720	2,310
Youngstown, O.	Girard, Pa.		725	2,100
Struthers, O.	Girard, Pa.		729	4,310
Beaver, Pa.	Kremis, Pa.		741	990
Youngstown, O.	Kremis, Pa.		747	1,215
(Fourteen waybills)				14,375

For example "11" is the flag number for a car going to Shenango Junction, and 11X means that the destination is on the B. & L. E. to be transferred at Shenango Junction.

On the divider sheet which separates one car from another in the stowman's book, there is a note to the effect that for freight being loaded into this car for stations on connecting lines which do not appear in the alphabetical list, he must, in addition to flag and location number, have the authority of a symbol letter: and this letter is shown.

When the ballot shows only the flag number and the packages are destined to a station not shown in the stowman's book, they are rejected by him and the assistant foreman adjusts the irregularity.

As soon as the freight is deposited in the car by the stowman he removes the ballot from his pocket and stamps at the top of the ballot, the impression of the flag number of the car, by the use of a rubber stamp attached to the veri-check box. He then writes his name at the bottom of the ballot and deposits it in the veri-check box. Stowmen are prohibited from handling more than one shipment or one ballot (or set of ballots for one shipment) at one time.

Immediately after the completion of the check of the shipment by the check clerk at the receiving door, all portions of the bill of lading are compared, and stamped with the regulation time stamp, showing the hour and date of receipt; and he signs his full name on the original, in the space provided under the agent's printed name.

The time stamp used in receipting bills of lading is attached by a chain to the clothing of the check clerk, in order that unscrupulous persons may not have the opportunity to sign spurious bills of lading. The original and memorandum portions of the bill of lading are returned to the shipper's representative and the shipping order is placed on a spindle on the check clerk's desk. These are collected at intervals by a messenger and taken to the freight house veri-check desk in the central flagging office.

The Daily Records

At the beginning of the day's business the veri-check clerk prepares a sheet with numbers equal to the probable number of shipments that will be received on that day. This is veri-check sheet No. 1. These numbers are arranged for quick reference according to the last digit of the number, from "1" to "0"; i.e., number "495" is placed on the "5" column. These numbers are placed on the sheet with a consecutive numbering machine.

Immediately upon the receipt of shipping orders at the freight-house veri-check desk the numbers shown thereon are checked against the arbitrary numbers shown on the sheet, a circle being placed around the number to denote that that particular shipping order has been received at the desk. This is to insure that all shipping orders shall be accounted for.

The veri-check progressive numbers shown on the shipping orders, with the number of pieces of freight, are then recorded on the freight-house veri-check sheet No. 2, each number being entered under the flag number of the proper car. The shipping orders are then sent to the office for waybilling.

At intervals the veri-check ballots are collected by a messenger from the boxes in the cars. He examines the flag number as shown on the flag board and as stamped on the ballots by the stowmen, and if a ballot is found with the wrong number it is turned over to the assistant foreman for adjustment.

A rubber band is placed around each lot of ballots taken from each box, and the ballots are sent to the freight-house veri-check clerk where they are checked against veri-check sheet No. 2 to account for proper loading in car, a circle being placed around the numbers. The ballot is now sent to the main office veri-check desk.

Any omission found by the freight-house veri-check clerk such as the stowman leaving off his name, or failure to show impression of flag stamp, is immediately called to the attention of the assistant foreman. If a veri-check ballot is missing, record No. 2 immediately detects it. For example: if a veri-check number shown under the car on sheet No. 2 has not been circled, while the one below it has been circled, that is a danger signal to the clerk, and the shipping order or waybill is obtained from the waybilling office and an inspection made of the freight in the car to see if it is there. When found a ballot is made covering the shipment and that ballot, marked "duplicate," shows that the freight has been actually loaded in the car.

The checking of the arbitrary progressive numbers on the veri-check sheet number 1 will immediately detect any missing shipping order and reference is made to the record maintained by the flag clerk of the veri-check numbers on the shipping orders; and the shipper is immediately questioned as to the possible delivery of all portions of the bill of lading to him; and the shipping order is returned or a copy made and the record cleared.

If any shipment is held over and not loaded into the car, the shipping order is obtained and the veri-check number cancelled thereon; it is also cancelled on the sheet showing the arbitrary numbers. Every arbitrary veri-check number shown on the sheet must be accounted for at the end of the day's business, or cancelled on the sheet and an explanation made of the reason for the cancellation.

Every veri-check number and number of pieces in a shipment as shown under the flag number on veri-check sheet No. 2 must be accounted for before the cars are closed.

Way-billing and Mailing

Immediately upon receipt of the veri-check ballots in the main office they are placed in a case provided for them, in compartments numbered to correspond with the permanent loading schedule (layout or spot sheet), ready to be checked against the combination invoice and veri-check record.

There is a waybill distribution case with 100 compartments numbered according to the flag numbers on the cars. All waybills show the flag number of the car and they are distributed into the waybill distribution case according to these flag numbers. They are then written on the final veri-check record, which is a combination veri-check record and invoice of waybills. As soon as these waybills are entered on this form, the veri-check ballots are checked back against this record, and if the total number of pieces shown on the ballot or ballots agrees with the number of pieces shown against the record of the waybill, the main office veri-check clerk attests the fact by writing his initials in the verification column on the record; and he then files the ballots for future reference. If the number of pieces on waybill as shown by the record does not agree with number of pieces shown on the ballots the shipping order is secured; and if an error in waybilling has been made a new waybill is made. If there is a missing ballot, the freight-house veri-check record is inspected.

In waybilling freight the veri-check number, as taken from the shipping order, is shown on the waybill in a regularly assigned space. At the close of the day's business, after the ballots have been checked against the combination veri-check and invoice sheet and all items closed out, the main office veri-check clerk goes through each compartment of the waybill distribution case and first compares all of the flag numbers shown on the waybills with the number of the compartment. Then he refers to the permanent loading schedule and finds the initial and number of the car, compares it with the number shown on combination veri-check and invoice form, and then again goes through the waybills and compares the initial and number of the car shown thereon to see that they are all correct.

In addition, he counts the number of waybills and com-

pares them against the number of entries on invoice as shown by the numbered items thereon. He then attaches the invoice to the waybills, together with a copy of the non-revenue waybill upon which the car moves, and places the whole in the envelope, which has previously been prepared. This shows the flag number, the car number, initials, station from and date. If a way car, the original non-revenue waybill is attached to the other waybills.

Before mailing, the envelope is compared against the combination invoice and veri-check record of the car, the copy of the non-revenue waybill attached thereto, and against the permanent loading schedule to see if the car number and initial and the mailing destination of the car are correct.

A copy of the combination veri-check record and invoice is retained at the station as a permanent office record.

A Typical Shipment

In order that the reader may review this method of loading, free from details, we will follow a shipment from the shipper's dray through its various processes to the completion of the waybill and the mailing of that document.

Take a shipment of one box of patterns, 310 lb., shipped by the Carnegie Steel Co., Youngstown, Ohio, to the Edgar Thomson Foundry, Bessemer, Pa.

1. All parts of the bill of lading are presented at the central flagging office. Flag clerk enters (a) the routing (via Shenango & B. & L. E. R.R.); (b) flag number of car ("11G") and location number (409); (c) veri-check progressive number (96) put on with a consecutive numbering machine. He makes a record of the shipping order against the shipper's name, as before noted, and returns all parts of the bill of lading to the shipper's representative.

2. All portions of the bill of lading presented at the receiving door are then separated; and all shipping orders are arranged alphabetically according to destination stations. The caller calls the marks and unloads the freight from the dray and puts it in his truck. The checker checks against the shipping order and announces 11G-409, the flag and location of car, to the caller, who chalk-marks these numbers on one of the packages. The check clerk makes a ballot and hands it to the caller, who places it in the receptacle on the truck. The caller pushes the truck across the house to the car side. The checker stamps and signs all parts of the bill of lading; he returns the original and the memorandum to shipper's representative and hangs the shipping order portion on a hook on his desk.

3. This shipping order is picked up by a messenger and delivered to the freight-house veri-check desk. There it is checked on veri-check sheet No. 1 and the information shown on the order is recorded on sheet No. 2.

4. The shipping order is sent to the main office for billing.

5. The truck with freight thereon is moved by tractor or by hand to a point opposite location board "409."

6. The stowman notes the chalk mark and the flag number and moves the freight into car 11. He removes the ballot from the receptacle on the truck; compares flag number "11G" with flag board No. 11 and symbol G, shown on the board and on the box inside of the car. He counts the number of pieces on the truck and compares with the number shown on the ballot. He does not need to check destination, as the symbol letter "G" is shown. (If no symbol letter is shown the stowman unloads according to destination mark, referring to his book to find any destinations with which he is not familiar) and stamps the ballot with the flag number of the car, he signs his name on the ballot and deposits it in the box inside the car.

7. Messenger collects all ballots from box 11; compares rubber stamp impression number 11 with number 11 on the flag board; takes ballot to freight house veri-check office where it is checked against record No. 2, which shows progressive number and number of pieces; the ballot is then sent to main office.

8. Shipping order is taken by the rate clerk and the rate is entered on it. He enters the waybill number (E-698) thereon with a consecutive numbering machine; extensions are made by the comptometer operator in blue pencil, and the waybill is made by a typist, who makes an exact copy

SAMPLES OF ITEMS IN LOADING GUIDE, YOUNGSTOWN, O.

Flag No.	Station
5	Castile, N. Y.
16	Cattaraugus, N. Y.
6	Cedar Grove, N. J. (Ppd.).
3	Cement Works, O. (Ppd.).
7	Central Valley, N. Y.
7	Charlottsburg, N. J.
5	Cheektowaga, N. Y. (Ppd.).
12	Clanricarde, Ind. (Ppd.).
16	Clarion Jct., Pa. (Ppd.).
7	Clemo, Pa. (Ppd.).
4	Cleveland, Ohio.
6	Clifton, N. J.
7	Clifton, Pa.

YOUNGSTOWN, O.—FOREIGN

	Flag No. and symbol
Baltimore & Ohio R. R.:	
Akron, Ohio	1 A
Barberton, Ohio	1 A
Bessemer, Pa. (P. & L. E.)	26 T
Burbank, Ohio	1 A
Cleveland, Ohio	4 B
Dexter, Pa. (P. & L. E.)	26 T
Kent, Ohio	2 AC
Mt. Jewett, Pa.	16 L
Mansfield, Ohio	1 A
Bessemer & L. E. R. R.:	
Meadville, Pa.	14 K
Greenville, Pa.	22 Q
Shenango, Pa.	11 G
Buff., Roch. & Pitts. R. R.	
Bradford, Pa.	16 L
Brockwayville, Pa.	16 L
Carrollton, N. Y.	16 L

A LEAF FROM A STOWMAN'S BOOK. YOUNGSTOWN, O.—FLAG NO. 6

Allwood, N. J.
Arlington, N. J.
Athenia, N. J.
Atlantic Terminal, N. Y.
Atlantic Term., Brooklyn, N. Y.
Awosting, N. Y.
Babbitt, N. J.
Baltic Term., Brooklyn, N. Y.
Bardonia, N. Y.
Belleville, N. J.
Bellwood Park, N. J.
Bloomfield, N. J.
Bloomfield Ave., N. J.
Bloomingdale, N. J.
Boardville, N. J.
Bogota, N. J.
Brighton Ave., N. J.
Brooklyn, N. Y.
Brooklyn E. D. Term, N. Y.
Bush Term., Brooklyn, N. Y.
Butler, N. J.
Bush Dock, N. Y.
Caldwell, N. J.
Campgaw, N. J.
Carlstadt, N. J.
Carlton Hill, N. J.
Carlton Park, N. J.
Cedar Grove, N. J.
Clifton, N. J.
Closter, N. J.
Cooper, N. J.
Cresskill, N. J.

of the written portion of the bill of lading. A shipping order when finally filed bears seven notations. For example, in the case of the box of patterns referred to:

1. The flag number 11G, and the spot number, 409, written in red pencil.
2. The progressive number, "96."
3. The routing, rubber stamped, "Route 5237 Shenango, B. & L. E."
4. The rate, in red ink, 79½.
5. The freight (310 x 79½), $2.46.
6. Total amount including war tax, $2.53; and the waybill clerk stamps on it the number of his waybill, 698.

9. The waybill is sent to main office mailing desk and there placed in compartment number 11, faced up.

10. The mail clerk transcribes the waybill on a combination invoice and veri-check record (see illustration); then checks the ballot number against the item on the record and returns both the waybill and record to compartment number 11, faced down.

11. The mail clerk counts the waybills and compares the number of each bill with the number shown on the invoice; then he checks all flag numbers shown on waybills to see if they agree with the compartment number; obtains the car number from the loading schedule and checks the car numbers on all waybills; addresses the envelope; attaches invoice and copy of non-revenue waybill to other waybills; compares address on envelope with destination of car as shown on loading schedule, and sends to mail room for mailing. (Loading schedule shows that number 11 car is Erie 68482 and destination Kremis Transfer, B & L E.)

Satisfactory Economy

Mr. Johnson informs us that at a station or transfer handling from 900 to 1,200 consignments a day the additional cost necessary for the operation of the "veri-direct" loading method will not exceed $200 a month; and he declares that this amount is insignificant compared with the saving made by the use of the method in the elimination of loss and

damage claims. He will be glad at any time to meet representatives of railroads who may be interested, at one of the large stations on the Erie and explain the operation.

The method is in use at the following stations: Jamestown, N. Y.; Meadville, Pa.; Youngstown, Ohio; Cleveland, Ohio; Akron, Ohio; Ashland, Ohio; Mansfield, Ohio; Sharon, Pa.; Warren, Ohio.

Freight Transferred

In the handling of outbound freight all through waybills received at the freight-house with goods from connecting railroads are treated the same as bills of lading received direct from consignors. Each such waybill is rubber-stamped when the goods are transferred, showing station and date and car loaded into, and it also has a veri-check number, put on with the numbering machine, the same as though it were a shipping order.

Each freight station that transfers freight from one car to another keeps a loose-leaf record showing all necessary details of every shipment. The record of a given inbound car at Youngstown, for example, shows not only the freight transferred but also all freight for Youngstown proper, with any necessary notations as to condition of goods found in bad order.

Clerks Demand Large Wage Increases

Railroad Labor Board Asked to Restore Rates of Pay Received Under Its Decision No. 2

ANOTHER DEMAND for large wage increases was placed before the Railroad Labor Board when representatives of the clerical employees on approximately 50 carriers appeared before that body on November 23, 24 and 25. In general their requests were for the restoration of the rates of pay in effect under the Board's Decision No. 2, in other words the restoration of the highest rates of pay ever received by these employees. According to their testimony, the increases requested, if granted, would add $5,895,000 to the monthly payroll for clerks (based on the August, 1922 figures) and $1,330,000 to the monthly payroll for freight handlers, a total monthly increase of $7,225,000.

A new argument in favor of wage increases was included in the employees' presentation when, in dealing with the ability of the carriers to pay the increased rates requested, they openly made the charge that "the railroads have persistently concealed the true measure of prosperity which they enjoyed by the grossly misleading practice of carrying excessive charges to maintenance." This "method of concealing profits has long been an integral part of railway financial policy" and is "common knowledge," they continued. "The extent to which it has been indulged and the full significance of that indulgence has been clearly recognized and forcibly driven home by only one prominent financial writer, Thomas Gibson, who in recent years has devoted a large measure of his time to extended analysis of this factor in the railroad income statement and has repeatedly urged his clients—the holders of railroad securities—to realize the influence which overmaintenance exerts in depressing railroad net earnings below their actual proper level."

Numerous "weekly market letters" written by this man were quoted in support of their position, but upon cross-examination none of the employees' representatives could definitely identify the author.

In concluding his argument for a wage advance, E. H. Fitzgerald, president of the Brotherhood of Railway & Steamship Clerks, Freight Handlers, Station & Express Employees, said:

> We have proven:
>
> (1) That inequalities in the wage rates paid to freight handlers in certain localities have worked an injustice and merit immediate action by the Board.
>
> (2) That the cost of a decent standard of living in the United States today is far above the wages received by the classes of employees we represent.
>
> (3) That the standard of living of these workers has fallen and unless the Board acts now, the increases in living costs which are being daily reported will inevitably operate to further depress the standards of living of these railway employees.
>
> (4) That business conditions in general, and the condition of the railroads in particular, are such that an increase in the wage rates can be easily paid from railway earnings. Not only is the financial condition of the railways now very favorable, but every indication points to the conclusion that the railways will profit even more liberally in the near future. We have shown in this connection that the granting of punitive overtime rates for all time worked in excess of eight hours a day or 48 hours a week is under existing conditions not only just and reasonable but an absolute necessity.
>
> (5) That the wages of employees in outside industries have increased very rapidly in the general upward movement that has taken place in the last six months. We have shown that the wages of railway trainmen have been continued at the level prevailing after July 1, 1921. We have shown that individual railways, acting in agreement with their employees, have increased the rates under Decision 1074 in their application to the employees we represent.

In regard to the alleged inequalities, the employees' representatives contended that freight handlers in the larger terminals are suffering from a maladjustment originating in Supplement 7 to General Order 27 and petitioned the Board to restore the differentials formerly existing between clerks and freight handlers in freighthouses.

The "relation between wages and the cost of living" factor enumerated in the Transportation Act as one of the principles to be considered in fixing wages, is inseparably connected with the budget method and the theory of the "living wage," they argued. The minimum cost of living level, they added, averaged more than $1,960 throughout the country, whereas the yearly wages of the classes of employees involved in this dispute ranged between $1,730 for "Class A" clerks and $932 for common labor. In this connection, they also went into the subject of "real wages," basing their conclusions upon a comparison of wages and retail prices of food between 1895 and 1922. This comparison purported to show that the wages of station employees now, measured by their purchasing power, are seven per cent less and the wages of clerks eight per cent less than they were in 1895.

A great deal of the employees' testimony was devoted to an attempt to prove that the carriers' financial difficulties are now over and that they are able to pay the higher wage scale requested. It was in connection with these contentions that the employees introduced their charges of "concealed profits in the form of overmaintenance."

Employees' Testimony Answered by E. J. McClees

The reply of the eastern carriers was presented by E. J. McClees, secretary of the Bureau of Information of the Eastern Railways, who repeatedly called attention to the fact that almost all of the arguments advanced by the employees have been subjects of extended hearings and in many cases

of decisions by the Board. This was particularly true, he pointed out, in regard to the men's demands for punitive overtime and various changes in their working rules.

For instance, the changes in rules requested by the employees should be declined, Mr. McClees said, because: (1), they are merely repetitions of requests previously filed with the Board and upon which exhaustive hearings were held in 1920 and 1921; (2), the railroad testimony submitted at that time clearly showed the drastic and restrictive nature of the proposed rules; and (3), there has been no change in the conditions affecting the employees which would justify a reconsideration of these questions.

Referring to the comparison of wages and retail food costs from 1895 to 1922, Mr. McClees pointed out the "impossibility of establishing any earnings of these classes of railway employees from the Interstate Commerce Commission's reports for these past periods" and also the changes which the Department of Labor has made in the food item at various times between 1900 and 1913 all of which tend to nullify the comparison.

"We feel that there is only one conclusion to be drawn from the general statement on behalf of the employees," Mr. McClees continued, "and that is set forth in the statement made by committees on practically every eastern railroad which is represented in this hearing, namely, that it is the position of the organization that Decisions 147 and 1074 of the Labor Board did not recognize conditions as they existed and therefore were improper and unjust; in other words, that the Labor Board erred when it ordered these reductions."

Taking up the contentions of the employees, namely, first that Decisions 147 and 1074 were improper and unjust, second, that there is an upward trend in the cost of living, third, that the present wages of the employees involved are not sufficient to maintain an average family in health and decency, and fourth, that there have been increases in wages in other industries since Decision 1074 was rendered, Mr. McClees said in part:

"(1) Our exhibits clearly indicate that the treatment which employees have received in the way of adjustment is a complete answer to the claims of the organization concerning inadequate or improper treatment, and demonstrates that all the classes of employees involved in the present hearing have received fair treatment whether viewed from the standpoint of actual increases or upon the basis of reduced purchasing power of money.

"It will be noted for instance that the average hourly rate for clerks in 1915 for the railroads indicated was 27 cents; in October, 1917, 30.7 cents; June, 1921, 62.7 cents; June, 1922, 56.4 cents, and at present 53.3 cents; that the clerks involved are at present enjoying an increase over 1915 of 97.4 per cent in their rates and, after making allowance for the reduced purchasing power of the dollar, they are 18.7 per cent better off than they were in 1915. Using 1917 as a base they are 48.6 per cent better off now than in 1917.

"(2) As to the claims of the representatives of the employees concerning the upward trend in the cost of living, the latest information available completely contradicts the claims of the employees. The Department of Labor bulletin shows that for July, 1922, the index number of the cost of living was 166.9 based on 1914, compared with 166.3 for September, 1922, September being the latest figure available, and 174.3 for December, 1921. Such fluctuations as have taken place since last spring are not sufficiently pronounced to justify the reconsideration of the wage scales upon that factor.

"(3) As to the employees' contention that the present wages do not yield a reasonable living wage, we believe that in view of the conclusions reached by the Board in its recent decision in the maintenance of way case no further argument need be made by the railroads on that subject.

"(4) The best information available shows that nothing approaching a general increase in wages has taken place in other industries. Such changes as have taken place have been spotted and largely confined to associated industries. A summary of an investigation made by the individual railroads as to changes which have taken place in the wage scale of clerical forces in other industries, shows that 83 per cent of 733 firms canvassed have made no changes in the wage scales of their 31,957 clerical employees, that 85.8 per cent of the employees have had no increase or decrease while 15.7 per cent of the firms made increases applying to 14.2 per cent of the employees. It will be observed that nothing resembling a general adjustment has taken place, in increases which have been granted it is evident that they must have been based upon the merits of the individual cases."

Several presentations were made on behalf of the individual carriers and Dr. C. P. Neill and J. W. Higgins presented brief statements outlining the position of the southeastern and western carriers, respectively, the bulk of the testimony on behalf of the latter group was given by representatives of the individual lines involved.

Representatives of the Pennsylvania and the Mobile & Ohio protested their inclusion in the controversy but no ruling was made by the Board on this point. The hearings ended on November 25.

An Automatic Substation for the New York Central

The New York Central Railroad has contracted with the General Electric Company for an automatic substation installation to be used on its electrified division. The new substation, which is the first to be installed on an electrified steam road, will be located beneath the elevated tracks at One Hundred and Tenth street and Park avenue, New York, near the point where they emerge from the Park avenue terminal. While the equipment furnished will provide for full automatic operation, the operator at Mott Haven substation No. 2, about two miles distant, will have the new station under his supervision through pilot wires providing for remote control. This equipment offers an interesting and economical solution to some of the problems of train operation at points where the growth of traffic develops load centers which did not exist at the time of the original installation.

The equipment will consist of a 2,000-kilowatt motor-generator set operated directly from the 11,000-volt transmission line and with the generator supplying power to the 660-volt third-rail system.

The set may be floated on the line all day or may be closed down during the periods of light traffic at the discretion of the operator at the Mott Haven Junction substation. To start the station, he simply operates a control switch and the automatic control in the new substation takes care of starting the motor-generator set and bringing it on to the line. An operator in the station at Mott Haven may also follow the output of the machine and its load conditions at any time of the day. From his knowledge of train movements he is in a position to know when the set may be unnecessary and the indicating equipment on his meter panel gives an additional check on the line load.

In the event of a service interruption due to failure of the high tension supply, the automatic station will of itself shut down and be ready to come onto the line again with the resumption of service from the power station.

The automatic station control is laid out so as to present the characteristics of a constant current generator. The control can be adjusted so that the generator will supply continuously any value of current below the rated output for so long as the operator may anticipate the concentration of load or for such a period as is possible without overheating.

Southern Pacific-Central Pacific Hearing

Washington, D. C.

The hearing before Commissioners Meyer and Potter of the Interstate Commerce Commission at Washington on the application of the Southern Pacific for authority to retain its control of the Central Pacific by lease and stock ownership was continued this week. Following the presentation of testimony by officers of the Southern Pacific, a large amount of testimony was given by representatives of western shippers and of state commissions who have intervened in the case to favor or oppose the Southern Pacific's application. Those who urged the commission to approve the Southern Pacific's application did so largely on the ground that they preferred to maintain the Southern Pacific as a strong railroad system, which they looked upon as a California institution, rather than to have additional competition, while many of them also feared that the service would be impaired by a separation of the Central Pacific from the Southern Pacific. Others who favored the separation took the position that if separated from the Southern Pacific, the Central Pacific would display more interest in the development of the intermountain territory. The Union Pacific witnesses are to be heard later.

L. J. Spence, director of traffic of the Southern Pacific, was cross-examined at length by H. A. Scandrett, commerce counsel of the Union Pacific, regarding the extent of preferential solicitation by the Southern Pacific of traffic over its southern routes. In reply to questions, Mr. Spence said that while the Southern Pacific was under Union Pacific control the agents were supposed to solicit business through the gateway which yielded the longest haul to the system lines, but that after the separation he had substituted specific directions based on the definite geographical line which he had described in his original statement and that in what he called Atlantic-Gulf territory the Southern Pacific agents were instructed to solicit preferentially via the southern routes. In the territory north of that line they solicited preferentially via the Ogden route. He denied that it was the practice to solicit for the southern routes in the territory north of the line. In other words, he said, the Southern Pacific undertook to use the route by which it could most successfully get its share of the business. He admitted that under this policy the Southern Pacific tried to get freight from Cincinnati via the southern route, although the distance was somewhat greater than via Ogden because the southern route was available for this purpose and by it the Southern Pacific would receive a greater revenue, but, he said, the company regarded the Omaha route as an indispensable route by which to solicit business as against the Santa Fe and other lines and that the Union Pacific is indebted to its organization for many a car via Ogden when the Southern Pacific could not get it the other way. Mr. Scandrett inquired whether an independent Central Pacific would view the Cincinnati traffic in the same way and Mr. Spence admitted it would not. When Mr. Scandrett asked if this does not indicate that the Southern Pacific competes against itself, Mr. Spence replied that, in his opinion, the railroad having a long haul by one route and a short haul by another route necessarily competes against itself. He denied that the Sunset-Gulf route is a material competitor against the Ogden route, on the ground that because of canal competition the transcontinental traffic does not amount to much. The canal competition, he said, now has three times the force it had when the Southern Pacific-Central Pacific case was submitted to the court. He also denied that the Southern Pacific had made lower rates over the Sunset-Gulf route to take business away from the Ogden route, asserting that the desire was not so much to make a differential as against the rail lines as for the purpose of meeting the canal competition. Mr. Spence said that when the policy of solicitation was adopted after the separation of the Central Pacific and the Southern Pacific, he had informed Judge Lovett, chairman of the Union Pacific, at his request, and that Judge Lovett had said it was entirely satisfactory.

Commissioner Potter asked if the Southern Pacific in drawing the line had attempted to be impartial. Mr. Spence said that it had drawn the line with reference to the points at which it could make its solicitation effective. Fred H. Wood, counsel for the Southern Pacific, had the witness repeat his original testimony showing that the traffic which moved via El Paso last year which might have gone via Ogden amounted to less than 83,000 tons and that the same policy of solicitation had put 316,000 tons of freight over the Central Pacific which would not have moved that way if the Southern Pacific had not solicited it. Commissioner Potter inquired how much tonnage the Southern Pacific would lose if the line from Ogden to San Francisco alone were taken from the Southern Pacific. The witness said he had made no estimates along that line.

In connection with the cross-examination, Mr. Scandrett recalled testimony by William Sproule, president of the Southern Pacific, before the Railroad Commission of California in 1913 to the effect that the separation of the Central Pacific from the Southern Pacific would be of great benefit to the shippers and the public of California, that additional railroads bringing new competition were always of benefit to a community, and that there would be no advantage in rates and no inconvenience to the public to result from such a separation.

F. L. Burckhalter, assistant general manager of the Southern Pacific, was cross-examined for an entire day by Mr. Scandrett and by H. W. Clark, general counsel of the Union Pacific, regarding the operating conditions which would result from a separation. Mr. Clark attempted to show by the questioning that existing routes need not be disrupted by a separation of the ownership and that the public would not be seriously affected in any way because arrangements could easily be made for joint use or running rights over the trackage so that very little change in present methods of operation need result. He insisted that the Southern Pacific's objection to such joint use was based on questions of economy from the Southern Pacific standpoint, while as to several lines, Mr. Burckhalter said that the Southern Pacific could not afford to enter into any arrangements for joint use because it had lines of its own serving practically the same traffic. "We do not assume that all disruption of traffic is against the public interest," Mr. Clark said, "although that is evidently the case of the Southern Pacific in this hearing. We propose to show that a disruption can be made that will not particularly injure the present service and will in the long run afford better service." With a large map of the lines Mr. Clark had Mr. Burckhalter point out the various routes and cross-hatch with a red pencil the lines over which trains of both railroads could be run without, as he said, much change in methods of operation. Mr. Burckhalter would not admit that traffic would continue to move in the same way in the event of a separation, but Mr. Clark insisted that this merely meant that he thought it would not be economical for the Southern Pacific to enter any joint use arrangements.

Athol McBean, vice-chairman of the California Shippers' Committee, which he said represented the shippers of 90 per cent of the freight tonnage of California, whose freight bill amounts to $250,000,000 a year, appeared in support of the Southern Pacific's application. He said the shippers of California and the Pacific Coast feel that the Southern Pacific is essentially a California institution and dependent to a large extent upon the growth and development of that territory for its prosperity, and that they preferred a strong railroad organization to the competition of additional lines. They also saw in the Southern Pacific Company an institu-

tion which looks from the West east rather than from the East west. The opening of the Panama Canal, he said, and the resultant dwindling of the so-called transcontinental business have accentuated this situation and the freight paying public is virtually unanimous against dismemberment of the Southern Pacific System, because they believe that from such a local institution the state will receive its fullest measure of co-operation. He took the position that the substitution of competitive operation, were the Central Pacific lines not operated by the Southern Pacific, would impair service and substitute higher rates for a two-company haul than are now charged for a single-line haul. Under cross-examination he said it was a good thing for the Santa Fe System to go into northern California and that the competition of the Western Pacific was welcomed, but he declined to admit that the operation of the Central Pacific as an independent system would be of benefit. "We would not want so much competition that it would break down the good service we now have," he said. "There are too many transcontinental lines into Oregon and Washington now. We want one strong road rather than two weak ones. If the Union Pacific wants to build into California, we will go with you, but we don't want you to come in and break down the one strong system we have." He was asked if joint use of the lines would not meet the difficulties as to service, but he insisted that better service could be obtained under unified management by the Southern Pacific.

Grant E. Halderman, chairman of the Public Utilities Commission of Colorado, opposed the Southern Pacific application on the ground that control of the Central Pacific by the Southern Pacific would "perpetuate intolerable conditions now existing" and would be greatly detrimental to the state of Colorado. The interests of the public in Colorado, he said, as well as in the intermountain region, demand that the decision of the Supreme Court be speedily and completely carried into effect and Colorado sentiment is a unit in urging that this course be pursued. He presented resolutions from several organizations in the state favoring a separation of the Central Pacific from the Southern Pacific on the ground that the Southern Pacific has diverted to its southern route a large amount of traffic which would otherwise pass through Colorado and thereby add to the efficiency of the railroads serving that state.

Mr. Wood asked the witness if he or the senators and others from Colorado who have been sending telegrams to public officials in Washington urging a separation of the Central Pacific, on the theory that it would increase the tonnage moving via Colorado lines, had made any investigation of the amount of tonnage that would be affected. The witness said that he "knew nothing about the traffic game" and that he had not heard any of the others discuss the amount of traffic involved. Mr. Wood then asked if he thought an increase of less than 100,000 tons through the Ogden gateway, or less than one per cent of the tonnage of the Union Pacific, would have any very substantial influence one way or the other. The witness admitted that if that were the amount he would not think it was a matter of great importance to the people of Colorado whether the tonnage moved via Ogden or through El Paso, although he thought it might be of some advantage to the proposed tunnel on the Moffat road. Mr. Wood then asked if he knew whether the efforts of the Union Pacific are directed more largely to putting its transcontinental business through Omaha, where it does not pass through Colorado, or through the Kansas City line, where it does pass through Colorado. The witness said that without knowing much about it, it would largely be determined by the origin of the tonnage and that much of it would naturally go through Omaha. Mr. Wood then asked questions to bring out that if the Union Pacific should acquire control of the Central Pacific and close the use of the Central Pacific as a connection of the Denver & Rio Grande, the traffic over the D. & R. G. through Colorado would be likely to be reduced.

H. W. Prickett, testifying on behalf of the state of Utah and various chambers of commerce in that state, favored the retention of the Central Pacific by the Southern Pacific. He said it is the unanimous opinion of those he represents that the future development of the state will be best served by continued competition between the Central Pacific and the Southern Pacific. He feared that a separation would weaken the Central Pacific and that the state would have less competition than it now has with two lines from Utah and California. He testified that Vice-President E. E. Calvin of the Union Pacific had told him that if the Central Pacific was separated from the Southern Pacific there would be no question but that the Union Pacific would acquire it. In his opinion, the amount of traffic moving through the state that would be affected is of comparatively small significance, but that if the Union Pacific or interests friendly to it controlled the Central Pacific they would have a practical monopoly and would advance rates. Other business men of Utah, California and Oregon gave similar testimony. F. A. Summers of San Francisco, who has a large grain warehouse at Port Costa, said he feared that if the Central Pacific were separated it would set up a grain terminal of its own which would deprive Port Costa of a great part of the business it now receives. A number of representatives of the Willamette Valley lumber interests also testified in favor of the Southern Pacific application, saying that control by the Southern Pacific gives competition with the Union Pacific and that joint operation of the Central Pacific by the Union Pacific and the Central Pacific would result in impairment of service.

Representative F. W. Mondell of Wyoming testified in favor of the complete separation of the Central Pacific from the Southern Pacific, saying that the national interest demands that the transcontinental line represented by the Union Pacific and the Central Pacific should be operated by one system. With the Central Pacific under management and control whole-heartedly favorable to the utilization and development of the transcontinental system of which it was intended to be and is a part, he said, the service now rendered in and to Wyoming would be extended, enlarged and improved. Branch and feeder lines would be built and with them would come increased population and a general improvement of conditions in the state. He said he had no quarrel with the Southern Pacific officials, but they cannot be expected and should not be asked to serve two interests.

George E. Erb, president of the Idaho Public Utilities Commission, also opposed the Southern Pacific application, as did C. L. Draper, chairman of the Public Service Commission of Wyoming. J. F. Shaughnessy, chairman of the Nevada commission, presented an intervening petition in support of the Southern Pacific application, saying that a separation leaving the Central Pacific unattached to a strong operating company would cripple it. He said he did not wish to commit the state as to the final disposition which should be made of the property. He also read a letter from another member of the Nevada commission which took the position that it should remain neutral until the federal commission has completed its investigation on the ground that the state commission has held no hearings and the sentiment of the shippers has been represented only by a series of ex parte petitions in about equal number secured by representatives of the Southern Pacific or the Union Pacific.

Richard Sachse, chief engineer of the California Railroad Commission, testified at great length in support of the Southern Pacific application, asserting that a separation of the properties and an attempt to operate over the Central Pacific lines jointly would result in a great decrease in efficiency. He occupied the stand for nearly a day and a half and was cross-examined in detail by Mr. Scandrett.

General News Department

The United States Supreme Court will hear arguments on January 8 in the injunction suit of the Pennsylvania Railroad against the Railroad Labor Board.

Examiners Mullen and Borland of the Interstate Commerce Commission will resume hearings at Washington on December 4, in the general air brake investigation.

The New York Central Lines' Train Control Committee witnessed a preliminary test of the Clifford Automatic Train Control system which was conducted on the Erie at Port Jervis, N. Y., on November 28. The test was made at the request of this Committee and proved satisfactory.

The Senate on November 24 in committee of the whole adopted an amendment to the Liberian loan resolution providing for an appropriation of $170,100 for 35 additional locomotive inspectors for the Interstate Commerce Commission, but on November 27 the Senate voted to recommit the resolution to the finance committee.

Renewed complaint about the condition of railroad equipment as a result of the shop strike was made to President Harding on November 25 by William H. Johnston, president of the International Association of Machinists, and B. M. Jewell, president of the Railway Employees Department of the American Federation of Labor.

They also protested to the President that several railroads were still violating orders of the Railroad Labor Board regarding the contracting out of shop work.

The American Short Line Railroad Association announces the removal of the Consolidated Purchasing Agency from Washington to Chicago, effective December 1. It is also completing plans for a finance corporation, through which gasoline passenger motor cars may be acquired by member lines and others under a lease purchase contract. It is believed that this will be a great help to a large number of railroad companies who have otherwise found difficulty in financing the purchase of motor equipment on this basis.

Pierce Butler of the law firm of Howe, Butler & Mitchell of St. Paul, Minn., has been nominated by the President as an associate justice of the Supreme Court of the United States succeeding William R. Day, resigned. Mr. Butler was formerly general attorney of the Chicago, St. Paul, Minneapolis & Omaha and later counsel for the western group of the Presidents' Conference Committee on Valuation. Representatives of the radical and labor elements in the Senate have announced their intention of opposing the confirmation of the appointment by the Senate.

On Tuesday the Senate Judiciary Committee voted to report favorably to the Senate on the nomination.

Payments for loss and damage of freight by the New York, New Haven & Hartford in the month of September amounted to $39,690, which is a large sum of money; but it is 75 per cent less than the sum paid in September, 1921. Bills paid for losses of entire packages decreased 95 per cent. The percentage of total damage payments to gross freight revenue was eight-tenths of one per cent, as compared with 3.7 per cent in September, 1921. The record for September was not so very exceptional, the payments for the nine months of 1922 having been 62 per cent less than in the same period of 1921.

Employees of the Pennsylvania Railroad have bought, through the Mutual Beneficial Association, 27,000 shares of the stock of the railroad company, and about 1,500 shares were thus bought by employees during one week recently. J. K. Linn, treasurer of the Mutual Beneficial Association, Philadelphia, through whom the purchases are made, says that he recently received from one limited territory nearly 1,000 names of employees desiring to buy stock, most of them ordering a single share each. The stock is bought in the open market and the Mutual Beneficial Association keeps the shares for a time so as to allow the buyers to pay in installments.

The Northern Pacific has announced a new style of land contract. Lands are to be sold on terms which will provide for the spreading of payments over a period of 19 years. One-tenth of the consideration is to be paid in cash and the balance, drawing simple interest at six per cent, is to be amortized over the above period. Under the new plans, purchasers must reside on or within 10 miles of the premises or move thereto within six months, and must maintain this residence for five years. They must utilize the land for farming or stock raising and within one year, place upon the premises improvements of a value equal to five per cent of the purchase price; and, the same in each of the next three years.

The track elevation committee of the City Council of Chicago has given the Pennsylvania and the Baltimore & Ohio ten days to resume work on the elevation of their tracks at Garfield boulevard near Leavitt street, Chicago, in compliance with the provisions of an ordinance of 1921. The roads were notified that unless they started the work within this period, the city would start it and charge the cost to the railroads. If the order of the committee is not observed, the committee will request that policemen be stationed at the grade crossing to stop all trains. It is said that notices will also be sent to the Chicago & Western Indiana, the Baltimore & Ohio, the Monon and the Belt Railway to elevate their tracks at 103rd street and Harvard street and 116th street and Michigan boulevard.

Senator G. W. Pepper, of Pennsylvania, to whom the representatives of the American Federation of Labor, speaking for former Pennsylvania Railroad shopmen, have appealed for aid, had a long conference last week with vice-president W. W. Atterbury, and on Monday, November 27, at the invitation of General Atterbury, conferred at his office in Philadelphia with chairmen of the new associations of shopmen which have been organized since the strike, representatives of the former shopmen also taking part. This tripartite conference on Monday, after three hours' deliberation, was adjourned to a date to be selected by Senator Pepper. Reporting this conference, General Atterbury reiterates the determination of the railroad company to continue its present arrangement with its shopmen, unless the shopmen themselves desire a change; and says that he asked their representatives to confer with the Senator because, "I simply wanted them to share with me the burden of convincing people that what we have jointly set up on this railroad is fair and mutually satisfactory."

St. Louis Southwestern to Spend $5,000,000

The St Louis-Southwestern has announced a $5,000,000 improvement program including the purchase of 500 box cars, 500 automobile cars and 200 convertible cars; also the reballasting during the next three years the entire line from Illmo, Mo., to Texarkana, Tex., and replacing 75 lb. rail to 85 lb. rail on about 100 miles of main line and the conversion of locomotives used in Texas from coal to oil burners. The new equipment purchased will amount to $3,000,000.

Foreign Trade Council Extends Trade Adviser Service

The National Foreign Trade Council has announced that the trade adviser service, which has been a feature of the foreign trade conventions, has been made a year-round service instead of only a few days each year during the progress of the convention. The trade advisers are appointed from

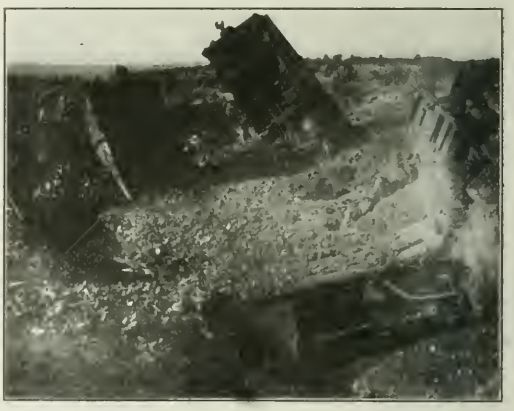
the country's experts in the various lines of foreign trade and their advice on the particular problems of individual manufacturers and exporters is offered free of charge. Further details may be obtained from the secretary of the National Foreign Trade Council at 1 Hanover Square, New York.

The Moffat Tunnel

The Colorado Supreme Court has handed down a unanimous decision upholding the constitutionality of the Moffat Tunnel Act, which provides for the financing of a six-mile tunnel through the Continental Divide on the line of the Denver & Salt Lake by assessment on the property included in an improvement district served by this railway. This decision was the result of a friendly suit to test the validity of the bonds which it is proposed to issue to finance this work. This project was described in the *Railway Age* of September 23, 1922, page 571.

A Spectacular Wreck

In the derailment of a freight train near Cabeza, New Mexico, on the El Paso & Southwestern on October 25, at about 7 p. m., 36 cars of coal (of a train of 43 cars) were thrown off the track because of excessive speed, on a steep descending grade, and the wreck was piled up in a space only 325 ft. long. Only two trucks in this wreck were found in condition for use in moving a car to the nearest shops. One engineman and one brakeman were killed and two other employees were injured; and the property loss was over $92,000.



A Sudden Stop on a Two Per Cent Grade—Two Trainmen Killed, Two Injured

There were two locomotives at the head of the train, but one of these was dead. The engineman of the train lost control of the air brakes, and when the speed rose to 67 miles an hour (as indicated by the speed indicator) some of the cars in the front of the train left the track at a curve of eight degrees; and as before stated, these cars piled up, in a great wreck, the whole of the train except seven cars at the rear. Two views of the wreck are shown below.

Pennsylvania Starts Clearing Way for Pittsburgh Improvements

In an endeavor to clear the way for a widespread future improvement program covering the passenger station and freight station facilities at Pittsburgh, Pa., an ordinance has been submitted by the Pennsylvania Railroad to the City Council. The agreement covers a relocation of Liberty avenue, which adjoins the station, between Eleventh and Seventeenth streets, the probable construction of a large freight station on the north side of Forbes street, a tunnel under Forbes street, the widening of the present Grant Hill tunnel, the relocation of Grant street between Seventh and Liberty avenues, a change in track alinement leading to the Allegheny river crossing and a widening of Cherry way. The present Grant street freight house will be vacated under this plan making the space available for a proposed new post office. The relocation of Liberty avenue with the attendant closing of the old avenue will make available for the railroad a large area for future expansion of station and track facilities to the north.

Subjects for A. S. M. E. Annual Meeting

Many topics of interest to the railroads will be discussed during the Annual Meeting of the American Society of Mechanical Engineers to be held at the Engineering Societies' building, 29 West Thirty-ninth street, New York, December 4-7, 1922. On Tuesday morning, the Management Section will discuss several subjects, including the Installation of Management Methods and Measurement of Managerial Ability. On Tuesday afternoon a session on Training for the Industries will take up reports on Extension and Correspondence Schools, Schools for Apprentices and Shop Training and Industrial Education as Represented in Schools.

The Railroad Session on Wednesday morning will discuss Steam Distribution in the Locomotive, Stresses in Locomotive Frames and Mechanical Drafting of Locomotives. On Thursday morning a session will be held on Power and Safety Engineering. On Thursday afternoon the Forest Products Division will meet. There will also be held during the week sessions on Machine Shops, Material Handling, Research, Standardization and Stokers. A feature of special interest will be the joint session Wednesday evening, December 6, with the American Economic Association at which E. M. Herr, president of the Westinghouse Electric & Manufacturing Company, will speak on The Human Element in Industry, and Wesley C. Mitchell of Columbia University will deliver an address on Making Money and Making Goods.

Petition in Court Against Railroad Labor Board

The Railway Service & Supply Corporation which contracted with the Cleveland, Cincinnati, Chicago & St. Louis to repair freight cars and locomotives at the road's shops at Beech Grove, Ind., and Brightwood, Ind., has petitioned the Federal District Court at Chicago for a writ of certiorari in order to obtain a court ruling on the action of the Railroad Labor Board in declaring these contracts to be violations of the Transportation Act and of decisions of the Labor Board. Petitioner points out that under the contracts the road is saving from $115,000 to $125,000 annually on the repair of locomotives and approximately $11,000 a year on repair of cars. All of the legal arguments which have been advanced before the Board and directed against that body's right to rule against such contracts are cited, and petitioner avers that the Board's decision "unjustly and unlawfully interferes with and prejudices relations established by petitioner with its employees and the railway company" and "any unlawful interference [with these relations] will deprive the petitioner

of the full benefit of time, efforts, industry and large sums of money expended in perfecting the efficiency of its organization employed by it in operating the ships, to the great and irretrievable loss and damage of the petitioner." The application also calls attention to the fact that if the Board's ruling is allowed to stand "petitioner has good reason to fear that the railway company will terminate the contract" and "it will deter other railroads from seeking the services of the petitioner and from entering into similar contracts, all to the petitioner's great and irreparable damage." The Board is charged with exceeding the authority conferred upon it by the Transportation Act, and with infringing upon the judicial power of the courts and the legislative powers of Congress. The fact that the contractor was not represented at or notified of the hearings in the case is cited by the petitioner as depriving it of its rights of property and contract.

Cummins Postpones Plans for Railroad Legislation

Senator Cummins, chairman of the Senate committee on interstate commerce, announced on November 28 that he would not attempt to secure consideration at the present extra session or the forthcoming short session of Congress of bills which he had previously proposed, to amend the transportation act in order to provide a prohibition against strikes, compulsory consolidation of railroads, etc., but would withhold his bills until the next Congress. Senator Cummins has had conferences with the President on the subject and there had been reports that the President would suggest some legislation along these lines in a message at the opening of the regular session of Congress next week, but it is understood that it has now been practically decided that it is inadvisable to open up the subject at this time, particularly in view of the short time available for consideration of the ship subsidy, and plans are also being made for legislation for the relief of the farmer which it is hoped may cause some lessening of the demand for lower necessary appropriation bills on freight rates.

A delegation of representatives of the National Association of Railroad and Public Utilities Commissioners, headed by President D. H. Lewis, called on President Harding on November 23 to present the resolutions proposing amendments to the transportation act which had been adopted at their recent annual convention at Detroit, which included provision for the restoration of the powers of state commissions relating to rates and distribution of cars. They informed the President that they had brought the matters to his attention because it was understood he would probably touch upon the subject of transportation in his message to Congress.

The campaign for legislation to reduce freight rates, particularly on farm products, was opened in the Senate on November 23 in a speech by Senator Capper of Kansas, head of the farm bloc. After describing the conditions faced by the farmers as a result of low prices for their products, he referred to the recent large increases in railroad traffic and to the earnings of some of the more prosperous railroads and rumored increases in dividends to show that the roads could afford to reduce rates. He also argued that the railroads cannot afford not to make reductions in the interest of future traffic. He said that the railroads ought to make further rate reductions voluntarily and at once or in default of such action the Interstate Commerce Commission must reduce rates promptly, and he hoped to see the interstate commerce committee of the Senate report favorably at an early date on his bill repealing Section 15a of the transportation act. Senator Capper particularly criticized the provision in the law under which the Interstate Commerce Commission makes rates intended to produce a fair return for the railroads by groups averaging the strong roads with the weak roads.

James R. Howard, president of the American Farm Bureau Federation, in an address before the annual convention of the Association of Land Grant Colleges on November 21, said that the farmers are looking to Congress to bring relief from high railroad rates. "But we will look in vain," he said, "for the laws of economics supersede any statutory enactment. It is my own conviction that the solution of the railroad problem lies in a more economical handling of present facilities, the continual improvement of equipment and operation and such legislation as will permit the exercise of personal initiative with only that degree of government supervision which insures an honest service to the public, and ultimately in electrification."

Meetings and Conventions

The following list gives names of secretaries, dates of next or regular meetings and places of meetings

Air Brake Association.—F. M. Nellis, 165 Broadway, New York City. Next convention, May 1-4, 1923, Denver, Colo. Exhibit by Air Brake Appliance Association.

Air Brake Appliance Association.—J. F. Gettrust, The Ashton Valve Company, 318 Washington St., Chicago. Meeting with Air Brake Association.

American Association of Demurrage Officers.—F. A. Pontious, Supervisor of Demurrage and Storage, C. & N. W. Ry., Chicago.

American Association of Dining Car Superintendents.—L. A. Stone, C. & E. I. Ry., Chicago.

American Association of Engineers.—C. E. Drayer, 63 E. Adams St., Chicago.

American Association of General Baggage Agents.—E. L. Duncan, 332 So. Michigan Ave., Chicago.

American Association of Passenger Traffic Officers.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

American Association of Railroad Superintendents.—J. Rothschild, Room 400 Union Station, St. Louis, Mo.

American Electric Railway Association.—J. W. Welsh, 8 W. 40th St., New York.

American Railroad Master Tinners', Coppersmiths' and Pipe Fitters' Association.—C. Borcherdt, 202 North Hamlin Ave., Chicago, Ill.

American Railway Association.—J. E. Fairbanks, General Secretary, 75 Church St., New York, N. Y. Special session, December 6, Blackstone Hotel, Chicago.

Division I.—Operating. J. C. Caviston, 30 Vesey St., New York, N. Y.

Freight Station Section (including former activities of American Association of Freight Agents). R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago, Ill.

Medical and Surgical Section. J. C. Caviston, 30 Vesey St., New York, N. Y.

Protective Section (including former activities of the American Railway Chief Special Agents and Chiefs of Police Association). J. C. Caviston, 30 Vesey St., New York, N. Y.

Safety Section. J. C. Caviston, 30 Vesey St., New York.

Telegraph and Telephone Section (including former activities of the Association of Railway Telegraph Superintendents). W. A. Fairbanks, 30 Vesey St., New York, N. Y. Annual meeting, December 12-14, Hotel La Salle, Chicago.

Division II.—Transportation (including former activities of the Association of Transportation and Car Accounting Officers). G. W. Covert, 431 South Dearborn St., Chicago, Ill.

Division III.—Traffic, J. Gottschalk, 143 Liberty St., New York.

Division IV—Engineering, E. H. Fritch, 431 South Dearborn St., Chicago, Ill. Exhibit by National Railway Appliances Association.

Construction and Maintenance Section. E. H. Fritch.

Electrical Section. E. H. Fritch.

Signal Section (including former activities of the Railway Signal Association). H. S. Balliet, 30 Vesey St., New York, N. Y. Annual convention, March 13, Drake Hotel, Chicago.

Division V—Mechanical (including former activities of the Master Car Builders' Association and the American Railway Master Mechanics' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill. Exhibit by Railway Supply Manufacturers' Association.

Equipment Painting Section (including former activities of the Master Car and Locomotive Painters' Association). V. R. Hawthorne, 431 South Dearborn St., Chicago, Ill.

Division VI—Purchases and Stores (including former activities of the Railway Storekeepers' Association). W. J. Farrell, 30 Vesey St., New York, N. Y.

Division VII—Freight Claims (including former activities of the Freight Claim Association). Lewis Pilcher, 431 South Dearborn St., Chicago, Ill.

Car Service Division—C. A. Buch, 718 18th St., N. W., Washington, D. C.

American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Exhibit by Bridge and Building Supply Men's Association.

American Railway Development Association.—A. Leckie, Industrial Agent, Kansas City Southern Ry., Kansas City, Mo.

American Railway Engineering Association.—(Works in co-operation with the American Railway Association, Division IV.) E. H. Fritch, 431 South Dearborn St., Chicago. Exhibit by National Railway Appliance Association.

American Railway Master Mechanics' Association.—(See American Railway Association, Division V.)

American Railway Tool Foremen's Association.—R. D. Fletcher, 1145 East Marquette Road, Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.

American Short Line Railway Association.—T. F. Whittelsey, Union Trust Bldg., Washington, D. C.

American Society for Steel Treating.—W. H. Eiseman, 1600 Prospect Ave., Cleveland, Ohio.

American Society for Testing Materials.—C. L. Warwick, University of Pennsylvania, Philadelphia, Pa.

American Society of Civil Engineers.—Prof. J. H. Dunlap, University of Iowa, Iowa City, Ia. Regular meeting 1st and 3d Wednesdays in month, except July and August, 33 W. 39th St., New York.

American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 39th St., New York. Annual meeting, December 4-7, 29 W. 39th St., New York.

Railroad Division—A. F. Stuebing, Manager Editor, Railway Mechanical Engineer, Woolworth Bldg., New York.

American Train Dispatcher's Association.—C. L. Darling, 1310-1311 Mallers Bldg., Chicago, Ill. Next convention, June 18, 1923, Chicago.

American Wood Preservers Association.—S. D. Cooper, A. T. & S. Fe R. R., Topeka, Kan. Next meeting, January 23, 1923, New Orleans, La.

Association of Railway Claim Agents.—H. D. Morris, Northern Pacific R. R., St. Paul, Minn.

Association of Railway Electrical Engineers.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

Association of Railway Executives.—Alfred P. Thom (general council), 61 Broadway, New York.

Association of Railway Supply Men.—A. W. Clokey, 1658 McCormick Bldg., Chicago. Meeting with International Railway General Foremen's Association.

Association of Railway Telegraph Superintendents.—(See American Railway Association, Division I.)

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—(See American Railway Association, Division II.)

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—John Nelson, Joseph E. Nelson & Sons, 3240 South Michigan Ave., Chicago. Meeting with convention of American Railway Bridge and Building Ass'n.

CANADIAN RAILWAY CLUB.—W. A. Booth, 53 Rusbbrook St., Montreal, Que.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 626 North Pine Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—Thomas B. Koeneke, 604 Federal Reserve Bank Bldg., St. Louis, Mo. Meetings, first Tuesday in month at the American Hotel Annex, St. Louis.

CENTRAL RAILWAY CLUB.—Harry D. Vought, 26 Cortlandt St., New York. Regular meetings, 2d Thursday in January, March, May, September and November, Hotel Iroquois, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. P. Elliott, Terminal Railroad Association of St. Louis, East St. Louis, Ill.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S SUPPLY MEN'S ASSOCIATION.—D. B. Wright, 34th St. and Artesian Ave., Chicago, Ill. Meeting with Chief Interebange Car Inspectors' and Car Foremen's Association.

CINCINNATI RAILROAD CLUB.—W. C. Cooder, Union Central Bldg., Cincinnati, Ohio. Meetings, 2d Tuesday in February, May, September and November.

EASTERN RAILROAD ASSOCIATION.—E. N. Bessling, 614 F St., N. W., Washington, D. C.

FREIGHT CLAIM ASSOCIATION.—(See American Railway Association, Division VII.)

GENERAL SUPPERINTENDENTS' ASSOCIATION OF CHICAGO.—C. H. Treichel, Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Friday in month, Room 1414, Manhattan Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Exhibit by International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—George P. White, 747 Railway Exchange, Chicago. Meeting with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, 702 E. 51st St., Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasb Ave., Winona, Minn.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—C. W. Sullivan, Garlock Packing Co., 326 W. Madison St., Chicago. Meeting with International Railway Fuel Association.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 26 Cortlandt St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION.—(See A. R. A., Division V.)

MASTER CAR BUILDERS ASSOCIATION.—(See A. R. A., Division V.)

NATIONAL ASSOCIATION OF RAILWAY TIE PRODUCERS.—Warren C. Nixon, Western Tie & Timber Co., 905 Syndicate Trust Bldg., St. Louis, Mo.

NATIONAL ASSOCIATION OF RAILWAY AND UTILITIES COMMISSIONERS.—James B. Walker, 49 Lafayette St., New York.

NATIONAL FOREIGN TRADE COUNCIL.—O. K. Davis, 1 Hanover Square, New York.

NATIONAL RAILWAY APPLIANCE ASSOCIATION.—C. W. Kelly, People's Gas Bldg., Chicago. Annual exhibition at convention of American Railway Engineering Association.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Next meeting, November 14.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 26 Cortlandt St., New York Regular meetings, 3d Friday in month, except June, July and August, at 29 W. 39th St., New York.

PACIFIC RAILWAY CLUB.—W. S. Wollner, 64 Pine St., San Francisco, Cal. Regular meetings, 2d Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1116 Woodward Building, Washington, D. C.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 600 Liberty Bldg., Broad and Chestnut Sts., Philadelphia, Pa.

RAILWAY CLUB OF PITTSBURGH.—D. Conway, 515 Grandview Ave., Pittsburgh, Pa. Regular meetings, 4th Thursday in month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY DEVELOPMENT ASSOCIATION.—(See Am. Ry. Development Assn.)

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, General Electric Co., Chicago. Annual meeting with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—I. W. Engg, Boss Nut Company, 1732 N. Kolmar Ave., Chicago. Meeting with Traveling Engineers' Association

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, C. & O. Ry., Richmond, Va.

RAILWAY SIGNAL ASSOCIATION.—(See A. R. A. Division IV, Signal Section.)

RAILWAY STOREKEEPERS' ASSOCIATION.—(See A. R. A., Division VI.)

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meeting with A. R. A., Division V.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, Commercial Trust Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W. Ry., Sterling, Ill. Exhibit by Track Suply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, Sunbeam Electric Manufacturing Company, New York City. Meeting with American Railway Association, Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, P. O. Box 1295, Atlanta, Ga. Regular meetings, 3d Thursday in January, March, May, July, September and November, Piedmont Hotel, Atlanta

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—J. L. Carrier, Car Serv Agt., Tenn. Cent. Ry., 319 Seventh Ave., North Nashville, Tenn.

SUPPLY ASSOCIATION OF AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—H. S. White, 2 N. Jefferson St., Chicago.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hilburn, N. Y. Meets with Roadmasters' and Maintenance of Way Association

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, 1177 East 98th St., Cleveland, Ohio. Exhibit by Railway Equipment Manufacturers' Association

TRAVELING RAILWAY CLUB.—Bruce V. Crandall, 605 North Michigan Ave., Chicago. Regular meetings, 3d Monday each month except June, July and August

Traffic News

The Traffic Club of New York has elected as president for the ensuing year Frank W. Smith, Chairman of the Official Classification Committee.

The traffic clubs of Grand Rapids and Lansing, Mich., have joined the Associated Traffic Clubs of America, making the total membership of this organization to date 32 clubs.

The report of the Government superintendent of Glacier National Park for the season just closed shows that 23,935 people visited the park last summer. This is an increase of 21 per cent over the season of 1921. The increase in arrivals by railroad was 53 per cent.

The consolidated freight classification, as issued by the Official Classification Committee, 143 Liberty street, New York city, can now be had in a "Pocket edition," 5 in. by 6¾ in. The page-forms are reduced by photographic process from the standard edition of the classification. A limited number of copies will be for sale by the committee; price two dollars.

Because of the threatened destruction by fire of a large stock pile of bituminous coal, and at the recommendation of the federal fuel distributor, the Interstate Commerce Commission, in Service Order No. 27, directed the Baltimore & Ohio to assign open top cars at the mine of the Elkhorn Piney Coal Manufacturing Company, located on the Long Fork Branch of the Baltimore & Ohio at Weeksbury, Ky., for the loading of coal, at the rate of 30 cars per day for each consecutive working day until a total of 250 cars are so furnished.

Because of the rapid improvement in the coal situation, the Interstate Commerce Commission on November 23 issued an amendment of its Service Order No. 25 so as to release from the requirement that priority be given to coal shipments, open top gondola cars with sides 48 in. or less in height. The previous order had exempted only cars with sides of 42 in. or less.

The commission has issued an order directing the Green Brier & Eastern, the Chesapeake & Ohio and the Norfolk & Western to furnish four cars a day for 10 consecutive working days to three named coal mines for coal consigned to the Commonwealth of Virginia Purchasing Commission in preference to any other use of such cars.

Freight traffic on the Warrior river, Alabama is increasing, and barges are able to get loads both ways. The Birmingham Age-Herald reports a recent shipment of three barges of canned goods from Mobile to up-river ports, to be distributed to points in the states of Alabama, Tennessee, Georgia and Mississippi. These goods came from the Pacific coast on a Luckenbach line steamer to Mobile. Three barges laden with wire mill products were sent from Birmingham to Mobile to be transferred to ocean going barges for Texas. Four barges laden with sulphur from Freeport, Tex., have just moved from Mobile to Birmingham. Selma is shipping 1,700 bales of cotton for export by rail to Demopolis and thence by barge to Mobile. Northbound barges are bringing Brazilian ore for the Tennessee company at Ensley.

New Haven Football Traffic

The New York, New Haven & Hartford reports that the passengers carried to and from New Haven on Saturday, November 25 on the occasion of the Harvard-Yale football game, numbered 56,978; and that 122 passenger trains were run, 59 to New Haven in the forenoon and 63 out in the afternoon and evening. During a period of two hours in the forenoon, a train was unloaded every 2.1 minutes; and for a similar period in the afternoon, a train was loaded every 2.5 minutes. Of the inward trains, 45 were specials and of the outward, 49; and 83 locomotives 369 cars had to be assigned to passenger service over and above the normal number. Forty-seven extra trains had to be run to take empty cars to their proper starting points and, after the rush, to return them to their usual locations. The whole movement was carried

out on substantially the schedule arranged. The total number of passengers was about 3,000 greater than the total on a similar occasion in November, 1920.

Anthracite Shipments in October

Shipments of anthracite in October as reported to the Anthracite Bureau of Information, Philadelphia, amounted to 6,567,928 tons, as compared with 5,872,783 tons during the corresponding month last year, an increase of 695,145 tons. Shipments by originating carriers were as follows:

	October, 1922	October, 1921
P. & R.	[illegible]	[illegible]
L. V.	1,166,195	[illegible]
C. of N. J.	617,[illegible]	[illegible],189
D. L. & W.	[illegible]36,375	759,492
D. & H.	[illegible]	[illegible]8,376
Pennsylvania	579,3[illegible]6	492,632
Erie	[illegible]1,27[illegible]	618,034
N. Y. O. & W.	179,865	126,925
L. & N. E.	292,941	253,311
Total	6,567,928	5,872,783

Coal Production

Bituminous coal production during the week of November 13-18 is placed by the Geological Survey at 11,213,000 tons as against 10,147,000 tons in the week preceding. Early returns for the week, November 20-25, indicate that 11,000,000 tons will be raised. Both bituminous coal and anthracite output in the week ended November 18 were at high rates, and the total coal raised, 13,404,000 net tons, was the highest weekly outturn since the strike and was exceeded this year only in the week ended March 25, when the total outturn was 13,543,000 net tons.

The movement of coal across the Hudson River into eastern New York and New England increased to 3,289 cars of bituminous coal and 3,582 cars of anthracite in the week ended November 18. In addition, 215 cars of soft coal and 35 cars of anthracite were forwarded through Rouses Point. The total all-rail shipments of bituminous coal during 1922 to date are now 21 per cent behind, whereas the anthracite shipments are 72 per cent greater than during the corresponding period in 1921.

The movement of bituminous coal from Lake Erie ports increased slightly in the week ended November 19. Reports from the Ore and Coal Exchange show that 1,042,792 tons were dumped. Of the total dumpings, 1,003,621 tons were cargo coal and 39,171 tons were vessel fuel. Cumulative dumpings of cargo coal during the present season to date stand at 16,839,249 tons, of which 15,718,082 tons went to regular Lake territory, and 1,221,167 tons went to destinations not ordinarily taking Lake coal. In comparison with the three years preceding, the quantity of cargo coal dumped in 1922 is about 22 per cent less than the average for those years.

Colorado River Basin Compact Signed

The Colorado River Basin compact was signed on November 24 at Santa Fe, N. M., by the representatives of the seven states concerned, according to a telegram received at the Department of Commerce from Herbert Hoover, chairman of the Colorado River Commission. The States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming have resolved to enter into a compact, the major purposes of which are to provide for equitable division and apportionment of the use of the waters of the Colorado river system to secure the expeditious agricultural and industrial development of the Colorado River Basin, the storage of its waters and the protection of life and property from floods. The compact is to become binding when it shall have been approved by the legislatures of each of the signatory states and by the Congress of the United States. It was approved by Chairman Hoover.

The project involves one of the greatest national improvements, requiring over a term of years an expenditure of several hundred millions of dollars. The land under irrigation in 1920 from the river and its tributaries amounted to about 2,464,000 acres in the United States and 190,000 acres in Mexico. It is estimated that the amount of irrigated land can be increased to about 6,123,000 acres in the United States and 800,000 in Mexico. Development of six million horsepower is a possibility as an incident to development of irrigation storage.

Commission and Court News

Interstate Commerce Commission

The commission has suspended until March 25 the operation of numerous schedules of Western and Southwestern carriers and Agents F. H. Boyd and F. A. Leland which propose a general readjustment of rates on grain and feed from western and southwestern points to the Mississippi river crossings, Cairo, Ill., and south thereof, also interior points in the Mississippi Valley and southeastern territory.

The commission has suspended from November 30 and later dates until March 30, 1923, the operation of schedules which propose to reduce the transcontinental rates applicable on various commodities from New York, N. Y., piers, Southern Pacific Atlantic Steamship Lines (Morgan Line) via Galveston to the same basis applicable from Group "D" (Chicago) via all-rail to the same points of destination in the west and southwest.

United States Supreme Court

Statute Imposing Attorney's Fees on Railroad Held Invalid

An action against the Chicago & North Western questioned the validity of a Nebraska statute making every common carrier liable for a reasonable attorney's fee in suits for collection from it of claims for damage, etc., not adjusted within 60 days.

A corporation of Fremont, Neb., which shipped hogs to South Omaha sued for $2,097 and $900 attorney's fees, for loss or injury to hogs shipped in 105 intrastate shipments, the railroad having refused to pay any amount whatever. The jury awarded $802, with interest and the court fixed attorney's fees at $600. On appeal to the State Supreme Court, a remittitur was consented to for $209 and the attorney's fee was reduced to $200, but the Supreme Court taxed the railroad company with an attorney's fee of $100 for services in the Supreme Court.

The Supreme Court of the United States, on the question of the statutory provision for attorney's fees said that: "These are costs imposed on the defeated defendant in the litigation but not on the defeated plaintiff. This is an inequality and the question is whether it is a discrimination which the legislature may make and not take the defeated defendant's property without due process of law." The court made an extended review of its more recent decisions concerning the constitutional validity of inequalities of this general character as between claimants and common carriers, and stated as the general rule to be gathered from these cases that "common carriers engaged in transportation may be grouped in a special class to secure the proper discharge of their functions, and to meet their liability for injuries inflicted in their performance; that the seasonable payment of just claims for faulty performance is a part of their duty, and a reasonable penalty may be imposed for failure promptly to consider and pay such claims. This penalty or stimulus may be in the form of attorney's fees. But it is also apparent from these cases that such penalties or fees must be moderate. . . . The 105 claims sued on were reduced to 72, and the trial lasted four days. The Supreme Court considers that in such case, an attorney's fee of $200 does not shock one's sense of fairness. The fee of $100 imposed on the railroad when it won its case on appeal by reducing the amount recovered in the trial court presented a different question. The original Nebraska statute was amended to read "and in event an appeal be taken, and the plaintiff shall succeed, such plaintiff shall be entitled to recover an additional attorney's fee to be fixed by such court or courts." . . . Thus we have a requirement that the carrier shall pay the attorneys of the claimant full compensation for their labors in resisting its successful effort on appeal to reduce an unjust and excessive claim against it. This we do not think is fair play. Penalties im-

posed on one party for the privilege of appeal to the courts, deterring him from vindication of his rights, have been held invalid under the Fourteenth Amendment.—Missouri Pacific v. Tucker, 230 U. S. 340. . . . So much of the statute as imposed an attorney's fee upon carrier in this case in the Supreme Court was invalid. "The judgment of the Supreme Court is to this extent reversed and in other respects affirmed." —Chicago & North Western v. Nye Schneider Fowler Co. Opinion by Mr. Chief Justice Taft. Decided November 13.

Labor Board Decisions

Payment for Yard Crews

Helping Trains Out of Terminals

Prior to April 1, 1920, yard crews were helping trains out of yards and beyond yard limit boards at various terminals on the Minneapolis & St. Louis as a part of their regular assignment, compensation therefor being covered by yard rates without arbitraries or special allowances. After that date yard crews were allowed a minimum of one hour at road rates of pay, in addition to the day's pay for yard service, for each time such service was required of them, in accordance with an interpretation of paragraph b, Article 20, of supplement 24 to General Order No. 27. After the receipt of decisions rendered by the Labor Board of Adjustment No. 1, indicating that no change in the manner of payment for such services was contemplated in paragraph b, of Article 20, this allowance was discontinued. Members of the train men's organizations then appealed to the Labor Board, contending that this allowance should be continued. The Labor Board decided that paragraph b applied only when yard engineers assist trains beyond the switching limits.—Decision No. 1285.

Classification of Drawbridge Tenders

In a controversy with the Pere Marquette the Order of Railroad Telegraphers raised the question: (A) whether employees who operate drawbridges and are classified as levermen should be paid at a rate less than that provided in Decision No. 2 for such classes, and (B) whether employees who decline to sign application or a contract providing for a lower rate of pay and different conditions should be given employment in their former positions and paid for time lost because of their refusal to sign such a contract. The Labor Board decided that no change should be made in the rates of pay and conditions of employment for drawbridge tenders unless made in accordance with the rules of the agreement or in the manner provided in the Transportation Act. The employees refusing to sign the contract and not taking employment were considered as having severed their connection with the company and claims were denied.—Decision No. 1253.

Compensation for Working on Rest Days

Certain train dispatchers on the Erie were required to work on their rest days during the period from January 30 to March 12, 1921, in violation of Decision No. 2; and application was made for reimbursement and refund of amounts deducted from their earnings as set forth in Decision No. 91. The Erie had issued instructions suspending relief days as it felt that there was no outstanding decision of the board on this point. The Labor Board decided that the carrier should reimburse the train dispatchers for the amount arbitrarily deducted from their earnings and for the rest days which they were required to work in January, February and March, 1921. Decision No. 1332.

The Order of Railroad Telegraphers also had a case before the Labor Board against the Erie with reference to the request of employees in telegraph service for reimbursement of amounts deducted from their wages in January, February and March, 1921. The employees stated that the action of the carrier was taken without consulting or advising the committee regularly elected to represent these employees. The carrier stated that this reduction in working time of the force was put into effect because of the necessity of economizing, as its operating expenses were at that time in excess of its operating revenues. The Labor Board decided that the action of the carrier in deducting certain amounts from the wages of telegraph employees was in violation of the Transportation Act and that the employees affected should be reimbursed for the amount deducted during the above-mentioned months. Decision No. 1286.

Equipment and Supplies

Locomotives

The Chicago, Milwaukee & St. Paul has ordered 25 Mikado type locomotives from the Baldwin Locomotive Works, in addition to the 50 reported in the *Railway Age* of November 25.

The Northern Pacific, reported in the *Railway Age* of October 21 as inquiring for 20 Mikado, 20 Pacific, 15 switching and 4 Mallet type locomotives, has ordered 49 locomotives from the American Locomotive Company.

The Central of New Jersey, reported in the *Railway Age* of November 18 as inquiring for 10, 8-wheel switching locomotives, has ordered this equipment from the American Locomotive Company. This company is now inquiring for 5, 6-wheel switching locomotives.

Freight Cars

The Winston-Salem Southbound is inquiring for 25 gondola cars.

The Canadian National Railways are inquiring for 1,250 stock cars and 50 caboose cars.

The Manila Railroad is inquiring through its office at 17 Battery Place, New York City, for prices on 50 box cars of 28 tons' capacity.

The Missouri Portland Cement Company has ordered 10 steel hopper cars of 50 tons' capacity from the American Car & Foundry Company.

The Northern Pacific, reported in the *Railway Age* of October 28 as inquiring for 3,000 box cars, is expected to place this order this week.

The Pittsburg, Shawmut & Northern, reported in the *Railway Age* of September 16 as inquiring for 200 stock cars, has postponed this inquiry indefinitely.

The Chicago, Rock Island & Pacific, reported in the *Railway Age* of November 18 as having placed orders for 500 box cars and 500 gondola cars, has issued an inquiry for 250 refrigerator cars, 250 ballast cars, 250 flat cars and 250 stock cars.

The Pere Marquette, reported in the *Railway Age* of October 28 as inquiring for 500 hopper cars of 50 tons' capacity and 1,000 box cars, has ordered the former from the Ralston Steel Car Company and the latter from the Western Steel Car & Foundry Company.

The Southern Pacific, reported in the *Railway Age* of November 18 as contemplating the purchase of 7,000 freight cars, is asking for prices on 3,700, 40 ft. single sheathed box cars of 50 tons' capacity; 650, 40 ft. flat cars of 50 tons' capacity; 550, 36 ft. 6 in. stock cars of 40 tons' capacity and 100, 8-wheel caboose cars.

The Chicago, Milwaukee & St. Paul, reported in the *Railway Age* of October 28 as inquiring for 3,000 gondola cars, 1,500 box cars and 500 automobile cars, has placed orders with the Bettendorf Company for 3,000 gondola cars, the Western Steel Car & Foundry Company for 2,000 box cars and the General American Car Company for 500 automobile cars.

Passenger Cars

The Pere Marquette is inquiring for 2 dining cars.

The Philadelphia & Reading is inquiring for 45 steel suburban passenger coaches and 5 steel suburban combination passenger and baggage cars.

The Canadian National Railways are inquiring for 35 first class coaches, 20 sleeping cars, 30 baggage cars, 10 mail cars and 50 express refrigerator cars.

Iron and Steel

THE CHICAGO UNION STATION company is inquiring for 1,500 tons of structural steel to be used on the Roosevelt Road viaduct, Chicago.

THE CHICAGO, ROCK ISLAND & PACIFIC has placed an order with the Milwaukee Bridge Company for 103 tons of structural steel for bridge spans.

Miscellaneous

THE CHICAGO UNION STATION COMPANY has ordered 6 tractors and 200 trailers from the Mercury Manufacturing Company, Chicago, and 2 tractors from the Elwell-Parker Electric Company, Cleveland, O., for use in the new mail terminal.

Signaling

THE ILLINOIS CENTRAL has ordered from the General Railway Signal Company an electric interlocking machine, Model 2, for installation at Homewood, Ill. The machine will have 50 working levers. The order includes 22 switch machines, Model 5.

Railway Construction

CHICAGO, BURLINGTON & QUINCY.—This company has awarded a contract to Joseph E. Nelson & Sons, Chicago, for the laying of 18,000 ft. of 16 in. pipe for its water treating plant at Galesburg, Ill.

CHICAGO, ROCK ISLAND & PACIFIC.—This company, reported in the *Railway Age* of November 18 as closing bids November 14 for a frame ice house at Eldon, Ia., to cost approximately $12,000, has awarded the contract to Joseph E. Nelson & Sons, Chicago. This company will also accept bids until December 8 for the construction of a brick and stone station at Clay Center, Kan., to cost approximately $15,000.

EDWARD HINES YELLOW PINE TRUSTEES.—The Interstate Commerce Commission has issued a certificate authorizing the Edward Hines Yellow Pine Trustees to place in operation in interstate commerce a railroad from Lumberton to Kiln, Miss., a distance of approximately 52 miles. The road was built primarily to facilitate the applicants' logging operations, but a demand arose from the inhabitants of the territory to have it placed in operation as a common carrier.

ILLINOIS CENTRAL.—This company will construct an extension and rearrange its passenger station at New Orleans, La., at an approximate cost of $20,000.

MORGAN'S LOUISIANA & TEXAS.—This company has been ordered by the Louisiana Public Service Commission to construct a viaduct over and across its tracks, facilities and properties in the fifth district in the city of New Orleans, La.

MISSOURI PACIFIC.—This company has awarded a contract to Joseph E. Nelson & Sons, Chicago, for the construction of a one-story brick boiler house 47 ft. by 50 ft. at Coffeyville, Kan.

YAKIMA SOUTHERN.—This company will construct 90 miles of line from Yakima to Underwood in the state of Washington. Contracts for grading and bridges will be let in May, 1923. The maximum grade will be 1½ per cent. The grading on 60 miles of the line through the mountains will be side hill excavation consisting of 30 per cent solid rock, 40 per cent loose rock and 30 per cent earth, and on 30 miles in the valley will consist principally of earth. There will be 12 bridges averaging 100 ft. in length, one tunnel 5,000 ft. long and another tunnel 1,000 ft. long.

THE NORFOLK & WESTERN announces that an agreement has been completed with the newly formed association of its shop employees.

A FIRE at Springfield, Mass., on Sunday afternoon, November 26, damaged the passenger station of the Boston & Albany about $25,000. That part of the station on the north side of the tracks was burned out inside. Plans already had been made to discontinue the ticket office on the north side and to concentrate all ticket selling on the south side.

Supply Trade News

John B. Bassett has been appointed assistant engineer of the New York district with office at 120 Broadway, New York City, of the **General Electric Company**, Schenectady, N. Y.

C. G. Harwig, chief engineer of the Regan Safety Devices Company, with headquarters at Niagara Falls, N. Y., has been appointed sales engineer of the **Hall Switch & Signal Company**, with headquarters at Chicago.

The Reed-Prentice Company, Worcester, Mass., has purchased outright the good will, business and certain assets of the Becker Milling Machine Company, Hyde Park, Mass., and the Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass., and will manufacture the products of these two companies henceforth in its own plant at Worcester. The products will carry their former names, but the manufacturing will be all concentrated in the Reed-Prentice plant and the selling will be done by their present, and enlarged, sales force.

E. Bodde has been appointed consulting engineer for the **Regan Safety Devices Company, Inc.**, with headquarters at Niagara Falls, N. Y. Mr. Bodde was born in Holland and studied in Paris and London before coming to America in 1902. His first position in this country was in the testing room of the General Electric Company at Schenectady, N. Y. He was later employed by the Hall Switch Signal Company in the engineering department at Garwood, N. J., and left this position to undertake research work and wireless telegraphy in Professor Fessenden's laboratory at Brant Rock, Mass. His next position was with the Norwich University at Northfield, Vt., after which he returned to the General Electric Company at Lynn, Mass. During the war he was associated with Elihu Thompson in research work. When the war closed he contracted with the government of China to head the department of electricity in the Institute of Technology at Shanghai, China, which position he was holding at the time of his recent appointment.

Rice & Ilsley, Inc., is the name of a new firm of engineer-appraisers located at 18 Tremont street, Boston, Mass., with which is associated **Ernest W. Rice**, architect, and **Arthur B. Ilsley**, formerly engineer of bridges, Lines East, of the Southern Railway with headquarters at Charlotte, N. C. Mr. Ilsley was born at Limerick, Me., on March 29, 1873, and was graduated from Dartmouth College and the Thayer School of Civil Engineering, entering railway service with the New York, New Haven & Hartford in February, 1896. He subsequently left the New Haven to go with the Boston & Maine as assistant bridge engineer, serving in that capacity until March, 1904, when he left that road to become assistant engineer in the bridge department of the Southern Railway. In August, 1909, he was promoted to engineer of bridges and served in that capacity until February, 1917, when he was appointed as engineer of bridges, Lines East, following a division of jurisdiction, a position he held until his recent resignation. Mr. Rice was formerly employed by the American Appraisals Company, Milwaukee, Wis., and has had 20 years' experience in this work, during the last two years of which he was district superintendent of the company for New England.

Bethlehem Steel Corporation Absorbs the Midvale and the Cambria Companies

The board of directors of the Bethlehem Steel Corporation at a special meeting on November 24 authorized contracts for the purchase of the plants and other assets of the Midvale Steel & Ordnance Company and of the Cambria Steel Company, excepting the ordnance plant and other business located at Nicetown, Pa., and assets appurtenant thereto. In payment for the properties to be acquired, the Bethlehem Steel Corporation, besides providing for the assumption of the bonds and other indebtedness of the Midvale and Cambria companies will issue about $97,650,000

par value of the Bethlehem common stock, of which $95,000,000, par value, will go to the Midvale Company for distribution on dissolution to its stockholders, and the balance to the holders of the stock of Cambria not held by Midvale. As a result of these purchases the stockholders of the Midvale Company will receive for each two shares of $50 par value, of the Midvale Company stock $95, par value, of the Bethlehem common stock, together with a pro rata share of the stock of the new corporation to which the Nicetown plant is to be transferred.

Through the acquisition of the properties of the Midvale and Cambria companies, the Bethlehem Company will acquire plants at Coatesville and Johnstown, Pa., and Wilmington, Del., and important developed iron ore properties in Michigan and Minnesota, as well as developed coal properties in Pennsylvania. It will also give to Bethlehem important lines of steel products which it does not now manufacture, such as steel freight and mine cars, steel wheels, boiler tubes, agricultural implement parts, etc. The Bethlehem Company's present annual ingot capacity of 4,800,000 tons will be increased to 7,600,000 tons by the Midvale-Cambria purchase.

No increase in the aggregate indebtedness is necessary for this transaction. With the additional common stock to be issued for the properties to be purchased and with the 8 per cent preferred stock converted into the new 7 per cent cumulative preferred stock, the approximate capitalization of Bethlehem Steel Corporation will be about $213,500,000 funded debt, $62,000,000 7 per cent preferred stock, $180,250,000 common stock. The combined investment in property and plant, less depreciation and depletion, will be about $465,500,000 and the aggregate net quick assets will be about $133,700,000.

Standard Stoker Company

The management of the Standard Stoker Company, Inc., New York, has been changed. Frank L. Connable, of New York, vice-president of E. I. du Pont de Nemours Co., who was president of the Standard Stoker Company, is now chairman of the board; W. A. Larner, of New York, vice-president of Peyton-du Pont Securities Company, is now president; Eugene du Pont, of Greenville, Del., a director of E. I. du Pont de Nemours, remains as vice-president of the Standard Stoker Company and T. W. Keithley, of Wilmington, Del., formerly secretary, is now secretary and treasurer. The directors include F. L. Connable, W. C. Peyton, of New York, who is president of Peyton-du Pont Securities Company; W. A. Simpson, director of traffic of E. I. du Pont de Nemours Co., Wilmington, Del., G. W. Keithley, Eugene du Pont and W. A. Larner. W. R. Williams, of Richmond, Va., has been appointed general manager with headquarters for the present at Erie, Pa., and Frank P. Roesch, who was western manager, has been appointed sales manager with headquarters at Chicago.

W. R. Williams

William R. Williams was born in Bristol, Va., on November 16, 186[illegible], and was educated in the schools of Richmond, Va. He later, for ten years, attended Virginia Mechanics' Institute, a night school, part of the time teaching mathematics and drawing. At the age of 15 he entered the employment of the Old Dominion Iron & Steel Co. at Belle Isle, Richmond, serving for six years and when he left that company was chief of works' office. He [illegible] to the Richmond Locomotive Works, and was secretary of the company when it was consolidated with the American Locomotive Company. He remained with the latter company two years [illegible] purchasing agent, a total length of service with the [illegible] companies of 18 years. In 19[illegible], in co-operation with [illegible], formerly president of the Richmond Locomotive Co., he organized the Richmond Forgings Corporation. Mr. Williams served as vice-president of the new company until his recent appointment as general manager of the Standard Stoker Company. In July, 1920, he was appointed assistant secretary of war by President Wilson and served until March 4, 1921, when he was reappointed by President Harding and served for one month, returning to the Richmond Forgings Corp.

Frank P. Roesch was born in Alsace, France, and came to this country immediately after the close of the Franco-Prussian War. After graduating from high school he entered the service of the Chicago, Rock Island & Pacific as machinist's apprentice at Trenton, Mo., and while serving his apprenticeship studied mechanical engineering under the tuition of his father. Upon the completion of his apprenticeship he went west, working as a machinist in various shops until he resigned a foremanship to take a job as fireman, being later advanced to locomotive engineman. In 1899 he was promoted to traveling engineer on the Colorado & Southern and later was general traveling engineer of the Colorado & Southern System-Atchison, Topeka & Santa Fe, joint lines. In February, 1902, he was appointed master mechanic of the Chicago & Alton at Slater, Mo. He later served as general manager of the Hicks Locomotive & Car Works until the plant was sold in 1906, when he resigned to become master mechanic of the Southern Railway at Birmingham, Ala., and later was transferred to Spencer, N. C. In 1908 he was appointed master mechanic of the El Paso & Southwestern at Douglas, Ariz., where he remained until August, 1918, when he was appointed regional fuel supervisor, Northwest Region, U. S. R. A., and at the close of the railroad administration he became identified with the Standard Stoker Company, as its western manager.

Frank P. Roesch

Mr. Roesch has been a frequent contributor to the various railway technical journals since 1898. He is an authority on subjects pertaining to locomotive operation, combustion, etc., and is a past president of the Traveling Engineers' Association.

B. H. Tripp, formerly San Francisco manager of the Chicago Pneumatic Tool Co., has associated himself with **F. C. Severin**, formerly of Niles-Bement-Pond Company and Betts Machine Company in the sale of new and used machinery, with offices at 2220 Chestnut street, Philadelphia, Pa., and 25 Church street, New York City, under the name of **Severin-Tripp Machinery Company.**

Obituary

J. J. McCarthy, treasurer and chairman of the board of directors of the Chicago Cleveland Car Roofing Company, Chicago, died in that city from pneumonia on November 25.

J. E. Simmons, assistant to the vice president in charge of sales of the Republic Railway Supply Company, Chicago, died on November 24 from paralysis. Mr. Simmons was born in 1860 at Devonshire, England, and came to this country in 1880, where he entered the employ of the Lake Shore & Michigan Southern in the car repair department at Cleveland, Ohio, and later at Youngstown, Ohio. Some time thereafter he was placed in charge of the car department of the Pittsburgh Coal Company at Pittsburgh, Pa. He was later employed at the Hicks Locomotive Plant, Chicago, and later represented the Pittsburgh Steel Foundry and the Ft. Pitt Spring Company. In 1917 he entered the employ of the Joliet Railway Supply Company as assistant to the vice-president in charge of sales and upon the taking over of this company by the Republic Railway Supply Company in July, 1922, he was appointed to the same position, which position he was holding at the time of his death.

Railway Financial News

ATLANTA & NORTH CAROLINA.—*Asks Authority to Issue Bonds.*—The company has applied to the Interstate Commerce Commission for authority to issue $325,000 of first mortgage 6 per cent bonds for refunding purposes.

ATLANTA, BIRMINGHAM & ATLANTIC.—*Receiver Asks Permission to Issue Certificates.*—B. L. Bugg, receiver, has filed a petition in the United States District Court at Atlanta, Ga., asking for permission to issue $80,000 receiver's certificates for repairing 400 wooden gondolas. Judge S. H. Sibley has set the date of hearing on the petition for December 2.

BANGOR & AROOSTOOK.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to issue $250,000 of equipment trust certificates for the purchase of 300 box cars.

BOSTON & MAINE.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $4,000,000 of 6 per cent mortgage bonds to be sold at not less than 87.89 to provide for the payment of bonds maturing on January 1 and May 1.

CHICAGO & ALTON.—*Asks Authority to Issue Receivers' Certificates.*—The receivers have applied to Federal Judge Carpenter for authority to issue $2,000,000 receiver's certificates. One half of the amount sought will be used in repairing 24 locomotives and 500 cars, 400 of which are coal cars, and for the purchase of 90-lb. rail to be used on 15 miles of its line. The other half of the $2,000,000 is required to pay off pressing debts.

CHICAGO, ATTICA & SOUTHERN.—*Authorized to Operate Lines.*—The Interstate Commerce Commission has issued a certificate authorizing this company to acquire and operate a line from La Crosse to a point 25.72 miles north of Brazil, Ind., and of a branch line extending from Percy Junction to the Illinois state line, having a total length of about 145 miles. The lines form a part of what was formerly the coal railway division of the Chicago & Eastern Illinois, which were recently abandoned in accordance with a certificate issued by the commission. The company proposes to pay $250,000 for the property.

DEATH VALLEY.—*Authorized to Issue Stock.*—Upon further consideration, the Interstate Commerce Commission has reversed its former decision denying the application of this company for authority to issue stock for the purpose of retiring outstanding first mortgage bonds and has authorized an issue of $99,100 for this purpose.

DETROIT & MACKINAC.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell $450,000 of prior lien bonds, the proceeds to be used to pay off notes.

GLADY & VALPENA.—*Abandonment of Line Authorized.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment as to interstate and foreign commerce of this company's line of railroad from Gladwin to Evenwood, W. Va., 18 miles. The line was built primarily to handle forest products and the available supply of timber has been cut.

MAGMA ARIZONA.—*Authorized to Issue Stock.*—This company has been authorized by the Interstate Commerce Commission to issue $800,000 of stock at not less than par for the purpose of changing its narrow-gage railroad of 30 miles connecting at Magma, Ariz., with the Arizona Eastern, from narrow gage to standard gage.

MISSOURI, KANSAS & TEXAS.—*Extension of Time.*—J. & W. Seligman & Co. and Hallgarten & Co., reorganization managers, have announced that the time for the deposit of assignments of claims against the road and of its guaranteed bonds has been extended to January 2, inclusive.

NEW YORK CENTRAL.—The United States Supreme Court, in a decision handed down on November 27, held that the consolidation of the Lake Shore & Michigan Southern and other roads into the New York Central Railroad was not in violation either of the Sherman or Clayton anti-trust laws. The decision was by Justice Van Devanter in a case brought by the General Investment Company of Maine.

NEW YORK, ONTARIO & WESTERN.—*New Director.*—J. L. Richards has been elected a director to succeed Thomas De Witt Cuyler, deceased.

PENNSYLVANIA COMPANY.—*New Director.*—E. E. Ingersoll has been elected a director to succeed Thomas De Witt Cuyler, deceased.

PENNSYLVANIA RAILROAD.—*New Director.*—Arthur W. Thompson, of Pittsburgh, Pa., has been elected a director to succeed Thomas De Witt Cuyler, deceased.

PITTSBURGH, CINCINNATI, CHICAGO & ST. LOUIS.—*New Director.*—Bayard Henry has been elected a director to succeed Thomas De Witt Cuyler, deceased.

RICHMOND, FREDERICKSBURG & POTOMAC.—*Operating Study.*—See article on another page of this issue entitled "Perishable Freight Service Specialty of R. F. & P."

ST. LOUIS-SOUTHWESTERN.—*Preferred Dividends Resumed.*—The directors have declared a semi-annual dividend of 2½ per cent on the preferred stock. This is the first dividend paid on the preferred since April 15, 1914, when ½ of 1 per cent was paid.

Authorized to Acquire Control.—This company has been authorized by the Interstate Commerce Commission to acquire control of the Valley Terminal Railway for 50 years from January 1, 1922.

TEXAS & PACIFIC.—*Terminal Improvements Planned.*—Discussing the bill which has been introduced in Congress by Senator Morris Sheppard to authorize this company, which operates under a federal charter, to issue additional securities amounting to approximately $7,000,000, J. L. Lancaster, receiver of the road, said that if the measure is passed about $1,000,000 will be expended in Dallas on terminal improvements during the next two years. Mr. Lancaster said:

> The development of Texas, especially the territory served by the Texas & Pacific, during the last year has been so rapid that we have not been able to keep abreast with the situation. The greatest need of the line is better terminal facilities. If the road is given authority to issue the $7,000,000 in bonds, the sum will be spent chiefly for terminal improvements.
>
> The present bond limit of the Texas & Pacific is $50,000,000, this being established under the reorganization plan of 1888. If the amendments proposed by Senator Sheppard are allowed by Congress, the second mortgage bonds of the Texas & Pacific totaling about $25,000,000, will be converted into preferred stock and the amount for new bonds for improvements will automatically be made $25,000,000. The second mortgage bonds is the issue under which the Texas & Pacific is now in the hands of receivers.
>
> Reorganization of the Texas & Pacific and dissolution of the receivership will follow rapidly upon the passage of proposed amendments to the company's charter.
>
> The Texas and Pacific is in need of improvements along its entire system. The management of the road has been unable to make such improvements as have been needed since all betterments had to be made out of the earnings of the road. The necessity for larger improvements and the inability of the road to increase its earnings sufficiently to make these improvements, led to the presentation of the bill in the Senate.

WHEELING & LAKE ERIE.—*Loan from Revolving Fund.*—The Interstate Commerce Commission has certified to the treasury a loan of $500,000 to this company to assist it in meeting maturing indebtedness.

Dividends Declared

Atlantic Coast Line: Common, $1.50, quarterly, payable December 9 to holders of record November 30.

Erie & Pittsburgh: 1¾ per cent, quarterly, payable December 9 to holders of record November 29.

St. Louis & Southwestern: Preferred, 2½ per cent, semi-annually, payable December 16 to holders of record December 15.

Trend of Railway Stock and Bond Prices

	Nov. 28	Last Week	Last Year
Average price of 20 representative railway stocks	64.53	66.67	58.87
Average price of 20 representative railway bonds	84.44	85.29	81.94

Railway Officers

Financial, Legal and Accounting

Miss E. S. Redel, chief clerk in the office of the President and vice-president of the Minneapolis & St. Louis, at Minneapolis, Minn., has been promoted to assistant secretary, with the same headquarters.

Operating

R. F. Finley, superintendent of telegraph of the New York Central, west of Buffalo, with headquarters at Cleveland, Ohio, has been appointed also superintendent of telegraph of the Indiana Harbor Belt, the Chicago River & Indiana and the Chicago Junction, succeeding W. L. Connelly, deceased. Mr. Finley acts also in this territory as the superintendent of the Western Union Telegraph Company.

F. S. Elliott, general superintendent of the Western district of the Great Northern, with headquarters at Spokane, Wash., who has been on leave of absence, has resumed his duties. **W. R. Smith,** acting general superintendent of the Western district, has returned to his former position as general superintendent of the Central district, with headquarters at Great Falls, Mont., and **F. Wear,** acting general superintendent of the Central district, has returned to the Butte division as superintendent with the same headquarters.

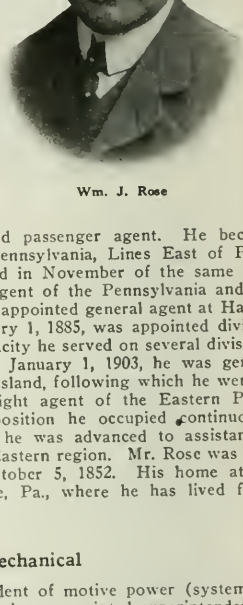
I. H. Luke, general superintendent of the Utah lines of the Denver & Rio Grande Western with headquarters at Salt Lake City, Utah, has been promoted to assistant chief operating officer of the system, succeeding **W. E. Green** who has resigned to accept service with the Train Service Board of Adjustment for the Western Region. **J. D. Stack,** superintendent of the First Division with headquarters at Pueblo, Col., has been promoted to general superintendent of the Utah lines in place of Mr. Luke. **C. E. Leverich,** superintendent of the Third Division with headquarters at Gunnison, Col., has been transferred to Pueblo, succeeding Mr. Stack. **J. W. Martz,** assistant superintendent of the First Division with headquarters at Pueblo, has been promoted to superintendent of the Third Division in place of Mr. Leverich.

W. F. Thiehoff, general manager of the Chicago, Burlington & Quincy, Lines West of the Missouri river, with headquarters at Omaha, Nebr., has been appointed general manager of the Lines East of the Missouri river, with headquarters at Chicago, succeeding **L. B. Allen** who has resigned on account of ill health. **E. Flynn,** General Superintendent of the Nebraska district, with headquarters at Lincoln, Nebr., has been promoted to General Manager of the Lines West, succeeding Mr. Thiehoff. **L. B. Lyman,** general superintendent of the Illinois district, with headquarters at Galesburg, Ill., has been transferred to the Nebraska district in place of Mr. Flynn. **J. H. Aydelott,** superintendent of transportation of the system, with headquarters at Chicago, has been appointed general superintendent of the Illinois district, succeeding Mr. Lyman. **W. H. Card,** division superintendent, with headquarters at St. Joseph, Mo., has been promoted to general superintendent of the Iowa district, with headquarters at Burlington, Ia., succeeding F. H. Ustick, deceased. **J. D. Farrington,** superintendent of the Quincy, Omaha & Kansas City, with headquarters at Kansas City, Mo., has been appointed superintendent of the St. Joseph division of the Burlington succeeding Mr. Card. **H. D. Brown,** who has been doing special work on the staff of the operating vice-president, with headquarters at Chicago, has been appointed superintendent of transportation with the same headquarters, succeeding Mr. Aydelott. **T. J. Thomas,** who has been doing special work in the office of the president, has been appointed superintendent of the Quincy, Omaha & Kansas City in place of Mr. Farrington.

Traffic

J. E. Reilly, chief clerk in the general passenger agents department of the Pere Marquette at Detroit, Mich., has been promoted to general western passenger agent with headquarters at Chicago, succeeding O. L. Kinney, deceased.

William J. Rose, assistant to the traffic manager of the Eastern region of the Pennsylvania, has retired from active service at the age of 70 years, under the pension regulations of the company. Mr. Rose served the Pennsylvania 56 years and 8 months, practically all of which time he spent in the traffic department. At the age of 13 his railroad career began in the engineering department of the Warren & Franklin now a part of the Pennsylvania. In 1867 he was assigned to clerical work in the office of the superintendent of motive power at Altoona. He was out of the service from 1870 to 1871, when he re-entered as a special agent, and on January 1, 1872, he was appointed general freight and passenger agent. He became commercial agent of the Pennsylvania, Lines East of Pittsburgh, on May 8, 1879, and in November of the same year was promoted to general agent of the Pennsylvania and the Northern Central. He was appointed general agent at Harrisburg in 1882, and on January 1, 1885, was appointed division freight agent, in which capacity he served on several divisions. From January 14, 1901, to January 1, 1903, he was general freight agent of the Long Island, following which he went to Harrisburg as division freight agent of the Eastern Pennsylvania division, which position he occupied continuously to January 1, 1922, when he was advanced to assistant to the traffic manager of the Eastern region. Mr. Rose was born at Pittsburgh, Pa., on October 5, 1852. His home at the present time is at Carlisle, Pa., where he has lived for a number of years.



Wm. J. Rose

Mechanical

C. S. Patton, superintendent of motive power (system) of the Seaboard Air Line, has been appointed superintendent of motive power, Northern district, with headquarters at Norfolk, Va. **J. J. Hanlin,** assistant superintendent motive power (system), has been appointed superintendent of motive power, Southern district, with headquarters at Savannah, Ga. **L. D. Freedman,** assistant superintendent of motive power (system), has been appointed assistant to the manager of the mechanical department with headquarters at Portsmouth, Va. Master mechanics will hereafter report directly to the manager of the mechanical department on matters concerning classified repairs and to superintendents of motive power of their respective districts on other mechanical matters. Shop superintendents and other officers hitherto reporting to the superintendent of motive power (system) will report to the manager of the mechanical department.

Engineering, Maintenance of Way and Signaling

W. R. Bennet, signal engineer of the Eastern Bengal Railway, Calcutta, India, who recently spent some time in this country studying railway signaling, sailed from England on November 21 for Calcutta where he will resume his regular duties.

Arthur B. Ilsley, engineer of bridges, Lines East, Southern Railway, with headquarters at Charlotte, N. C., has resigned to become associated with the new firm of Rice & Ilsley, Inc., Boston, Mass., further notice of which appears elsewhere in this issue.

Railway Age

EDITORIAL

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Marine Borers Invade Atlantic Harbors

When the collapse of several docks in San Francisco Bay a few years ago revealed the presence of marine borers in large numbers in the timber substructures, the railways and other owners of water-front property became much concerned over this new danger. At first the activities of these insects were believed to be confined to the Pacific coast, but it is now evident that they have also become active in the harbors along the Atlantic coast. The investigation which the National Research Council is now making shows that they are to be found as far north as Provincetown, Mass., and south to the Gulf of Mexico. This new danger is of live interest to the railways reaching these ports because of the large investment which they have in piers and other water-front structures. The situation is one which demands prompt attention if the inroads of these insects are to be arrested. While extensive scientific investigation must be made to determine means of overcoming their attacks, the destruction they bring about is so rapid that these investigations must be conducted with the utmost speed. The railways which have property in danger from this source should, therefore, give their full support, financially and otherwise, to this investigation before the damage becomes increasingly serious.

Use Train-Order Form 19

The way to get rid of the delays to trains incident to requiring conductors' signatures to dispatchers' orders is to introduce the general use of Form 19 instead of Form 31. The way to introduce it is to use it. An executive order of two sentences, with the proper signature, is enough to start an important progressive movement. This simple truth is known to all well-informed operating officers (and, in some cases, so well known that the knowledge has led to action), yet many, who seem convinced, apparently fear to make the change. Any manager who thinks that possibly the abolition of signatures might increase the risk of collision by a millionth of one per cent ought to re-read the convincing arguments in favor of Form 19, which have been repeatedly published, and then see if he cannot get some neighboring road to join him in accepting and acting on those arguments. If the legal department of your road must be educated before its assent can be secured, the plan of educating two or more legal departments simultaneously may help to overcome inertia. We suggest this neighborhood arrangement because anything like country-wide co-operation seems to be out of the question, at least for the present. One progressive manager who appealed to the Train Rules Committee of the American Railway Association to take action received the reply that the Standard Code rules already allow any road to use Form 19 as freely as it pleases; and the committee dropped the subject. We are not sure but the characteristic conservatism of the A. R. A. is, in this instance, harmless. This reply is a direct challenge. It may be a good thing for railroad managers to loosen up a trifle in their hide-bound worship of precedent, and get out of the habit of hiding behind a big and frigid organization. One leading road, the Southern Pacific, is to extend the use of Form 19 on January 1 throughout its thousands of miles of lines, as noted in the *Railway Age* last week, page 1052. There is ample time for any number of other roads to join in the same movement. Why not make this change on your road on the same day?

Genuine Employee Interest

A communication from an engineman in the employ of the Great Northern Railway of England was recently published by our British contemporary, the Railway Gazette, telling of the "locomotive improvement" classes provided by his railway. The writer tells of a particularly interesting lecture which was given recently at one of these classes. The subject was the valve gear of a three-cylinder locomotive and the lecture was illustrated by a working model. The correspondent says that the lecture room was packed with all classes of enginemen and engine-house employees, "from the chief to the call boy." The audience, he continues, took an active interest in the lecture and plied the speaker with pertinent questions. The correspondent concludes by emphasizing the great change which has come over the employees in their increased interest in their work and their desire to perfect themselves in it. The *Railway Age* has already called attention to the classes in railway economics, operation, law and kindred subjects which have been organized by the British railways and which are attended by hundreds of earnest students—all of them employees of the railways. We have also noted how railway officers and employees are meeting together in committees and councils, not only to settle disagreements, but to take counsel with each other on means and methods of improving the efficiency of the railways. Moreover we have the word of a leading English technical journal to the effect that the harmonious relationship with labor is the most encouraging feature of the British railway situation. Surely American railway officers and employees can learn much about mutually advantageous co-operation from England's example!

Making a Track Capacity Study

A road that proposes to undertake an investigation of the possibility of increasing the capacity of a line should collect the required information with care. If the signal engineer is a close student he should lead the investigation. With the assistance of the engineering department, the large field maps can be reduced to simplified straight line track diagrams on a scale of about one to 1,000, with the grades and curvature indicated by auxiliary lines and with all passing tracks, water tanks, coal chutes, station platforms and train order signals indicated. He should then make a trip over the territory on a motor car to locate on his map numerous local conditions affecting operation, so that these features may be in mind during the studies to follow. He may then well proceed to the dispatcher's office, where he can prepare "time-distance" charts in consultation with the chief dispatcher, covering all train movements for various 24-hour periods of normal and heavy traffic, as taken from the train sheets. A study of these charts will show how trains are spaced and the time that the track is occupied by certain movements. With a

knowledge of the estimated traffic to prepare for, the signal engineer, with the aid of the chief train dispatcher or the superintendent, is now in a position to prepare prospective "time-distance" charts, in which are incorporated the additional train movements that will be permitted by signal protection. With the proper co-operation of the operating and mechanical officers in the study of such charts, relatively accurate conclusions can be drawn regarding the possibilities of expediting the movement of traffic by a signal system. In view of this fact and considering the small incidental expense involved, it would seem advisable for numerous roads to institute such investigations on their busiest single-track divisions that are now giving trouble from apparent lack of track capacity.

"Main Tracker" Here to Stay

In the days when James J. Hill was developing the heavy train load there were many experienced railway men who shook their heads and said that while such a method might work out satisfactorily on the Great Northern, it would not meet the peculiar conditions which existed on their roads. However, the Hill idea has prevailed and one road after another has come to realize its economies until today its merit is generally conceded. The point may be raised whether we are not now facing a similar situation with reference to the making up of trains for movement intact through intermediate terminals to remote destinations. A few roads have followed this practice for years, others have adopted it more recently and there are still many roads who feel that this plan is not practical for their conditions. A few weeks ago when the traffic was at its peak, the capacity of the roads was determined largely by the number of cars which could be classified and dispatched through the terminals. Every train that was kept out of a terminal added, therefore, to the capacity of the roads. The peak of traffic has passed, but capacity is still of prime importance, since many roads are still being offered more business than they can handle. However, there are other advantages of the "main tracker" of equal or even greater value. Foremost among these advantages is the reduction in operating costs. One large railway which has pioneered in this direction estimates that it is saving three-quarters of a million dollars monthly by this plan, considering only those costs which can be allocated directly, such as labor and fuel. Another railway which inaugurated an intensive campaign in this direction about a year and a half ago has been able to effect a reduction of between 50 and 60 eight-hour switch engine tricks daily. This road has also been able to reduce the number of men employed to inspect and repair cars because of the reduced amount of switching. Surely, such economies as these warrant the closest investigation in times of heavy traffic or of light traffic. The "main tracker" idea has been developed on a sufficient number of roads to demonstrate the soundness of the principle. The question on those roads which have not yet taken it up is not whether it is practicable or not, but rather whether when it will be adapted to the local problems of these particular roads.

How to Get New Railroads Built

The petition filed with the Public Service Commission of Oregon asking the Interstate Commerce Commission to order some one or more of the railroads serving that State to construct a considerable amount of new railroad mileage in eastern, central and southern Oregon, as reported in last week's is sue, is interesting as the first important case in which the provisions of the Transportation Act authorizing the commission to require the building of new railroad facilities have been invoked. It is also a most significant illustration of the fact that there are parts of the country where the public wants new railroads which the existing railroad companies have not built voluntarily. The war and the period of business depression which followed it undoubtedly account for some of the lack of railroad extension and expansion in the last few years, but the Oregon commission's petition says that there exist practical and feasible routes for the extensions which it asks that the railroads be compelled to make and that in some instances construction was actually begun many years since, but never completed. If this is the case, it must have been because the projectors of the railroads were unable to demonstrate to those who had capital to invest that the railroads proposed would be profitable enterprises. One of the reasons which has caused doubt as to the prospective profitableness of a railroad enterprise has been the kind of regulation which has been applied to existing railroads, and one of the surest ways of bringing about an increase in railroad facilities would be a policy of regulation which would hold forth a prospect of profitable operation. These remarks are not made particularly for the benefit of the Oregon commission, which was one of the comparatively few State commissions that offered no obstructions to the putting into effect of the increased rates authorized by the Interstate Commerce Commission in 1920, and which may be willing to accord to the new railroads it wants some excuse for being from the viewpoint of others besides those who desire the service. The Transportation Act, which gives the Interstate Commerce Commission power to order new extensions, also expresses a policy intended to appeal to those who must furnish the necessary capital and it also attempts to encourage new construction by providing that a new railroad may retain any "excess" earnings without recapture for 10 years. We are told that the revenue provisions of the act have not yet been able to work as intended, because of the abnormal conditions that have prevailed. If more normal conditions make it possible for the railroads to reach the standard set by Section 15-a of the act, it may be that Oregon can get new lines built without the need for invoking Paragraph 21 of Section 1.

Monthly and Annual Reports

It is as an index of what may be expected from the year's operations as a whole that the monthly reports of railway revenues and expenses find their greatest—although, of course, by no means their only—value. As an index of what the year's earnings may prove to be the monthly earnings' statements have their leading value because they are available in from three to four weeks after the close of the month which they cover. Proper use of the figure for the month and for the cumulative period supplies a readily available measure of the year's results available promptly and increasing in accuracy and in value in proportion to the proportion of the year which the cumulative period includes. It is common sense to say that a railway's report for a particular month or for a particular cumulative period must be used with proper regard to the railway's own peculiar conditions. Thus, for a road like the Atlantic Coast Line which normally shows its best months in the earlier part of the year when the perishable freight is moving, an entirely different set of conditions is presented as compared with those of the Great Northern which makes the better of its net when the iron ore and wheat are moving in the latter half of the year. Realizing the value, with due regard to the road's characteristics and underlying conditions generally, of the monthly statement as an indication of what the year as a whole may show, it would be natural for us to expect that every care would be taken to show a proper relationship between the figures given in the monthly statements and those which ultimately appear in

the annual report itself. This unfortunately seldom proves to work out in actual practice, and the reasons that it does not work out are several. The first is that only a comparatively few roads show in their annual reports that important figure in the monthly report—namely, net railway operating income. Another reason is that frequently the annual report covers a different mileage—because possibly of the inclusion of subsidiary lines—from the monthly report. Third, there are almost always corrections which cause the annual report to show different figures from those which appear, let us say, in the December cumulative statement. And we might go on. Taking the situation by and large, however, it seems evident enough that this is a matter which should be given greater attention than has thus far been given to it. Under present conditions there is much confusion about the figures that should be entirely unnecessary.

Orders in November

With the car and locomotive orders for the first eleven months of the year placed, we are now in a position to make a pretty fair estimate as to how 1922 as a whole will rank with other years from the standpoint of equipment purchases. Up to and including last week's issue, the *Railway Age* had reported in its equipment and supplies column, orders placed for 2,175 locomotives, 139,257 freight cars and 1,706 passenger cars for use on the railways in the United States. These figures break no records but, on the whole, they compare very favorably indeed with the totals for recent years, as is shown in the following table:

DOMESTIC ORDERS

Year	Locomotives	Freight Cars	Passengers Cars
1915	1,612	109,793	3,101
1916	2,910	170,054	2,544
1917	2,704	79,367	1,124
1918	2,593	114,113	109
1919	214	22,062	292
1920	1,998	84,207	1,781
1921	239	24,346	246
1922 (11 mos.)	2,175	139,257	1,706

In this table the striking feature is the comparison with 1921 and the fact that the 1922 eleven months' total for freight cars is the best in the period given with one exception, 1916, when orders for 170,054 cars were reported. Orders in November this year totaled 319 locomotives; 13,599 freight cars, and 153 passenger cars. The November figures and the cumulative totals are shown as follows:

DOMESTIC CAR AND LOCOMOTIVE ORDER IN 1922

Month	Locomotives	Freight Cars	Passenger Cars
Jan.	5	7,960	235
Feb.	8	14,721	160
March	76	5,550	25
April	672	50,507	540
May	99	18,337	235
June	22	11,097	37
July	353	15,675	120
Aug.	220	576	22
Sept.	617	6,717	63
Oct.	184	14,498	116
Nov.	319	13,599	153
Total (11 mos.)	2,175	139,257	1,706

The orders in 1922 are apparently going to hold up well to the end of the year. The November totals were good. The more important fact is that in the equipment and supplies column this week there are reported 3,000 tank cars placed by the Union Tank Line, which 3,000 are not included in the November figures already quoted. The Southern Pacific has arranged to secure some 7,000 cars, inquiries for 5,000 of which are already issued. Inquiries have also been sent out for 5,000 refrigerator cars for the Pacific Fruit Express and it is understood that bids will shortly be asked for 300 additional refrigerator cars for passenger train service. This means that the 1922 eleven months' total is likely to be substantially increased before the year is out.

The Truth About the Transportation Act

RADICAL POLITICIANS and labor leaders will, within the next few months, make an energetic drive to secure the repeal of the Transportation Act, or at least of those provisions of it against which they have constantly carried on propaganda during the last two and a half years. They will make this drive upon the assumption that the Transportation Act is beneficial to the railways. They and many other people seem to reason that anything which benefits the railways must harm labor and the public.

The *Railway Age* advocated the Transportation Act. We still believe that if its provisions had been in the past, and should be in the future, carried out in the spirit in which they were enacted it would do more good and less harm than any other railroad legislation ever enacted in this country. In our opinion, however, the Transportation Act thus far has done the railroads at least as much harm as good, and it is doubtful if they should very strongly oppose its repeal.

The most important provisions of the Act are those relating to rate making, to labor controversies and to consolidations.

The rate making provisions directed the Interstate Commerce Commission to so fix rates that the railways would be able to earn a fair return upon their valuation, giving due consideration to the transportation needs of the country. It directed the Commission to take as a measure of a fair return for the two years ending with March 1, 1922, not less than 5½ per cent. The Commission ruled in the 1920 rate case that a fair return at that time would be 6 per cent, and in the 1922 reduced rate case that a fair return would be 5¾ per cent. What have the railways actually got? In the year ended March 1, 1921, including the government guarantees for the six months of that year, they had a net return of only 3½ per cent. In the year ended March 1, 1922, they had a net return of 3.05 per cent. The average for the two years was 3.57 per cent. For the entire two years, it was $918,000,000 less than a return of 6 per cent on their valuation, and $730,000,000 less than a return of 5½ per cent.

Thus the Commission, in fixing the rates, completely failed to carry out the instructions and intent of the law with respect to these two years. Its failure was mainly due to the depression of business, but it failed in spite of the fact that the railways, during those two years, received $730,000,000 less than the minimum return mentioned by the law, the Commission, immediately after the termination of these two years, yielded to public clamor and made a general reduction of freight rates, and during the seven months ending with last September the net return earned was less than 4 per cent, and in August and September averaged only 2¾ per cent. The net returns which the railways have received in the thirty-one months since the Transportation Act went into effect for which we have complete figures has been $1,146,000,000 less than 6 per cent and $844,000,000 less than 5½ per cent, and has been in fact the smallest return they ever have received in any equal period since statistics for the railways as a whole have been kept.

In other words, the Transportation Act as administered by the Commission, has thus far failed to enable the railways to earn anything approaching a "fair return." It is inconceivable that even if the Act had never been passed, regulation would have or could have restricted them to a lower return than they actually have received under it. But while the rate making provisions thus far have done the railways no good, they have, in one respect, done them much harm. They have afforded pretext for the wide-spread dissemination of propaganda to the effect that the railways are "guaranteed" a return of 5½ or 6 per cent; and this propaganda has done much to create sentiment hostile to the roads.

The rate making provisions further provide that any rail-

way which earns more than 6 per cent on its valuation must hand one-half of its net return in excess of this amount over to the Interstate Commerce Commission. This provision manifestly was predicated upon the assumption that the provision assuring to the railways an opportunity to earn a "fair return" would be carried out. But while the railways as a whole have not earned anywhere near the returns specified in the law and expected by them the Commission, in conformity with the law, is taking steps to collect this "excess" net return of the more prosperous railways.

The results of the passage of the rate making provisions are, then, that the railways never have earned anywhere near a "fair return"; that the provisions have been made the pretext for damaging propaganda against them; and that some railways must surrender a part of their net return which they could have kept if the Transportation Act had not been passed. Plainly, the rate making provisions up to this time have done the railways more harm than good.

From the latter part of 1920 until recently other industries secured the benefit of sharp reductions of wages, especially those of unskilled labor. The Transportation Act required all controversies between railways and their employees that might threaten interruption of transportation to be submitted for settlement to the Railroad Labor Board. The second decision rendered effective by the board on May 1, 1920, caused the largest advance in the wages of railway employees ever given to any class of workers. It put the level of railway wages far higher than it was during the war just when the greatest decline of business in history was beginning. The board subsequently awarded reductions of wages, but they were not made until long after extensive reductions had been made in almost every other industry, and even then left railway wages higher than those in other industries.

Thus, during a period of acute business depression the railways, under the Transportation Act, were compelled to pay wages far in excess of what they probably would have paid if the Labor Board had not been created.

The principal purpose for which the Labor Board was created was to prevent strikes. Its creation did not, however, prevent the most extensive and costly railroad strike that ever occurred.

It is easy to see how railway employees have benefited from the passage of the labor provisions. On the other hand, it seems probable that the railways, during the last three years, would have been better off if these provisions had never been enacted.

The consolidation provisions required the Interstate Commerce Commission to frame a plan for the consolidation of the railways into a limited number of competing national systems. The Commission has tentatively adopted a plan many parts of which might be carried out to the advantage of the railways and the public. This plan would, however, work the disruption of the great Hill system, with consequences which would seriously injure the railways composing that system and which would not benefit the public. Furthermore, the provisions of the Act require that when two or more railways are consolidated, the total securities they have outstanding must be adjusted on the basis of their combined valuation, which tends to make the whole consolidation scheme unworkable. If the law merely authorized any consolidation of railways that the Interstate Commerce Commission should hold not contrary to the public interest, it would promote the welfare of both the railways and the public, but it is doubtful if the provisions actually adopted will ever prove to be of any value, and certainly they have not conferred any benefits thus far.

The truth is that the only provision of the Transportation Act which have done the railways any good are those which continued the war time guarantees during the first six months of private operation and which resulted in loans being made to them by the government to carry them through the period of transition from government to private operation.

The Transportation Act on the whole is a good law. Its rate making provisions, from the standpoint of the welfare of both the railways and the public, are the best part of it. But a good law is no better than a bad law if it is not backed by public sentiment and carried out in the spirit in which it was enacted. The principal purpose of those who framed the Transportation Act was to give the country a law which would end the near-confiscation policy of regulation which prevailed for more than ten years before government control of railways was adopted, and so restore the earning capacity of the railways as to enable them to provide sufficient transportation for the country. With the exception, perhaps, of its consolidation provisions, it should be kept on the statute books if it is ever going to be given the effect its authors intended. If, on the other hand, it is to be emasculated by repeal of its only constructive and valuable provisions, or is not to be carried out in future differently from the way it has been in the past, then every syllable of it might as well be wiped out. The railways would be much better off with a more intelligent public sentiment and the much worse laws by which they were regulated prior to 1920 than they are with a public sentiment poisoned against the Transportation Act by propaganda; for as long as this public sentiment exists, it will do the railways far more harm than any law will do them good.

Human Problems in the Mechanical Department

DURING THE PAST five years the relations between the railways and the employees of the mechanical department have undergone a series of profound and sudden changes. Nineteen eighteen saw the the first complete unionization of shopmen; 1920 marked the introduction of wage adjustment by arbitration of a governmental agency; 1922 brought the first nation-wide shop strike, resulting in the formation of many company unions. On most roads the strike has nominally been settled, but the problems arising out of the strike and the five eventful years that preceded it are by no means settled. Some roads have made great progress in re-establishing satisfactory relations with their employees; on other roads ill feeling still exists. No individual or road has a monopoly of all the good ideas for correcting the present situation and for that reason mechanical officers should find it distinctly helpful to get together when the Mechanical Division meets next year and discuss frankly and thoroughly the methods that have proved effective in improving relations with the employees.

The scope of this question is so broad that a scattering discussion would arrive nowhere. To make it effective some logical plan must be adopted and the most important topics outlined, preferably in individual papers. The starting point for any discussion of this subject should be the development of foremen. No railroad can regard without alarm a possible recurrence of the situation that existed during the strike, when foremen at many points struck with the men. Above all things, the roads must develop in their foremen a high degree of loyalty. Why did some of these men support the labor organizations instead of the managements, and what can be done to prevent it in the future? Mechanical department officers should work diligently to find the answer to this question.

Many new foremen have been employed since the strike. Giving them a title does not automatically qualify them to interpret the policies of the company and to direct men in a way that will win their support and get the best service they are capable of giving. If any railroad is to operate

successfully, it must have foremen who are more than mere time-servers and more than mere mechanics. These men must be made to understand the vital part they play in the organization and the many-sided character of their work, which requires something of the qualities of the diplomat, the business man and the craftsman. The average foreman does not receive a training that will develop all the necessary qualifications. How can he best be fitted for his responsibility? Surely some methods of training are needed.

One large road has adopted the practice of holding annual meetings of its master mechanics, traveling engineers and foremen in the various branches of the mechanical department. Such meetings may have an important effect in unifying the policy and practice of a road, disseminating information as to improved methods, and building up an esprit de corps. This should be a fruitful topic for discussion, for the problem of training foremen is one that the railroads will always have with them.

The present labor situation is focusing the attention of the mechanical officers again on the human problems which, in recent years, the Mechanical Division has consistently avoided. There is need for a return to the constructive viewpoint which J. F. Deems voiced in his presidential address before the Master Mechanics' Association in 1907: "What shall we leave to aid in solving the problems of the future, many of which may be more perplexing than those we are called upon to solve today? We may work in brass and steel, and leave the most perfect mechanism; we may develop and improve and evolve methods and practices until nothing more can be desired; we may reach perfection in all these, in mechanism, structure and method, and yet our bequest be a failure and itself a burden unless we provide that which is paramount, which is over and above the sum total of all this, and for which even today events throughout the world are crying aloud—the man. A man prepared, experienced, earnest; hopeful and happy; consecrated to his work and ready to the hand of the future."

On Making Friends for the Railways

THE RAILROADS sorely need more friends. The best way to make friends is to show that you take real interest in and are truly anxious to promote the welfare of those that you want for your friends. Many intelligent people are influenced, or even controlled, in forming their opinions regarding matters of importance, such as the railroad problem, by the evidence and arguments presented regarding it. But even they are much more susceptible to conviction by spokesmen for an industry that they believe is treating them as well as it can, than by spokesmen for an industry that they believe cares nothing at all about their welfare; and a large majority of people are influenced much less by reason than by sentiment, and therefore are much more likely to give their friendship and support to persons or concerns that they believe are really interested in their welfare than to persons or concerns that never manifest any interest in it.

One of the principal reasons why it is so easy to create a public sentiment hostile to the railways is that railways make so little effort to show the public that they not only want to make money by serving it, but that they really want to so serve it as best to promote the welfare of the public, and especially of the producers, the shippers and the travelers, in their own territories. The railways have lines and representatives in every territory and community. They are selling about five billion dollars' worth of service annually to the public. For the most part it is good service. It is doubtful, however, if any other industry or concern in the world does relatively as little as the railroads of the United States to convince its patrons that it is rendering them the best service that it can, and trying as hard as it can to so render the service and fix the charges for it as to promote the interests of its patrons. The problem presented cannot be solved merely by public addresses or advertising, although they are important. It never will be solved until the railways are so managed and organized that their officers and representatives will come in contact with a larger part of the people and until those who do come in contact with the people so treat them as to show them that the railways take a friendly interest in them.

There is a certain large city from which a certain large railway system derives millions of dollars of business annually. The editor of the leading newspaper in that city recently made the statement that he had never had a call from, and never in his life had come in personal contact with, any officer or representative of this railway. Nor is this an exceptional case. There are literally hundreds of chambers of commerce throughout the country. The railway is one of the largest business concerns in every community that it serves. But there are many of these chambers of commerce in whose affairs no railway officer ever participates. There are, in fact, many large towns which are never visited by any railway officer.

But the most neglected class of all are the farmers. Directly and indirectly, the farmers furnish to the railways a large part of their traffic. There are innumerable public meetings of farmers' organizations to which railway officers would be welcome, and in which they would be given opportunity to participate in the discussions regarding matters affecting the welfare of agriculture, including transportation matters. Seldom, indeed, are these meetings attended by anybody authorized to say a word regarding matters in which the farmers and railways are mutually interested. Every year millions of passengers buy tickets at railway ticket offices and stations. Comparatively little effort is made by railways to select, train and supervise ticket agents so that they will always show an intelligent and courteous interest in the problems of the traveler.

Probably if the whole matter were sifted to the bottom it would be found that the principal and fundamental cause of the constant troubles of the railways with the public is that most railways hardly make any real effort to sell themselves, as institutions, and their services to the public in the right way. Salesmanship is an art in the knowledge and practice of which the railways are strangely deficient. Nobody who constantly comes in contact with all classes of people can have any doubt that the average man regards the average railroad as a huge money-making institution which cares little or nothing about the interests and welfare of its customers, employees and the public. The failure of the railroads to get and keep in close human contact with the people leaves wide open the door of opportunity for demagogues and radical labor leaders who see their own interest in misrepresenting the railroads. The demagogues and labor leaders win railway patrons and employees to their support by professing the most intense interest in their welfare; and day in and day out, year in and year out, the misrepresentation of the railroads, not only by politicians and labor leaders, but even by hundreds of thousands of the railways' own employees, goes on unceasingly. The average man who never meets a railway officer or representative of any rank except ticket agents and train employees, who never hears or reads a refutation of any of the misrepresentations of the railways and hears them constantly repeated, but who does come frequently into contact with the many ardent "friends of the people" who live and further their ambitions by attacking the railways, is sure sooner or later to become hostile to the railways and to act accordingly.

It may be asked, how can railway officers do their present work and at the same time participate in the affairs of chambers of commerce, attend meetings of farmers, call upon local business and newspaper men and otherwise come into

contact with the public? If they cannot do these things—and probably they cannot—that fact plainly discloses a very serious weakness in the organization of the railroads. It indicates that the railways are under-officered; and as to most railways, this is undoubtedly true, at least in some departments. When the organization of a business concern is in such a condition that its officers and representatives cannot do the things which obviously must be done to sell the concern, as an institution, and its services to its patrons on the right terms, then very plainly there is something seriously wrong with its organization which should be promptly remedied.

It will cost money to make the changes in the organizations of the railroads necessary to increase and improve the human contact between them and their patrons and employees. It may be necessary to increase the official staffs, not only at headquarters, but on every division. But how much is it annually costing the railways in net return not to make their organizations such as to enable them to establish better relations with the public? Unfair and prejudiced public sentiment expressing itself in corresponding regulation is costing the railroads hundreds of millions of dollars. They are now handling the largest freight business in their history and yet, owing indirectly to unfriendly public sentiment, failing at the rate of a half billion dollars annually to earn a 5¾ per cent return. If adequate public relations work carried on in the right way would improve public sentiment, it would be worth literally hundreds of millions of dollars to the railways annually. The cost that would be incurred in doing such work would really not be a net loss even if it were a failure. If it were a failure the final outcome would be the destruction of private ownership and management; but it is only a matter of time until private ownership and management will be destroyed anyway unless a more intelligent and friendly public sentiment can be created and maintained.

Mechanical Conventions and Exhibits

THE VIEWS of a supply man as to the proper relationship between the railroad associations and the organizations which exhibit at their conventions, are set forth in a communication elsewhere in this issue. The writer maintains that holding the June convention at a summer resort creates the impression that the convention and exhibit are holidays rather than business affairs; and that, from the exhibitors' standpoint, an organization of the various mechanical associations, so that the members of all of them could attend a meeting or meetings at various times during a continuous period of two weeks, during which time a single comprehensive exhibit would be maintained, would give the best results.

In considering this matter of the relationship of the associations and exhibitors the fact should not be overlooked that the primary objects of the two groups are not identical. The various railway associations have been organized by groups of officers or supervisors, in most case voluntarily, for the purpose of educating and broadening the members and furthering progress in the various branches of the art of railroading. The exhibits, on the other hand, are one form of sales development work of the companies manufacturing and selling tools, materials or devices to the railroads. They are the organized means of seizing the opportunity presented by the convention for a display of wares before, and personal contact with, a large number of men specifying or using these tools, materials or devices, at one time and place. The relationship between the two groups is fundamentally that which always exists between the prospective buyer and the seller. The seller aggressively seeks the more or less passive prospects and by every means at his command seeks to make it easy for him to see and develop a desire to buy whatever goods are offered. In this process entertainment is a time-honored means of creating good will and helping to convert passive into active interest.

When and how the conventions of the railroad organizations are to be held is a matter to be settled by their members in the manner which they believe will best further the purposes of the organization. If, from their standpoint, the exhibits possess real educational value or are otherwise of real service to the members as a whole, then the convenience of the exhibitors should not be left entirely out of consideration.

Whatever the action of the railway associations, however, the question as to whether or not exhibits are to be held must be settled finally by the supply companies and the supply companies alone. They must decide whether or not these exhibits are effective sales development agencies. It is doubtful whether a unanimous affirmative could be obtained in answer to this question. The very fact that exhibits continue to be organized, however, indicates that many companies believe that they are effective. But they might be effective and still be less efficient in the use of time and money than other equally effective methods. Some light may be thrown on this question by an analysis of the cost of the Atlantic City convention and exhibits. Including the hotel bills of both railway and supply men, this cost is estimated at about $1,000,000. In 1922 there were 341 exhibits which were visited by approximately 1,300 railroad men. More than one-half of these men were members of the Mechanical Division and more than one-third were men of lower rank whose principal interest was the exhibit. The remainder were purchasing agents and storekeepers. It is evident then, that had the entire expense been borne by the supply men, the average cost would not have been quite $3,000 for each exhibitor, in reutrn for which he has the opportunity of imparting some knowledge of, or interest in, his product to 1,300 railroad men. But it may be assumed that probably not more than one-half of these men are interested in any one product or device. If this be true, then the total average cost per prospect reached is a little more than $4. Part of this is borne by the railroad men whether there is an exhibit or not. But if the entire amount came out of the pockets of the exhibitors, is it conceivable that the same results could be obtained in any other manner without a several times larger unit expenditure?

At the outset the statement was made that the primary end of the associations and exhibitors are not identical. But if the railroad man finds the exhibit a valuable medium of education and a convenient means of shopping, and if to the supply man it is an effective means of sales development at a comparatively small unit cost, it is evident that there is a strong mutual interest between the associations and the exhibitors. It is evident, however, that this is a strictly business interest and the relations between the two parties should be established on a strictly business basis. On such a basis, elaborate entertainment, although it is a natural development of the buyer and seller relationship, is not essential. On a large scale it cannot escape unfavorable comment, which in itself is detrimental to the interests of the railroad association and indirectly at least to the effectiveness of the exhibit.

It is not the purpose here to enter into a discussion of the feasibility of the form of organization of the various mechanical associations suggested by the writer of the letter already referred to. Suffice it to say that the idea of a combined exhibit with consecutive meetings during a continuous period has already been considered and considered favorably by a number of the minor mechanical organizations. The fact must not be overlooked, however, that the primary object of conventions is not the exhibit and that however mutually advantageous the exhibits may be, any association which cannot function without them has little reason to continue its existence.

Letters to the Editor

The Mechanical Conventions—A Supply Man's View

CHICAGO

TO THE EDITOR:

Your editorials on the defunct 1923 mechanical convention, in the issues of November 11 and November 18, have been read with a great deal of interest. There can be no question but that you have made some very pertinent points in these editorials, but all of the urging which you can put into your pages will not serve to correct a condition which is caused by something deeper than mere lack of interest, which has been increasingly evident in the work of the mechanical conventions during the past few years. There is something basicly wrong, and while we are all loath to believe it, we must face the fact that the mechanical conventions, as held at Atlantic City, are not in conformity with the requirements of present day conditions in the field of railway operations. The proof is before us.

You point to the consistent work of the American Railway Engineering Association, in its annual sessions. These sessions have been held in Chicago, and whether or not they were more business-like, they certainly appeared so. When a railroad man visits Chicago from any part of the United States or Canada it is looked on as a business trip, or, in other words, what it purports to be. When a railway officer visits Atlantic City, this is not true. The trip may be one of business or it may be an annual vacation. If it is a business trip and if the railroad employing the officer who makes it sees benefit therein, why should he have to go to the far east coast from San Francisco, St. Paul or Denver? If it is a vacation, why should he be compelled to take it in June, regardless of the requirements of the service on his railroad?

You point to the success of the International Railway Fuel Association and of the Traveling Engineers' Association in their annual conventions, held in Chicago. Why should not the traveling engineers and members of other minor mechanical organizations, such as the general foremen, the tool foremen, the master blacksmiths, the car and locomotive painters, the fuel men, and others, be amalgamated into one good mechanical association, Division V of the American Railway Association, if you please, or an independent organization? Let them meet on different days in a centrally located city, but let those days be consecutive, the committee reports being so arranged that certain classes of men can come to the convention, sit through that part of the discussion in which they are interested and go home. This is now a new thought, but for some reason it has not been expressed with sufficient force to gain a logical negative reply from those who are not in agreement, so far as I have been able to discover.

The railway supply manufacturers' interests cannot be overlooked in this matter. A dozen conventions throughout the year, spread all over the United States, result in unnecessarily large bills, which must be paid by the railroads and finally by the public. There is no question but that the criticism which has resulted in postponement and abandonment of convention after convention at Atlantic City, comes from those who have considered these facts. Why, then, should we obstinately ignore this sentiment and continue to hold our major mechanical conventions in haphazard manner, always at Atlantic City or not at all? Is there anyone who believes a real convention at Atlantic City would be possible without the support of the supply manufacturers with their exhibits? Had the mechanical association followed the apparently business-like methods of the American Railway Engineering Association, its conventions would have been just as consistently held, year after year.

The railway supply manufacturer who sincerely wishes to exhibit to the railway engineering officers in convention assembled is fortunate indeed, compared with the manufacturer who has wished to effect the same purpose with respect to the mechanical officers. We hear it said everywhere that the railway officers assembled at Atlantic City are confined to a small area throughout the convention, and that, therefore, they will give the exhibits more close attention, there being nothing else to take their spare time, but that if such a convention were held in Chicago the interests would be so diversified that the exhibits would get small attention. The persons who make this statement are paying our railway officers no compliment. The officers who attend the convention for business reasons will consummate their mission. On the other hand, those who go down to the seashore at convention time for a vacation cannot be forced to take any more effective notice of the exhibits by the mere fact that they are imprisoned, so to speak.

In your issue of November 18, D. I. S. Gusted writes pointedly and heatedly on this subject, but he does not get us anywhere except that he adds his voice to the clamor for a convention. By all means let us have a convention. Call it a business meeting, if that sounds better, but let it be a business convention. Encourage the co-operation of the supply manufacturer by furnishing some sort of a guarantee that the attendance will include a representation of all classes of mechanical department officers and he will take chances on their seeing his exhibit whatever may be the other interests of the visitors.

Sentimental inertia dies hard. The writer has seen 13 mechanical association conventions and, compared with the majority in annual attendance, he is low on the seniority list. During these years the exhibit and discussion of a tremendous number of devices has resulted in the improvement of locomotive, car and shop performance, but the space actually demanded for the exhibition of bonafide new devices would not have amounted to more than one-tenth of the space used. The rest was pure waste, not only in space rental, but in the movement of heavy machinery and of locomotive and car parts and devices. Why? Because a few new members were in attendance each year, who might not have seen the exhibits in previous years.

The hand-writing is on the wall. These unnecessary expenditures of time and money must be stopped, but the work must go on. It is true that each annual convention has included a few new faces occasioned by promotion and appointment, but they are not laymen injected suddenly into the railway field. They have been slowly educated and advanced, step by step, to the position of importance which allows of their attendance. Now, if their knowledge of those devices customarily exhibited at conventions is important—and it is—that fact must be recognized and it might as well be recognized early in the individual's service. The difficulty is that he cannot, early in his career, be sent to an Atlantic coast resort with its attendant absence from duty of from 10 to 30 days, its "soup and fish" formality, its $12 a day hotels. The logical result is an attendance year after year of those who "have arrived" and who, therefore, are not as absorbent of new ideas.

Suppose, then, a mechanical department convention were arranged for a centrally located point to extend over a period of two weeks. Suppose committees were organized to include representation of every phase of mechanical department service, including those minor interests represented at present in six or eight different associations. Suppose these reports were systematically programed to make it unnecessary, except in special cases, for any individual to spend

more than two days in attendance, and yet arranged to bring all reports to the fountain head of the general committees made up of members of the present major associations at the close of the general convention. Is not the benefit to the greater number obvious?

Now, consider the case of the supply manufacturer under such an arrangement. He first would plan on a worth-while exhibit, cheapened in cost by the very location. He has men who must work with the general foremen. He has other men who must deal with the traveling engineers. He has still other men whom he must depend on to meet master mechanics and mechanical superintendents. He has but to consult the program and act accordingly, making each man-day and each expense-dollar count.

The exhibit has a run of two weeks during which, not only all railway officers who at present are numbered as members of many present organizations, but younger men who are being educated to follow, may visit it. The cost is reduced to the minimum per observer. The results will be vastly more satisfactory.

The plan suggested is business-like and should command the support of those who have made the faults of past practices so evident as to effect the abandonment of the convention.

L. F. Wilson.
Vice-President, The Bird-Archer Company.

Combine Train Control With Block Signals

Chicago, Ill.

To the Editor:

Referring to the editorial which appeared on page 874, of the *Railway Age* for November 11, 1922, under the caption "Institute a Signal Investigation," it is generally accepted as a fact that the installation of automatic block signals on busy single track railroads has substantially increased capacity. Indeed, there is little doubt that such installations afford substantial relief from congestion because the blocks are reduced in length, permitting following movements to be made under comparatively close headway and under signal protection.

However, an expenditure of $4,500 per mile for signal protection only on single track lines seems unwarranted, for the reason that no real physical protection is afforded by such an installation. It is, of course, true that such an installation will give certain signal indications, but even with this there is no absolute assurance that trains will be governed thereby.

After an installation of automatic block signals is completed—be the scheme what it may—there still remains unspanned a gap between the fixed signals and the trains which they are intended to govern, so that while the signaling system may be complete as such, it is incomplete as to protection. As is well known, each signal is connected through the running rails of the track with the train which it is intended to protect—but is this sufficient? Is it not a fact that in reality the danger lies in the train which the signal is intended to stop? With such a signal system there is no assurance that the approaching train will stop and it is under precisely such circumstances that the conditions peculiar to train operation may bring disaster. The cause may be low visibility occasioned by fog, snow or storm, or the occasional lapse of mind of the engineman. Be the cause what it may, such accidents are the most regrettable because they are entirely preventable.

Why should any railroad management desire to spend approximately $4,500 per mile for signaling when it is possible to secure a signal system and with it complete automatic train control protection for an equivalent amount, with not alone an increase in the capacity of the track but with such safety as signals alone cannot provide? Why continue to install expensive motor-operated semaphore signals with the necessary complicated electrical and mechanical means for moving a semaphore arm when adequate light signals are available, operated entirely through relay contacts? Why not install a combination of light signals and automatic train control such as will not only give signal indications—the same indications by day as by night—but with such an installation bridge the gap between the signal and the approaching train and thus eliminate the possibility of collisions by striking out from our otherwise splendid railroad system the unnecessary hazard which, under existing operating conditions, is always present in the almost irresistible force of a high-speed train closing in upon another train in its path. It is as practicable to control the approaching train as it is to control an automatic block signal. Assuredly then, the cycle of safe operation should be completed in all future installations by combining such automatic block signals as it is necessary to install, with automatic train control.

The attention of railroad managements should be called to the fact that capacity with safety can only be secured by means of a system of automatic train control consistent in its operation with the indication of fixed signals and with sufficient flexibility to meet any demands of traffic. Further, that numerous unnecessary stops will be eliminated by the installation of such a system and the time lost due to rear flagging will be considerably reduced if not entirely eliminated.

J. Beaumont,
Vice-President, Regan Safety Devices Corp.

Need for Diplomatic Apologies

New York City.

To the Editor:

The letter of William W. Tirrell in your issue of October 28, page 783, is a most searching analysis of the factors in our problem of establishing a good understanding between the railroad owner and the men who work for him; so searching, indeed, that the most superficial reader must see at once that the question is rather abstruse. The only way to get practical results, on the broad lines which are sketched in this letter, would be to establish a night school and to require study, for several weeks, on the half dozen important topics suggested. In other words, we have here the texts for a series of lectures of 40 minutes each—the value of which lectures, however, would depend greatly on who gave them and to what kind of men they were addressed.

Mr. Tirrell, indeed, reminds us that the science of educating a thousand railroad employees in mind, conscience and public spirit, so that they will give ideal service, is a complicated science; and one in which very few of us are proficient. In short, the whole matter is so difficult that it continues to be neglected. But, though we have made little progress in the application of this science, we are not debarred from practicing some of its precepts. Let us make a start in some branch that we already have some knowledge of.

For example: "Each employee must be taught to take a personal interest . . . and to defend his railroad, and *know why* he defends it." Set 25 of your best men a definite task in this direction. Require them to write a 200-word essay. Set them to defend some policy, or practice or condition which can be only partly justified; which in part must be apologized for.

The superintendent of a large division, doing a heavy passenger and freight business, could spend $200 in no better way than to offer prizes for excellence in this kind of work. Every large railroad has been obliged of late years to do a good deal of apologizing; and most of the conductors and station agents, on whom dependence is placed for maintaining the road's reputation, have very little skill in that kind of work.

B. R. B.

How Can Employee Relations Be Improved?*

A Catechism That Develops Certain Truths Which Must Be Recognized if Conditions Are to Be Bettered

By Roy V Wright
Managing Editor, *Railway Age*

Question. What is a railroad for?

Answer. To furnish adequate transportation for freight and passengers—in short to serve the public.

Question. Who actually performs the detail work in rendering this service?

Answer. The rank-and-file of railroad employees.

Question. How does the public want to be served?

Answer. With courtesy promptness, certainty and as cheaply as possible.

Question. Are the employees specially trained to serve in this way?

Answer. Apparently not, except in a limited number of cases, and even then often only to a limited degree.

Question. Should this special training apply only to those employees who come in actual contact with the traveling public and the shippers?

Answer. No! Every employee can contribute to more efficient or more economical operation. Sometimes it may be in an obscure place or in a seemingly very indirect way. If the contribution is in more economical operation or in the elimination of waste of some sort resulting in more economical operation—and even without coming in contact with the patrons of the road—it is important because it means that better service can be rendered at the same rates or the rates can be lowered for the same service. On some roads with limited earnings or deficits it may even mean keeping them out of bankruptcy.

Question. Are the employees generally imbued with this spirit of service?

Answer. No.

Question. Give some illustrations to prove this.

Answer. (1) The attitude of indifference, sometimes even bordering on discourtesy, on the part of some ticket sellers, agents, conductors, brakemen, gatemen, porters, waiters, freight house employees, clerks, etc., toward the patrons, particularly if of humble appearance, is one illustration[1]—and this in face of the fact that the patrons of the railroad are all cash customers.

(2) Another evidence of the disloyalty toward railroad managements on the part of some employees, is indicated by the unfair and misleading propaganda promoted among many classes of employees through some brotherhood magazines and by so-called labor economists or experts employed by the men. In this respect one quotation in Mr. Brazier's paper is specially significant: "A mule cannot pull while he is kicking, and he cannot kick while he is pulling." What sort of service is being given by employees who are interested in promoting and spreading such propaganda?

Question. The above illustrations are only typical and may be multiplied many times over. In the last analysis, whose fault is it that such conditions exist?

Answer. The managements'.

Question. Surely your answer is wrong! It is inconceivable that railroad managements would knowingly allow such conditions to exist if it were in their power to remove them. Can you prove your point?

Answer. There are several reasons for the failure of railroad managements to realize their full duty and responsibilities and discharge them properly. In the first place, it would almost seem—at least in many respects—that they feel the patrons are under a distinct obligation to them when they condescend to sell them transportation and to serve them. Except in a few cases no real salesmanship[2] ability is shown in dealing with the customers, and no attempt has been made to train even those employees who are engaged in the actual selling processes in the principles of real salesmanship. Moreover, in these days even banks and professional men advertise for business, and yet the railroads with all that they have to sell, spend a mere pittance[3] for real advertising.

Question. Would the amount of transportation as a whole be increased by better salesmanship and more real advertising? Does not the amount of railroad transportation sold depend directly on general business prosperity in the same way as does the sale of postage stamps?

Answer. Decidedly no! Passenger traffic,[4] especially, can be greatly increased by the right sort of salesmanship and advertising. Skillful railroad development departments[5] have found many ways of developing new business. Salesmanship and advertising[6] can be made to pay in many *direct ways*.

Question. Why emphasize *direct ways?* What other good results will follow?

Answer. Shippers and patrons, often irritated and even angered by indifference and ignorance on the part of railway employees, may be converted into friends,[7] and surely the railroads need friends today more than they ever needed them before.

Question. What is another reason for your reference to the failure of the railway managements?

Answer. They have failed to take the employees and the public into their confidence as to their problems, finances, etc. This has allowed a degree of mystery to creep into the

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* Presented in the discussion of a paper on "The Training of Men to Act in Supervisory Capacities and Best Results in Handling Men," which was read before the meeting of the Central Railway Club on Thursday, November 23, 1922, by F. W. Brazier, assistant to the general superintendent of rolling stock, New York Central Railroad.

[1] This is reflected in the following articles which have appeared in the *Railway Age*: "Do Railways Lack the Selling Sense?" December 2, 1922, page 1039; "A Shipper Comments on Railroad Morale," November 18, 1922, page 929; "Observation of a Trans-continental Traveler," March 11, 1922, page 583.

[2] See "Do Railways Lack the Selling Sense?" *Railway Age*, December 2, 1922, page 1039.

[3] See "Railroads and Public Relations Advertising," *Railway Age*, November 25, 1922, page 967.

[4] See "Public Relations Work and Advertising" (Communication), *Railway Age*, April 22, 1922, page 953.

[5] See annual reports of the meetings of the American Railway Development Association.

[6] See "Do 'Selling' the Railroads," *Railway Age*, February 18, 1922, page 410; "One Big Thing That Is the Matter With the Railroads," *Railway Age*, February 25, 1922, page 457; "Positive Public Relations Work," *Railway Age*, March 18, 1922, page 733.

[7] See "Why Not Sell the Necessary Service at a Profit?" *Railway Age*, March 4, 1922, page 595; "Public Relations Work," *Railway Age*, March 11, 1922, page 553; "For a Better Understanding Between the Railways and the Public," *Railway Age*, April 22, 1922, page 954; "More About Public Relations Work," *Railway Age*, May 20, 1922, page 1155.

business, particularly since there are persons who have been ready—through ignorance, or for other reasons—to spread misleading propaganda as to the earnings, valuations, etc. Except in a few cases—the Illinois Central[8] is one notable example—the managements have done little in a large way to remedy this by giving general publicity to the facts.

Question. What do you regard as another failure of railway managements?

Answer. The managements have failed,[9] as the systems have grown larger and larger and the rank and file has been further and further removed from the chief executives, to give the necessary attention to the selection, training and promotion of employees.[10] Men have often been promoted to the position of foreman purely because of their abilities as craftsmen, or because of their technical knowledge rather than that they understood men, or knew how to direct them. These untrained foremen have frequently irritated and antagonized the men under them when they should have been building up a spirit of loyal co-operation and teamwork among them. Several years are required to train a machinist in the operation of a few simple tools, and yet no special training is given a foreman to fit him to direct the most complicated and highest type of machine in the world—the human being. President Smith of the New York Central is responsible for the statement that "the efficiency of a railroad depends principally upon its men. It is estimated that 95 per cent of railroading is human"—and yet what a lack of appreciation is shown on most roads for taking advantage of the most up-to-date and scientific knowledge concerning the successful handling and direction of human energy.[11]

A number of large industries have found that it paid well to develop limited but intensive training courses for foremen and other officers, or for prospective foremen. These courses have proved so popular and have been so thoroughly appreciated by both the men and the managements where they have been properly conducted, that it would seem the railroads could well afford to develop similar courses of training for their foremen.

Another splendid way of inspiring and training foremen and officers is through the conventions or meetings of their various associations. While these organizations are largely technical, fortunately a few of them have recognized that the human problem was, after all, one of the most important problems which confronted them and have talked the question over frankly both in their open meetings and among themselves outside of the regular sessions. These conventions and meetings act as clearing houses for the best practices and thoughts and should be encouraged.

It is unfortunate that the Mechanical Division, A. R. A., the parent organization in the mechanical department, has failed to recognize this and has limited its committee investigations and the convention proceedings largely to questions relating to equipment standards. It is to be hoped that the mere fact that there has been little time for the preparation of committee reports during recent months will automatically force the consideration at the 1923 meeting of questions relating to employees' relations, through the presentation of individual papers or reports by men who are specially qualified to consider the various aspects of the personnel question.

Question. In what other way have the managements failed?

Answer. In realizing that autocracy must be replaced by a spirit of democracy.[12]

Question. Hold on a minute, you say. This is no place to preach radicalism, socialism or communism. You had better stop where you are.

Answer. The above statement might have been challenged successfully 10 or 20 years ago, but times have been changing rapidly for the better. No one would accuse the Pennsylvania Railroad[13] of being radical; its position has usually been considered quite conservative. That road has summarized its present policy and practice in its relation with its employees in this sentence: "To give all employees an opportunity to have a voice in the management in all matters affecting their wages, working conditions and welfare; and in other matters of mutual concern affecting the welfare of the company and of the public which the company serves."

Question. Are you going to take things out of the hands of the management? What will become of discipline?

Answer. No. The employees can participate in the above mentioned matters and yet it will be possible to preserve the strictest sort of discipline. It is, of course, necessary to have thoroughly understood just what are the rights and responsibilities of the management and just what are the rights and responsibilities of the employees.

Question. Is this in any way related to the training of men to act in supervisory capacities?

Answer. If the representatives of the employees gather around the table with the representatives of the management to discuss matters relating to wages, working conditions and welfare, both sides will come to understand each other much better. Moreover, the bringing up of grievances and the receiving of constructive suggestions from the men should automatically locate weak spots in the organization and foremen and officers who do not understand how to deal with men properly. Efforts can then be concentrated upon these men to coach and train them to deal with the men in the right way. In most cases an immediate improvement will be noted. In some cases where the men are unfitted for the handling of men they can be transferred to positions which do not require their coming in contact with the men in a supervisory capacity.

Question. This matter of employee representation looks good and the scheme seems logical, but is not something else needed to insure its success?

Answer. Yes. It will fail unless it is dominated by justice and the spirit of a square deal.

Question. You fail to use the expression "Golden Rule," which is so much in vogue. Did you do this intentionally?

Answer. Yes.

Question. Why?

Answer. The term "Golden Rule," rightly interpreted, is far more satisfactory than the expression we have used, but it has been applied so thoughtlessly and carelessly that it is to be feared it has lost its real force and meaning to many of those who use it. Obviously, if we are to solve the human relations problem on the railroads, thus insuring the most efficient and economical transportation and the best service to the public, we must inject a real spirit of brotherhood into

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[8] See "[illegible] Relations Work on the Illinois Central," *Railway Age*, October [illegible], pages 6[illegible]4 and 683.

[9] See "Developing Machinery and Neglecting Men," *Railway Age*, September 16, [illegible], page 4[illegible]5.

[10] See "Getting Better Results From Railroad Organizations," *Railway Age*, February [illegible], page [illegible]; "Benefits Derived From Apprentice Training," *Railway Age*, March [illegible], page [illegible]14; "Training and Developing the Railroad Worker," *Railway Age*, March 18, [illegible], page 71[illegible]; "Management Problems and the Human Element," *Railway Age*, June 1[illegible], 192[illegible], page 13[illegible] and [illegible], page [illegible].

[11] "A Personnel Department For the Railway," *Railway Age*, June 18, [illegible]; "[illegible] of the Human Element in Railroading," *Railway Age*, October [illegible], page [illegible]; "Labor Turnover Not a Disease But [illegible]," *Railway Age*, December [illegible], 1920, page 1157; "The Function of a [illegible] Employment Service," *Railway Age*, February 4, 1921, page [illegible]; "[illegible] Analysis and Job Specification," *Railway Age*, September 3, [illegible]; "[illegible]," *Railway Age*, September 2[illegible], 192[illegible], page 54[illegible].

[12] See "The Human Problems of Modern Industry," *Railway Age*, November 25, 1922, page 977.

[13] See "Employee Representation on the Pennsylvania," *Railway Age*, October 14, 1922, pages 682 and 691 and November 11, 1922, pages 874 and 87[illegible].

the railroad organizations. In other words, the Golden Rule must be applied in its best and strongest sense.

Question. This sounds Utopian and possibly borders a bit too closely on the religious. Why try to put something into the transportation industry that commercial and industrial interests do not recognize?

Answer. Hold up! You are going too fast. Not a few industries and at least one large Chamber of Commerce have come out clearly and forcefully for a more widespread recognition of the Golden Rule in the business world.

Consider the Philadelphia Chamber of Commerce, for instance. That body appointed an industrial relations committee to look into the question of industrial unrest, determine what caused it and suggest a remedy. The committee came to the conclusion that basically it was caused by a too prevalent spirit of greediness and suspicion. The remedy suggested by the committee, enthusiastically endorsed by the Philadelphia Chamber of Commerce, was the recognition of the Golden Rule in its best and highest sense. Attention was directed to the fact that the success of our forefathers in establishing a democracy in this country was due to the fact that they were inspired by a spirit of service and unselfishness and looked to Divine Providence for inspiration and leadership. United States Senator George Wharton Pepper in speaking to the group of 850 business men of Philadelphia, who later adopted what is known as the Golden Rule Pledge, stated that labor and capital could not be reconciled by any of the mechanical methods which trusted in force, but that "we must go back to God." The Golden Rule Pledge which was adopted by the Chamber of Commerce, and which is receiving endorsement by other similar bodies, and is being enthusiastically promoted by Philadelphia business men, follows:

Golden Rule Pledge

"*As Americans*, we recognize that we face a crucial condition in our social, political and industrial life, which, if not corrected, can lead only to individual and national disaster.

"*We Recognize* that the trend of combining interests of individuals and groups will continue.

"*But We Likewise Recognize* that such interests in the creation of their relationships to the many must be controlled by the spirit of equity and reason if they are to endure.

"*Unjust Exploitation* of the many by the few, regardless of its position or field of activity, cannot continue, for self-preservation would force all citizens into hostile groups.

"*The Remedy* of our present malady lies in approaching the interests of others, be they employer or employee, buyer or seller, producer or distributor, individual or group, in a spirit of fairness actuated by the *Golden Rule.*

Facts

"We are all workers.

"The United States is our union.

"Our membership is over 100,000,000 in good standing.

"Our allegiance is first to God and then to that union.

"Our nation is a living expression of belief in our Creator.

"Liberty is our human right by Divine right.

"The Declaration of Independence acknowledges American liberty to be a gift of God: 'All men are endowed by their Creator with certain inalienable rights. * * * * With a firm reliance on the protection of Divine Providence.' —*Declaration of Independence*

"The Declaration of Independence establishes, without discrimination
Independence of person
Independence of property and
Independence of contract.

"The Declaration of Independence is maintained by the Constitution of the United States.

"The Constitution of the United States is administered by representative government.

"Our representative government is controlled by public opinion.

"Public opinion is based on ignorance, illusion, prejudice —or knowledge, truth, judgment.

"The Declaration of Independence—the Constitution of the United States—and representative government will be maintained or destroyed by public opinion! Public opinion is what men think. Our problem is not to change habits, laws or men, but to make facts the basis of thinking.

"*We, as Americans*, recognizing the fundamental nature of the above facts, do hereby declare that we will in all ways urge upon our associates, and those with whom we come in contact, the importance of making *facts the basis of their thinking*, and

"*We Pledge* our loyalty and renew our allegiance to *God* and *Country* to the end 'That this nation under God shall have a new birth of freedom and that the government of the people, by the people and for the people' (*Lincoln*) shall be sustained."

Question. This sounds well, but can it be interpreted in the terms of actual practical application? Does it not border too much on the sentimental?

Answer. Many schemes and methods have been suggested and tried throughout the industrial world for replacing the friction and unrest between the employees and the managements with a spirit of co-operation and teamwork. Some of these plans have proved eminently successful, but only to the degree that they were dominated by a sincere appreciation of the spirit of a square deal, based on the Golden Rule. Looking at the facts frankly, it must be admitted that the most serious problem confronting the railroads today is that of employees' relations. Railroad managements and railroad employees realize that things are not as they should be, and that they cannot continue on the present basis. Both sides are earnestly seeking relief from this impossible situation. Unless the spirit of friction and unrest that exists in many cases can be replaced by a spirit of co-operation and teamwork, the railroads are surely headed toward disaster, which will in the last analysis, affect adversely the interests of the public, the employees and the investors. The old methods of organization and of directing the human element have failed absolutely. The one thing that is left, and the only one which promises any real relief and success, is that which has been suggested in this catechism.

What could the railroads not do in giving better and more adequate service to the public, in improving the living conditions of the employees, and in insuring a fair return to the investors if the organizations could be dominated by the Golden Rule—"Thou shalt love thy neighbor as thyself, and thou shalt do unto others as ye would have them do unto you."

FIVE HUNDRED THOUSAND TONS was the amount of ice transported by the Delaware Lackawanna & Western in 1921, according to an advertisement of the road printed in New York City papers. Most of this ice was taken from lakes in the hills and mountains of New Jersey and Pennsylvania. It is cut with modern machinery, and is so pure that it can be used for storage batteries, druggists' prescriptions and other purposes ordinarily requiring distilled water. About 100,000 tons is shipped to creameries. Ice houses have discarded sawdust and straw packings in favor of insulated walls. Ice cars are carefully washed and pre-cooled and the ice protected from shrinkage by paper linings. The Lackawanna ices refrigerator cars at Buffalo, Elmira, Gouldsboro and Hoboken, and there are separate icing stations for milk cars at Binghamton, Richfield Springs and Chenango Forks.

Who Builds the Highways?*

WHO SHALL PAY for the construction and maintenance of hard-surfaced roads to be ground to powder under the wheels of motor vehicles, of which many of the most destructive compete with the railroads for freight and passenger traffic? The growing use of motor vehicles for commercial purposes and the extension of hard-road systems to cover the entire country make this an important problem. The railroads and their patrons have a great deal at stake in the solution of it.

There were approximately 10,500,000 motor vehicles in this country in 1921, of which more than 1,000,000 were trucks, commercial cars, taxicabs and buses, engaged in the service of transportation. To a large extent, it is true, the service performed by this motorized fleet is supplemental to the transportation service performed by the railroads, but in many instances the two services are competitive. Whether motor vehicle transportation service is supplemental to or competitive with the railroads, however, does not alter the problem.

The railroads pay for the construction, maintenance and improvement of the roadways over which their trains pass, and that cost necessarily becomes a part of the nation's railway transportation bill. In 1921 the maintenance of the tracks, roadbed, buildings, bridges and other structures used by the railroads cost $756,948,985. This was exclusive of interest on the investment and improvements chargeable to capital account. It represents approximately 16.5 per cent of the total operating expenses of the railroads in 1921. A considerable part of the revenues received by the railroads from carrying freight and passengers went to pay that particular cost.

More than 1,000,000 motor vehicles used the public roads for commercial purposes last year. The amount which they paid for that privilege represents only a small fraction of the cost of constructing, maintaining and improving the roadways which they helped to destroy. The total revenues derived from the registration of all motor vehicles and from the issuance of licenses to owners, chauffeurs, manufacturers and dealers amounted to $122,269,071.33, out of which there was available for road work $116,117,167.80, exclusive of taxes on gasoline, which amounted to $5,302,259.79. As compared with this, however, the construction of highways in the United States last year cost $767,421,375. The difference represents the amount which the public had to pay out of funds raised by general taxation. In other words, the users of all motor vehicles paid about 15 per cent of the cost of road-building, and the other 85 per cent was paid by general taxation.

The public at large has as great an interest in transportation by railroad as it has in transportation on the public highways. In fact, the benefits accruing from the use of the railroads are more widespread than the benefits accruing from the use of the highways by the more destructive vehicles—trucks, commercial cars, taxicabs and buses. It is no more equitable that those who do not derive immediate benefit from the destructive use of the highways should pay for them than that the public should be taxed for the cost of building, maintaining and improving the roadways used for rail transportation.

It is important to note in this connection that the railroads pay a not inconsiderable portion of the taxes from which come the funds for 85 per cent of the road work. In 1921 the taxes paid by the Class I railroads of the country in the various states amounted to $237,872,319. This was exclusive of $37,176,773 in federal taxes, $79,042 in District of Columbia taxes, $660,218 in Canadian taxes and $95,244 in taxes not localized to the states.

In order to emphasize the comparison between motor vehicle revenues and highway expenditures, there is shown herewith a table giving the figures by states for 1921.

It is up to railway men to impress upon the public the fact that every burden placed upon the railroads is a burden upon their patrons. The railroads do not have an inexhaustible supply of funds out of which to pay operating expenses, taxes and other charges. A railroad is an institution organized for the giving of a great public service, in the performance of which certain costs are incurred, and these costs are charged back against the public in the form of freight and passenger rates. The shippers and passengers who use the railroads, therefore, pay the railroads' operating expenses, taxes and other charges as truly as if the railroads were not an intermediate involved party in the financial transaction.

When the public gets that view of the situation—and it is the proper view—there will be fewer attempts to unload tax burdens and burdensome operating costs upon the railroads. And when the public comes to realize that the cost of building, maintaining and improving the highways is not being paid by those who put them to a destructive use, a solution will be found for this problem.

	Motor Vehicle Revenues	Highway Expenditures
Alabama	$1,147,265.00	$4,065,000.00
Arizona	195,969.75	8,800,000.00
Arkansas	856,543.60	23,300,000.00
California	6,834,089.52	38,200,000.00
Colorado	906,059.27	8,291,898.00
Connecticut	2,129,861.12	*6,000,000.00
Delaware	375,469.00	3,403,822.00
Florida	734,845.50	5,180,000.00
Georgia	1,705,941.24	25,153,452.00
Idaho	841,212.93	*15,000,000.00
Illinois	6,803,556.21	30,300,000.00
Indiana	2,422,227.00	14,000,000.00
Iowa	7,719,127.47	28,323,920.00
Kansas	†1,200,000.00	23,366,848.00
Kentucky	1,771,887.02	8,500,000.00
Louisiana	453,276.00	12,430,918.00
Maine	1,004,750.25	7,052,419.00
Maryland	2,460,162.04	*8,850,000.00
Massachusetts	4,717,389.30	14,000,000.00
Michigan	6,751,924.51	31,000,000.00
Minnesota	5,672,424.61	25,672,859.00
Mississippi	751,946.63	6,000,000.00
Missouri	2,505,353.90	13,675,000.00
Montana	594,520.50	6,714,409.00
Nebraska	2,824,811.25	11,032,805.00
Nevada	102,800.00	1,710,379.00
New Hampshire	876,322.14	3,423,000.00
New Jersey	3,974,063.75	14,030,000.00
New Mexico	198,632.77	3,238,366.00
New York	‡10,288,858.25	47,126,068.00
North Carolina	2,259,240.43	*8,078,298.00
North Dakota	683,052.45	4,600,000.00
Ohio	6,894,159.73	57,000,000.00
Oklahoma	2,619,713.49	9,800,000.00
Oregon	2,334,931.25	23,000,000.00
Pennsylvania	9,470,174.31	*58,525,232.00
Rhode Island	848,723.59	2,300,000.00
South Carolina	741,114.79	5,600,000.00
South Dakota	720,587.00	12,275,000.00
Tennessee	1,387,870.10	11,000,000.00
Texas	3,806,395.25	51,481,000.00
Utah	441,359.88	6,989,036.00
Vermont	668,288.50	3,200,000.00
Virginia	2,021,146.09	*11,400,000.00
Washington	3,140,730.74	15,900,000.00
West Virginia	1,250,525.82	9,000,000.00
Wisconsin	3,671,645.50	24,750,000.00
Wyoming	288,121.88	4,681,556.00
Totals	$122,269,071.33	$767,421,375.00

†For period July December, inclusive. ‡For period February December, inclusive. *Estimated.

Motor vehicle revenues include the revenues from motor vehicle registrations and from owners', chauffeurs', manufacturers' and dealers' licenses. Figures furnished by Bureau of Public Roads, Department of Agriculture.

Highway expenditures include the amounts spent in various states for highway construction. Figures furnished by Bureau of Public Roads, Department of Agriculture.

* From an editorial in the Illinois Central Magazine for October, 1922.

Marine Borers Attack Piling Along Atlantic Coast

The National Research Council Has Undertaken an Investigation to Determine Methods of Protection

BECAUSE of the large investment which the railways and other industries have made in docks and other structures along the waterfront in the harbors along the Atlantic coast, there is cause for concern in the evidence now being brought to light regarding the appearance of marine borers in these waters. Only three years ago the collapse of a

Condition of Test Blocks. (1) From Ft. Sumpter, S. C., Installed on September 6, 1922, and Removed on October 2, 1922. (2) From Ft. Sumpter, S. C., Installed on September 6, 1922, and Removed on October 23, 1922. (3) From Ft. Scriven, Ga., Installed on September 15, 1922, and Removed November 1, 1922.

number of structures in San Francisco Bay brought the ravages of these borers prominently before the owners of waterfront property in this country. As a result of the great damage done in the upper waters of San Francisco Bay, previously immune from marine borers, a committee was organized by local interests to study the problem. This committee soon found that it was necessary to enlarge the scope of the work so as to cover the entire country, and at its suggestion the National Research Council organized a committee to carry on a nation-wide study.

An investigation of the existing literature showed that while much study had been given borers for the past three hundred years, these studies had been disconnected and while much information had been developed, no conclusion had been reached. It was evident that a co-ordinated biological, engineering and chemical investigation offered the best chance for success.

There was found to be little information as to the distribution of the various species of borers and their living requirements. It was, therefore, necessary to find out where these various species existed, under what conditions they lived and what conditions in the water governed their distribution and activities. The damage in San Francisco

Section of an Untreated Pile from Lehigh Valley Pier at Jersey City after Ten Year's Service Indicating Recent Attack. Living Organisms Were Extracted from This Pile in September, 1922

(Left) Condition of Untreated Pile Attacked by Bankia after One Year's Service in Harbor at Norfolk, Va.
(Center) Untreated Piling Attacked by Martesia
(Right) Condition of Untreated Pile Attacked by Bankia after Six Month's Service in Harbor at Norfolk, Va.

was done by the teredo navalis, the pile-worm of Holland. No thoroughly authenticated records could be found which indicated its previous occurrence on the American coasts. It was first identified on the East coast in Barnegat Bay, New Jersey, in 1921.

In order to secure definite information regarding the distribution of the various species and their rate of growth, a test board was designed carrying 24 blocks, one of which is to be removed from each board on the first and sixteenth days of the month and sent to Harvard University or the University of California for biological study, determination of species and rate of growth of the different species. These test boards are expected to determine the presence and species of marine borers in any locality and also the time of the year in which they work and breed. The blocks are 2 in. by 4 in. by 5 in. in size, of wide ring sappy yellow pine,

surfaced on four sides. Each block is identified by a copper tag. The board with its 24 blocks is sunk from the end of a wharf or pier to an elevation about a foot above the mud line and fastened securely in place.

Condition of a Pile Removed from the Standard Oil Company's Pier at Bayonne, N. J., in November, 1922, After Seven Year's Service

With the co-operation of the railroads, the Coast Guard, the Navy, the Army, the Bureau of Lighthouses and various state and municipal bodies and industries owning waterfront structures, 235 of these boards have been put in place between the Eastern boundary of Maine and Kodiak, Alaska, as well as in harbors of the American possessions in the Caribbean Sea and on the Pacific Islands. The first boards were placed in June, 1922, and the number has been increased until the total mentioned above are now in place.

As a result of the inspection of the blocks taken from these boards, teredo navalis has been found in practically all harbors from Provincetown, Mass., south to Delaware Bay, and in several other harbors in the South Atlantic and Gulf. Because this species appears to thrive in water of low salinity and with a high degree of pollution, and since it also has a very high rate of reproduction, it may be considered as probably the most destructive species of borer. The greatest activity has been found in Providence, R. I., where blocks on one of the test boards were practically destroyed in three and one-half months.

Bankia gouldi (xylotria) have been found from Delaware Bay south through the Gulf and on the Pacific Coast. This species grows at probably twice the rate of teredo navalis, but it does not reproduce as rapidly—probably about 1,500,000 young per year as against 2,500,000 for teredo navalis, and so far as known it does not seem to have the resistance to low salinity and pollution that teredo navalis possesses. One of the boards carrying the test blocks in Galveston Bay was totally destroyed in two months by bankia.

A number of new or little known species of molluskan borers have also been identified; some of them apparently not being affected by creosote. The economic importance of these species will be established by further study of the test blocks.

Limnoria have been identified in harbors practically all the way from Maine to Alaska. Their rate of destruction is extremely variable. It seems to be high in some locations in New England and in some Gulf and Pacific harbors.

The biological studies have shown some interesting and

Map Showing Location of Test Boards, Laboratories and Experiment and Salinity Stations

perhaps significant indications in the effect of the proximity of copper and iron to the borers and tests are now being carried on at Providence, R. I., Charleston, S. C., and Galveston, Texas, to determine whether a system of protection for both old and new structures cannot be developed by the use of these metals in strips or wire. The laboratory studies of teredo navalis carried on by the University of California have given some extremely valuable information regarding this most destructive species.

In co-operation with the University of California and the Forest Products Laboratory, test blocks impregnated with various chemicals and various fractions of creosote are being tested by immersion in Gulf and Pacific harbors. Tests are also being made of several tropical woods which are reported to resist borers. Some of these timbers have European and Asiatic records showing a high resistance. As a portion of the report of the Wood Preservation committee of the American Railway Engineering Association to be submitted in March, 1923, a comprehensive study has been made of the literature on the subject of service records of various methods of protection. This report, when published, will give considerable information as to methods which have not been successful, as well as others which have given good results over considerable periods.

Reinforced concrete as a substitute for timber is becoming more and more used. Unfortunately, its record is not one of universal success. In fact, the committee has found very many more cases of failure than of success, and in most cases the causes of failure are very obscure. Studies are being carried on to endeavor to determine these causes and to produce a specification which will result in a construction which can be depended on to give long life, if such a thing be possible with this material.

As the investigation goes on, the interest of the various co-operation agencies has been increasing, as several ideas giving some promise of satisfactory results have developed from the study. The next season's work should be even more productive than the last, as the preliminary work is largely completed and the lines of investigation to be followed by the biologists and chemists are becoming much clearer.

This investigation is being conducted by the Committee on Marine Piling Investigations of the National Research Council, New York City, of which William G. Atwood is director.

Road Test of Clifford Automatic Train Control

Apparatus of the "Conductive" Type Having Continuous Control Feature Tried Out On the Erie

A DEMONSTRATION and test of an automatic train control device which has been developed by the Clifford Automatic Train Control and Signal Corporation was made on the Erie before the New York Central Lines Signal Committee, Train Control branch, other interested railroad men and guests on November 28. A Pacific type passenger locomotive was equipped with the control apparatus while other apparatus was used in the car to demonstrate its operation. The tests were made on the eastbound main track between Port Jervis, N. Y., and Graham, four block sections being equipped with the train control circuits.

The train control apparatus developed by this company is what is known as the "conductive" system. It gives an indication at any point in the block corresponding to any change which takes place in the track conditions ahead. No roadside apparatus is employed, as a superimposed circuit is used in connection with the track circuit and the drop in voltage between the front axle of the engine and the rear axle of the tender in train control territory is utilized as the primary impulse to actuate the apparatus. Through the primary impulse, which actuates specially designed three-position polarized relays, other relays, of the telephone type, are controlled; which in turn govern a solenoid magnet which actuates the air apparatus and also the cab signal. The cab signal is auxiliary to the system itself and can be used or not as desired. This signal consists of white, red, yellow and green lights, from which four indications are obtained. Time element relays of the inverse time element overload type are used in connection with the delayed application effect. The entire electrical equipment, with the exception of the eight-volt storage battery, will be contained in a box 5 in. by 8 in. by 12 in. mounted in a convenient location on the engine.

The circuits used in the test were d. c. polarized circuits of the double rail type. The imposed circuits are carried to the rails over two No. 6 B. & S. gage copper wires and equalized by keeping the voltage in the two rails balanced with the line. The imposed voltage is approximately 18 volts per circuit. In order to get the advance indication the polarity is reversed on the imposed circuit. Current is required in each block section to permit the train to proceed and in this manner the apparatus is made self checking. The circuits which can be used are the double rail imposed circuit, the single rail imposed circuit or the diagonal wired double rail imposed circuit. These have been designed to meet varying conditions and their application is not confined to d. c. steam road operation. An eight-volt storage battery is used to operate the air valve and cab signal lights on the locomotive.

The engine air equipment consists of an eliminating valve cut in the main reservoir lead between the engineman's automatic brake valve and the pipe leading to the main reservoir. The function of this valve is to prevent the engineman from releasing his brakes after an application is made, but it does not prevent him making a greater application if desirable. In addition to the eliminating valve there is an electro-pneumatic or solenoid valve controlled through the track circuit; and also the actuating valve, which sets in motion the automatic brake control valve, which in turn controls the eliminating valve which makes the proper brake pipe reduction. After the proper brake pipe reduction has been made, the actuating valve returns automatically to its normal position. After the stop is made, there is a releasing valve which, when opened, actuates a piston in the eliminating valve which again opens up the lead from the main reservoir to the engineman's automatic brake valve.

Under normal conditions the solenoid valve is always energized. When it is de-energized the solenoid opens an air valve which allows equalizing air to flow against a piston in a graduated air valve which produces an application of the brakes in proportion to the speed of the train and at the same time cuts off the main reservoir supply to the standard E. T. or L. T. brake equipment so that the engineman cannot release his brakes until the train is brought to a stop; but he can make a heavier application if he wishes. As stated above, after the solenoid valve produces the necessary stop application it closes automatically and returns to normal, leaving the standard brake equipment lapped and the

automatic features of the train control device ready for a further application.

The tests made consisted of running the engine in automatic block signal territory not wired up with the train control circuits to show that the engine equipment was not sensitive to the ordinary track circuit; engine running in train control territory with the blocks clear; a shunt put on the track two blocks in advance, showing that the engine would receive an advance caution indication (white and green light) two blocks back, and a caution (yellow light) followed by a stop indication (red light) with an automatic brake application in the next block; a test of the air apparatus to show that the engineman could not prevent the stop but could make a greater application of the air, and a test showing how the device operated when attempting to follow a train too closely.

When the engine entered train control territory, not occupied, the green light showed. A shunt was then put on the track two blocks ahead and the white and green lights showed, these automatic functions taking place irrespective of the train's position in the block. When the train ran into a red block at a speed of 45 m. p. h. or under, the yellow light showed up for about 20 seconds (delayed application), after which the yellow light went out, the red light came on and the train was stopped automatically. If the train operates at a speed over 45 m. p. h. there is no delayed application, but the red light appears immediately and the stop takes place.

The next test was made with the train moving at approximately 25 m. p. h. by putting a shunt on in the block in which the train was running. A delayed stop application was made. With the shunt still on, the engineman released himself after coming to a full stop and then proceeded. The shunt was then taken off with the train in the block and the apparatus cleared up automatically, the green light showing.

The train next went on a siding to allow another train to pass, and after it had cleared the block the train backed out of the siding, the apparatus automatically indicating a clear block by the green light showing.

The next test consisted in opening the track wiring on one of the superimposed circuits to show that the apparatus would still function through the remaining circuit on the one rail. When the train ran from automatic train control territory into non-automatic train control territory an automatic stop was made with the apparatus as it was installed for test purposes. After the engineman released himself he could then proceed without receiving additional stops.

In order to test the effect of foreign current keeping a track relay energized with a train in the circuit, a shunt was put on a block in advance of the train and the track relay was maintained in its normal position corresponding to no train in the block. When the train ran into this section it was automatically stopped in braking distance. This test produced the same effect as if the train had run from automatic train control territory into non-automatic train control territory.

Another test made was to have the test train attempt to close up the gap between itself and a train ahead. In this test the proper indications were received, corresponding to the positions of the trains in the respective blocks, but when the test train ran into the block occupied by the train ahead, the test train was automatically stopped.

As the speed control apparatus was not installed no speed control tests were made, those conducted being in connection with the automatic stop feature only.

Freight Car Loading

WASHINGTON, D. C.

ALTHOUGH the number of cars loaded with revenue freight is showing the usual seasonal drop the reduction continues to be less abrupt than it has been at this season in recent years. For the week ended November 25 the total was 955,495, which was over 13,000 cars less than the loading for the previous week but was 282,030 more than the loading for the corresponding week of last year and 151,794 more than that for the corresponding week of 1920. This was partly due, however, to the fact that the Thanksgiving day holiday last year and the year before came earlier in the month than this year, which destroys the value of comparisons with the figures for the corresponding calendar dates. Grain and grain products loading continued heavy, with a total of 54,790 cars, or slightly less than the week before. Coal loading showed a decrease of about 3,000 but there were increases in the loading of coke, forest products and miscellaneous freight. Ore loading, 15,052 cars, was only about half of that for the previous week.

The freight car shortage was further reduced during the period from November 15 to 23 to 152,565 cars. This was a decrease of 5,671 in approximately a week. The shortage included 79,037 box cars and 43,683 coal cars. At the same time 5,306 surplus cars were reported.

REVENUE FREIGHT LOADED

SUMMARY ALL DISTRICTS. COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, NOVEMBER 25, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year	Corresponding year 1921	Corresponding year 1920
Eastern	1922	10,614	4,171	64,790	2,710	5,937	2,358	64,051	89,392	244,023	.....	.....
	1921	8,103	2,819	39,521	1,647	4,194	1,203	56,289	58,785	.....	172,561	185,290
Allegheny	1922	3,848	3,838	57,782	6,465	3,642	4,980	47,282	76,119	203,965	.....	.....
	1921	2,079	2,784	41,075	3,128	2,636	1,989	42,638	45,872	.....	142,201	173,179
Pocahontas	1922	272	123	17,947	578	1,693	128	5,893	3,439	30,073	.....	.....
	1921	192	100	15,677	147	1,176	.....	4,974	2,787	.....	25,053	31,622
Southern	1922	3,853	2,444	24,450	1,200	22,943	1,215	38,480	44,943	139,528	.....	.....
	1921	2,818	1,636	16,436	461	15,950	471	34,203	32,327	.....	103,305	121,190
Northwestern	1922	17,394	11,189	10,086	1,756	15,812	3,636	26,509	36,363	122,745	.....	.....
	1921	9,593	6,915	7,931	722	8,609	713	23,350	22,313	.....	80,046	107,234
Central Western	1922	13,508	15,033	21,683	393	7,919	2,13	30,949	53,668	145,285	.....	.....
	1921	8,964	9,209	14,299	121	4,730	704	26,543	31,083	.....	95,653	120,789
Southwestern	1922	5,301	3,419	5,294	132	8,160	594	15,607	31,429	69,876	.....	.....
	1921	3,410	308	3,078	130	6,496	638	13,927	24,659	.....	54,646	64,397
Total Western Districts	1922	36,203	29,641	37,063	2,281	31,831	6,362	73,065	121,460	337,906	.....	.....
	1921	21,967	18,432	25,308	973	19,835	2,055	63,720	78,055	.....	230,345	292,420
Total, all roads	1922	54,790	40,217	202,032	13,234	66,046	15,052	228,771	335,353	955,495	.....	.....
	1921	35,159	25,771	138,020	6,356	43,791	5,718	200,824	217,826	.....	673,465	.....
	1920	33,30	29,987	208,966	14,445	48,014	31,964	172,517	259,500	.....	.....	803,701
Increase compared	1922	19,631	14,446	64,012	6,878	22,255	9,334	27,947	117,527	282,030	.....	.....
Decrease compared	1921	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1920	1,482	10,230	.....	.....	18,032	.....	61,251	75,853	151,794	.....	.....
Decrease compared	1910	.....	.....	6,934	1,211	.....	16,912	.....	.....	.....	.....	.....
November 25	1922	54,790	40,217	202,03	13,234	66,046	15,052	228,771	335,353	955,495	673,465	803,701
November 18	1922	55,761	40,735	205,034	12,431	61,403	32,780	228,932	332,595	969,094	790,363	889,138
November 11	1922	52,501	38,001	188,312	12,273	60,392	39,383	228,050	331,997	953,909	755,777	927,586
November 4	1922	51,912	39,731	194,077	11,641	60,013	47,046	234,737	355,670	994,827	837,576	915,615
October 28	1922	51,913	42,644	197,928	11,388	60,584	48,005	233,680	368,338	1,014,480	951,384	981,242

Southern Pacific—Central Pacific Hearing

Most Pacific Coast Witnesses Want Unified Operation Retained—Middle West for Separation

Washington, D. C.

THE HEARING before Commissioner Meyer and Potter of the Interstate Commerce Commission on the application of the Southern Pacific for permission to retain control of the Central Pacific has been continued during the past week, testimony being presented by representatives of the various commercial organizations and state commissions that have intervened in the case either in support of or in opposition to the application. In a general way most of the representatives of California and other Pacific coast communities have strongly urged the retention of the present unified operation of the Southern Pacific-Central Pacific lines, or at least that there should be no separation until the commission has completed its final consolidation plan and has definitely allocated the Central Pacific, while representatives of the inter-mountain and middle western communities served by the Union Pacific have been more inclined to favor the separation of the Central Pacific from the Southern Pacific and its operation either independently or by the Union Pacific. Members of the California Shippers' Committee Against Dismemberment of the Southern Pacific-Central Pacific System have shown more interest in the network of lines in California and indicated the belief that their interests would be better served by maintaining a strong railway system with headquarters in California than by building up competition against it and they have also insisted that rates would be increased and service impaired if the present system and its methods of operation were disrupted.

Those supporting the Union Pacific contention that the Supreme Court's decree ordering a dissolution under the Sherman law should be carried out have shown more interest in the line from Sacramento to Ogden and have taken the position that the Southern Pacific discriminates against the Ogden route because of its greater interest in the longer haul over Southern Pacific rails via the El Paso gateway and that if the Central Pacific were operated independently or by the Union Pacific it would display more interest in developing the territory served by the Ogden line and the Union Pacific. The witnesses have been cross-examined by counsel for the Union Pacific and the Southern Pacific and there has been much discussion of the extensive propaganda conducted by both roads and by the organizations that have lined up with them and numerous questions as to who paid for advertising and publicity matter or what promises on the part of the roads influenced the attitude of the shippers.

Labor Intervenes for S. P.

In addition to the shippers, bankers and public officials who have testified, general chairmen of the train service organizations on the Southern Pacific, reinforced by Grand Chief Warren S. Stone of the Brotherhood of Locomotive Engineers, appeared and protested vigorously against a separation of the Central Pacific from the Southern Pacific, on the ground that it would cause relocation of terminals and the creation of new divisions, thereby uprooting the employees from their homes, causing chaotic conditions affecting their seniority rights and reducing the continuity of employment by dividing the work in California between two railroads.

C. E. Childs of the Omaha Chamber of Commerce testified on November 28 and opposed the Southern Pacific petition, urging the development of the Central Pacific and Union Pacific as a through transcontinental line. He was followed by a number of representatives of the California committee against dismemberment, who supported the Southern Pacific application, including H. H. Sanborn, traffic expert for the committee; Alden Anderson, representing the California Fruit Distributors; James A. Keller, of the Pacific Portland Cement Company; H. H. Van Horn of the California Packing Corporation; Frank Clifford of the Sperry Flour Company; Dallas H. Gray, of the Shippers' Committee for the South San Joaquin Valley; G. J. Bradley, of the Merchants' and Manufacturers' Association of Sacramento; Seth Mann, of the San Francisco Chamber of Commerce; Frank M. Hill, of the Fresno Traffic Association; F. P. Gregson, of the Associated Jobbers of Los Angeles; R. L. Vance, of the California Portland Cement Company; C. L. Bailey, representing warehouse owners; H. E. Woolner, of the Great Western Milling Company; Charles R. Thorburn of the Watsonville Chamber of Commerce, and C. L. Crumrine of the La Habra Shippers' Association. E. O. Edgerton, director of the shippers' committee, filed with the commission 1,000 copies of resolutions adopted by commercial and civic bodies of the Pacific coast territory, which, he said, urged the commission to allow the Southern Pacific to continue to operate the Central Pacific as one system.

See Increased Rates

Many of these witnesses said that a separation of the two roads would substitute two or three line hauls for one line hauls with a consequent increase in rates which, in many instances, they said, would be sufficient to interfere with the movement. Mr. Mann said that while the San Francisco Chamber of Commerce in 1913 had assented to the proposal that the Central Pacific be sold to the Union Pacific, it was influenced at that time by the fact that the government had announced its intention of bringing suit for a separation of the Central Pacific from the Southern Pacific and he also said that conditions had changed since that time. The Panama Canal lines have taken a large part of the transcontinental traffic, the Union Pacific has acquired complete ownership of a line into Los Angeles and there has been a complete change in the country's transportation policy as expressed in the Transportation Act.

The representatives of the employees spoke in a very complimentary way of their relations with the Southern Pacific management and expressed some doubt as to whether their relations would be so satisfactory with another railroad. For example, they said another company might not maintain a pension system. They also said that the Southern Pacific's interest in California was so diversified that it is enabled to employ a large number of trainmen on its southern lines at one time of the year and its northern lines at another time, thereby giving continuous employment which they might not have if the service and the employees were divided among different companies. They testified as to the large number of men that own their own homes and said that some of them were afraid they would have to leave the salubrious climate of California. Also, it was stated that the men who stand high on the seniority list on the Southern Pacific would be placed much lower on the list if transferred to the service of another railroad and perhaps might not be able to obtain employment because of their age.

On December 2 a number of witnesses took the stand in support of the Union Pacific's contention in this case that the Central Pacific should be separated from the Southern Pacific. The first of these was Frank Francis, mayor of Ogden, who said that the Southern Pacific showed only a passive interest in the Central Pacific line to Ogden and treated it as a bridge for through traffic, while reserving its

progressive upbuilding and development work for the territory from which it would receive a longer haul. James Brennan of Ogden, banker and live stock man, also gave similar testimony. A. M. Holloway of Salina, Kan., testified that under present conditions shippers in the middle west are not able to use the Ogden route to the fullest advantage. H. H. Corey, member of the Public Service Commission of Oregon, told of that commission's recent petition to the Interstate Commerce Commission for an order requiring one or more of the railroads of the state to build additional lines through eastern, central and western Oregon and said that the commission is interested in a disposition of this case which will bring Oregon more railroads and more competition. It would oppose, he said, any lease of the Central Pacific to the Southern Pacific which would preclude any joint use of that company's lines in connection with the proposed Natron cut-off. On cross-examination by F. H. Wood, counsel for the Southern Pacific, he said that that question is the particular concern of the Oregon commission and that it would not object to a temporary arrangement which would cause only a reasonable delay in the construction of that line.

The I. C. C.'s Jurisdiction

This led Commissioner Potter to question Mr. Wood as to whether the Southern Pacific's petition contemplates only temporary relief and as to what will be the situation if the commission should decide that it has power only to deal with the permanent situation. Mr. Wood said the company's desire is to present to the commission primarily the situation for the immediate future, because it desires to avoid disruption of its system which might become unnecessary if the Central Pacific were finally allocated to the Southern Pacific in the consolidation plan, but that it asked relief to the extent which the commission shall decide is in the public interest. It has no desire to limit its application to temporary relief, but intended to leave it to the commission to determine the extent of the relief that could be allowed.

A number of witnesses also appeared from Salt Lake City who differed from the position which had been previously taken by witnesses who had appeared on behalf of the governor of the state and the Salt Lake Commercial Club. They said that the people of Northern Utah in general were in favor of an independent Central Pacific that would be interested in developing the territory which it traversed. One of the witnesses told the commission that it would have great difficulty in ascertaining the real sentiment of the shippers and of the public because so many who had taken sides in the case had been influenced by propaganda without making a first-hand investigation of the facts. It was admitted that the Oregon Short Line had paid for some of the full page advertisements which had appeared in Utah papers in the name of the committee of shippers.

Admits Association Financed by U. P.

A strong opposition to the Southern Pacific's application was expressed on behalf of the California Producers' and Shippers' Association. E. F. Treadwell made an opening statement for this association in which he undertook to reply to a statement made by Mr. Wood at the opening of the hearing that this association was "merely an alias" for the Union Pacific. He said that after the Southern Pacific had undertaken a publicity campaign, the Union Pacific had undertaken a counter campaign by getting the support of a large number of producers and shippers throughout the state and that an organization had been formed which consisted of 8,000 members, who, he said, are deeply interested in seeing the spirit of the court decision carried out. He said the association is not pledged to support any ambition of the Union Pacific to acquire the Central Pacific, but is willing that its disposition be controlled by natural laws and by the commission under the laws of the United States. Charles Teague and Van Bernard appeared as witnesses on behalf of the association, among others, asserting that there is a large territory in the Sacramento and San Joaquin valleys that is inadequately served by the railroads, that the farmers have suffered enormous losses by reason of car shortage and that the territory would not be adequately developed without the competition of additional lines. On cross-examination by Mr. Wood, Mr. Bernard, who appeared as a farmer and as chairman of the executive committee of the California Producers' and Shippers' Association, admitted that the organization had been financed by the Union Pacific and that he was being paid by the Union Pacific. Under questioning by Mr. Wood, he testified that the present organization was formed on July 21, although he and a few others had been doing organization work before that and that he had appointed an executive committee consisting first of a farmer, who afterward resigned, two real estate men and an insurance man. Meetings were held and members secured by distributing postal cards, which, he said, had been signed by 3,720 up to the time he left California and additional names since had brought the total membership up to 7,837.

When Mr. Wood questioned him regarding publicity material in opposition to the Southern Pacific's efforts to retain control of the Central Pacific, which had been given out as coming from the "Washington headquarters of the shippers and producers of the Pacific coast," and later from the "Washington headquarters of the California Shippers' and Producers' Association," the same office address being given in both cases, he said he knew nothing of such publicity work prior to the date of this hearing, that the office named was not the headquarters of the association but the office of the publicity bureau which he knew had been giving out publicity during the hearing, and that neither he nor any one representing the association that he knew of had authorized or paid for the publicity. One of these statements purported to be an interview with Secretary McGinty of the Interstate Commerce Commission regarding the effect of the Supreme Court's decision on the commission's consolidation plan, which was dated June 23, 1922, prior to the date of the organization of the association. Mr. Bernard also denied knowledge of a statement handed him by Mr. Wood, in which Wallace Alexander of San Francisco had challenged the association to state who it represented, or a statement issued from the Washington publicity bureau on July 22 announcing the formation of the committee in Sacramento the day before. He said he had been in the office of the Washington publicity bureau but once, when he presented a letter from a publicity man in Sacramento who had been working with his association. When asked who paid the publicity men, he replied: "I don't mind telling you that so far as I know, the Union Pacific is paying the bills. We have made no secret of it."

Other witnesses for the association were Victor R. Larsen, of Lodi; H. S. Maddox, of Sacramento; H. H. Dunning, of Marysville; and John A. Livingston of Auburn, Calif.

Chicago for Separation

J. P. Haynes, appearing on behalf of the Chicago Association of Commerce, and the Chicago Shippers' Conference Association, urged that the Central Pacific be disassociated from the Southern Pacific control in order that the transcontinental route from the central west to San Francisco and northern California may be managed by those who are interested in developing new traffic for that route rather than by an organization whose primary interests, he said, are in the development of traffic from the Atlantic seaboard in preference to movement from the central west.

W. B. Biddle, former president of the St. Louis-San Francisco, speaking for canning interests of Oregon, said

that the interests of Oregon and the Pacific coast would be promoted by the increased competition which would result from a separation of the Central Pacific from the Southern Pacific and F. G. Donaldson, speaking for lumber interests of the Willamette Valley, said that the development of that territory was largely dependent upon increased competition.

Throughout the hearing there have been more publicity agents than newspaper men in attendance most of the time, and the newspaper men who have been sending out stories on it have had the assistance of three sources, as well as three distinct types, of publicity material. The Southern Pacific's representatives have given out copies of the prepared statements of Southern Pacific witnesses and occasionally some extracts from the stenographic report of the hearing. Representatives of the shippers' committee against dismemberment have given out enthusiastically-written stories regarding the testimony of their witnesses and twice daily stories have been given out in the name of the California Producers' and Shippers' Association regarding the testimony of the witnesses who were opposed to the Southern Pacific application, and frequently giving adverse editorial comment on the testimony favorable to the Southern Pacific.

Annual Report of Interstate Commerce Commission

Regulator of Railroads Finds a Revenue Problem of Its Own In Reduced Appropriations

WASHINGTON, D. C.

THE Interstate Commerce Commission has made its annual report to Congress for the year ended October 31, 1922. For the reasons stated elsewhere in the report and in former reports, the commission makes the following recommendations:

Summary of Recommendations

1. That section 1 of the interstate commerce act be amended to provide for the punishment of any person offering or giving to an employee of a carrier any money or thing of value with intent to influence his action or decision with respect to car service, and to provide also for the punishment of the guilty employee.

2. To provide for increases in the number and salaries of locomotive inspectors and the increase in the number of inspectors under the safety appliance acts provided for by the first deficiency act, approved September 22, 1922, be made permanent.

3. That subject to appropriate exceptions the use of steel cars in passenger-train service be required, and that the use in passenger trains of wooden cars between or in front of steel cars be prohibited.

4. That the hours of service act of March 4, 1907, be so amended as to require all service of employees subject to the act to be construed as continuous service, except that if an employee is given a release from duty for a definite period of not less than three hours, and under such circumstances that the employee has proper facilities and opportunities for securing rest during such relief period, such relief period can be used to break the continuity of the service and the service ceases to be continuous and becomes aggregate service.

5. That to complete some and undertake other of the important duties and to keep the general work current, we recommend appropriations sufficient to meet our absolutely necessary requirements. * * *

6. That section 20a of the interstate commerce act be amended to cover electric railway companies engaged in the general transportation of freight.

7. That paragraphs 4 to 8, inclusive, of section 5 of the interstate commerce act be made to clearly provide whether and, if so, how voluntary consolidations may be effected pending ultimate adoption by us of a complete plan of consolidation.

8. That section 25 of the interstate commerce act be amended by making it unnecessary for common carriers by water in foreign commerce to file, and for us to publish, the information referred to in paragraph 1 of the section.

9. That section 19 of the merchant marine act, 1920, be amended so that its provisions will clearly not be applicable to the Interstate Commerce Commission, and that section 28 of this act be reconsidered by the Congress in the light of the circumstances set forth in our 35th annual report

Appropriations Curtailed

The first part of the report is devoted to a discussion of the commission's experiences with government regulation of its own revenues by the Bureau of the Budget; an argument that the commission must have adequate appropriations to do its work properly. For the fiscal year ending June 30, 1923, the commission submitted to the Bureau of the Budget an estimate that $5,649,500 would be required. The bureau after an extended investigation, suggested that because of the financial condition of the Treasury, certain additional activities delegated to the commission by the Transportation Act of 1920 be further held in abeyance and that the commission endeavor to perform its duties within amounts less than the estimates. Therefore, the estimates for this year were cut by the bureau to $5,344,907. This included a reduction of $130,000 in the appropriation for valuation work, from $1,630,000 to $1,500,000. These amounts were approved by the President and submitted to Congress, but were further reduced by Congress to $4,879,500, the amount for valuation being reduced to $1,300,000. The commission recently submitted a deficiency estimate for the fiscal year including $100,000 for general purposes, $73,500 for safety, $201,917 for locomotive inspection, in response to which Congress appropriated $100,000 for general purposes and $66,150 for the work of the Safety Bureau, but failed to provide the amount requested for locomotive inspection. As a result, the commission's appropriations for the current fiscal year are $5,045,650, impairing its ability to complete some and undertake other important duties laid upon it by law. This has resulted in curtailment of activities in several bureaus, notably those of accounts, service, safety, locomotive inspection and valuation. "The same is true," the report says, "as to the studies of economy and efficiency in operation which seem to have been contemplated by the Congress as necessary incidents to some of the duties expressly imposed by recent legislation."

In compliance with the direction of the budget bureau, the commission submitted prior to August 1 an advance report of its estimates for the fiscal year 1924 amounting to $5,204,500, which included $1,280,000 for valuation. The director of the bureau later advised that the President had approved the allocation to the commission of $4,494,500 as a tentative maximum and that, therefore, the estimates should not exceed this amount; but if, in the opinion of the commission, the reduced amount would not meet its absolutely necessary requirements, the estimates might be accompanied by a supplemental statement. This amount, the commission points out, is $710,000 less than its total estimate for the ensuing year and $551,150 less than the current total appropriation. The report then says:

"We have given careful consideration to our work * * *. Reducing the appropriation for valuation more rapidly than we had planned may practically defer recovery of excess earnings under section 15a of the interstate commerce act. Reduction in the current appropriation for our bureau of accounts will retard the policing of carriers' accounts as contemplated by section 20, the revision of the accounting classifications, and the prescribing of classes of property for

which depreciation charges may properly be included under operating expenses. If we are to function promptly and efficiently, more funds must be supplied to care for the disposition of pending fourth section applications. Investigation and suspension cases are increasing and necessarily cause delay in the disposition of other cases. Under paragraph 3 of section 6 of the act we are authorized to make suitable rules and regulations for the simplification of tariffs, but thus far we have been able to only approach this important subject." (The recommendation of the budget bureau submitted to Congress on December 4 provides $4,514,500 for the Interstate Commerce Commission.)

Car Service

In a review of the commission's exercise of its emergency powers relating to car service during the past year, the report points out that the accumulations of freight did not cause congestion at the large terminals as was the case in 1920. Loaded cars accumulated at intermediate terminals or were set out at sidings along the line. The effect of the shop strike caused deterioration of motive power. On certain important trunk lines, the report says, the condition of motive power was most serious and on some lines the number of locomotives retired for repairs was over 60 per cent of the total owned and this condition forced a diversion of freight to lines better able to handle it. Statistics are given showing the accumulated carloads which carriers were unable to move promptly. The number increased from 56,868 in the second week of July to 80,320 in the third week of September, but was then greatly reduced until for the fourth week of October it was down to 52,973. The commission reviews the shortage of freight cars (179,239 on October 31) and says that a considerable net surplus, perhaps 100,000 cars, is necessary to the prompt filling of orders and to avoid waste in transportation. This shortage is attributed to the lack of efficient transportation service, particularly in the south, during the early part of the shopmen's strike, and the inability of the carriers to move cars promptly on account of strike difficulties following the resumption of heavy coal shipments and seasonal crop movements in the north and west. Emergency orders were issued for lake coal, but dealers and consumers in regions remote from their sources of supply are urged to make contracts for a supply in season for early transportation. "They can hardly expect to rely upon our regulatory power continually to relieve them from the consequences of their own inertia." Acting under the coal anti-profiteering act, the commission has ordered priority in transportation and distribution in 14 instances covering 879 cars, but has not found it necessary to lay embargoes.

Freight Rates

A review is given of the case in which the commission made a general reduction in freight rates on July 1 and in this connection the commission says:

"The net railway operating income for the year 1921 was $614,810,531, clearly an inadequate income. * * * The tonnage moved by the railroads has been steadily increasing in recent months until the traffic is almost equal to the largest ever handled. Manifestly the existing rates are no longer interfering with the free flow of commerce as a whole, whatever may have been the situation prior to the reductions of July, 1922. Little opportunity has been afforded for determination of the effect of the reduced rate level upon net earnings because of freight congestion * * *."

Locomotive Inspection

The work of the Bureau of Locomotive Inspection, the report says, has been restricted, the expenditures being kept within the appropriation of $290,000 only by curtailing the activities of the inspecting force to the detriment of the service. There are only 50 inspectors for approximately 70,000 locomotives housed or repaired at 4,600 places.

Automatic Train Control

After outlining the orders issued for the installation of automatic train control devices, the report says the need for such devices has been further emphasized since January 1, by its investigation of six serious train accidents resulting from non-obedience to automatic block signals which resulted in the death of 50 persons and injury to 488 others.

Studies in Efficiency and Economy

Calling attention to the fact that the law requires that in adjusting rates it shall have in mind "honest, efficient and economical management," the commission says:

"To go into the question of efficiency of management in a thoroughly effective way would necessitate an organization of experts especially qualified to investigate the numerous and complex phases of railroad management, such as shop methods, locomotive performance, road and terminal operation, maintenance of way and structures, purchasing, and many others. This would involve a large additional appropriation and would in some degree duplicate the work of the technical staff of the railroads. We have not been convinced that we are called upon to engage in the study of operating efficiency upon this elaborate plan. We have undertaken, however, to emphasize to a greater degree than heretofore the systematic comparison of operating results through statistical reports. We have also given attention to plans for improving the efficiency of the national transportation system by a more effective co-ordination of the various transportation agencies.

"The subject of terminal expense is one of growing importance because of the complexity of terminal operation incident to commercial and industrial activity concentrated in large and growing cities. Delays in transportation are traceable in the main to terminal handling, not to the line haul, and terminal expenses seem out of proportion to line-haul costs. Intensive study of terminal problems, long important, has become of first importance to the communities served, the shipping public, and the carriers. Methods of handling less than carload shipments must be developed which will materially reduce the present cost and delay. The need is no less in respect of carload shipments and the release and return of cars. Discussion of such methods would be unprofitable at this stage of our studies, but we note with approval the attention which carriers are giving to the subject. We are convinced that much can be accomplished along these lines and that the carriers should accomplish it."

Bureau of Finance

Under paragraphs 18 to 22 of section 1 of the interstate commerce act, 100 applications for certificates of public convenience and necessity were filed. Of these, 53, covering 2,941 miles of line, were for authority to construct new lines or to extend existing lines, and 47 were for authority to abandon mileage aggregating 808 miles of line. The commission issued 57 certificates, of which some were on applications made during the preceding year, 27 covering 446 miles of new construction and 30 authorizing abandonment of 526 miles of line, and denied 11 applications, six covering 259 miles of new construction and five seeking authority to abandon 79 miles of line; 12 applications, seven covering the construction of 175 miles of line and five for authority to abandon 100 miles of line, were withdrawn.

In 24 cases hearings have been held for the commission by state commissions during the year, and in the majority of such cases it has followed the recommendations of the state authorities.

The question whether, under paragraphs 4 to 8, inclusive of section 5 of the interstate commerce act, two or more carriers may consolidate their properties either with or without the commission's approval, pending the adoption by it of a complete plan of consolidation, is undetermined * * *.

Paragraph 2 of section 5 authorizes the commission to approve the acquisition by one carrier of the control of one or more carriers in any manner not involving consolidation into a single system. Under this paragraph, 28 applications have been filed and 24 authorizations have been issued. Several important acquisitions have been brought about.

Preliminary to the determination and recovery of excess income, orders dated January 16 and March 16 were served on carriers requiring each to report the amount of its net railway operating income for the applicable period ended December 31, 1920, and the year 1921; the value of the railway property held for and used by it in the service of transportation; the net railway operating income in excess of six per cent of the value; and to remit to the secretary one-half of the excess income received, if any. Returns have been received from all large and many small carriers. Compliance with the orders is still the subject of correspondence with some of the small carriers.

Returns were filed by 739 carriers for the applicable period ended December 31, 1920, of which 17 reported an aggregate of $737,567 net railway operating income in excess of six per cent of the value as reported. For 1921, returns were filed by 692 carriers, of which 21 reported an aggregate of $696,944 in excess of six per cent. Of the carriers reporting excess income, seven reported an aggregate of $50,475 and remitted one-half of the amount to be placed in the general railroad contingent fund. The commission is giving consideration to all returns which indicate that excess income was earned, with a view to early determination of the property values and ascertainment of the excess income recoverable.

Issuance of Securities.—The commission has received 195 applications under section 20a of the act and has authorized the issue of securities and the assumption of obligations and liabilities in respect of securities of others in an aggregate amount of $889,719,710.23 plus 69,760,500 French francs. The report shows how much of each class and how much for new money, for refunding, etc.

Under paragraph 9 of section 20a, certificates of notification of the issue of notes maturing within two years, in the aggregate sum of $54,141,584, were filed.

The Illinois Central and the Chesapeake & Ohio made applications for authority to issue preferred capital stock, the proceeds to be used in making additions and betterments. These applications constitute encouraging indications, the commission says, inasmuch as of late years it has been generally the practice to finance additions and betterments through sale of bonds carrying fixed charges. Both applications have been granted.

Interlocking Directorates.—The provision of section 20a of the act making it unlawful for any person to hold the position of officer or director of more than one carrier unless authorized by the commission became effective January 1, 1922. The evils which the statute was designed to prevent arose mainly from interlocking relationships between operating carriers. * * * The majority of instances in which authority has been denied have related to operating carriers, especially where there has been substantial competition for traffic between the carriers. The commission received 413 applications from individuals and 305 from carriers; 1 carrier application was wholly denied, and 408 individual applications and 308 carrier applications were granted in whole or in part, making a total of 727 applications, 415 individual and 312 carrier applicants, of which disposition was made.

Deficits Under Federal Control.—Claims have been filed for reimbursement by 344 carriers, under section 204, claiming approximately $25,000,000. It is estimated that the amount to be certified on these claims will be approximately $15,000,000, of which $5,093,350 has been certified to date. Settlement has been effected with 83 roads and 17 cases have been dismissed. The commission thinks that practically all of these claims will be settled during 1923.

Six Months' Guaranty for 1920.—As shown in the last annual report, 547 of the 667 carriers which had accepted the guaranty provision claimed an amount approximating $818,000,000 by their returns filed in response to the order of October 18, 1920. An aggregate of approximately $600,000,000 is claimed by 578 carriers which have filed returns conforming to the report and order of December 15, 1921. The commission finds no occasion, however, to make any change in its estimate of the total amount probably payable under the guaranty as stated in its last report, viz., $536,000,000.

Settlements have been effected with 119 carriers and 75 cases have been dismissed. Practically all certificates issued since October 31, 1921, have been in settlement of claims. Of the amount estimated as necessary to make good the guaranty, viz., $536,000,000, the commission has issued certificates in the aggregate amounts indicated below:

As advances under section 209	$263,935,874
As partial payments under section 209 as amended by section 212	168,970,412
In final settlement under section 209g	17,166,759
Total	$450,073,045

Leaving an estimated amount still payable to the carriers under section 209 of $85,926,954.

Loans.—Under the revolving fund, the time during which applications for loans might be made expired February 28, 1922. Loans from the fund subsequent to that date have been and will be confined to applications so made. The aggregate amount of loans requested in pending applications is large, but it is not thought that the total amount of loans yet to be made will be substantial. An appendix contains a revised statement of loans and of the present status of the revolving fund. Out of the original appropriation of $300,000,000 the commission has held out $40,000,000 to cover claims and judgments arising out of federal control as provided by the statute.

Bureaus of Accounts and Statistics

The accounting examinations in determining the amounts due carriers under sections 204 and 209 of the transportation act, 1920, have absorbed much of the time of the bureau, but this work has now decreased and the bureau has resumed in part the general examinations of carriers' accounts. Substantial progress has been made in investigation of the classes of depreciable property and the related percentages of depreciation which, under section 20, the commission is required to prescribe. A vast amount of research is required. A reduction in the appropriation of the bureau made it necessary to restrict the number of field examinations in connection with the work of checking carriers' claims under sections 204 and 209. This has delayed the settlement of these claims to some extent as well as the completion of the special accounting work required by these provisions of the law.

Additional emphasis has recently been put by the Bureau of Statistics upon analysis and research. The development of statistical standards for judging of the adequacy of maintenance, the formulation of index numbers to show the effect of changes in wages and prices of materials upon the cost of railway operations, the separation of terminal and line costs, and a history of changes in wage rates and working conditions from 1918 to 1922 are among the subjects to which attention has been given.

The principal analytical work that is being done is the comparative study of operating averages. An examination is being made of the differences in results obtained by various railroads operated under similar conditions. Although it is difficult to reach final conclusions as to the honesty,

economy, and efficiency of railway management from statistical tests in a central office, it is believed that a systematic effort to explain apparently abnormal results will prove of value.

Formal Docket

The formal complaints filed numbered 1,264, of which 1,127 were original complaints and 137 subnumbers, a decrease of 223 as compared with the previous period; hearings numbered 1,862, producing 227,037 pages of testimony, as compared with 1,616 hearings and 185,111 pages of testimony during the preceding period.

Bureau of Traffic

The commission's activities of an administrative character dealing with the various kinds of charges for transportation and transmission, including rules and regulations affecting those charges, are largely centered in this bureau. The current year has continued to be one of transition, readjustment, and reduction. The number of freight rate changes proposed and made was the greatest in the history of American railroads. In addition to the general reduction on July 1 of all freight rates not previously reduced since 1920, thousands of readjustments of rate relationships disturbed by general changes during war years have been made. Many individual situations have also been revised to remove inequalities and discriminations.

Efforts to settle rate controversies without litigation through correspondence and conferences with shippers and carriers have been continued with considerable success. Tariff publication is permitted upon less than 30 days' notice wherever the proposed rates appear likely to facilitate the free movement of commerce and correct improper adjustments. Due to the rapid and extensive rate changes of the past five years, the tariff situation, already complicated, has become more complex, and special efforts toward simplification of tariffs are being made in conjunction with committees representing carriers and shippers, it being the aim to lessen the expense of tariff publication and to facilitate ready determination by all concerned of the legal charges.

There were filed 135,433 tariff publications, and 2034 were tendered for filing and rejected because of failure to give the notice required by law. Those filed represent an increase of 31,685 over the preceding year. During June approximately 34,000 tariff publications comprising in the aggregate 375,397 pages were filed, most of them in compliance with the findings in Reduced Rates, 1922. Over 8,000 rate memoranda have been prepared for the commission's use or for the use of inquiring shippers, carriers, and other branches of the government, including the federal traffic board.

For violations of the interstate commerce act and related acts 27 indictments were returned, 16 informations filed, and 20 cases concluded. The indictments returned and informations filed charged the falsifying of records of common carriers, unlawful use of passes, false billing of interstate shipments, and frauds in connection with the issuance and use of bills of lading.

Bureau of Service

With a steady improvement in business conditions, there has been a corresponding increase in the demand for cars. This, with the strike of the miners and shopmen, made necessary the exercise of emergency powers. Continuous efforts have been made to improve the efficiency of transportation service by the rerouting of loaded cars over open routes, by urging the return of cars to the originating carriers and by correcting the specific deficiencies in transportation * * *.

Bureau of Safety

The work of the bureau of safety is reported in a separate document. During the fiscal year 1922, the bureau investigated 51 train accidents, involving a total of 117 persons killed and 953 persons injured. Two investigations pertaining to strength of materials are in progress, one having to do with the prevalence of transverse fissures in rails and the other concerning the endurance of chilled iron wheels under conditions of service. Plans of 179 [safety] devices were examined and opinion thereon transmitted to the proprietors. Of those examined, 23 possessed meritorious features but required further development or service tests to determine their practical utility and nine possessed merit as safety devices warranting some degree of commendation. In co-operation with the American Railway Association, observations of three automatic train-control devices in service have been made and tests of two other devices, of the magnetic-induction type, are now in progress.

Bureau of Locomotive Inspection

A summary of the fiscal year 1922, as compared with the fiscal year 1921, shows a decrease in this department of 48.4 per cent in the number killed, and 11.3 per cent in the number injured. Since 1912, the first year of the existence of the law, there has been a decrease in the number of accidents of 68.1 per cent, 72.5 per cent in the number of persons killed, and 68.3 per cent in the number of persons injured.

The report of the bureau does not mention the shop strike, but says that a comparison of all accidents and casualties during July, August and September, 1922, with those of July, August and September, 1921, shows 288 accidents, 10 persons killed, and 350 persons injured during the three months of 1922, and 152 accidents, 3 persons killed, and 173 persons injured during the corresponding period of 1921, increases for the 1922 period of 89.5, 233, and 102 per cent, respectively. Reports made to this bureau are checked with the accident reports made to the bureau of statistics. The figures for the three months of 1921 include the reports made to both bureaus, but the figures for the corresponding period of 1922 do not include the reports made to the bureau of statistics for August and September, which are not yet available for checking.

A comparison of the number of locomotives inspected during the months of July, August and September, 1921, with the corresponding period for 1922, shows:

	1922	1921
Number of locomotives inspected	16,380	16,722
Number found defective	11,231	7,963
Percentage inspected found defective	67	48
Written notices for repairs served	1,396	817
Total defects found	43,012	24,910

About 3,500 more locomotives were inspected than during the preceding year; but during that year the locomotive inspectors devoted an aggregate of 962 days to special work in connection with the transportation act, 1920, and the interstate commerce act, as against an aggregate of 200 days devoted to such special work in the ensuing fiscal year. On the other hand, during the fiscal year 1922 the inspectors spent a greater amount of time than usual at such points as they visited and at their headquarters, so as to reduce travel and subsistence charges. As a result they were unable to make inspections at 1,913 points where locomotives are housed or repaired.

Because of defective condition of locomotives and willful violation of lawful order of inspectors, suit was brought in the United States district court for the southeastern division of the eastern district of Missouri against one carrier and judgment was rendered on 20 counts in favor of the government. No formal appeal from the decision of any inspector was filed during the year.

Bureau of Valuation

Regarding the work of this bureau the report says in part: "We have reached the stage in valuation of the steam railroads where, except for rechecking, the inventorying of

roads recently constructed, and a few minor details, the original field work has been completed. Underlying reports are being issued in large numbers, and hearings and final arguments on protested tentative valuations are in progress. Of 287 tentative valuations served, 101 have become final through absence of protest. Full hearings upon protests have been had in 39 cases. Six cases have been partly heard and 35 are assigned for hearing before December 31, 1922. Final arguments have been had in three cases and 12 were set for argument in November. Issues raised by protestants in 19 cases have been submitted without argument.

"The act provides that valuation shall be kept up to date and we have taken steps to comply with that provision. We have completed the transfer of all forces and records of the bureau to the central office in Washington. The number of employees has been reduced to approximately 550, or about one-third of the maximum reached in 1918. Expenditures have been reduced from approximately $3,000,000 per annum during the first few years, $2,735,911 for the fiscal year 1920-21, and $1,597,572 for the fiscal year 1921-22, to approximately $1,300,000. This reduction has, in large part, been made possible by the termination of original field work.

"The following table shows data with respect to the underlying reports which have been completed and issued:

Section	Number of reports	Number of corporations	Miles of road	Per cent of total mileage
Accounting, as of Oct. 31, 1921	271	444	61,731	44.80
Accounting, as of Oct. 31, 1922	555	983	151,572	91.11
Engineering, as of Oct. 31, 1921	423	755	133,139	53.68
Engineering, as of Oct. 31, 1922	636	1,165	179,475	72.37
Land, as of Oct. 31, 1921	371	765	71,558	28.85
Land, as of Oct. 31, 1922	671	1,096	144,411	58.23

A like summary covering tentative valuation reports follows:

Date	Number of reports	Number of corporations	Miles of road	Per cent of total mileage
Oct. 31, 1921	151	193	24,493	9.86
Oct. 31, 1922	287	409	39,956	16.11

"These summaries do not adequately reflect the progress made. One feature of reorganization was the concentration of effort on production of reports covering the major steam railroad properties, particularly those of carriers whose gross revenues were $25,000,000 or more per annum. Material progress has been made on these reports. Moreover, 58 tentative valuation reports, embracing 84 corporate properties and 12,939 miles of road, which were completed but not issued on October 31, 1922, are not included in the immediately preceding table.

"The emphasis laid upon valuation by the transportation act, 1920, has necessitated expediting the valuations of the steam railroads to meet increasing requirements.

"In our consideration of Reduced Rates, 1922, we had available underlying valuation reports covering 47.7 per cent of the total mileage. Analysis of the preceding summaries and of the schedule for the remaining months of 1922 indicates that for a similar survey of rates, fares, and charges the underlying reports available early in 1923 would cover approximately 75 per cent of the total mileage.

"Section 5 of the act provides that, in preparing and adopting the plan for consolidation of the railway properties into a limited number of systems, the grouping should be so arranged that the rates, as between competitive systems and as related to the values of the properties through which the service is rendered, shall be the same so far as practicable. Paragraph six of that section provides that the bonds and capital stock at par of the corporation which is to become the owner of the consolidated properties shall not exceed the value of the consolidated properties as determined by us, and makes it our duty to proceed immediately to the ascertainment of such value upon the filing of the application for consolidation. We have need also for valuation findings in regulation of security issues for existing companies and for the recapture of excess earnings. Requisitions for data are made by other branches of the government. Local governments have called for valuation maps for use in planning development of industrial sites, flood control, port development, relocation of tracks, and planning of terminals.

"Although the activities and energies of the bureau have been mainly directed to the properties of steam railroads, all original field work on the properties of the Western Union and Postal Telegraph companies has been completed. The field work on the properties of the Pullman Company has been completed. No substantial amount of work on the telephone lines has yet been completed and no work has been done, except incidentally, on electric railway lines and express and pipe line properties."

Some Experimental Results With Quick Setting Concrete

DURING THE LAST meeting of the International Railway Congress at Rome, Italy, mention was made of the use of a quick setting concrete known as "Ciment Fondu." This is a French cement which has certain characteristics which are distinctly interesting. Predominant among these is its ability to attain a usable strength in a very short period of time. In June, 1922, the Boston Elevated Railroad Company obtained some samples of this product and conducted a series of tests, the results of which are given in the tabulations.

The material was tested at the laboratories of the company in comparison with three well-known brands of American cement and with the specifications of the American Society for Testing Materials for 1921. Three different mixes of ciment fondu were used. Figures were obtained on the amount passing through a No. 200 sieve, the time of initial set and final set, the strength of the French cement after 24 hours, the strength of all cements of the one-to-three mix after 7 and 28 days, and the results of a five-hour boiling test. Separate tests were made of the one-to-two and one-to-one mixes of ciment fondu. From the results it will be noted that the French cement obtained a strength in 24 hours greater than any of the standard cements did in 7 days and that the 7-day test of the French cement is greater by 15 per cent than the 28-day test of the others. On the 28-day test it showed a slight loss in strength compared with that at seven days. This cement, however, did not stand up well under the five-hour boiling test, as it cracked and scaled.

It was the intention of this road to secure some of this cement, if possible, for use during winter weather or for use in track work to shorten the time of from seven to ten days which is required with American cements before traffic can be turned on newly concreted or paved track. Communications with French manufacturers, however, indicate that the question of supply has not been stabilized and so far it has not been possible (at the time of this writing) to secure any of this material.

We are indebted to Edward Dana, general manager of the Boston Elevated, for information regarding these tests.

COMPARATIVE TESTS OF 1:3 MIXTURE

Make	Initial set	Final set	Per cent passing #200 sieve	24-hr. tensile	7-day tensile	28-day tensile
A. S. T. M.	*0 hr 45 min.	†10 hr. 0 min.	78	...	#200	*300
"A" Brand	2 hr. 40 min.	6 hr. 10 min.	85.2	...	348	377
"B" Brand	2 hr. 50 min.	5 hr. 40 min.	85.4	...	271	300
"C" Brand	3 hr. 0 min.	7 hr. 25 min.	85.0	...	282	356
French	3 hr. 5 min	6 hr 20 min	96.4	376	423	...

*Not less than.
†Not more than.

COMPARATIVE STRENGTH OF DIFFERENT MIXES OF CIMENT FONDU

Mixture	24 hr test	7-day	28 day	Per cent of of strength
1 cement 3 sand	376 lb	423 lb.	407 lb	4.0
1 cement 2 sand	578 lb.	725 lb.	671 lb.	7.25
1 cement 1 sand	688 lb.	1,112 lb.	1,078 lb	3.0

How To Get at the Inside of a Railroad Payroll

Suggesting a Method of Recapitulation and Comparison of Costs with Transportation Produced

By John Collins Owers

NOTWITHSTANDING the old proverb that familiarity breeds contempt, in these days no one concerned with railroading permits himself lightly to regard the payrolls. On the contrary, indeed, each succeeding month these important documents seem to inspire still greater respect, especially in the hearts of those whose duty it is to direct operating affairs. This is going to continue, so that there can be no diminution of the effort to obtain still higher degrees of efficiency. There will be no let-up in the insistent demand for still more ton-miles per dollar spent.

Obviously then, the thing necessary is to get the best possible understanding of the payrolls, to search their innermost recesses and expose the hidden secrets of non-productive costs, and lost motion wastes, which even on the most carefully supervised roads still sap at the tenderly nourished earnings and hinder achieving the so much desired net; and anything that offers to facilitate such an understanding, and assist in the better control of these expenditures is worthy of receiving thoughtful consideration.

Few railway officers can devote the time necessary really to study their payrolls as they come from the timekeepers, and if they did, such study, however carefully done, cannot possibly result in the thorough comprehension that is really necessary. This will be found true even though the rolls contain the number of hours or miles for which each individual is paid, because neither hours of service nor miles properly indicates how much actual transportation the expense has produced, nor the cost per unit, without which it is impossible correctly to adjudge the expenditures.

Form A

RECAPITULATION OF TRANSPORTATION DEPARTMENT PAYROLLS - OLD COLONY DIVISION
Period Ending and compared with Standard Wages & Labor Hours

Service Group	Current Rolls		Standard Rolls		Variation from Standard				Percentage			
					Increase		Decrease		Increase		Decrease	
	Hours	Wages	Hours	Wages	Hrs.	Wages	Hrs.	Wages	Hrs.	Wages	Hrs.	Wages
Superintendence:												
Supervision	416	$ 260	448	$ 255		$ 5	32			1.9	7.2	
Dispatching Trains	336	341	352	358		17	16		5.		4.8	
Station Service:												
Large Passenger	2881	1500	2880	1500	1	-	-					
* " Freight	9423	5200	8200	4526	1223	1674			15.	37.		
Other Stations	6338	3765	6328	3760	10	5			.1	.1		
Yard Service:												
Passenger	1295	1002	1012	783	283	219			28.	28.		
* Freight	8760	6705	6778	5242	1982	1453			29.	28.		
Train Operation:												
* Passenger	6984	7110	6190	6301	794	809			13.	12.		
* Freight	7672	6461	7975	6716			303	$255			3.	3.8
Tel & Tel Signal & Interlookers	2992	1828	2296	1405	696	413			3.	2.9		
Crossing Protection	12102	4143	12000	4114	102	29			.8	.7		
Miscellaneous Service:												
Draw Bridges	392	246	392	245	-	1						
* Non-Revenue Trains	210	763	210	714	-	49				4.9		
Other Employees	96	66	96	65	-	1						
Total Payroll	59897	39389	55167	34984	5091	4675	351	255				

* - Standard roll based on produced units; L.C.L. tonnage, Cars Received, Car Miles, Gross Ton Miles and Work Train Hours respectively.

STATISTICS OF OPERATION

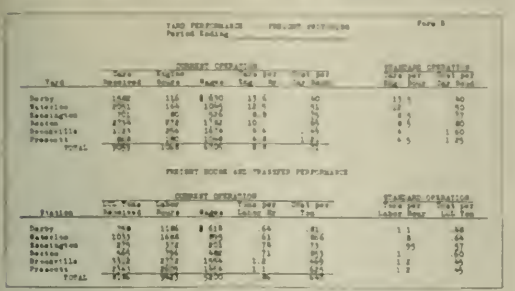
	Current Period	Corresponding Period Previous Year	Inc.	Dec.	Percentage Inc.	Dec.
LCL Tons Recd. Large Stations	8186	5988	2198		36.7	
Cost per Ton (Cents)	64.7	88.5		23.8		36.
Tons Handled per Labor Hour	.86	.54	.32		37.	
Cars Received All Yards	9059	8081	978		12.1	
Freight Switch Engine Hours	1086	1271		185		17.
Cars Handled per Engine Hour	8.8	6.4	2.4			
Cost per Car Received (Cents)	.71	1.13		.42		57
Passenger Train Miles	16204	16571		367		2.2
Cost per Train Mile (Cents)	.439	.44	-	-	-	-
Passenger Car Miles	53362	60795		7433		12.2
Cost per Car Mile (Cents)	.133	.13	-	-	-	-
Freight Train Miles	9800	9947		147		1.5
Cost per Train Mile (Cents)	.659	.918		.259		39.3
Gross Ton Miles	7975210	7354107	621103		8.	
Cost per 1000 G.T.M. (Cents)	.91	1.24		.43		53.
Loaded Freight Car Miles	162264	150306	11948		7.5	
Empty Freight Car Miles	84838	74919	9914		11.7	
Ratio Loaded to Total Car Miles	65.7	66.7				1.
Average Freight Train Load - East (Tons)	776	720	56		7.2	
" " " " - West "	853	799	54		6.4	

Form A—Recapitulation of Transportation Department Payrolls

Nevertheless, there is a way by which even the busiest officer can speedily delve to the innermost recesses of his payrolls, notwithstanding the bulk of the sheets or the volume of amount they may carry, and bring to light their most obscure secrets, whether of values received, or losses incurred. This may be done by recapitulating the rolls and relating the money that has been spent with the transportation that has been produced; a comparison of cost and accomplishment, which is really a very simple process, but one that is tremendously effective in obtaining a clear understanding of what the payrolls mean. To do this it is necessary only to group the classes of employees engaged in producing a given service, and obtain the total expense of performing their

work, compare this with a proper standard cost for the service rendered and with the transportation results obtained.

For transportation department rolls a recapitulation of this sort would require consolidations of the amounts expended for the purpose of administration, or as it is termed in the classification of expenses, "Superintendence"; Station Oper-



Form B—Yard and Station Performance

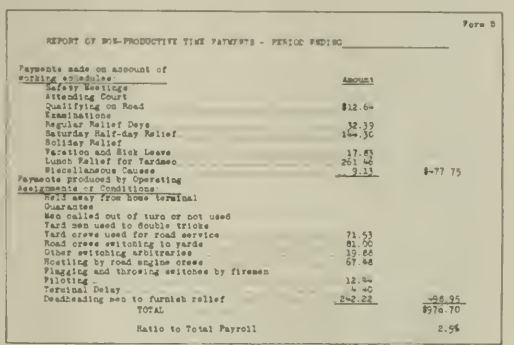
ation, Yard Operation, Passenger and Freight Train Service, Train Control on Line of Road and Highway Crossing Protection, with still one other group to comprise the miscellaneous employees and services, such as non-revenue train operation, police protection, drawbridge operation, and so forth.

To produce the best results, some of these groups, such as "Superintendence" and "Station Service," may be subdivided; Superintendence, being separated as between "Supervision" and "Dispatching Trains," and "Station Service" divided into three sections; one, to include the employees at exclusive passenger stations; the second, those at the freight stations at which the forces fluctuate with the volume of traffic; and the third, to include all the other stations, the forces of which are governed by general operating characteristics.

By recapitulating the amounts of wages paid to the employees in group order as outlined, the total wage expense for a given service is obtained and may be compared with a

becomes possible to ascertain whether the work has been done economically or otherwise.

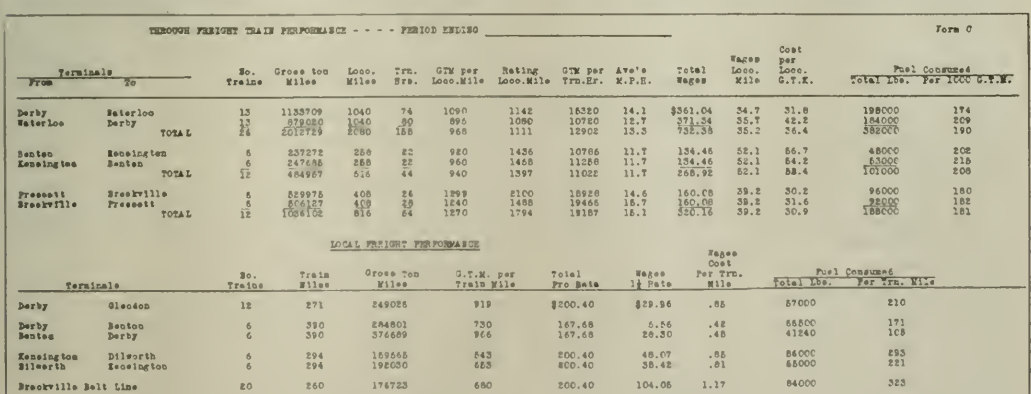
These standards may be made by determining the required number of labor hours and amount of wages to produce a given unit of transportation, such as for passenger and freight train operation per car or ton-mile, or per ton of freight handled at stations, or per car handled in yards. Standards for the other groups may be based on actual requirements for operating purposes. Thus, for the passenger station or train control groups, no difficulty would be encountered in determining the actual wages expenses necessary to provide the service assigned for normal weekdays, Sundays and holidays, and such separate daily totals having been obtained, the normal requirements for each payroll period may be secured by multiplying the standard wage



Form D—Report of Non-Productive Time Payments

expense by the number of weekdays, Sundays and holidays comprising the period under consideration and thus reach a standard total. This recapitulation (Form A) occupies only a letter size sheet, but it furnishes a complete picture of the payrolls, and tells a quick, positive story of the success of the operation, regardless of volume.

In case, however, a closer view of what has been done is



Form C—Through and Local Freight Train Performance

previously determined standard of what the amount should be, and variations noted; also in conjunction with such groups as comprise the train, yard and freight station services, it is valuable to set up the number of miles run, cars or tons handled and the unit cost for each, so that it at once

needed, and it usually is, this sheet should be supplemented by a detail of such operations as readily lend themselves to analysis. For instance, the results obtained at individual yards and freight stations, and the movement of freight service, are particularly interesting, and because of the fact that

these services are largely controlled by the flow of traffic, the forces employed require frequent adjustments in order that a proper balance may be maintained. To provide this information, another sheet (Form B) has been devised, one section of which is devoted to the freight houses and the other to the yards. On this form, each point stands alone, and tells its own story of wage expenditures, tons of freight handled or number of cars received, and the cost per ton and per car, compared with previously determined standard costs; and for those who care for the further information, the number of tons handled per labor hour, or cars handled per switch engine hour may be given with their proper standards for purposes of comparison.

Passenger train service needs no special analysis beyond a comparison of the actual with the standard cost per car mile. A greater than normal variation from the standard is usually caused by overtime, deadheading, or other schedule allowances for which a special sheet is provided.

Although the cost of freight train service is properly comparable with a standard, there are so many elements likely to increase the expenses of operation that it is well to secure a still closer examination of the service, and for this purpose another sheet (Form C) is designed. On this is shown the performance of through and local trains separately by directions and by routes. Thus, if a division consists of a portion of main line and several branches, all the through eastbound trains on the main line between crew terminals are reported in one group, and conversely all the westbound through service between the same points. In separate groups are shown trains operated on the branch lines, whether the service is entirely operated from, or partly operated over, the main line. Thus, all through service between any two terminals will be reported upon a single line which shows the number of trains run, the locomotive miles, gross ton-miles, train hours and wages, with appropriate statistics to show the gross ton-miles and rating ton-miles per locomotive mile, the average speed, the gross tons per train hour, wages cost per locomotive mile, and per 1,000 gross ton-miles; and although fuel consumption is not payroll, the statement may be further extended to show the quantity of fuel used in total, and per 1,000 gross ton-miles, thereby making the report more complete as an operating statement.

On the same sheet, following the through service, is given the local or way freight performance, but not in such detail, as local service is not as readily susceptible to traffic conditions. Data in regard to this class of trains is, therefore, restricted to the number of trains run between specified terminals, the train miles, gross ton-miles, gross tons per train mile, wages cost divided between pro rata and time and one-half pay, the cost per train mile, and also, if the information is desired, the fuel consumption per train mile.

These statements bring out the payroll details in a pretty thorough manner, with the exception of one feature, which, by the way, too often serves as the woodpile for the payroll jinx. This is the element of schedule arbitrary and penalty payments, which unless guarded against may destroy the effect of otherwise good operation. These items run the gamut from passenger conductors' monthly guarantees to the penalty for calling a laborer in advance of his regular reporting hour. They are little foxes continually reaching up to spoil the good grapes; but before they can be stopped they must first be exposed, and their composition and cause brought to the surface. To do this, one more sheet has been added; but it is well worthy of careful study.

This one (Form D) is entitled "Report of Non-Productive Time Payments," because, although in most instances the allowances represent some service rendered, it is almost always the case that they are in the nature of penalties imposed on the company for failure to meet certain operating conditions with employees specially designated to perform the work required.

Thus, a road engine crew ordered to report 30 minutes earlier than the ordinary reporting hour of the run, for the purpose of heating passenger coaches with their locomotive, will not only be paid for the extra 30 minutes that they perform service, but an hour additional because they are doing work not properly that of an engine crew. There are, therefore, at least two hours of entirely non-productive time, and if conditions were such that the work could be assigned to an enginehouse employee, the expense of the 30 minutes actual time might also be avoided, a total of three hours time. Items of this character, unless brought into prominence through such a sheet, become buried in the general cost of service, and are completely lost sight of, but with a proper detail, the interested officer can save many a good dollar from disaster.

By means of the statements described, it is possible to obtain a quick, but thorough, comprehension, not only of what has been spent, and the way it has been distributed, but of what has been obtained in return from each of the groups of employees, and also to ascertain how near to standard the operations have been conducted.

In the "Recapitulation," the whole payroll is brought into view and compared with "budget," or other standard allotments, and any deviation from the allotment by any group can be at once noted. The second sheet brings up for review the individual freight house and transfer platforms, and the individual yards, and at once localizes any discrepancies which may have appeared on the "Recapitulation" data of freight handling, or yard expenses, and thus indicates unmistakably where corrective effort needs to be applied. The third sheet performs a similar service in connection with road freight operation and points immediately to the trains that are not being handled advantageously, so that whatever further investigation is necessary, may be applied directly to the runs needing attention, and the offending individuals brought into proper step.

The last sheet brings graphically to the surface all the little wastes and losses produced by schedule rules and inefficient operating conditions, such as deadheading spare men to furnish relief, guarantee payments, switching arbitraries, time paid for but not worked, initial terminal delays, men called but not used, piloting, and the many other items of similar character that occur on every railroad, but which do not show on the payrolls or usual payroll statements, because the expense is lost in the total wages paid either to the individual, or to the class of employees being dealt with. Such items as these can often be avoided by a little extra foresight on the part of yardmasters, dispatchers, agents and others under whose direction the expense is incurred, and a statement of this character brings very forcibly to the forefront the need of all the foresight that can be brought to bear on the subject.

The preparation of these statements is relatively simple. The basic information is always available, and for the purpose of these sheets needs only to be brought into the proper combination and related with what has been produced as transportation within the same period.

By following the same general principles, analyses may be made of the payrolls of the mechanical and maintenance of way departments; the underlying idea being first to determine how much properly should have been spent during the payroll period, either by means of direct budgeting or by a process of time allotment per unit of production, and then to compare the actual expenditures with the standard. The statements may be made more interesting and valuable by the addition of columns showing the labor hours, as well as the money amounts, but the principle of bringing figures of expense into relationship with figures of production is the only true way by which to determine whether the expense has been wise or otherwise, and by which waste can be forestalled and good operation improved.

Essential Elements of the Human Problem*

"Scientific Management" Must Be Broadened—Employers as Well as Employees Need Education

By E. M. Herr
President of the Westinghouse Electric & Manufacturing Company

THE HUMAN PROBLEM in industry is not a new thing. During a thousand years of ancient times, for the most part before the Christian era, self-supporting and self-regulating organizations of workmen existed, which were remarkably similar to the trade unions of today. They were publicly acknowledged and legislative enactments made to control them. But they were weakened under the reigns of successive tyrants and finally lost with the Christian massacres of Diocletian in the early part of the fourth century and the subsequent feudalism of the dark and middle ages. The immediate cause of the destruction of these far-reaching labor organizations seems to have been the coveting of their wealth and power by the rulers of the day. * * * Constantine in A. D. 337 recognized 35 crafts—architects, brass and copper smiths, blacksmiths, carpenters, decorators, doctors, founders, fullers (cloth), furriers, glaziers, goldbeaters and gilders, goldsmiths, ivory workers, joiners, looking-glass workers, lapidaries, masons, marble cutters, plasterers of various kinds, pearl and filigree workers, potters, painters, plumbers, pavers, sculptors, silversmiths, stonecutters, statuaries, veterinaries, wagon makers, workers in mosaic. There were many strikes, usually called historically, when they attained sufficient proportions, "servile wars." The greatest and last of these was the uprising led by the gladiator Spartacus. Practically all ended disastrously.

And so the tide of the human element in industry has ebbed and flowed through the centuries. The so-called English (industrial) revolution in 1760 marked the beginning of the factory system and a departure from isolated craftsmanship under oppressive landlordism. * * * As late as 1820 less than five per cent of the American people lived in cities with a population of 8,000 and over. Today we are the greatest manufacturing nation in the world and over half of our population are city dwellers. In Massachusetts from 1800 to 1815 laborers received from 35 to 75 cents a day; carpenters and blacksmiths about $1.00, and women employed as domestic servants their board and 50 cents a week. About 1825 occurred the first strike for a ten-hour day. "Sweatshop" methods had then begun. Local trade unions sprang up more or less intermittently early in the century, principally in the shoemakers' and printers' trades, both for mutual benefit and insurance, and for the reduction of working hours and the increase of wages, but it was not until the fifties that national organizations began to take effective form. These were pretty well shattered by the depression preceding the civil war and did not really come into being until the seventies and eighties.

[The speaker here reviewed the development of manufactures in this country, showing, from the census of 1920, that 40 per cent of the inhabitants support the whole, directly or indirectly.]

Principles Underlying the Human Problem

Let us now turn our attention more directly to this problem in an endeavor to ascertain at least some of the directions toward which its solution trends. The principal new thing about the problem is that industry is now conducted on a scale larger than ever known before. The problem has been intensified by the greatly increased size of manufacturing establishments, by the concentration of population in cities having a large foreign element of often radical tendencies, and by the insecurity of employment, in which business cycles play a large part.

The underlying labor unrest and distrust are born of fear and misunderstanding—fear of coercion, unemployment and sickness—and a lack of mutual confidence as between employer and employed. There is more liberty and consideration for the workers than has ever been known before, and with it has come to the workers the greater vision of what they believe should belong to them in welfare and happiness. The social responsibility of management is being emphasized as never before. The awakened worker of today, more sensitive than his predecessors, intelligent, critical and perhaps irritable, must be convinced of the ability of management as well as its good faith, and in extreme cases even of the necessity of its being. It is said that democracy without management reverts to despotism on the mere ground of its inefficiency, and that the fundamental error in the recent Russian failure was confiscation of the factories and the expulsion of the managers, with the resultant breakdown of discipline and credit, on a false theory that labor alone creates wealth, whereas management, with credit and good faith, is of the first importance in the process of production. * * * It is the duty of the management of today to prove its "reason for being" and that the collective result of the combined efforts for managers and workers is a fine and great thing. If they can feel that this is the case, most men will toil cheerfully as subordinates. The management must convince employees by their experience that their treatment is fair and honest and without "bluff." It takes time to establish such confidence, and men will discover very quickly if the "boss" is not square. It must be established that labor and management are not foes.

The personnel department is now becoming common, but its intelligent extension still has far to go and it is regrettable that some companies have seen fit to curtail this activity in times of depression when they and their men need it most. These relations should not be handled and directed by the personnel department alone. The active heads and real managers are the ones on whom this responsibility must rest and who must handle it with their employees, not occasionally nor spasmodically but regularly and continuously, for work of this kind requires a great deal of time and patience. This effort on their part will gain the confidence of the employees and instil a spirit of co-operation throughout the organization, and it must be exerted on those directly in charge of the daily work of production. Anything less than this is futile and doomed to failure. Boards of directors must keep in mind this relation and work with the officers in determining policies which the managers can carry out without destroying valuable relations established only after long and patient work and almost impossible to renew.

Shop Representation Plans

One very large organization cites good results of five years' experience. * * * They find that if the men are free to make suggestions to the management they will not ask an outsider to do it for them. They find that workmen

*Abstract of an address delivered in New York City on Wednesday, December 6, before a joint session of the American Society of Mechanical Engineers and the American Economic Association.

are anxious to learn if given a chance, and they encourage the study in factory schools of the work of other departments. This broadens the employees' perspective and increases their interest in their own work.

It is credibly stated that at present there are in the United States more than 300,000 employees working under shop-representation plans created to give them a voice in the conduct of the shops in which they work, and that in by far the larger number of cases considerable progress has been made in establishing the most cordial relations between management and employees.

The crux of the industrial problem includes the question —How the just share of each party to industry is to be determined and how is each to be guaranteed its right to share progressively in increasing productivity, and be held also to the corresponding obligation to see losses proportionately shared? This obligation is often overlooked. Nominal wages have increased enormously, and it is safe to assert that real wages have also augmented despite the high cost of living and the fact that in the early days of industry few workers depended entirely upon their wage but were "found" many things which must now be purchased. * * * Manufacturers naturally wish to see their employees receive a wage, with reasonable working hours, which will support them in comfort. This, of course, is only possible when economic conditions will permit, as wages are not and cannot be based on the cost of living. If this condition is to obtain, the employee must live in accordance with his income and responsibilities and exercise frugality and care in his expenditures. Unless this is done, the real interest of the employer and employee will not be conserved because wages would be lifted to the point of throttling the industry.

Scientific Management

Scientific management—which is in fact little more than getting rid of confusion and perfecting adjustments, or in other words, good management—has entered largely in recent years into the human problem in industry. As helping to avoid undue strain on the part of the worker, and waste of time and materials, it should be of benefit to all concerned. It should remove the cause of any hostility to the broadest application of scientific knowledge of the conditions of maximum labor efficiency, to the gain of all parties to production. The scientific management which dealt in the earlier stage with individual output in an engineering way must now deal with men collectively and develop that scientific breadth of imagination and application which is becoming a vital necessity for the welfare of a modern civilized community. The psychology of labor, both in good and hard times, says Professor Commons, is fundamentally the psychology of a class of people whose life is insecure. The accident-compensation law has accomplished the first little step toward giving security to the job. It has shown that the only way to establish safety and security is by making it financially profitable to do so. And so shall we make it financially profitable to business to eliminate to a large extent the wage loss due to unemployment on account of sickness, on account of changes in seasons, and on account of fluctuations in business. Labor can never accomplish this result. The only possible accomplishment of it will come when the employer arranges to cover unemployment from sickness by some adequate form of insurance, to the expense of which the employee will contribute, indemnifying the employee against loss of employment from this cause (accident is now covered by our compensation law), and to lessen unemployment on account of the fluctuation in production because of changes in seasonal demand by the proper use of stocks of finished product so as to smooth out these fluctuations and also those due to abnormal variations in business.

Increased security and continuity of employment greatly lessen the human problem, but on account of lessened labor turnover and uniformity of production they also reduce the cost of the product. Many progressive industrial organizations have gone far beyond the requirements of the accident compensation laws and the safety of the worker, incurring large expense in providing liberally for free life insurance, advantageous savings and loan opportunities, housing, service pensions, and education.

Education, Economic and Moral

Additional phases of helpful education might well be tried; for example, how to make repetitive work, in itself monotonous, interesting. A knowledge of the "why" of their product and the use of it and of related products of other departments has been found to materially broaden the operator's perspective. Then, too, workers can be encouraged to exercise their ingenuity in devising means to lighten and quicken their work and thereby incidentally increase their earnings. With shorter working hours there arises the question of what to do with idle time. Any one who investigates the use to which the average employee devotes his leisure undoubtedly will be convinced that such employee would be much better physically, mentally, and morally if he had less idle time, for it is generally used in loafing or in amusements which consume a material part of his earnings without corresponding benefits.

Work well done and with a knowledge of progress is a source of enjoyment with many, taking the place of the recreation others find necessary to their happiness, but education of both sexes in ways in which to use leisure time profitably yet pleasantly is needed. The young should be taught thrift, for a thrifty person will not uselessly waste his leisure time. The human problem in industry cannot but be largely affected by example. H. G. Wells speaks of the disturbing influence of "the obvious devotion of a large and growing proportion of the time and energy of the owning classes to pleasure and excitement. This spectacle of amusement and adventure affects the imagination of the working man. In making labor a part of every one's life and the whole of nobody's life lies the ultimate solution of our industrial difficulties."

The human problem in industry is very complex and can never be entirely solved. To measurably improve the feeling of confidence of the employee in the employer we must always and fundamentally be absolutely honest in our dealings; not only honest in our actions but also in our thoughts and intentions. Unpleasant facts and information necessary to be told to the employees should be given them as honestly as the others, and very promptly, so as to give them as much time as possible to adjust themselves to difficult or distressing conditions.

Finally, is it not clear that at least one direction of the solution of the problem is along educational lines? First, education of ourselves, the employers, to a more general understanding of the spiritual, personal, economic, and physical relations involved; and second, education to encourage and aid in every proper way the general and vocational training of the employees in thrift, especially the younger boys and girls, but also the mature but still impressionable group of young men and women who are keen to learn how their position in the workaday world can be improved. Example in this effort to educate and train the employee is especially effective. Such educational effort should establish confidence and encourage co-operation. It should also be directed so as to develop individuality in each workman and woman.

Let us therefore substitute the rule of reason and intelligence for force and so endeavor to restore in America the freedom of the individual, be he employer or employee— "that freedom which enables the young man to look into the future with confidence, knowing that the only limitations to his achievements are the boundaries of his intellect and the ne sure of his energy."

Fan Draft for Locomotives Discussed by A. S. M. E.

Proposed Construction Would Permit Application of Additional Equipment for Saving Fuel

THREE WIDELY different phases of locomotive design formed the topics of the papers presented at the Railroad Session of the annual meeting of the American Society of Mechanical Engineers held in New York on December 6. An extremely technical discussion of Stresses in Locomotive Frames was presented by R. E. Eksergian of the Baldwin Locomotive Works. George H. Hartman gave an analytical discussion of valves and valve gears in a paper entitled "Steam Distribution in the Locomotive," and Frans H. C. Coppus brought out the advantages that might be derived by securing the draft in a locomotive through the use of turbine-driven fans in a paper on Mechanical Drafting of Locomotives. An abstract of Mr. Coppus' paper, which is especially noteworthy because of the possibility of effecting large fuel savings by the method which he proposes, is given below.

The Mechanical Drafting of Locomotives

By Frans H. C. Coppus

GENERALLY speaking, it is a simpler task to incorporate extensive improvements into the design of a new locomotive than to apply them to one already in operation. Though the author would be the last person to discourage the development of the locomotive along radical lines that would require a total reconstruction or rearrangement of the present locomotive power plant, he believes that more can be accomplished for the immediate future by adding to the existing locomotive equipment which is standard, in principle at least, in stationary and marine practice, and which does not necessitate extensive or costly alterations. The existing locomotives, 68,000 in this country alone, represent such a large investment that no matter how efficient a new locomotive may be built, it is out of the question to relegate them to the scrap heap, and they will be with us for many years to come.

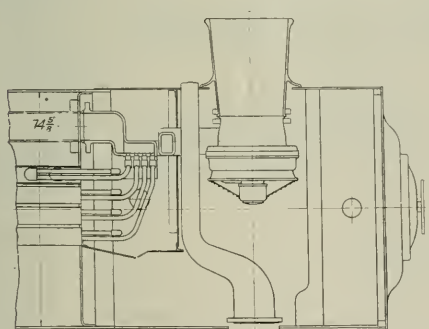


Fig. 1—Modified Form of Standard Front End with Induced Draft Fan

In the treatment of this subject the author has therefore limited himself to the existing locomotive. The supporting data employed are based on modern steam locomotives equipped with superheater and brick arch and fed by means of a live-steam injector.

The use of the exhaust steam for drafting the locomotive makes the locomotive power plant differ in principle from the marine or stationary power plant. In the latter the boiler is an independent unit, while in the former the boiler and the engine are interdependent inasmuch as the exhaust of the engine creates the draft for the boiler and the shutting down of the engine renders the boiler inoperative. Separate the two by substituting mechanical draft for the exhaust jet and there is no reason why the locomotive power plant cannot be fitted out with the devices which have been responsible for the low cost of power generated in marine and stationary power plants. The problem is one of successful adaptation with reliability and moderate maintenance cost, within the present limitations of clearances and other conditions under which the locomotive must operate.

The logical course of development would be as follows: I mechanical induced draft, II undergrate forced draft, III condensing the exhaust steam, IV pumping the hot water from the tender through a waste-gas heater into the boiler, V operating condensing.

Mechanical Induced Draft

About ten years ago extensive experiments with mechanical induced draft were made on the Atchison, Topeka and Santa Fe, but they failed because of the "inability to secure a fan of sufficient capacity to properly handle the volume of gases" within the limitations of clearances.

It is doubtful if a fan without the introduction of an intensifying element can be built to overcome this difficulty. Only recently this new element has been brought out. It takes the form of stationary guide vanes held in a casing. The current of air leaving the propeller is radially subdivided by the individual vanes and taken up without shock. These guide vanes, which have a curvature increasing in the direction of the rotation of the propeller, concentrate the air current and give it a further acceleration, so that a large part of the pressure is produced and a large part of the end thrust taken up by them. This new fan or blower is very much smaller than a multi-blade centrifugal fan of the same capacity, both of commercial construction. Because of this fact the former can be made applicable to the locomotive and the latter not.

Fig. 1 shows the smokebox of a modern locomotive fitted out with a blower in the stack and the exhaust pipe and nozzle displaced by a plain exhaust pipe discharging the exhaust steam into the atmosphere. The guide-vane casing takes the place of the lower part of the stack.

A modification of the fan is necessary in order that it may function properly as an induced-draft blower for locomotives, keeping in mind especially, simplicity of construction, low maintenance cost and assurance that the bearings are kept cool and well lubricated at all times, as the success of the whole scheme hinges not only on the capability of the blower to create the desired draft in the smokebox, but also to stand up under it. A special design has been prepared in which the fan is driven by high pressure steam acting on a turbine wheel at the periphery of the propeller. The revolv-

ing unit has oil cooled bearings and the end thrust is taken up by floating the shaft in oil under pressure.

Saving by Reduction of Back Pressure

One of the outstanding advantages of the use of an induced-draft fan instead of the exhaust jet for drafting the locomotive is the reduction of the back pressure in the cylinders. Prior to the experiments of the Atchison, Topeka and Santa Fe, a series of indicator cards taken from actual road tests of representative locomotives in various classes of service were prepared showing the initial pressure, mean effective pressure, back pressure, and indicated horsepower, and in addition the added mean effective pressure and indicated horsepower which could be obtained by reducing the back pressure to 4 lb. These showed increases in indicated horsepower ranging from 18 to 30 per cent for simple locomotives and an average of 53 per cent for a Mallet compound.

The author understands that since these tests were made the exhaust nozzles have been opened up considerably so that the back pressures have been greatly reduced. It would be idle to estimate what saving in fuel would result from a strong bearing directly upon fuel economy and will greatly increase the overall boiler efficiency.

The heat loss due to combustible in cinders, estimated anywhere from 5 to 20 per cent depending largely on the class of service, is generally classed among the "unavoidable losses." With a fan the constant flow of air through the fuel bed, while gradually changing in intensity, will not lift or tear the fire, and this loss, therefore, can be practically entirely eliminated.

Undergrate Forced Draft

To put the ashpan of a locomotive under pressure might prove impractical for several reasons. To overcome this difficulty the author has constructed a grate with hollow bars taking the air from a wind box to which the forced-draft blower is connected.

The forced-draft blower is of the same general construction as the induced-draft blower. It operates, however, in a horizontal position with no excessive end thrust and handles cold air. Therefore, the special lubrication, end-thrust balancing, and cooling features are unnecessary.

While it is not impossible to operate a forced-draft blower

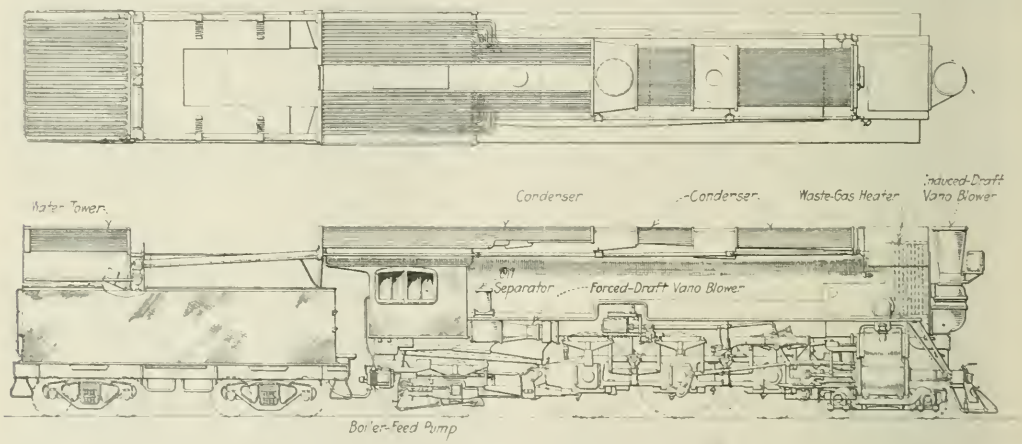


Fig. 2—Proposed General Arrangement of Locomotive with Induced and Forced Draft, Centrifugal Boiler Feed Pump, and Steam Condensing Apparatus

drafting locomotives mechanically due to reduction in back pressure. However, the field seems broad and the prospects bright for enormous savings along this line.

If the only effect of drafting locomotives mechanically was the elimination of the back pressure on the pistons, this would in itself be sufficient to deserve the keenest interest of those responsible for the economical operation of locomotives, but the subject embraces a great many other questions and vitally affects many features in connection with the economical generation and use of steam. Mechanical drafting gives the locomotive a degree of flexibility which it does not now possess.

The steam pressure may be picked up at will or allowed to drop, regardless of the amount of work the engine is doing.

This flexibility of draft makes it unnecessary to favor the engine at any time. The practice of favoring the engine on hills, often no doubt unavoidable under the present method of drafting, is not only wrong from the point of efficiency but cannot help but result in leaky tubes, increasing maintenance cost, and in shortening the life of the boiler.

The advantages of mechanical induced draft mentioned above largely relate to economy in the use of steam after it is once generated. In addition thereto mechanical draft has in conjunction with an exhaust jet, it is much simpler and better to connect it up to an induced-draft fan. The speed of the two blowers could be so adjusted—and after once adjusted, maintained—that there would be an atmospheric pressure condition in the combustion chamber, if carried to a nicety. This is very common practice with stationary and marine boilers. With the fire door open there would be no inrush of cold air nor any outward leaking of flames or gases. Such a condition is called "balanced draft." It can be effected only by the use of a forced-draft blower in conjunction with an induced-draft blower, jet blower, or stack. While in a locomotive boiler there is no boiler setting through which air can filter in, the draft over the fire is so much stronger than in stationary practice and the fire door (on hand-fired coal burners) opened so much oftener, that even greater economies than in stationary practice should result from balanced draft.

With forced draft there is no reason why cheaper grades of fuel could not be utilized, which will not only result in economy in the cost of fuel, but also in the cost of handling and storage of coal.

The air space in the grates may also be very small so that no fuel will be lost in the ashpan, and at the same time the

grate will let sufficient air through on account of the air being delivered under pressure.

The forced-draft blower creates sufficient pressure to force the air through the fuel bed, leaving only the drawing of the gases through the boiler tubes to the induced-draft blower, and the latter may, therefore, be smaller or may be run at a lower speed than if used alone. For these various reasons it is easier and more efficient to use a balanced-draft system than merely induced draft.

Condensing the Exhaust Steam

When the locomotive is drafted mechanically all of the exhaust steam is available for whatever use can be made of it. Heretofore a small part of the exhaust steam has been used to heat the feedwater. This practice has been quite common in Europe but has been only recently successfully carried out on this continent and to only a very limited extent, less than one per cent of American locomotives being thus equipped. The exhaust-steam feedwater heaters have been constructed on the principle of imparting to the water the maximum amount of heat with the minimum amount of exhaust steam because the latter was needed to draft the locomotive. With mechanical draft, the more steam used for heating the feedwater the better, as the more water will be

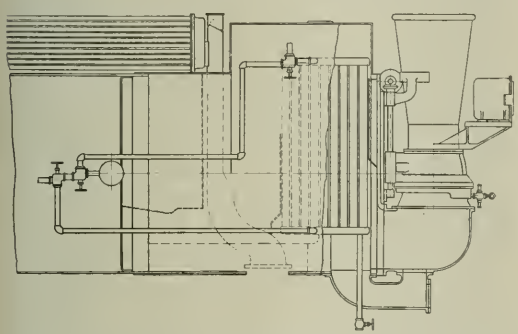


Fig. 3—Modified Front End, Equipped with Induced Draft Fan and Feed-Water Heater

saved. Railroad men fully appreciate the economy in time and fuel due to the saving of water, especially in freight service, and incidentally the not negligible economy in boiler repairs in bad-water districts.

Pumping the Hot Water from the Tender Through a Waste-Gas Heater into the Boiler

The exhaust steam, or as much of it as can be condensed, may be passed through a condenser on top of the locomotive running all the way back to the tender (see Fig. 2). The remainder may be allowed to pass to the air free for the time being. Such an arrangement affords a large cooling surface and the amount of water which can be saved without even attempting to run the engine condensing will be much larger than the amount saved by merely heating the feedwater by means of an efficient heater. The cooling surface may be made more effective by directing over it a current of air created by the speed of the locomotive with or without the assistance of the undergrate-draft blower. It is a simple matter to encase the condenser, provide it with louvers to catch the air, and connect it to the blower inlet by means of a duct. This would have the additional advantage of reclaiming part of the latent heat of the exhaust and supplying the fuel bed with preheated air. A cooling tower located on the back of the tender would further assist materially in condensing the exhaust.

It needs no explanation that with all the exhaust steam available it will be a simple matter to keep the water in the tender at any temperature desired up to the boiling point. This would convert the tender practically into an open heater. Instead of the injector a boiler-feed pump, preferably of the centrifugal type, installed in duplicate, will feed the water through a waste-gas heater into the boiler. The pumps will be located under the cab of the locomotive, so that there will be a sufficient head of water from the tender. Waste-gas heaters have been so far a distinct failure largely on account of the prerequisite that the heater should not interfere with the draft, because if it does the economy derived from its use would be nullified by an increase in back pressure.

The author has constructed a waste-gas heater which can be placed in the front end with slight alterations thereto, and which has a heating surface of over 1,000 sq. ft. By extending the front end this heating surface could be increased if necessary.

From the point of efficiency it may be considered that at the present time the water is put in locomotive boilers at an average temperature of 60 deg. F. the year round. If, instead of an injector, a pump is used the exhaust steam and the waste gases—which comprise the two largest items of waste energy in present locomotive operation—can heat the water from 60 deg. to 300 deg. With an absolute steam pressure of 200 lb. this is an undisputed saving in fuel of a little over 20 per cent.

Operating Condensing

Mechanical drafting of locomotives makes it possible to run locomotives condensing. It can be accomplished without material change in their construction outside of an enlarged and modified tender. This, however, will come later after the steam consumption of the locomotive has been made as small as possible, which will, in itself, make condensing operation easier.

General Arrangement

Fig. 1 shows the induced-draft blower located in the stack. This is naturally the logical first step in the development of an induced-draft system for a locomotive, but a blower in such a position is not readily accessible. Practical considerations led the author to place the blower outside of the smokebox. A diagram showing the general arrangement of exhaust pipe, waste-gas heater, and induced-draft blower is shown in Fig. 3 and will need no further explanation.

Means are provided whereby the guide-vane casing can be quickly separated from the fan casing, giving access to both the fan and the guide vanes for cleaning. Automatic adjustment is provided for maintaining the proper relation between the pressure at the grate bars caused by the forced-draft blower and the draft at the front end caused by the induced-draft blower. The speed of the fans is controlled to keep the boiler pressure from varying more than 10 lb.

The induced-draft blower not only furnishes the necessary draft but also controls the amount of fuel used and the water fed into the boiler. Proper provision is made whereby the steam supply to the different apparatus is partly shut off when the engine is standing, or drifting.

Conclusion

Whatever the saving in fuel will be, due to the elimination of back pressure, the heating of the feedwater, the stopping of the waste of unburned coal through the stack and through the grate, the elimination of cold air over the fire, etc., it is going to reduce just that much the amount of coal that is being fired, or the rate of combustion, which in itself greatly increases the boiler efficiency.

A rate of combustion of 100 lb. shows a boiler efficiency of 65 per cent. Reducing this rate of combustion to 60 lb., directly and indirectly by means of mechanical drafting,

which is not impossible, the corresponding boiler efficiency would be 74.2 per cent, or a saving of 9.2 per cent.

In a paper presented by John E. Muhlfeld, at the annual meeting of the American Society of Mechanical Engineers, December, 1919, entitled Scientific Development of the Steam Locomotive, the following heat balance is shown as representative of locomotives worked at from 25 to 35 per cent cut-off and hand-fired:

	Per cent
Heat absorbed by boiler	55
Heat absorbed by superheater	10
Heat loss in smokebox gases	14
Heat loss in cinders	8
Heat loss in vapors of combustion	4
Heat loss in combustible in ash	3
Heat loss in carbon monoxide	2
Heat loss in radiation and unaccounted for	4
Total	100

Under the same conditions but with mechanical draft and the waste-gas heater as described by the author, the heat balance should be approximately as follows:

	Per cent
Heat absorbed by boiler and waste-gas heater	74
Heat absorbed by superheater	10
Heat loss in smokebox gases	5
Heat loss in cinders	2
Heat loss in vapors of combustion	4
Heat loss in combustible in ash	1
Heat loss in radiation and unaccounted for	4
Total	100

In conclusion, it may be stated that mechanical drafting of locomotives is imperative for the following reasons:

(*a*) It reduces the back pressure to a minimum, effecting a saving in fuel of from 10 to 30 per cent; or increasing the power of the locomotive in the same degree, especially as speed increases, therefore adding to the hauling capacity or speed of fast freight and passenger engines, producing additional revenue tonnage and also eliminating or lessening the necessity for double-heading.

(*b*) It produces an engine that is free-steaming under the most adverse conditions and with all grades of fuel, decreasing liability of delay and saving time and money now spent in changing nozzle tips and experimenting with them.

(*c*) It keeps the steam pressure constant, regardless of load, saving steam now wasted every time the safety valve pops and making it unnecessary to favor the engine at any time, thereby saving fuel, avoiding unequal stresses in the boiler and resulting in saving in maintenance cost.

(*d*) It increases the efficiency of the boiler and grate by effecting better combustion and eliminating the waste of unburned fuel through the stack and in the ashpan—and incidentally stopping the inrush of cold air every time the fire door is opened—thereby avoiding sudden cooling of crown sheet and tubes.

(*e*) It makes possible the use of cheaper grades of fuel, resulting in large economies and in simplifying the handling and storage of coal.

(*f*) It eliminates the smoke nuisance in terminals and freight yards.

(*g*) It makes it possible to condense from 25 to 95 per cent of the exhaust steam, depending upon the season of the year and the kind of condensing apparatus used, resulting in economy in the cost of water and of maintenance.

(*h*) It effects a saving in fuel of 20 per cent by making it possible to preheat the feedwater from 60 to 300 deg. F., and incidentally greatly decreases the cost of maintenance by eliminating unequal stresses caused at present by the great difference in temperatures between the lower and upper portions of the boiler.

(*i*) It reduces the rate of combustion, thereby increasing the boiler efficiency.

(*j*) It lessens the work of both engineer and fireman, thereby necessarily increasing their efficiency.

Discussion

William Elmer (Pennsylvania System) questioned the desirability of making the boiler output independent of the locomotive steam consumption. To show the great amount of air that it would be necessary to handle with a fan if locomotives were drafted mechanically, he presented figures from test plant trials of a Pacific type locomotive with 27 in. by 28 in. cylinders. This locomotive developed over 3,000 hp., evaporated 65,000 lb. of water and burned 12,000 lb. of coal an hour. The draft in the front end was as much as 18 in. of water. It is difficult to determine the amount of air required to burn each pound of coal, but J. T. Anthony states it varies from 12.7 to 8.7 lb. Assuming an average value of 10 lb. of coal and assuming further that a locomotive consumes 10,000 lb. of fuel an hour, the fan would be required to handle 100,000 lb. of air per hour. This would amount to 1,300,000 cu. ft. per hour at atmospheric temperature, and at a temperature of 600 deg., which might be expected in the front end, the volume would be double.

Robert Rennie (American Locomotive Company) stated that a locomotive with 55 sq. ft. of grate area working at full capacity should have a fan capacity of at least 48,000 cu. ft. per min. at atmospheric pressure. Cooling the air before it is admitted to the fan would make mechanical drafting less difficult, but the additional resistance due to any appliance for recovering heat from the waste gases is a disadvantage. He considered that the method of reclaiming water from the exhaust steam would hardly be practical because of the enormous cooling surface required.

W. L. Bean (N. Y., N. H. & H.) called attention to the magnitude of the fuel problem on the railroads and pointed out the desirability of trying such designs as proposed by Mr. Coppus because of the possibility for large savings. He stated that fan efficiency and capacity had been greatly improved since the last trials of mechanical draft were conducted and urged early application of the design put forward after careful engineering investigation had been made.

Dr. W. F. M. Goss discussed mechanical drafting of locomotives by means of a turbo-exhauster. He called attention to the objection of the operation of locomotives in cities on account of the noise and smoke and outlined how these could be overcome by the turbo-exhauster. He stated that the required draft could be obtained with from 40 to 50 per cent of the existing back pressure, and in conclusion expressed the opinion that mechanical drafting had so many advantages that it is likely to come into use soon on the railroads.

In closing the discussion, Mr. Coppus stated that his proposal had in some cases been misunderstood due to failure to consider all the conditions set forth in the paper. His conclusions had been based on careful study and he felt certain that they were practical.

Courtesy Railway & Locomotive Historical Society

The "Uncle Tom," Fitchburg & Worcester Railroad (Massachusetts) 1850-60

The Relation of Syphilis to Railway Accidents

Call for Thorough Examination of New Men and Men Whose Errors Have Caused Collisions

By Archibald E. Chace, A.B., M.D., F.A.C.S. and George A. Hays, M.D.*

During 1920 there were 10,110 collisions on steam railroads in the United States, of which 8,246 or 82 per cent were due to "man failure." In other classes of railroad accidents, the role played by the human element as distinct from the "equipment factor," with the exception of derailments, is excessive.

There are many reasons, of which the most important are three. Those of us who are railroad surgeons have had a very narrow and completely frozen attitude toward our possible usefulness in the industry of transportation. From this has resulted, if not complacent indifference, at least a very skeptical attitude by the majority of railroad officers toward the possibility of overcoming man failure accidents. The engineer, both civil and mechanical, may have been more aggressive, for he had something to sell unhindered by professional strictures against advertising, and he certainly had an article which the practical business executive could test with his own senses—a gong which he could hear, a signal device which he could see and operate, a rail section or a switch which he could test in service—not an unseen almost unthinkable, entirely intangible normal human sensory-motor mechanism, and the maze of association centers which we must (and in time will) sell to the railroads of this country. To these two causes must be added a third: the antagonism of union labor.

Before the war teachers, professors and psychologists had accumulated some store of knowledge about the testing of brain function, especially of the student. Before, and in the main during, the war, psychologists gathered a large body of statistics both in industry and in the army. Since then they have with some success applied this information to the difficult task of fitting a man to his job. They feel, with some excuse, that a psychologist only is qualified to do this. They forget that an applicant for a job may have a brain perfectly suited and pulmonary tuberculosis. When we prove to railroad executives that we know the functions of the controlling organ in man, as well as we know other human functions, and then patiently study and experiment until we have a plastic, but never a crystallized, method of procedure, then can we be of real service in putting the right man in the right job and keeping him there, with safety to himself and others. This is one of the tasks of the railway surgeon, and the broad field of which the present inquiry is but a small part.

In the healthy man the capacity for judgment and the time of motor response, which are two of the essential elements in railroading, may be assumed to be fairly constant in any one individual under like conditions. In the diseased individual, whether the toxemia of intestinal stasis or an acute infectious disease be the variant, sudden and wide departure from this normal line of judgment and reaction time may be expected. This condition is so well known that proof or further consideration seems unnecessary.

So the study of, and elimination of, diseased individuals from hazardous occupations must be accomplished if we are to greatly lessen the man-failure accidents on our railroads. This as a rule means the removal of the disease, not of the man. To begin with a disease which would likely prove very important, we have undertaken to determine what the relation is between syphilis and man-failure accidents. Let us first examine, however, the general problem.

The Great Cost of Accidents

Railway accidents are usually classified as train accidents, train service accidents, and industrial (or shop and maintenance of way) accidents. These three grand divisions are then sub-divided minutely. Of the 126 sub-divisions of these headings, the two containing by far the highest number of accidents (involve almost entirely exercise of judgment, failure to control by hand brakes and improper handling of cars or locomotives in switching or coupling—giving 2,684 train accidents out of a total of 10,757 man-failures in 1920).

After considering such "causes" of railway accidents, however valuable they may be to railway executives, one is impressed with the undoubted fact that they are not causes at all. They are but visible and outward manifestations of the real cause. We get a little nearer when we discover a lack of judgment, a slow motor response, inattention or wilful misconduct. We are still closer when we find these conditions caused by fatigue, a man with a mental age of eight in a position requiring a mental age of 14; a man dazed by the toxemia of chronic nephritis; an engineer with glasses raising his vision from 20/80 to 20/20 and the one and only pair of glasses in his coat pocket at home; or some acute toxemia or brain syphilis. Such data would give us the real causes of man-failure accidents on railroads, and the means of prevention.

Would it pay the railroads to look into the real causes of man-failure accidents? The first item of the answer is the cost of such accidents now. In 1920 the cost of replacing cars and locomotives damaged by *train accidents alone for which employees were held responsible*, was roughly $10,200,000; and 330 persons were killed and 4,176 injured. In train service accidents there were 3,793 killed and 53,286 injured. In non-train accidents there were 439 killed and 100,519 injured. So we have an approximate total of 4,562 killed and 157,981 injured in one year. Taking the average cost of a death to a railway at $2,000 and $100 for each injury, and adding the equipment damages, we arrive at a total cost for one year of about $35,000,000. If this could be reduced even one-third by strict medical supervision alone—and there are grounds for the belief that it can—the saving would be between 11 and 12 millions of dollars a year, less a small additional cost over the present system. Of course, this calculation does not consider the trend of public policy involved. If then a great saving is possible, and public policy demands the lessened risk to human life, then why haven't the railways long since introduced strict medical supervision? The answer, we believe, is two-fold; firstly, the saving has not yet been fully demonstrated; secondly, the labor unions are opposed to it. What the railway surgeons seek is the opportunity to demonstrate.

Syphilis Among Railroad Men

Now let us consider syphilis in this relation. We are familiar with the ordinary manifestations of this disease. Even in the secondary stage it is now evident that the central nervous system is involved, and the toxemia may be so great as to cause complete incapacity for any occupation. From

*Dr. Chace is chief surgeon of the St Louis-South Western, and Dr. Hays is attending dermatologist at the company's hospital at Texarkana.

this virulent type to the milder affections of judgment and sensory motor response, we may include all cases of secondary syphilis. For this reason we believe such cases should be taken out of the service and given intensive treatment. When proper examination shows them to be Wassermann negative, spinal fluid negative to globulin and colloidal gold test and cell count negative, and normal in brain and nerve function as ascertained by thorough neurological examination, they may be returned to work with the proviso that they continue treatment and are re-examined at first once a month, later every two to six months, for ten years.

In the tertiary stage, so called, we may expect to meet a wide variety of conditions from aortic heart disease to paresis. The early detection of these conditions, and a change to a proper non-hazardous occupation under treatment is extremely important if we expect to exclude syphilis as a factor in railway accidents.

Knowing then the possibilities of syphilis, the next inquiry is whether or not it exists among railway men to an extent sufficient to cause concern. Evidently, if railroad men have very little syphilis, then our inquiry is of small importance. Our hospital statistics show that in the South, at least, more than six per cent of railroad men seek treatment *each year* with a venereal disease, of which half are luetic. Believing that state insane hospitals might throw some light on the subject, letters of inquiry were sent out to about 80 institutions, and so far we have 53 answers. These figures show that of all paretics, railroad men form roughly five per cent, and of these about 80 per cent are from train crews and dispatchers.

The Mayo Clinic has published its statistics of syphilis in regard to occupation. These show that nearly eight railroad men are affected to one farmer, three railroad men to one business man, and two railroad employees to one laborer. "Men of these types (train, yard and engine service), aside from the responsibilities which devolve on them, form an especially interesting occupational group, medically speaking, because they have for years been ostensibly under medical surveillance, and their health record is, therefore, in a sense indicative of the efficiency of the industrial medical practice of the past. To find so high a percentage of the men infected with a grave disease, capable of seriously impairing their efficiency and thus of bringing discredit on railroad administration and danger to the public, is a matter for concern. To find so much of the infection easily recognizable and yet apparently unrecognized, suggests the *need for a modern revision of methods* and conceptions in medical supervision."

Now if 4.2 per cent of all men have syphilis evident without a Wassermann, and if three per cent of railroad men are infected each year (our own statistics), it follows that the Mayo Clinic ratios are not too high as against railroad men.

Wrecks Due to Defective Health

The next inquiry was directed to determine if the records of railroads showed any wrecks caused by syphilis. We have answers from the chief surgeons or claim departments of 47 railroads. These clearly demonstrate that nothing has been done to determine the causes of wrecks.

The American College of Surgeons was next asked for assistance in unearthing railroad wrecks caused by syphilis. From the literature, there has been reported the following situation:

Expressions of belief in the important role played by syphilis as a factor in serious railway accidents are widespread. A bibliography of 22 titles is appended (appendix A). This belief is shared by a number of railway chief surgeons.

Incidents of near-wrecks when dangerous neurosyphilitics were found handling trains, or who became violently insane soon after exercising such responsibility, are also numerous. For example: (†) A conductor had vertigo and blunted memory while running fast train; another conductor (1) had "hemiparesis," amnesia, diplopia, etc., and had to be taken from his train; (2) a fireman became unconscious; (2) an engineer came to a hospital able to obey commands, but unable to understand what he was doing; (2) an engineer in a hospital insisted upon going back to work because "the president of the road had written" wanting him back, but this man had attacks of partial paralysis; there are several cases of forgetfulness while on duty, and the insane hospitals furnish many instances of violent insanity following closely upon duty in hazardous railroad occupations. One engineer ran a fast train in the East, two hours after completing the run tried to kill his wife, and died in a short time from brain syphilis. All of the above near-accidents, which could be multiplied many times, were due to syphilis, and most of them reported by physicians not in railroad work.

Actual wrecks caused by syphilis: The Baker Bridge accident on the Boston & Maine in 1905 appears to us undoubtedly due to syphilis, and the presumption is raised that many if not most wrecks, and other accidents, caused by an employee wilfully disregarding usual precautions are due to syphilis. There are many such accidents in medical literature; for example, conductors who confused orders, engineers who became paralyzed, unconscious or died suddenly in the cab or ran past signals; trainmen who fell from moving cars. Large damages are paid by railroads for "cord injuries" due to syphilis and actual insanity on duty. There are men in responsible positions who are suffering from brain and cord syphilis. Three cases of beginning insanity due to syphilis were discovered on one railroad. It cannot be doubted that a thorough examination would disclose many more.

Remedies

Granted that syphilis is an important factor in railway accidents, what are we going to do about it?

(1) Treat syphilis in railway hospitals and when feasible at emergency stations, because—

(a) We can get hold of the cases more often and quicker when free treatment is given and a square deal is assured.

(b) The community and other employees can be protected by quarantine in no other way.

(c) The patient can get efficient treatment.

(d) Laboratory facilities for early and prompt diagnosis and to check treatment are available.

(2) Teach the early diagnosis of neurosyphilis, by neurologic examination before the laboratory can tell us anything, and before definite tissue destruction has taken place so that neurosyphilis can be cured, not being misled by the lack of primary and secondary manifestations of the neurotrophic spirochete.

(3) When a man-failure accident occurs, the men involved should be very carefully examined, to determine every possible physical defect which might have had a bearing on the accident. This evidence should then be reviewed in conjunc-

† These numbers refer to the bibliography.

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tion with the facts brought out at the investigation of the accident.

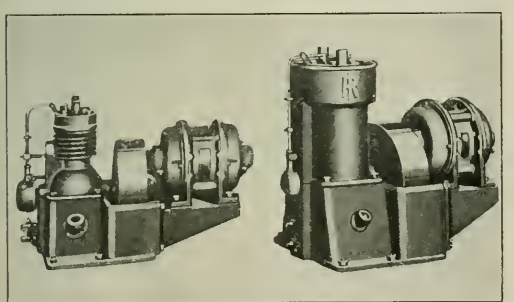
(4) Reorganization of the medical examination of applicants, and periodic re-examination of employees to meet modern standards.

It may reasonably be concluded from the above facts that syphilis alone would warrant a different viewpoint in demonstrating the causes of railway wrecks. Add to this disease all the other physical afflictions, congenital and acquired, which could have a bearing, and it would seem that we have sufficient reasons for a complete reorganization of our method of examining applicants for employment; for maintaining the physical condition of employees and for the more thorough investigation of railway accidents.

Small Vertical-Type Air Compressors

The Ingersoll-Rand Company, New York, announces a new line of small vertical air compressors known as Type Fifteen. In addition to plain belt drive, each of the four sizes is built as a self-contained electric motor outfit, driven through a pinion and internal gears, or by employing a short belt drive arrangement. The compressing end and electric motor of both gear and short belt-drive units are furnished mounted on a common sub-base, so that they are in no way dependent upon the foundation for correct alinement.

Several noteworthy features of construction have been incorporated, of which the constant-level lubrication system is the most important. Others include the constant speed unloader for plain belt-drive machines; the centrifugal unloader



3-in. by 3-in. Air-Cooled and 4½-in. by 5-in. Water-Cooled Ingersoll-Rand Air Compressors

for start and stop control machines; and the increased size of the water reservoir cooling pot.

The lubrication of small vertical compressors employing the enclosed crank case and splash system has often been a source of concern wherever oil in the air is a serious menace. The tendency of the old system has been to feed too much, resulting in the discharged air containing excess oil, or too little, causing scored cylinders, excess loads and burned out bearings.

As with the ordinary splash system, the base of the compressor forms an oil reservoir for the constant-level system. However, with this system, pet cocks determine the maximum and minimum amount of oil in the reservoir. Above this reservoir and directly underneath the connecting rod is a constant-level pan. Oil is pumped from the reservoir into this constant-level pan through a unique oil pump. Regardless of the amount of oil in the reservoir, so long as it is somewhere between the high and low level pet cocks, this system will function, insuring a constant-level of oil in the pan. A projecting stem on the connecting rod dips into this pan and distributes just a sufficient quantity of oil for proper lubrication.

The constant speed unloader controls the unloading of the compressor by automatically opening the inlet valve when the receiver pressure rises above that at which the unloader is set to operate. When the receiver pressure has fallen a predetermined amount, the unloader automatically releases the inlet valve and allows the compressor to return to work and thus build up the receiver pressure again.

The centrifugal unloader allows the compressor to start under "no load" such as is essential when automatic start and stop control is used, and permits the electric driving motor to come up to full speed before the load is thrown on automatically. This unloader accomplishes its purpose by holding the inlet valve open until the motor has reached full speed.

The smallest size is built with either ribbed cylinder for air cooling, where the service is intermittent, or a water-jacketed cylinder of the reservoir type for constant service. All other sizes are built with the water jacket of the reservoir type. The belt and electrically-driven machines include the 3 in. by 3 in. air-cooled, the 3 in. by 3 in., the 3½ in. by 4 in. and the 4½ in. by 5 in. water reservoir cooled machines.

The Daylight Lamp Type of signal gives a more arresting signal than a semaphore and is visible at a longer range in adverse conditions. This is from the report of Major G. L. Hall, inspecting officer of the British Ministry of Transport, on a collision which occurred near Gravesend on the South Eastern & Chatham Railway on August 21 last. In the somewhat limited space available at the location investigated—where an engineman and fireman had both passed the signal without observing it—the light signal is recommended "for the consideration of the managing committee" of the railway. Following this recommendation, and closing the report, Major Hall says this was a typical example of the class of accident preventable by automatic train control. The collision occurred at 6:45 a. m. during the prevalence of a dense mist. The engineman did not remember ever having been stopped at this signal before, and the inspector observes that the infrequency of stop signals at this point "has a distinct bearing on the case." The fireman's observation of the signal is believed to have been "quite perfunctory and he is very much to blame for having misled his driver."

International

"The Oldest Station of the Oldest Railroad in the World"

Mount Clare Station of the Baltimore & Ohio Built in 1830 and Used Now As a Freight Station. The Station Was Built For the Use of the Line From the Western End of Pratt Street, Baltimore, to the Carroll Viaduct, 1½ Miles, Toward Ellicotts Mills, the Terminus at That Time of the B. & O.—a 14-Mile Railroad—This Station Supplanted a Wooden Structure Built in 1829.

General News Department

The American Association of Freight Traffic Officers will hold its annual business meeting at the Waldorf-Astoria hotel, New York City, on Monday, December 11, followed by a banquet in the evening.

Employees of the Chesapeake & Ohio, to the number of about 600, are to receive bonuses, a fixed sum for each day, for their voluntary service in doing emergency work during the shopmen's strike of last summer.

The Northern Pacific Shop Workers' Association is the latest addition to the ranks of the "company unions" not allied with National organizations. The new union is reported to have agreed with the company on wage scales and working conditions.

The North Carolina Short Line Railroad Association held its annual meeting at Southport, N. C., on November 21. C. J. Fields, manager of operation and traffic of the Wilmington, Brunswick & Southern, was elected president of the association.

A jury in a trial court at Chicago, on December 1, awarded a brakeman on the Pere Marquette $41,000 for the loss of an arm and permanent injury to a foot, received when he was thrown from a freight car at Lansing, Mich. The brakeman maintained that the brake chain was too long.

The New York, New Haven & Hartford has made agreements with the enginemen's and the firemen's brotherhoods to continue present pay and conditions until September 30, 1923. The agreements provide for the withdrawal of all cases now pending before the United States Railroad Labor Board.

Pierce Butler's nomination as an associate justice of the United States Supreme Court was passed over by the Senate on December 4 at the close of the extra session, because of the opposition of Senators La Follette and Norris, and President Harding, on the fifth, sent the nomination to the new session of the Senate.

The Southern Pacific is operating a "demonstration train" of 11 cars over its Texas lines, carrying exhibits of agricultural products in great variety, live stock and farm implements; prize winning dairy and beef cattle, sheep, hogs and poultry. A home demonstration car contains exhibits of cooking and sewing. G. A. Long, director of exhibits of the West Texas Agricultural and Mechanical College, has charge of the exhibits.

Grade Crossing Controversy in Toledo

The Toledo, Ohio, city council has forbidden the further construction of railroad tracks in the Lower Town district of that city between Galena street and Bay View Park, following the action of the Ann Arbor Railroad in bringing suit against the city to secure authority to cross several streets in the forbidden district. A proposal to concentrate several Lower Town railroads across one street and thus avoid the cost of eliminating a number of grade crossings will be considered by the council at a future meeting.

Candidates for Officers of Signal Section, A. R. A.

The nominating committee of the Signal Section of the American Railway Association announces the selection of the following candidates for officers of the Section, to be voted for at the annual meeting next March: Chairman, B. T. Anderson (D., L. & W.), first vice-chairman, W. M. Vandersluis (I. C.), second vice-chairman, W. M. Post (Penn.). The time of holding the annual meeting having been changed, the terms of these officers will be from March, 1923, to March, 1924.

A. S. C. E. to Meet in January

The seventieth annual meeting of the American Society of Civil Engineers will be held at the headquarters of the society, 33 West 39th street, New York City, on January 17-19 inclusive. The business meeting will be called to order at 10 a. m. on January 17, at which time the annual reports will be read, officers for the ensuing year elected, reports of special committees presented, medals and prizes awarded, honorary membership conferred with formal appropriate ceremonies and other business transacted.

Automatic Train-Control Orders Modified

The Interstate Commerce Commission has authorized the Central of New Jersey to install, in accordance with the terms of its order, an automatic train-stop or train-control device between Red Bank, N. J., and Winslow Junction, N. J., in lieu of the installation required upon the portion of its line designated in the order of June 13. The Great Northern has also been authorized to make an installation upon one full passenger-locomotive division between Minot, N. D., and Williston, N. D., in lieu of the installation required in the order. The petition of the Richmond, Fredericksburg & Potomac for a modification of the order with respect to certain requirements was denied.

Largest Railway Mail Terminal

The largest mail terminal station in the world was put in operation on December 3, when the Chicago Post Office took possession of the new building at Van Buren street and the Chicago river, Chicago, erected for it by the Chicago Union Station Company. The building is 800 ft. in length and contains belt conveyors, automatic hoists, pneumatic tubes, tilting parcel dumps, and other mechanical devices to aid in the handling of mail. It is equipped to care for 3,000 tons or 100,000 sacks of parcels a day. The building has direct loading facilities on track level for the Chicago, Burlington & Quincy, the Chicago, Milwaukee & St. Paul; the Chicago & Alton and the Pennsylvania. This terminal was described in the *Railway Age* of March 4, page 513.

New Freight Cars in 1922

The railroads of the United States from January 1 to November 1 this year had 47,802 more new freight cars, either ordered and under construction, or installed in actual service, than during the entire year 1921, according to reports received by the Car Service Division A. R. A.; that is to say, a total of 117,238 cars. During the year 1921 the total was 69,436.

Of the total this year, 50,196 were box cars, of which, up to November 1, 19,352 had been installed. Coal cars ordered totaled 49,383, of which 26,812 were actually installed.

There was also an increase of 716 in the number of locomotives installed or on order. Locomotives installed up to November 1 totaled 860, while orders had been placed for 1,232, making a total of 2,098, as compared with 1,382 in the 12 months of 1921.

D. T. & I. Has Deficit for 10 Months

Deficits since July 1 have finally wiped out the net railway operating income earned by the Detroit, Toledo & Ironton during the first six months of the year, and for the 10 months ended October 31 the road had a deficit of $168,807, which represented a decrease of $514,115 as compared with the net earned in the corresponding period of last year, according to its report to the Interstate Commerce Commission. For October the deficit was $174,457. For the 10 months' period the operating revenues were $7,467,782, an increase of $2,056,464. The operating expenses were $6,328,875, an increase of $2,036,457, but there was

a debit balance in equipment rents amounting to $1,137,490, which was $531,561 greater than the debit balance for the previous year. Maintenance of way expenses increased $411,034, and maintenance of equipment increased $919,627, while transportation expenses increased $710,965 and traffic expenses decreased $12,425.

Lehigh Valley Disposes of Morris Canal

By an agreement signed last week by representatives of the State of New Jersey and officers of the Lehigh Valley Railroad Company, the Morris Canal, extending from the Delaware River at Phillipsburg, N. J., to New York Harbor at Jersey City, is officially abandoned, and the property is divided between the railroad company and the state, the railroad company paying over $875,000.

The canal has been in the hands of the railroad company since 1871, and though regular business on it has long since ceased, the railroad company has been at large and constant expense to keep the waterway technically in condition for navigation. Negotiations have been going on between the state and the railroad company for many years, but until now without result.

To the railroad company the important feature of the present agreement is the acquisition of absolute title to the freight terminal occupied by the road in Jersey City; the "Big Basin" going to the railroad company and the "Little Basin" to the state. The railroad retains the right-of-way of the canal from the eastern terminus to the Hackensack River, and also terminal properties at Phillipsburg. The state retains the rest of the canal, including the right to divert water from Lake Hopatcong, and other water rights.

Roadmasters Elect Officers

At the convention of the Roadmasters' and Maintenance of Way Association at Cleveland on November 23, the following officers were elected to serve for the ensuing year: President, J. P. Corcoran, roadmaster, C. & A., Bloomington, Ill.; first vice-president, J. B. Martin, supervisor, N. Y. C., Elkhart, Ind.; second vice-president W. E. Muff, roadmaster, A. T. & S. F., Newton, Kan.; secretary P. J. McAndrews, roadmaster, C. & N. W., Sterling, Ill.; treasurer, T. F. Donahoe, general supervisor of road, B. & O., Pittsburgh, Pa.; members executive committee (two years), H. R. Clarke, district engineer, C. B. & Q., Lincoln, Neb.; B. C. Dougherty, roadmaster, C. M. & St. P., Chicago; (four years), J. P. Davis, roadmaster, Central Indiana, Anderson, Ind., and C. H. Gruver, roadmaster, C. R. I. & P., Manly, Iowa. Chicago was selected as the place where the next convention would be held.

On the same morning the Track Supply Association, which presented an exhibit in connection with the convention, elected officers: President, F. M. Condit, railroad department, Fairbanks, Morse & Co., Chicago; vice-president, J. J. Cozzens, salesman, Union Switch & Signal Company, New York; secretary-treasurer, W. C. Kidd, Ramapo-Ajax Corporation, Hillburn, N. Y.; director (two years), J. Howard Horn, sales manager, National Lock Washer Company, Newark, N. J.

New York Railroad Club Golden Jubilee Dinner

The New York Railroad Club will celebrate its fiftieth anniversary by holding a Golden Jubilee Dinner at the Commodore Hotel, New York, on Tuesday evening, December 12. The principal speaker of the evening will be Ex-Governor John J. Cornwell of West Virginia.

Ex-Governor Cornwell comes of very old American stock and is regarded as the leading citizen of the state of West Virginia. He is resolute and fearless and an able and clear thinker. One of his friends is responsible for the statement that "He believes that we are the greatest commercial and agricultural nation atop of earth and he believes in the American people and does not believe that demagogic politicians should injure the American people. He believes in the railroads of our country as the great distributors of our products."

H. H. Vreeland will preside at the dinner as toastmaster. George A. Post will speak of the importance of the club and Mr. Vreeland will trace its history. Ten days before the dinner 2,100 reservations had been made, so that it will be the greatest railroad event of this kind which has ever been held in this country. Reservations may still be made through J. F. MacEnulty, Pressed Steel Car Company, 55 Broad street, New York.

A Bill to Create Seven Regional I. C. C.'s

A bill to amend the interstate commerce act by providing for the creation of regional Interstate Commerce Commissions located in districts to be constituted by the Interstate Commerce Commission was introduced in the House on December 5 by Representative Hawes. Mr. Hawes also introduced another bill, which provides for the creation of seven district commissions to be designated, respectively, as the New England, Eastern, Southeastern, Central, Western, Southwestern and Pacific divisions of the Interstate Commerce Commission, each consisting of three commissioners appointed by the President, to be charged with the duty of enforcing the provisions of the interstate commerce act pertaining to rates as to the territory included within their divisions. The bill provides for hearings before the commission at Washington in cases involving two or more of such divisions and for appeals from the division commissions to the commission at Washington.

Wage Statistics for September—
Over $3,000,000 in Bonuses

The total number of employees reported by Class I railroads for the month of September, 1922, was 1,708,591, an increase of 114,517, or 7.2 per cent, over the preceding month, according to the monthly statistical bulletin issued by the Interstate Commerce Commission. The total compensation was $238,735,394, an increase of $13,758,750, or 6.1 per cent. The largest increase in employment appears in the maintenance of equipment and stores group, which was 96,505. The total number of employees falling within that group was 410,278, or 85 per cent of the average number employed during the 12 months preceding the strike. The number of persons employed as machinists, blacksmiths, or boilermakers was 69 per cent of the average for the year ended June 30, 1922.

As in August, the overtime made by shop employees was abnormally heavy, representing 25.57 per cent of their total compensation. In June, 1922, or the month just prior to the strike, this percentage was 2.62.

Reports from 181 roads employing 98 per cent of the total number of employees indicate that during the month the employees received bonuses amounting to $3,689,907 for loyal service performed during the strike, which amount is not included in this summary.

Compared with the previous month, the increase or decrease (D) in the number of employees, by groups, was as follows:

Executives, officials and staff assistants	119
Professional, clerical and general	D 7,060
Maintenance of way and structures	1
Maintenance of equipment and stores	96,505
Transportation (other than train, engine and yard)	5,685
Transportation (yardmasters, switch tenders and hostlers)	863
Transportation (train and engine service)	18,404
Net increase	114,517

The reduction in the number of employees in the professional, clerical, and general group was brought about by a reduction in the number of lieutenants and sergeants of police and patrolmen. In June, 1922, there were 8,482 employees in these two classes. In July, as a result of strike conditions, the number was increased to 39,430.

A comparison of the number of employees and their compensation, by months, follows:

Month	Number of employees	Total compensation
September, 1921[1]	1,718,330	$223,972,822
October, 1921[1]	1,754,136	237,602,959
November, 1921[1]	1,732,353	225,304,006
December, 1921[1]	1,637,151	214,921,396
January, 1922[1]	1,552,014	205,178,639
February, 1922[1]	1,545,040	194,523,427
March, 1922[1]	1,570,158	216,701,408
April, 1922	1,578,133	203,413,071
May, 1922	1,628,228	216,672,028
June, 1922	1,685,414	222,932,689
July, 1922	1,467,824	193,571,244
August, 1922	1,594,074	224,976,644
September, 1922	1,708,591	238,735,394

[1]Excludes Detroit, Toledo & Ironton.

Commission and Court News

Court News

U. S. R. A. Baggage Regulations

The Texas Court of Civil Appeals holds that not only did the baggage regulations promulgated by the Railway Administration during federal control set aside any state laws in conflict with them, but they were binding upon all passengers, interstate or intrastate, regardless of the passenger's lack of knowledge of the regulations or the failure of the carrier to inquire as to the value of the baggage—San Antonio, Uvalde & Gulf v. Nast (Tex. Civ. App.) 240 S. W. 596.

Sudden Application of Brakes Danger to Cattle in Cars

In an action for killing mules on the track the Texas Court of Civil Appeals holds that with a heavy train, 40 carloads of cattle moving down grade at 15 or 20 miles an hour, with the mules only 100 ft. ahead, it would have been poor judgment for the engineman to apply his brakes in emergency, even if he could hope to avoid striking the mules, since this would have thrown the cattle in the cars off their balance, to their injury; and a judgment for plaintiff was reversed.—Hines v. Pennington (Tex. Civ. App.) 240 S. W. 703.

Landowner's Contract to Repair Railroad Fence

The Tennessee Supreme Court holds that a landowner's contract to keep a railroad fence in repair with material furnished by the railroad on notice of defects, the owner releasing the company from all claims for damages to straying animals, is not invalid for want of consideration, since the statute does not impose on railroads the absolute duty of fencing their tracks; it merely makes them liable for the value of stock killed by its moving trains if the track is not fenced. The owner cannot recover for the value of his stock killed as a result of his own failure to give notice to the railroad of defects in the fence.—Buford v. Louisville & Nashville (Tenn.) 240 S. W. 759.

United States Supreme Court

Alleged Overcharge Not Recoverable Under Anti-Trust Law

Action was brought under the Anti-Trust Act by a manufacturer of excelsior and flax tow at St. Paul against eight railroad companies, members of the Western Trunk Line Committee and their officers, for damages alleged to have resulted from an agreement for uniform rates from St. Paul on excelsior and tow. The rates had been approved by the Interstate Commerce Commission. Whether there was a cause of action under section 7 of the Anti-Trust Act was the sole question for decision. The Supreme Court of the United States answers the question in the negative, affirming a judgment in favor of the defendants by the Circuit Court of Appeals for the Seventh Circuit (271 Fed. 444).

The plaintiff alleged conspiracy to eliminate competition. The Supreme Court holds that a rate is not necessarily illegal because it is the result of a conspiracy in restraint of trade in violation of the Anti-Trust Act. What rates are legal are determined by the Act to Regulate Commerce. Congress did not intend to provide the shipper, from whom illegal rates have been exacted, with an additional remedy under the Anti-Trust Act. "If a shipper could recover under section 7 of the Anti-Trust Act for damages resulting from the exaction of a rate higher than that which would otherwise have prevailed, the amount recovered might, like a rebate, operate to give him a preference over his trade competitors. It is no answer to say that each of these might bring a similar action under section 7. Uniform treatment would not result, even if all sued, unless the highly improbable happened, and the several juries and courts gave to each the same measure of relief."

It is the Commission which must determine whether a rate is discriminatory, in the first instance at least. Not only did the injury complained of rest on hypothesis, but the damages alleged were purely speculative. Damages must be proved by facts from which their existence is logically and legally inferable. They cannot be supplied by conjecture. Exaction of the higher legal rate may not have injured the plaintiff at all; and for every article competing with excelsior and tow, the adjustment of the rate must have been made. No court or jury could say that, if the rate had been lower, Keogh would have enjoyed the difference or that any other advantage would have accrued to him. Judgment for defendants affirmed. Keogh v. Chicago & North Western. Opinion by Mr. Justice Brandeis. Decided November 13, 1922.

Not Liable for Obstruction of River by Old Piles

In 1895 the California Pacific was authorized to build a new bridge over the Sacramento River at Sacramento, the approval of the Secretary of War being given on condition that the company remove the piers of the old bridge to a depth of 7 ft. below low-water level. This condition was complied with, the old piles being cut down three or four feet lower than was required, to a level with or below the then existing bed of the river. Subsequent dredging operations by the government gradually lowered the bed of the river until, in 1918, the old stumps protruded several feet above the river bed. In that year a dredger, drifting down the river, struck a stump and sank. The owner sued the California Pacific and the Southern Pacific, the railroads using the bridge, for damages for collision. The federal district court dismissed the libel. This was reversed by the Circuit Court of Appeals, Ninth Circuit, on the ground that the railroads should have guarded against the probability of the channel shifting and the river bed being lowered.

The United States Supreme Court has reversed the decree of the Circuit Court of Appeals and affirmed that of the district court, holding that the railroads were entitled to rely on the order of the Secretary of War, and having complied with it, could not reasonably be held to an indefinite and speculative responsibility for changed conditions. The subsequent obstruction was due to changes of a most radical character in the river channel, brought about, in the main, by the government itself, which the railroads were not negligent in failing to anticipate, so that, even leaving out of consideration the order of the Secretary of War, there appeared no ground on which the railroads could be held liable.—Southern Pacific v. Olympian Dredging Co. Opinion by Mr. Justice Sutherland. Decided November 13, 1922.

Not Liable for Injury to Boy Climbing Bridge

A public municipal steel truss bridge over the tracks of the New York, New Haven & Hartford at 149th street, New York City supports cross arms carrying bare electric wires for operating the trains. The nearest wire is 19 inches from the floor of the bridge. With difficulty and danger active boys can climb to the highest parts of the bridge and often did, until chased away. A board at each end of the bridge bore a warning against the danger of live wires. In June, 1916, a boy eight years old climbed to the top of the bridge after a bird's nest, touched the wire and received severe injuries, for which he and his father sued the railroad. The Circuit Court of Appeals, Second Circuit, affirmed judgments for the plaintiffs February, 1921, 271 Fed. 419.

The United States Supreme Court has reversed these judgments. "Infants have no greater right to go upon other people's land than adults, and the mere fact that they are infants imposes no duty upon land owners to expect them and to prepare for their safety," in the absence of some temptation amounting to invitation. In the present case there was no such invitation. "It is clear that if the plaintiff had been an adult, he could not recover; and we are unable to find any sufficient evidence from which the jury could have properly concluded that the railway company either directly or by implication invited or licensed him to climb upon the strut to a point from which he could touch the bare wire thirty feet above the street. The motion for an instructed verdict should have been granted." N. Y., N. H. & H. v. Fruchter. Opinion by Mr. Justice McReynolds. Decided November 13, 1922.

Labor Board Decisions

Drawbridge Operators Classified as Stationary Engineers

A question was raised by the employees of the New York Central regarding the classification and rating of the men in charge of the operation of a drawbridge which is swung by steam power at Charlotte, N. Y. The duties of these men consist of operating the engine incident to the swinging of the bridge, firing the boiler and making routine repairs to the power plant. The employees contended that these men should be classified as stationary engineers, while the railroad contended that they are drawbridge operators. The Labor Board decided that they should be classified as stationary engineers.—*Decision No.* 1354.

Right of Express Company to Reduce Number of Messengers

In the complaint filed against the American Railway Express by the Brotherhood of Railway and Steamship Clerks, etc., the right of the company to make a reduction in the number of messengers on trains between Clarksdale and Yazoo City, Miss., was contested. On March 14, 1922, the company abolished one run and so arranged the schedules that three messengers were able to handle the same trains as four had handled before. The employees requested that the runs be re-established with the four messengers and that the three messengers who had been assigned to these runs be paid a salary commensurate with the number of increased hours they had been compelled to work. As the evidence did not indicate that the reduction in crews and increase in mileage was made for the purpose of offsetting the rules of the agreement, the Labor Board denied the claim of the employees.—*Decision No.* 1338.

Trainmen and Conductors Required to Operate Air Dump Cars

The Order of Railway Conductors and the Brotherhood of Railroad Trainmen protested against the action of the Northwestern Pacific in requiring trainmen to operate "Lidgerwoods," Jordan spreaders or air dump cars. In drawing up the agreement with its employees the railway agreed to relieve trainmen from the physical operation of Hart convertible and similar types of work cars which are dumped by means of a ratchet operated by a man at the end of the car. Air dump cars require merely the manipulation of a valve located on the end of the car to dump the car and return it to the normal position after dumping. It has been the practice for trainmen to operate these valves, while maintenance of way employees were assigned to the operation of such cars as required physical effort. The Labor Board decided that the service required was not unduly burdensome and that it was reasonable to call upon trainmen to operate the valves on air dump cars.—*Decision No.* 1326.

Proof of Authority for Representation Required

On April 18, 1922, the chief executive of the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers claimed, before the Labor Board, that the organization represented a majority of the maintenance of way employees and railway shop laborers on the Wabash, Chester & Western. The railway contended that there was no controversy between it and its employees; that on that railroad there was no organization of the employees referred to and that the complainant organization did not represent anyone on that road; and it refused to deal with them. The Labor Board decided that the road should arrange to hold a conference with the representatives of the maintenance of way organization; and if they can produce evidence that the employees on this road have designated that organization to represent them, negotiations shall be conducted in an effort to agree upon rules and working conditions covering the employees involved.—*Decision No.* 1357.

Engine Watchmen Entitled to Meal Period

The Gulf Coast Lines employ three engine watchmen at Anchorage, La., each of which is assigned to work 8 hours a day, exclusive of the meal period, which makes a spread of 8 hr. and 20 min., from the time they report for duty until they are released. The employees contended that these men should be allowed 20 min., or more for a meal period without deduction in pay since they did not leave the premises of the road for lunch, nor neglect any of their duties; there was sufficient time in which to eat while waiting for steam or for an engine to fill with water or oil. They contended further that the carrier has no right to hold them on duty an extra 20 min., without extra compensation. The carrier contended that it was within its rights by arranging the shifts in this manner and requiring a 20-min. overlap. The Labor Board decided that in accordance with section a-2, Article V, of Decision No. 501, the employees should be granted a meal period not to exceed 20 min., without any deduction in pay and without being required to lap shifts or make up this time. *Decision No.* 1345.

Extended Leave of Absence Sustained

A bridge and building foreman on the Chicago, Indianapolis & Louisville was granted two months' leave of absence to serve as general chairman of the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers. At the end of this period he decided to retain this position permanently and the railway demoted him to carpenter, contending that an employee in a supervisory capacity should not act as general chairman representing the employees. He was further notified that if he expected to remain in the service of the carrier as a carpenter, he would have to work enough time to keep his name on the payroll. The employees appealed to the Labor Board, which decided that it has been a recognized and time-honored practice with practically all carriers having working agreements with their employees to grant leaves of absence (ofttimes indefinite with full retention of seniority rights) to general chairmen representing large groups of employees in order that they might perform the duties incumbent upon that position. The Labor Board decided that the carrier was not justified in refusing this man further leave and free transportation and that he should be restored to the seniority roster in accordance with his standing prior to his demotion.—*Decision No.* 1342.

Selection of Employee Representation

In accordance with Decision No. 119, the Pere Marquette entered into negotiations with a committee representing the United Brotherhood of Carpenters and Joiners of America which was recognized by the carrier as the duly recognized representatives of the workmen in the bridge and building department. In these conferences certain working rules and agreements were agreed upon, while certain others were not agreed upon and were submitted to the Labor Board for decision. Later the road entered into negotiations with the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers, in the course of which a disagreement arose regarding the scope of the rules so negotiated. The Maintenance of Way Brotherhood contended that it represented all employees in the maintenance of way department, while the carrier took the position that the bridge and building employees were represented by another committee and should therefore be eliminated from the scope of the rules under consideration. Later the carrier placed in effect the provisions of Decision No. 501 for all employees referred to therein, including those of the bridge and building department in lieu of the rules agreed upon in the conference with the committee of the United Brotherhood of Carpenters and Joiners of America. Representatives of the employees took the position that the road should not have applied Decision No. 501 to the employees in the bridge and building department in lieu of the rules that had been agreed upon. In its opinion the Labor Board took the position that it will not decide questions as to the jurisdiction of organizations nor as to representation of employees. It sustained the carrier in the application of Decision No. 501 to the employees of the bridge and building department and stated that the inclusion of these employees shall not preclude them from selecting representatives of their own choosing.—*Decision No.* 1358.

Foreign Railway News

New General Manager for the Great Eastern of England

S. A. Parnwell, assistant general manager of the Great Eastern of England, has been appointed general manager succeeding Sir Henry Thornton, K. B. E., who has gone to Canada to take up his new duties as president of the Canadian National Railways. Mr. Parnwell entered railway service as a surveyor for the Great Northern Railway (England) and in January, 1909, was appointed land agent of the Great Eastern. When Sir Henry Thornton became general manager, Mr. Parnwell was named as one of a committee to draw up a new plan for the organization of the company. When the new organization was put into effect Mr. Parnwell was appointed assistant to the general manager. In 1916 he became secretary and comptroller. During the war when Sir Henry Thornton's military duties kept him from his post with the Great Eastern, Mr. Parnwell served as acting general manager. At the end of hostilities he was appointed assistant general manager.

British Firms Secure South African Electrification Contracts

A number of British firms have secured the contracts for the railway electrification in Natal, South Africa. The total expenditure involved is placed at £4,500,000. Among the firms participating are: Metropolitan-Vickers Electrical Co., Ltd.; C. A. Parsons & Company, Ltd.; Babcock & Wilcox, Ltd.; British Thomson-Houston Co., Ltd.; Telegraph Manufacturing Company; A. Reyrolle & Company, Ltd.; South African General Electric Company. For the automatic telephone exchange equipment contracts aggregating £100,000 have been awarded to Messrs. Siemens Brothers & Company, Ltd., of Woolwich, England.

The contracts placed with the Metropolitan-Vickers Company include seventy-eight 3,000-volt, direct-current electric locomotives, according to the Times (London) Trade Supplement for November 25, 1922. The electrical equipment for the locomotives will be built at the Sheffield works of the Vickers Company. The section of railway to be electrified extends from Glencoe to Pietermaritzburg, a distance of about 200 miles. The new locomotives are expected to be capable of making a round trip from Ladysmith to Pietermaritzburg once every twenty-four hours for six days a week, the distance being 129 miles each way.

International

Georges Clemenceau at New Haven—Yale Students Cheering for Him

Equipment and Supplies

Locomotives

The Canadian National Railways are inquiring for about 65 locomotives.

The Lake Terminal has ordered two 8-wheel switching locomotives from the Baldwin Locomotive Works.

The Union Pacific has ordered one 12-ft. cut rotary snow plow from the American Locomotive Company.

The Louisiana Central Lumber Company has ordered one Prairie type locomotive from the Baldwin Locomotive Works.

Norton, Griffith Ltd., Ceara, Brazil, have ordered 2, 4-wheel switching locomotives and 2 Consolidation type locomotives from the Baldwin Locomotive Works.

The Georgia Northern has ordered one 4-6-0 type locomotive from the American Locomotive Company. This locomotive will have 19 by 26 in. cylinders and a total weight in working order of 143,000 lb.

The Detroit Terminal has ordered 2, 8-wheel switching locomotives from the American Locomotive Company. These locomotives will have 25 by 30 in. cylinders and a total weight in working order of 240,000 lb.

The Minneapolis, St. Paul & Sault Ste. Marie has ordered 5 Pacific type locomotives from the American Locomotive Company. These locomotives will have 25 by 26 in. cylinders and a total weight in working order of 269,000 lb.

The Union Oil Company, Oleum, Cal., has ordered one 4-wheel switching locomotive from the American Locomotive Company. This locomotive will have 16 by 24 in. cylinders and a total weight in working order of 99,000 lb.

The Warren Pipe & Foundry Company, Phillipsburg, N. J., has ordered one 4-wheel switching locomotive from the American Locomotive Company. This locomotive will have 16 by 24 in. cylinders and a total weight in working order of 99,000 lb.

The Lehigh Portland Cement Company, Allentown, Pa., has ordered one 4-wheel switching locomotive from the American Locomotive Company. This locomotive will have 14 by 22 in. cylinders and a total weight in working order of 79,000 lb.

The Riverside Portland Cement Company, Riverside, Cal., has ordered one 0-6-0 switching locomotive from the American Locomotive Company. This locomotive will have 18 by 24 in. cylinders and a total weight in working order of 128,000 lb.

The Essex Terminal Railway, Walkerville, Ont., Canada, has ordered one 6-wheel switching locomotive from the American Locomotive Company. This locomotive will have 20 in. by 26 in. cylinders and a total weight in working order of 145,000 lbs.

The Inspectoria Federal das Estradas for: E. F. Central do Piauhy (Brazil) has ordered one 6-wheel switching locomotive and one consolidation type locomotive from the American Locomotive Company. The switching locomotive will have 13 by 18 in. cylinders and a total weight in working order of 70,000 lb., and the consolidation type will have 17 by 22 in. cylinders and a total weight in working order of 90,000 lb.

The Denver & Rio Grande Western has ordered 10 Mountain type and 15 Mallet type locomotives from the American Locomotive Company. The Mountain type will have 28 by 30 in. cylinders and a total weight in working order of 377,000 lb. Of the Mallet type, 10 locomotives will have 25 and 39 by 32 in. cylinders and a total weight in working order of 531,000 lb. and five locomotives will have a total weight in working order of 230,000 lb.

Freight Cars

THE GREAT NORTHERN is in the market for 500, 75-ton steel ore cars.

THE ST. LOUIS, TROY & EASTERN is inquiring for 300 flat cars of 50 tons' capacity, also for 100 gondola cars.

THE TEXAS COMPANY, reported in the *Railway Age* of October 21 as inquiring for 100 tank cars, has ordered this equipment from the General American Tank Car Corporation.

THE CANADIAN NATIONAL RAILWAYS will ask for bids soon for 100 general service coal cars, 100, 40-ton freight refrigerator cars, 100 ballast cars, 800 automobile cars and 2,000 box cars of 40 tons' capacity.

THE UNION PACIFIC is asking for bids on 5,000 refrigerator cars. These cars are for the Pacific Fruit Express. The plans also include the construction of 300, 50-ft., refrigerator cars equipped for passenger train service.

THE SOUTHERN PACIFIC, reported in the *Railway Age* of December 2 as asking for prices on 5,000 cars, is now inquiring for 1,700 cars additional, as follows: 1,150, 50-ton, drop-bottom gondola cars; 50, 50-ton tight-bottom gondola cars, and 500, 40-ton logging cars.

THE CHICAGO, MILWAUKEE & ST. PAUL has ordered 1,000 gondola cars from the Pullman Company and 1,000 from the Western Steel Car & Foundry Company. This is additional to the orders placed by this company for 5,500 cars, as reported in the *Railway Age* of December 2.

THE NORTHERN PACIFIC, reported in the *Railway Age* of October 28 as inquiring for 3,000 box cars, has ordered 1,000 of these cars from the American Car & Foundry Co., 1,000 from the General American Car Company, and 1,000 from the Western Steel Car & Foundry Company.

THE ST. LOUIS SOUTHWESTERN, reported in the *Railway Age* of November 4 as inquiring for 1,200 cars, has ordered 500 box cars from the American Car & Foundry Company, 500 automobile cars from the Mt. Vernon Car Company and 200 convertible cars from the Rogers Ballast Car Company.

THE UNION TANK CAR COMPANY, reported in the *Railway Age* of November 11 as inquiring for from 500 to 2,000 tank cars of 10,000 gal. capacity, has ordered 1,000 from the Standard Steel Car Company, 1,000 from the American Car & Foundry Company, 500 from the General American Tank Car Corporation and 500 from the Cambria Steel Company.

Passenger Cars

THE MEXICAN POST OFFICE DEPARTMENT is inquiring for 30, 40-ft. steel mail cars.

THE CANADIAN NATIONAL RAILWAYS will ask for bids soon for 100 steel sleeping cars.

THE SOUTHERN PACIFIC contemplates coming in the market soon for about 140 passenger train cars.

THE NEW YORK CENTRAL, reported in the *Railway Age* of November 11 as inquiring for 72 cars for passenger service, has ordered 35, 70-ft. steel coaches with 4-wheel trucks from the Pullman Company; 5, 70-ft. combination passenger and baggage cars from the Pressed Steel Car Company and 10 multiple unit steel passenger motor cars for suburban service from the Standard Steel Car Company, all for use on the New York Central. An order has also been placed for 10, 60 ft. 6 in. steel baggage cars with the American Car & Foundry Company for use on the Michigan Central.

Machinery and Tools

THE NEW YORK CENTRAL is inquiring for a 6-ft. radial drill.

THE SOUTHERN PACIFIC has ordered a piston-rod grinder, a lathe and a quartering machine from the Niles-Bement-Pond Company.

Supply Trade News

The Power Specialty Company, New York City, has opened new branch offices in Detroit, Mich., in the Dime Savings Bank building, in charge of **L. Lanyi**, and in Boulder, Colo., at 2324 Fourteenth street, in charge of **R. B. Nutting**, who was formerly Chicago district manager.

Ray G. White, formerly Chicago branch manager of B. M. Jones & Co., Inc., has recently been appointed eastern railroad sales agent for the **McInnes Steel Company, Ltd.**, Corry, Pa., manufacturers of hammered crucible tool steels. Mr. White has opened a temporary office at 56 Murray street, New York City.

W. D. Hudson, formerly principal assistant engineer of C. E. Smith & Co., has resigned to become associated in the capacity of transportation engineer with Harland Bartholomew, city plan engineer, St. Louis, Mo. Mr. Hudson will handle railroad and waterway transportation, also grade crossing elimination problems.

The General Electric Company, Schenectady, N. Y., has set aside a fund of $400,000, the income from which will be available for encouraging and rewarding service in the electrical field by giving prizes to its employees. As an expression of appreciation to Charles A. Coffin, who retired in May 1922 from the active leadership of the General Electric Company, the board of directors named it the Charles A. Coffin Foundation.

E. D. Lynch, of the railway department, **Westinghouse Electric & Manufacturing Company**, East Pittsburgh, Pa., has been transferred to the New Haven, Conn., office, to fill the vacancy made by **J. P. Alexander's** removal to the Boston, Mass., office. **R. W. Everson**, sales manager of the Mexican branch of the Westinghouse Electric International Company, has been appointed district manager of the Atlanta, Ga., office of the Westinghouse Lamp Company, to succeed Julien Binford, Jr., resigned. **A. G. Crocker** has been appointed special power representative in the Detroit, Mich., office of the Westinghouse Electric & Manufacturing Company.

A. C. Scherer has been appointed assistant to C. W. Gennet, Jr., in the supervision of the rail and track appliances department of **Robert W. Hunt & Company**, Chicago. Mr. Scherer graduated from the University of Wisconsin in 1909, and immediately entered the employ of Robert W. Hunt & Company, since which time he has served consecutively as chief inspector at the Monterey (Mexico) Steel works, and at the Lackawanna Steel Company's plant, and in charge of the physical laboratory at Chicago, which position he held at the time of his recent promotion. He served as a lieutenant in the ordnance department of the United States Army during the war.

Lorenzo C. Dilks has resigned as vice-president of the George A. Fuller Company, New York, to become vice-president of **Starrett Brothers, Inc.**, New York City. Mr. Dilks' offices will be in Chicago. Starrett Brothers, Inc., is a new corporation, formed to carry on the business of building construction by Paul Starrett, formerly president of the George A. Fuller Company, Colonel W. A. Starrett, formerly vice-president of the George A. Fuller Company, prior to that chairman of the construction division of the War Industries Board and who was also with Starrett & Van Vleck, architects; Ralph Starrett, formerly of the Thompson-Starrett Company, Andrew J. Eken, formerly vice-president of the George A. Fuller Company, and Lorenzo C. Dilks.

Daniel M. Brady Honored

The directors of the Brady Brass Company, New York, tendered a luncheon at the India House, New York, on December 6, in honor of their president, Daniel M. Brady. The dinner was given in recognition of the fact that he has just completed a half century of service in the railway industry and two score

years in the metal trade. There were a large number of guests, all business friends of Mr. Brady. Hon. Morgan J. O'Brien presided as toastmaster and addresses were made by Henry A. Bishop of Bridgeport, Conn.; John F. Fowles, vice-president of W. R. Grace & Co., and C. S. Trench, editor of the American Metal Market. Mr. Bishop made a presentation speech, Mr. Brady being the recipient of a gold watch, suitably engraved for the occasion, from the stockholders of the company.

Obituary

J. J. McCarthy, treasurer and chairman of the board of directors of the Chicago-Cleveland Car Roofing Company, Chicago, whose death in Chicago from pneumonia on November 25 was reported in the *Railway Age* of December 2, was born at Burlington, Vt., on April 8, 1842, and moved to Chicago with his parents in 1845. His first railway experience was acquired with the Chicago & North Western in 1855. He was engaged in the banking business from 1856 to 1881 in Chicago, being associated with the Tinkeham Banking Company, George C. Smith & Company and the Bank of Montreal, consecutively. During the Civil War he was in the service of the Army of the Potomac in the Quartermaster's Corps, being stationed at Harper's Ferry. In 1881, he organized the Chicago Car Roofing Company, which later became the Chicago-Cleveland Car Roofing Company. At the time of the Chicago fire, when the currency of the banks of that city could not be reached because of the fire, Mr. McCarthy went to New York and secured the first currency that was put into circulation immediately following the fire. Mr. McCarthy was said to be one of the two oldest residents of Chicago.

J. J. McCarthy

Trade Publications

LOCOMOTIVE STARTER.—A booklet describing and illustrating the Street locomotive starter has recently been issued by Clement F. Street, Greenwich, Conn. Photographs and drawings are included showing the locomotive starter as applied to the trailer axle, and also diagrams showing the increase in starting tractive force obtained by the application of the starter to various types of locomotives.

TRUCKING COMPANIES which do business at railroad freight stations in Manhattan, New York City, number more than 150, and the problem of general store-door delivery continues perplexing. As indicating the magnitude of the business to be dealt with, W. H. Connell, assistant manager of the traffic bureau of the Merchants' Association, gives the following data: "During August the American Railway Express Company made 2,626,000 calls to pick up outbound shipments from Manhattan, Bronx, Jersey City and Brooklyn. During this period that carrier made 857,000 calls delivering inbound shipments, or a total of 3,483,000 calls. Of this total 85 per cent of the pick-ups and delivery calls was made on Manhattan Island. Vehicles used numbered 786, of which 412 were engaged in pick-up service for outbound shipments and 376 for deliveries. The pick-up wagons made 237 calls per vehicle per day. The average calls per vehicle in delivering inbound shipments were 2,280 or 84.4 calls per vehicle per day. . . . It is reasonable to assume that no trucking concern in New York city is making 84 calls per vehicle per day on either inbound or outbound freight shipments."

Railway Construction

BALTIMORE & OHIO.—This company has placed a contract with Seaboard Construction Company, of Philadelphia, Pa., covering the erection of new spans required to provide additional waterway at its bridge crossing Grand Calumet river, Gary, Ind. The additional opening supplements a 14-ft. arch built in 1908. The new spans are of the deck plate girder type, double-track, solid floor, 78 ft. and 25 ft. long, respectively.

CANADIAN PACIFIC.—This company has awarded a contract to the Sidney E. Junkins Company of Winnipeg and Vancouver for the construction of an ocean pier, 330 ft. by 850 ft., at Vancouver, B. C., at an approximate cost of $2,000,000. The work is to be completed by September 30, 1923.

CHICAGO, BURLINGTON & QUINCY.—This company will build a second main track for six miles between Sorento, Ill., and Ayres, at a cost of approximately $200,000.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—This company will construct a one-story frame shop 45 ft. by 200 ft., at Lafayette, Ind., to cost approximately $8,000, to replace one recently destroyed by fire.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—This company has awarded a contract to the Ogle Construction Company, Chicago, for the rebuilding of a coaling station of 300 tons' capacity at South Hammond, Ind., to replace one which was recently destroyed by fire.

ILLINOIS CENTRAL.—This company will construct a spur track 3 mi. long from the main line at Elkville, Ill., to the mine of the Black Servant Coal Company, at an estimated cost of $50,000. The work will be commenced at once by company forces.

MISSOURI PACIFIC.—This company has awarded a contract to the Herman & McCain Construction Company, Little Rock, Ark., for the construction of a passenger station at Harrisburg, Ark. The building will be 24 ft. by 71 ft., and will be of brick with slate roof.

PACIFIC SOUTHWESTERN.—This company has been granted permission by the Railroad Commission of California to construct a standard gage line from Lompoc, Cal., to White Hall, a distance of approximately four miles.

WISCONSIN SOUTHERN.—This company, which was organized recently, has completed surveys for a line from Madison, Wis., to Calumetville, and plans to begin grading and track laying in March, 1923. The road will eventually extend from Madison to Manitowoc and other lake Michigan points, a distance of 164 miles. The project is expected to cost approximately $2,600,000. C. D. Smith, of Fond du Lac, Wis., is president of the road.

Kadel & Herbert

Irish Regular Army Railway Patrol Between Cork and Mallow

Railway Financial News

BUFFALO & SUSQUEHANNA.—*Special Dividend.*—This company has declared a special dividend of $10 a share in addition to the regular quarterly dividend of 1¾ per cent on the common stock, also the regular semi-annual dividend of 2 per cent on the preferred stock. The dividends will be paid December 30 and distributed to holders of record December 15.

CHICAGO, TERRE HAUTE & SOUTHEASTERN.—*Authorized to Issue Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $713,000 of 5 per cent first and refunding mortgage gold bonds to be delivered to the Chicago, Milwaukee & St. Paul for the payment of certain obligations of the company and for the payment by the Chicago, Milwaukee & St. Paul for additions, betterments and extensions to the property of the C. T. H. & S. E. The Chicago, Milwaukee & St. Paul was also authorized to assume obligation and liability in respect of these bonds.

CINCINNATI, INDIANAPOLIS & WESTERN.—*Equipment Trust Certificates Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $300,000 of equipment trust certificates.

DETROIT, TOLEDO & IRONTON.—*Reserves Decision on Lease.*—Justice E. J. Gavegan in special term of the Supreme Court of New York on Tuesday reserved decision in the application of Leon Tanenbaum, representing minority stockholders in the Detroit, Toledo & Ironton Railroad, for an examination prior to the trial of a suit against Henry Ford to restrain the company from executing a lease for 75 years to the Detroit & Ironton Railroad. This latter company was organized under the laws of Delaware by Henry and Edsel Ford, who own almost the entire stock. The complainant, who alleges that he invested $10,000 in the old company, charges that the lease to Ford interests would deprive the minority stockholders from sharing in any of the profits that might be derived from the lease.

ERIE.—*Cash on Hand* $6,000,000.—President F. D. Underwood has denied reports of an impending receivership, stating that the company has cash in hand of about $6,000,000 and bills due January 1, 1923, amount to $2,737,411.

MINNEAPOLIS & ST. LOUIS.—*New Director.*—E. E. Nash, vice-president in charge of operation and maintenance of this road, with headquarters at Minneapolis, Minn., has been elected a director.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Dividends Declared.*—The directors have declared a dividend of $2 on both the preferred and common stock from the accumulated surplus of 1909 to 1919, inclusive, payable December 28 to stock of record December 15. The same dividend was declared by the Soo Line in March out of accumulated surplus. The preferred stockholders, however, took the matter into court, claiming that it was illegal to pay anything on the common until the full amount for the year had been paid on the preferred. The lower court upheld the company, but the case was appealed and is still in litigation.

MISSOURI, KANSAS & TEXAS.—*Sale Again Postponed.*—The sale of the properties of this railroad has again been postponed to December 13, 14 and 15.

MISSOURI-KANSAS-TEXAS.—*Reorganization Plan Approved.*—The Interstate Commerce Commission on December 4 issued an order approving the principal features of the reorganization plan by which the Missouri-Kansas-Texas Railroad is to take over the properties of the Missouri, Kansas & Texas and authorizing the issuance of the securities in accordance with the plan. The commission issued a certificate that the public convenience and necessity require the acquisition of 19 lines of the system and authorized the purchase of the stock of the companies, also the acquisition and operation under trackage agreements of 5 lines and terminal companies. Authority was also given for the acquisition of control of the property leased by the Booneville Railroad Bridge Company to the Missouri, Kansas & Texas and by the Oklahoma Belt to Charles E. Schaff as receiver for that company, but action was deferred on the request for authority to acquire that property or the properties of the Missouri, Kansas & Texas Terminal Company of St. Louis. Authority was given for the issue of $52,942,752 of prior lien mortgage gold bonds, series A, $27,236,000 of prior lien bonds, series B, $29,121,347 of prior lien bonds, series C, of which $6,500,000 are to be pledged with the director general of railroads, and $57,500,000 of convertible adjustment mortgage gold bonds. The company is also authorized to issue $30,000,000 of 7 per cent preferred stock and such additional amount as may be necessary to effectuate the conversion of the convertible bonds, also 1,000,000 shares of common stock without par value. Commissioner Eastman dissented.

NEW YORK CENTRAL.—*New Director.*—W. P. Bliss has been elected a director to succeed A. T. Hardin, deceased.

STEWARTSTOWN.—*Asks Authority to Issue Stock.*—This company has applied to the Interstate Commerce Commission for authority to increase its capital stock from $100,000 to $200,000 to pay for some improvements and to pay off a small bond issue.

TIONESTA VALLEY.—*Asks Authority to Abandon Line.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line from a point near Brookston to a point near Nansen, Pa., 8¾ miles.

WICHITA FALLS & OKLAHOMA.—*Asks Authority to Issue Securities.*—The Wichita Falls & Oklahoma Railway has applied to the Interstate Commerce Commission for authority to issue $6,000 of capital stock and $109,000 of first mortgage gold bonds and the Wichita Falls & Oklahoma Railroad of Oklahoma has applied for authority to issue $7,500 of stock and $418,000 of first mortgage bonds. The Colorado & Southern has also applied for authority to purchase the stocks and bonds of the Railway company and to nominally issue its refunding and extension 4½ per cent gold bonds to the amount of $542,000 and to acquire control of the Oklahoma company by purchase of its stock.

WYANDOTTE TERMINAL.—*Authorized to Issue Stock.*—The Interstate Commerce Commission has authorized this company to issue $415,000 of common stock for the purpose of acquiring property formerly held under lease and additional property.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out or received from the several roads the following amounts:

Pittsburgh, Chartiers & Youghiogheny Railway Co.	$328,000
Ithaca Traction Corporation	8,000
Fort Street Union Depot Company	19,000
Hannibal Union Depot Company	10,000
Leavenworth Terminal Railway & Bridge Company paid Director General	2,500

Tentative Valuations

The Interstate Commerce Commission has issued tentative valuation reports, in which it finds the final value of property owned and used as follows:

		Owned	Used
Nevada County Narrow Gage	1916	$609,270	.....
Georgia Railroad	1916	15,209,360	$17,521,976
Akron Union Passenger Depot Company	1916	301,713	305,763
Mineral Point & Northern	1917	556,927	.....
Crittenden	1916	176,680	.....
Lexington Union Station Company	1917	776,498	.....

Treasury Payments to Railroads

Since last announcement, dated November 1, 1922, payments under Sections 204, 209, 210 and 212 of the Transportation Act, 1920, as amended, have been made by the Treasury as follows:

Section 204:	
Bloomsburg & Sullivan	$15,235
Bristol Railroad	729
Chicago Tunnel Company	22,747
Chicago Warehouse & Terminal Company	64,246
Frankfort & Cincinnati	7,551
La Salle & Bureau County Railroad	13,414
Madison Southern	5,953
Moshassuck Valley	9,224
San Joaquin & Eastern	53,741
Sterling Mountain	48,632
Wisconsin & Northern	2,224

Section 20	
Asheville & Craggy Mountain	1,224
Carolina & Tennessee Southern	4,435
Central New York Southern	15,277
Chicago Tunnel Company	16,813
Chicago Warehouse & Terminal Company	46,806
Cincinnati, Indianapolis & Western	282,081
Cumberland Railroad	15,828
Danville & Western	37,549
Durham & Southern	70,167
Frankfort & Cincinnati	152
Georgia, Florida & Alabama	15,450
Gulf & Ship Island	160,970
La Salle & Bureau County	375
Marion & Southern	2,924
San Antonio, Uvalde & Gulf	82,718
Washington & Choctaw	2,202
Wisconsin & Northern	45,867
Yadkin Railroad	11,008
Section 210	0
Section 212	0
Total	$1,055,542

Total payments to November 30, 1922—		
(a) Under Section 204, as amended by Section 212 for reimbursement of deficits during federal control:		
(1) Final payments, including partial payments previously made	$4,142,914	
(2) Partial payments to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	1,079,502	
Total payments a/c reimbursement of deficits		$5,222,416
(b) Under Section 209, as amended by Section 212 for guaranty in respect to railway operating income for first six months after federal control:		
(1) Final payments, including advances and partial payments previously made	$111,245,534	
(2) Advances to carriers as to which a certificate for final payments has not been received by the Treasury from the Interstate Commerce Commission	212,965,672	
(3) Partial payments to carriers as to which a certificate for final payment has not been received, as stated above	126,494,722	
Total payments account of said guaranty		450,705,928
(c) Under Section 210 for loans from the revolving fund of $300,000,000 therein provided		317,886,667
Total		$773,815,011

Repayments of loans have been made to the amount of $90,339,985.

Dividends Declared

Bangor & Aroostook.—Preferred, 1¾ per cent, quarterly; payable January 1 to holders of record December 15.

Beech Creek.—50 cents, quarterly; payable January 2 to holders of record December 15.

Buffalo & Susquehanna.—Common, 1¾ per cent, quarterly; common (special), $10; preferred, 2 per cent, semi-annually; all payable December 30 to holders of voting trust certificates of record December 15.

Fonda, Johnstown & Gloversville.—Preferred, 1½ per cent, quarterly; payable December 15 to holders of record December 5.

Illinois Central Leased Lines.—2 per cent, semi-annually; payable January 1 to holders of record December 11.

Lackawanna of New Jersey.—1 per cent, quarterly; payable January 2 to holders of record December 6.

Lehigh Valley.—Common, $0.87½, quarterly; preferred, $1.25, quarterly, both payable January 2 to holders of record December 9.

Minneapolis, St. Paul & Sault Ste. Marie.—Preferred and common, $2; payable December 28 to holders of record December 15.

Morris & Essex.—3¾ per cent, semi-annually; payable January 1 to holders of record December 9.

New York & Harlem.—Common and preferred, $2.50; payable January 2 to holders of record December 15.

New York, Lackawanna & Western.—$1.25, quarterly; payable January 2 to holders of record December 14.

New York, Philadelphia & Norfolk.—$3, payable December 31 to holders of record December 15.

Pittsburgh, Ft. Wayne & Chicago.—Common and preferred, 1¾ per cent, quarterly; payable January 2 to holders of record December 9.

Pittsburgh, McKeesport & Youghiogheny.—$1.50, semi-annually; payable January 2 to holders of record December 15.

Rensselaer & Saratoga.—$4, semi-annually; payable January 2 to holders of record December 14.

Rochester & Syracuse.—Preferred, $1, quarterly, payable December 15 to holders of record December 5.

Valley Railroad.—2½ per cent, semi-annually; payable January 2 to holders of record December 16.

Trend of Railway Stock and Bond Prices

	Dec. 5	Last Week	Last Year
Average price of 20 representative railway stocks	64.53	64.53	60.28
Average price of 20 representative railway bonds	85.19	84.44	81.88

Railway Officers

Executive

W. C. Ramsay has been appointed assistant to the president of the Oklahoma, New Mexico & Pacific and general manager of the St. Louis & Hannibal, with headquarters at Hannibal, Missouri.

P. J. Neff, division engineer of the St. Louis-San Francisco, with headquarters at Ft. Worth, Tex., has been appointed assistant to the president of the International-Great Northern, with headquarters at Houston, Tex.

Robert P. Jones, whose appointment as assistant to vice-president-accounting of the Seaboard Air Line with headquarters at Baltimore, Md., was announced in the *Railway Age* of November 11, page 917, was born on April 20, 1892, at Norfolk, Va. He attended grammar school and business college and entered railway service in 1907 as an office boy in the engineering department of the Virginian Railway. In 1909 and 1910 he was employed by the Southern Railway successively as collector, baggagemaster, freight receiver and assistant cashier at Norfolk and Portsmouth, Va. In 1910 he entered the service of the Seaboard Air Line and served successively in a number of various capacities, among which were assistant general bookkeeper, special accountant, principal assistant to the corporate comptroller (during federal control) and assistant general auditor, which last named position he assumed on March 1, 1920, and which he held until the time of his recent appointment as assistant to the vice-president. From September, 1917, to January, 1919, Mr. Jones was employed as cost accountant in the Ordnance Department, serving in the capacity of assistant supervisor and supervisor and during the latter part of his period he was in charge of the Pittsburgh district cost accounting branch.

R. P. Jones

Operating

I. P. DeWitt has been appointed superintendent of the Middletown & Unionville with headquarters at Middletown, N. Y.

J. W. Leyden has been promoted to trainmaster of the Chicago & North Western, with headquarters at Madison, Wis., succeeding L. Jutton, resigned to engage in other business.

J. L. Kendall, superintendent of the Memphis division of the Missouri Pacific, with headquarters at Wynne, Ark., has been transferred to the Missouri division, with headquarters at Poplar Bluff, Mo., and **A. A. Miller,** superintendent of the Missouri division, has been transferred to the Memphis division.

J. C. Goodfellow, terminal trainmaster of the Southern Pacific with headquarters at Los Angeles, Cal., has been transferred to the Tucson division, with headquarters at Yuma, Ariz. **J. J. Sullivan,** trainmaster of the Tucson division, has been transferred to terminal trainmaster at Los Angeles, succeeding Mr. Goodfellow.

W. R. Davidson, general superintendent of Western lines of the Grand Trunk, with headquarters at Chicago, has been transferred to the Eastern lines, with headquarters at Montreal, Que., succeeding **R. H. Fish**, who has been transferred to the Ontario lines, with headquarters at Toronto, Ont. Mr. Fish succeeds C. G. Bowker, whose promotion to operating manager of Lines East of the Detroit and St. Clair rivers was reported in the *Railway Age* of October 21, page 775. **J. A. Clancey**, superintendent of transportation at Chicago, has been transferred with the entire operating department of the Western lines in the United States to Detroit, Mich.

L. B. Allen, whose retirement as general manager of Eastern lines of the Chicago, Burlington & Quincy, with headquarters at Chicago, was reported in the *Railway Age* of December 2, entered railway service in 1885, as a messenger boy on the Chicago, Milwaukee & St. Paul at Austin, Minn. From 1886 to 1889 he served the same road as station clerk and clerk to the master car builder at Minneapolis, Minn. He was promoted to yard clerk and secretary to the superintendent of the Minneapolis Transfer Railway in 1889 and held this position until 1893, when he entered the transportation department of the Great Northern with headquarters at St. Paul, Minn. He was promoted to secretary to the general superintendent in 1896, and on November 15, 1898, was again promoted to assistant superintendent of the Fergus Falls division with headquarters at St. Cloud, Minn. He was promoted to superintendent of the Willmar division with headquarters at Willmar, Minn., on September 1, 1899, and was transferred to the Dakota division with headquarters at Larimore, N. D., on October 1, 1902. A year later he was appointed superintendent of the Cedar Rapids division of the Chicago, Rock Island & Pacific, with headquarters at Cedar Rapids, Ia., and on February 15, 1904, he was transferred to the Illinois division, with headquarters at Rock Island, Ill. On February 1, 1906, he was appointed superintendent of the Ottumwa division of the Chicago, Burlington & Quincy at Ottumwa, Ia. He was promoted to general superintendent of the Wyoming district, with headquarters at Alliance, Neb., on July 25, 1906, and he held this position until May 15, 1909, when he was transferred to the Iowa district with headquarters at Burlington, Ia. On September 1, 1910, he was again transferred to the Nebraska district with headquarters at Lincoln, Neb., and on June 1, 1915, was promoted to assistant general manager of Lines East with headquarters at Chicago. He was promoted to general manager of Lines East on September 1, 1907, and held this position until his recent retirement from service.

L. B. Allen

S. E. Miller, superintendent of transportation of the Boston & Maine, has been appointed superintendent of the Southern division, succeeding **H. C. Robinson**, retired. **W. H. Towne**, assistant superintendent of transportation, has been appointed superintendent of transportation. Mr. Robinson retires after 52 years of service. He has served consecutively as freight clerk, clerk to superintendent, passenger conductor, train dispatcher, chief dispatcher, assistant superintendent and superintendent. Mr. Miller entered the service of the Boston & Maine at Beverly, Mass., in 1899 as an operator. He has served the company in that capacity and as ticket agent, clerk and inspector of freight transportation.

H. Hulatt, manager of telegraph of the Grand Trunk, with headquarters at Montreal, Que., has resigned to accept an executive position with the Alexander Hamilton Institute. Mr. Hulatt was born on February 15, 1883, in London, England, and entered railway service in 1907 in the stores department of the Canadian Northern. In March, 1908, he was appointed private secretary to the manager of telegraph of the Grand Trunk Pacific at Winnipeg, Man., and in October, 1910, was promoted to chief assistant in the same office. He was promoted to superintendent of telegraph of the lines west of Fort William, Ont., in January, 1913, and served in this capacity until October, 1915, when he was promoted to manager of telegraph at Montreal, Que., which position he held at the time of his recent resignation.

H. D. Brown, whose promotion to superintendent of transportation of the Chicago, Burlington & Quincy, with headquarters at Chicago, Ill., was reported in the *Railway Age* of December 2, was born on May 10, 1882, at Atchison, Kan. He entered railway service as a call boy on the Chicago, Burlington & Quincy at St. Joseph, Mo., on March 1, 1898. Shortly after, he was promoted to yard clerk and subsequently to chief yard clerk with the same headquarters. He was a freight brakeman on the St. Joseph division for a short time and was then employed as a clerk in the office of the trainmaster. Later he was promoted to chief clerk in the office of the superintendent at St. Joseph, and served in this capacity until his promotion to assistant chief clerk to the general manager with headquarters at Omaha, Neb. He was promoted to trainmaster with the same headquarters on December 1, 1916. During the period of federal control he was a transportation inspector on the staff of the regional director of the Central Western region with headquarters at Chicago. He was promoted to transportation assistant to the regional director on November 1, 1919, and held this position until the end of federal control when he was appointed assistant superintendent of the McCook division with headquarters at Denver, Colo. He held this position until his recent promotion to superintendent of transportation at Chicago.

Financial, Legal and Accounting

Henry Wolf Biklé, whose appointment as general attorney of the Pennsylvania was announced in the *Railway Age* of November 25, page 1023, was born at Gettysburg, Pa., on October 20, 1877. He attended Gettysburg College, from which institution he received the degree of bachelor of arts in 1897 and of master of arts in 1900. In 1901 he received the degree of bachelor of laws from the University of Pennsylvania. Mr. Biklé entered the service of the Pennsylvania Railroad in 1907 as assistant general solicitor and held that position until July 1, 1916, when he was advanced to assistant general counsel. This latter position he held continuously until the time of his recent promotion except that during federal control he acted as assistant general solicitor of the Pennsylvania, Lines East, and as legal adviser to the traffic assistant for the Allegheny region, U. S. R. A. In addition to his connection with the Pennsylvania Railroad, Mr. Biklé has served on the faculty of the Law School of the University of Pennsylvania in the following capacities: from 1901 to 1908, lecturer in law; 1908 to 1913, assistant professor; and 1913 to date, professor of law. In this latter capacity Mr. Biklé is still serving, his courses being Constitutional Law and Law of Carriers.

H. W. Biklé

W. R. Durland has been appointed auditor of the Middletown & Unionville with headquarters at Middletown, N. Y., succeeding I. P. DeWitt, appointed superintendent.

Traffic

H. Allen, division freight agent of the Missouri, Kansas & Texas, with headquarters at Tulsa, Okla., has been promoted to assistant general freight agent, with headquarters at St. Louis, Mo.

L. F. Kemper, general agent of the Louisville & Nashville, with headquarters at Pittsburgh, Pa., has been transferred to Cincinnati, Ohio, succeeding E. T. Arnold, deceased. **E. L. Blandford** has been appointed general agent, with headquarters at Pittsburgh, succeeding L. F. Kemper.

R. C. Kerr, local freight agent of the Chicago & North Western at Milwaukee, Wis., has been promoted to general agent of the freight department in the same city, succeeding C. Thompson, deceased. **E. P. Rueter,** city passenger agent at Milwaukee, has been promoted to general agent of the passenger department with the same headquarters, also succeeding Mr. Thompson, who served as general agent of both freight and passenger departments.

Edwin N. Todd, whose appointment as freight traffic manager of the Canadian Pacific was announced in the *Railway Age* of November 18, page 965, was born at Huntingdon, Que., on October 17, 1879, and was educated at Huntingdon Academy and Montreal Business College. He entered railway service in May, 1896, as a junior clerk and stenographer in the foreign freight department at Montreal. In 1898 he was advanced to import clerk and served in that capacity at Montreal and at West St. John. In June, 1903, he became a contracting clerk in the office of the assistant freight traffic manager at Toronto. In May of the following year he was advanced to contracting freight agent in the foreign freight department at Toronto. He was promoted to assistant export and import freight agent with the same headquarters in May, 1905, and remained in that position until January, 1909, when he became export freight agent at Montreal. In September, 1911, he was appointed division freight agent at Montreal and, in September, 1915, was advanced to general freight agent. He was appointed general foreign freight agent in March, 1919, and served in that capacity until the time of his recent promotion to freight traffic manager.

E. N. Todd

E. M. Kain, general agent of the Erie, with headquarters at Buffalo, N. Y., has been appointed general freight agent, with the same headquarters. **W. R. Dusenbark,** general agent, with headquarters at Akron, Ohio, has had his jurisdiction extended over freight traffic in the Chicago region between Kent, Ohio, and Mansfield. **A. R. Tennis,** division freight agent, with headquarters at Marion, Ohio, has been assigned to the district from Mansfield, Ohio, to Kings Creek. **J. H. Hackett,** division freight agent, with headquarters at Huntington, Ind., has been assigned to the territory between Espyville, Ohio, and Saxony, Ind. **E. J. Brattain,** division freight agent, with headquarters at Dayton, Ohio, has been assigned to the territory between Urbana, Ohio, and Dayton. **L. Enos,** division passenger agent, with headquarters at Mansfield, Ohio, has been assigned to the territory between Kent, Ohio, and Dayton. **L. B. Smith,** division passenger agent, with headquarters at Huntington, Ind., has been assigned to the territory between Hammond, Ind., and Marion, Ohio. **M. P. O'Brien,** milk and live stock agent, with headquarters at Chicago, has been assigned to the territory between Chicago and Kent, Ohio, and between Marion, Ohio, and Dayton

Mechanical

G. T. DePue, mechanical superintendent of the Ohio region of the Erie, with headquarters at Youngstown, Ohio, has been transferred to the Chicago region, with headquarters at Chicago, Ill.

D. Davis, assistant master mechanic of the Lehigh Valley with headquarters at Easton, Pa., has been promoted to master mechanic with headquarters at Coxton, Pa., succeeding W. B. Woolever, resigned.

W. S. Tasker, general foreman of shops on the Atchison, Topeka & Santa Fe at Clovis, N. M., has been promoted to master mechanic of the Panhandle division, with headquarters at Wellington, Kan., succeeding **A. Dinan,** who has retired on pension.

Engineering, Maintenance of Way and Signaling

F. G. Jonah, chief engineer of the St. Louis-San Francisco, with headquarters at St. Louis, Mo., has been appointed assistant to the president and chief engineer in charge of engineering, maintenance and construction, with the same headquarters.

F. G. Swofford, trainmaster of the New York Central, with headquarters at Gibson, Lake County, Ind., has been appointed superintendent of telegraph on the Indiana Harbor Belt Railway and assistant superintendent of telegraph on the Illinois division of the New York Central, succeeding W. L. Connelly, deceased.

Special

Edgar J. McClees, secretary of the Bureau of Information of Eastern Railways, has been appointed secretary in charge of the bureau, succeeding J. G. Walber. Mr. McClees was born on March 31, 1875, at Philadelphia, Pa., and attended public school in that state. He entered railway service on September 15, 1890, as telegraph operator and extra agent on the Philadelphia division of the Pennsylvania Railroad. In 1897 he was transferred to telegraph operator in the office of the superintendent at Philadelphia and in 1904 was advanced in the same capacity to the general office of the company. In 1910 he was appointed clerk on wage matters in the office of the superintendent of telegraph, the superintendent of telegraph being at that time chairman of the general managers' labor board. In 1912 he was assigned to special duties with the Conference Committee of Managers of Eastern Railroads and in 1914 was advanced to chief clerk of the Bureau of Information of Eastern Railways. In 1918 he was appointed assistant secretary of the bureau and served also as chief of the wage bureau of the Eastern Region of the Railroad Administration. In 1921 he became secretary of the Bureau of Information of Eastern Railways and held that position until his advancement to the position of secretary in charge.

E. J. McClees

Obituary

E. C. Arnold, general agent of the Louisville & Nashville, with headquarters at Cincinnati, Ohio, died on November 24.

W. Queenan, assistant superintendent of shops of the Chicago, Burlington & Quincy with headquarters at Aurora, Ill., died November 28 after a short illness.

Railway Age

EDITORIAL

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Difficulty in Changing Shop Methods

Science, art and industry are in a continual process of change and development, and yet man is so much a creature of habit that he often unconsciously resists changes vital to his best interests. Perhaps this explains why in many railroad shops, new machines or methods of doing the work are introduced only with great difficulty and after unnecessarily long test periods. In some cases it is difficult to get new methods tried at all, and doubtless railroad shop operation is not now on as efficient a basis as it would be if shop executives and men as a whole kept in closer touch with modern industrial shop methods, adopting those best suited to railroad conditions and needs. All too often, satisfaction with a given process because it has always been done that way is a sign of indifference and laziness, pure and simple. The argument that it is best to leave well enough alone applies occasionally, but it can be greatly overworked. When used as a justification for resisting all changes and improvements in methods, it means mental stagnation and decay on the part of men holding it, and loss of money to their employers. One of the practical things which higher mechanical department officers can do to improve shop and roundhouse operation is to instill in their subordinates the idea that present shop methods are by no means perfect and a continual effort should be made to improve them. If shop foremen, for example, once get this idea and are encouraged to read technical papers and visit other shops, both railroad and industrial, where efficient operation obtains, the results in improved operation of railroad shops will be immediately noticeable.

The Next Step to Consider

In a recent issue of the *Railway Age* appeared an editorial entitled "The Water Supply and Traffic Movement." As readers may recollect, this editorial referred to the extraordinary demands which are now being made and which will continue to be made for some time upon railroads of the country for transportation service. It dwelt upon the relation borne by the water supply to this situation. It referred to the responsibility resting upon all officers engaged in or having jurisdiction over water service so to adjust all operations and practices in this department as will contribute most effectively to the unobstructed movement of cars, and finally it enumerated typical operations and practices warranting investigations directed to this end. But what does it avail to devote consideration to this factor in transportation if no agency exists which can be depended upon to put any findings made into effect? This observation brings us to the next step to consider, namely, the importance of having a water service organization. Mention has been made to the responsibility of officers engaged in or having jurisdiction over water service. As a matter of fact, on those roads upon which, generally speaking, water service warrants particular investigation at this time, there are no such officers, in the proper conception of the term. On many roads the water supply rather than being the primary function of some one officer or officers is only the incidental concern of not only several officers, but of several departments. For instance, it often happens that the engineering department is found effecting a change entirely out of harmony with the immediate interests of the mechanical and operating departments and vice versa, or the operating department is found establishing a practice inconsistent with the best interests of either. As a result, what is everybody's business is made nobody's, and the water supply, though the management may not be aware of it, does not function as it should and could if properly handled. Admittedly, it can be handled in the unorganized way which is typical of many roads, but in the interests of transportation it ought to be the special function of a water service organization.

The "Main Tracker" Expedites Movement

One of the objections which has been raised most frequently against the practice of classifying trains for movement through intermediate terminals without break-up is that it delays the cars so classified. In arriving at this conclusion consideration is given only to the originating terminal. It is evident that cars must be held longer at this point if trains are to be made up for a number of terminals than if they are grouped only for the next terminal and are forwarded as soon as there are a sufficient number to make a train. In raising this objection no thought is given to the time which is saved by keeping cars out of the intermediate yards. If a train can be moved through a terminal with only the minimum inspection and the changing of locomotives and cabooses and without breaking it up, it can proceed on its way with relatively little delay, whereas if it is necessary to break it up it is the common experience that the average delay to cars exceeds eight to ten hours. In general, on a line of fairly heavy traffic, any delay in the originating terminal is made up at the first terminal outside and the saving in time at other terminals is a net gain. That this practice expedites rather than delays traffic has been demonstrated on those roads which have applied this method systematically. One road which has specialized on the grouping of trains operating between large centers has found that the reduction of delays in the intermediate yards has enabled these schedules to be shortened as much as 24 hours in some cases, while at the same time it has been possible to add to the tonnage of these trains. From a competitive standpoint, this practice has enabled this road to secure business from other lines which are not able to make deliveries with the same regularity. This improvement in service was effected over and above a saving of one and a half million dollars in operating expenses in the first year it was in effect.

Give the Desk Man a Chance

Commissioner Meyer recently called attention to the fact that one man out of every eight in railway service is a clerk and to this class may be added others whose work keeps them in the office, so that an even greater proportion are denied the broadening influence of a physical contact with the real business of transportation. It has often been said that the desk man is more susceptible to dry rot or petrification than the one who rides on trains or who is directly concerned with the maintenance of cars and locomotives or the tracks on which they run; there is no denying that this barrier between the

man at the desk and the real business of the company which employs him not only decreases his efficiency for the work in which he is directly employed, but curtails his opportunity for advancement. This condition may be overcome at least in part by affording the office man some measure of opportunity to see railroading first hand. A train dispatcher who rides over the division is not only afforded a chance to see what a train is "up against" in moving from "A" to "B", but he will probably get an "earfull" from a conductor or two which will provide him with ample food for thought, granting, of course, that it must be taken with several grains of salt. An agent directing a large city ticket office, handling a heavy coupon ticket business, recently testified to the increased efficiency of a young woman on the staff who obtained a first-hand knowledge of the more popular vacation trips by taking the tours herself as opportunity afforded. Another group, whose work may well be benefited by direct contact with the physical facts, includes the auditor of capital expenditures and his staff; this was recently exemplified in a tour of inspection made by an auditor and a chief clerk over a section of heavy second-track construction accompanied by the engineer in charge. These men went back to the office with a better knowledge of the physical significance of the expenditures with which they were dealing that will pay the railroad many times over for the time and traveling expenses incurred while on the line. The fact that a recent list of appointments to important operating positions on one railroad included the names of two men whose training had been primarily clerical testifies to the ability of the office man to demonstrate his merits if he is given the chance.

The Future of the Irish Railways

The commission appointed by the Irish provisonal government to study the railway situation has recommended government ownership. These railways are at present operated by 28 companies and have 3,500 miles of line. The railways were released from government control on April 15, 1921, and immediately found themselves faced with a serious labor problem, arising out of the dissatisfaction of the employees with wages and working conditions. Arbitration was resorted to but the employees were not satisfied with the result. The commission of inquiry was then appointed to try to find a solution of the labor problem and, in general, to design a workable plan for the future operation of the railways. The commission's report recommends the acquisition of the properties by the government, payment to be made in bonds rather than in cash; the operation of the railways by a board of eight members—one an experienced railway officer, four representing industry and trade, two representing labor and one representing the Irish treasury; and the setting up of sectional conciliation councils, a general railway council and a general conciliation board to deal with labor disputes. The Irish railways under private ownership have been in a most unfortunate position since the war. Wages have increased 300 per cent and prices of material and supplies have increased tremendously. On the other hand, water competition is severe, with most important producing centers located on the sea or navigable rivers. The advantages of centralized ownership and operation by the government are enumerated as: (1) The saving in supervisory personnel, (2) the co-ordination of the services to avoid duplication, (3) standardization of equipment, and (4) the purchasing of supplies in larger quantities. It is thought that the management by a board rather than by a cabinet minister will remove the roads from political control. Acquisition by the government seems to be the lot of railways the world over when they are so unfortunate as not to be able to pay high wages to their employees, offer low rates to shippers and pay dividends sufficiently attractive to bring needed new capital into the enterprise. There seems to be no reason, however, why a combination of properties could not be brought about in Ireland as in England without government ownership and operation. The advantage of private initiative could then be retained together with any benefits which might arise from unified operation.

How Much Surprise Testing Do You Do?

How often must a surprise test be made, for any given engineman, in order to afford reasonable assurance that his propensity to let his mind wander is being thwarted as thoroughly as possible? That is to say, as thoroughly as is possible by means of surprise checking. A speaker at the last convention of the signal engineers, in New York City, said that on his road each trainmaster is required to make 30 surprise tests a month. If a trainmaster has 90 enginemen that means on the average one test for each runner every three months. So far as the signal engineer is concerned, many of the tests included in most surprise schemes have no definite value. Practically all that he cares to know is that the engineman is vigilant at distant signals. If we exclude all tests but those at distant block signals, it is probable, on any road, that most enginemen are tested by the trainmaster less frequently than once in three months. Is not that spreading the tests out pretty thin? Even if a "test" means an eight-hour tour, in which surprises are sprung on as many enginemen as practicable, the adequacy of the program, as regards frequency, still remains questionable. A very practical question for every trainmaster is, How many men should I employ to assist me in this part of my work? Or, to put it in the way that the question first appeals to his mind, how many men can I afford to employ? How many will the general superintendent approve? The speaker to whom we referred believed it to be, probably, impossible for the superintendent of runners traversing 100 or 200 miles of line to enforce the high degree of vigilance in signal observance that prevails on the Interborough Rapid Transit Company's lines (where any runner can be interviewed every few hours and where all block sections are less than 1,000 ft. long); and that may be so. It is certain that the runner who aims to discipline himself finds the task much easier where block sections are short and of uniform length. It would be very interesting, however, to have a direct statement from any superintendent who will deliberately aver that he has done everything that can be done to imitate the discipline of the subway lines.

Increase Miles Per Hour by Decreasing Delays

The prime object of transportation is to remove the barrier which distance imposes on commerce. Second only to this is the conservation of time. The importance of this second element has always been recognized in passenger service but it is only within recent years that any adequate consideration has been given to it in the case of freight train movement. For many years the ton-miles per trip, which is only another way of saying the tons per train, was considered an adequate measure of freight train performance. There is now a growing appreciation that the time consumed in making this trip must also be given some consideration and ton-miles per train hour is coming into use as a measure of freight train performance. This unit carries with it the suggestion that tonnage and time are opposing factors in the ratio and that if less tonnage means less time there might be a possibility of increasing the value of the ratio by decreasing the train load. Considerable light is thrown on this question by a series of tests conducted on the Illinois Central during the

Railroad Administration operation, an account of which will be found on another page in this issue. In the light of these tests the ton-mile per train-hour ratio seems to be a satisfactory measure not only of the amount of transportation per train unit but also of the efficiency with which it is rendered. The tests indicate, however, that the operation of light trains generally does not permit a sufficient decrease in time between terminals to increase the ton-miles per train hour because of the disturbing effect of delays, which were found to be the largest single factor in the equation. This gives emphasis to the importance of eliminating delay in order that the economy of operation as well as the capacity of the line may be increased. The elimination of delays requires the utmost care in every feature of train operation, but the dispatching and spacing of trains is the factor which probably affects the results most directly. Where excessive delays are constantly encountered it no doubt indicates a need for additional track facilities. But even in this case the best utilization of any additional facilities that may be secured, will only be obtained by the utmost skill in dispatching. The ideal conditions would be a scheduled operation which did not vary from day to day, thus making possible a 100 per cent utilization of carefully located passing tracks. Of course, no such operation can be obtained, but is there not a possibility that it may be much more closely approximated than it now is, by the establishment of fixed times for dispatching freight trains with time intervals based on the requirements of the maximum traffic, some of which may be cancelled without disturbing the others, when less trains are required? Some such methods of scheduling have already been tried on several railroads with marked success in the reduction of delays.

Developing Efficient Shop Employees

In the *Railway Age* for December 9, the Human Problems of the Mechanical Department were discussed and several suggestions were made as to what the Mechanical Division might do regarding the training of foremen. The question of the foremen is a big one, yet it is only a part of the labor problem in the mechanical department. Settling the strike has enabled many railroads to obtain their full quota of mechanics. But the individual efficiency of the employees is far more important than the number of men in the shop. The strike settlement did not automatically make efficient mechanics of the new employees and it did not remove the principal causes of labor unrest.

During the past few months shop organizations have been completely disrupted and it will take a long time to build them up again. The forces must be reorganized and while the railroads have the opportunity they should see that the forces are put on a better basis than before. There is a tendency to place the entire responsibility for training men upon the foreman. This is a mistake because the foreman already has too many duties. The railroads need to take more definite measures to train the men in the various crafts. Some railroad officers will, no doubt, say that on their roads apprentice courses are maintained for training competent mechanics. This is fine if apprenticeship really means more than time-serving, but how many competent all-round mechanics have come out of the apprentice courses in recent years? How can apprentice training be utilized in educating the many new men now in the shops? Training methods should be developed that will improve present conditions and that will be suitable to insure a sufficient number of competent mechanics under conditions that may be expected in the immediate future. Is apprenticeship impracticable under present conditions? Some roads maintain that the only salvation for the shops and roundhouses lies in the development of specialists but, on the other hand, at some shops there is a waiting list of high-school graduates who have applied for admission to the apprentice courses.

No doubt a great deal of labor trouble could be avoided if railroad managements would deliberately pay more attention to keeping the employees interested and contented. There is a tendency in some quarters to regard this merely as a question of wages. As a matter of fact, it goes far deeper into the life of the workman. The average employee has an ambition to get ahead in the world; he cannot be satisfied without the consciousness of progress or the anticipation of increased future rewards. No doubt the reason why many men put their loyalty to the union before their loyalty to the company was because they believed the only prospect for larger income lay in the union's program. This indicates the necessity for providing graduated wage scales, piecework and bonus systems, or other incentives for the employees.

Another cause of discontent among the shop men is the belief, carefully fostered by the labor leaders, that railroad profits are unreasonably large and that the wage earners are not getting a fair share of the gross revenues. The campaign of misrepresentation has led to shirking, sabotage and strikes. It still threatens to undermine the organization. We read with amazement of the workmen breaking the first machinery that was built to increase production. Production at the present is not entirely dependent on machinery; it depends fully as much on organized effort. Today the unions are deliberately trying to break down the organizations on which production depends and are setting up friction which keeps them from functioning, yet practically nothing is done to counteract this.

The work of establishing a proper understanding among railroad employees should not be left entirely or mainly to public relations or labor specialists. The local officers should be made to understand that technical skill is only a part of their equipment; that an understanding of the human problem is of equal, or even greater, importance; that they should study carefully every condition which leads to discontent and thereby reduces production. The results obtained in shops still depends quite as much on personnel and organization as on facilities. No one can deny that the personnel problem is and will continue to be one of the most important factors in shop management and shop production. It is one of the outstanding problems and is so big and vital that the Mechanical Division cannot afford to ignore it. The question demands immediate and thorough consideration; this is another reason why the Mechanical Division should not fail to hold a real convention next year.

"Salesmanship in Transportation"

The railways of the country might well publish and send to every employee who sells passenger tickets the address on "Salesmanship in Transportation" delivered by C. A. Cairns, passenger traffic manager of the Chicago & North Western Railway, at the annual convention of the American Association of Railroad Ticket Agents at Savannah, Georgia, on November 13. We publish most of Mr. Cairns' address elsewhere in this issue.

A very large part of all the people in the country buy passenger tickets every year. This is the only form of direct dealing with the railroads that most of them ever have. They have to give their tickets to the conductor but the conductors do not sell them anything. As Mr. Cairns points out, the ticket agent is a railroad salesman in exactly the same sense that a clerk in a store is a salesman. For the benefit of his employer the ticket agent should show the utmost courtesy to every customer and appreciation of the business the customer is giving to the railroad. He should

be so thoroughly informed regarding his goods, which consist of trips on railways throughout the United States, that he can promptly give to the customer all the information he desires. The salesman who does not know his goods and how to present their merits attractively is a poor salesman.

Mr. Cairns' address shows plainly that he knows most railroad ticket agents are poor salesmen. Everybody who has frequent occasion to buy tickets knows this. The average railway ticket agent is quite as well paid as the average clerk in a store but the average ticket agent does not greet his customer with the cordiality that the store salesman does; he is more likely to show ignorance of what he is trying to sell and he is more likely to treat the customer contemptuously if the customer shows ignorance about what he is trying to buy. A chilly attitude, curtness in speech and other characteristics never shown by salesmen are shown by a large majority of railway ticket agents. How many ticket agents ever even say "Good morning" in greeting a customer, or "Thank you," when they take the customer's money? Extremely few.

Mr. Cairns related the incident of a railroad that required its ticket clerks to keep a tally over a period of ten days of the number of the total prospective travelers who called. Subsequent comparison of the total prospects with the total sales made revealed a most unsatisfactory situation. A contest was then started among the ticket agents with prizes for increased sales, and the result was a large increase in the number of sales. The principal point of this story seems to be that the kind of ticket salesmen a railway will have will depend upon what efforts the management makes to develop ticket salesmen. The same thing is true of selling in every branch of the railroad business. Whether a railroad and its service will in the long run be sold right to its customers will depend mainly upon the efforts that the management makes to select the right kind of men to deal with the public, to teach them how to deal with it and to check up on their work to make sure that they are dealing with it right.

While Mr. Cairns' address dealt chiefly with salesmanship in the passenger department, most of it is of much broader application, and it may be read and pondered with profit by officers and employees in every branch of the business.

The Proposed National Transportation Institute

THE ESTABLISHMENT of a "National Transportation Institute" was advocated in addresses made at a dinner in Chicago last week by men representing three different points of view. Those making the addresses were Representative Sidney Anderson, chairman of the Joint Commission of Agricultural Inquiry of Congress, James R. Howard, president, and C. B. Hutchings, transportation manager, of the American Farm Bureau Federation, and Bird M. Robinson, the president of the American Short Line Railroad Association.

The idea of the need for such an organization was an outgrowth of the work of the Joint Commission of Agricultural Inquiry. This body made a remarkably thorough investigation of the relationship of transportation to agriculture and industry. It found it impossible to get a great deal of the information that it wanted. It also found, however, that when the facts regarding any particular situation could be ascertained it was comparatively easy to get men representing diverse interests to agree on the conclusions to be drawn from these facts.

The proposed National Transportation Institute would be supported by and would represent the large agricultural, manufacturing, mining, banking and transportation organizations of the country. It would have a twofold purpose. The first of these would be to investigate and ascertain the facts regarding the relationship of railway rates and service to agriculture, to manufacturing, to mining and to the general public interest. Its second purpose would be to disseminate the information gathered and the conclusions reached among all special interests and the general public in order to form and maintain a sound public opinion regarding transportation matters.

The desirability of accomplishing the objects mentioned is plain. There is no other industry in this country which has been investigated so much and scrutinized so closely by public officials as the railroad business. There is no other industry regarding which so much information is available to those who really want it. The widespread prevalence of misinformation about the railroad business is chiefly due to misrepresentations of it by persons who have deliberately misstated the facts and by persons who have ignorantly repeated these deliberate misstatements. There is, however, a great deal of information not readily available which an institute such as that suggested could collect and make more readily available. But the most valuable function it could perform would be that of disseminating correct information with an authority that would cause it to be accepted by, and through channels and in ways that would cause it to reach all classes of people in all parts of the country.

If, however, such an organization were to accomplish anything that cannot be accomplished through existing organizations one thing would be prerequisite. This would be that it should represent and be supported by the agricultural, industrial and financial interests as well as by the transportation interests. If most of the money for its support were furnished by the railways the information given out and the conclusions stated by it regarding railroad matters would be discounted by many people to as great an extent as these same people now discount information given out and conclusions stated by organizations or persons representing the railroads. The first and most practical question to be raised regarding the proposed organization, therefore, is whether it can enlist the confidence and support of farmers' and business men's organizations. If it can the railways will be justified in giving it their reasonable share of the support it will need. If it cannot first command confidence and support from other interests, the railroads had as well have nothing to do with it.

A transportation institute which did not represent and receive its support ratably from and command the confidence of both those who buy and those who sell transportation service, but which was supported mainly or entirely by the railroads, would merely duplicate the work and expense of existing railroad organizations of high character, such as the Bureau of Railway Economics.

Do the business men and farmers of the country really want to know the facts about the transportation industry and about the relationship of its rates and service to other industries? Do they really want the facts disseminated among the public, and the public's policy of dealing with transportation agencies based upon the facts? Do they really believe that a fair and sound policy on the part of the government in dealing with transportation problems would be beneficial to all concerned? If they do, will they show their belief by indicating their willingness to give material as well as moral support to a proposed institute whose creation is endorsed and advocated by men so entirely removed from railroad influence as Mr. Anderson, who is chairman of the House Committee on Agriculture, and Mr. Howard the head of the largest farmers' organization in the country?

The railroads might well give their support to such an organization along with other special interests, because the railroads have everything to gain and nothing to lose by having the actual facts regarding them more thoroughly investigated and more widely disseminated.

The Standardization of Lumber

THE PURCHASER of lumber is at a marked disadvantage as compared with the buyer of steel because of the much greater variability of the product. The basic reason for this lies in the fact that the lumber manufacturers simply cut into workable shape and sizes a product otherwise entirely finished by nature, while the steel maker has almost complete control of the quality as well as the size and shape of the product. Because nature produces timber in infinite variety as to density and strength with an unending variation as to natural defects, no two pieces of finished lumber can be exactly alike. Furthermore, the common implements for reducing timber to finished lumber, namely, the saw and the planer, function through the reduction of a considerable portion of the material to sawdust and chips. This affects the sizes of the finished material with the result that a so-called "two by four" is rarely, if ever, two inches thick by four inches wide. Steel and iron have fixed specific gravities. Consequently, they are readily sold by weight, but the specific gravity of lumber varies with the species, the rate of growth and the water content, making it necessary to sell wood by volume, that is, by designating a given number of pieces of a specific size and length. This has led the unscrupulous dealer to depart even further from nominal sizes than is necessary because of the limitations of manufacture.

Efforts have been made from time to time by organizations of both the users and the producers of lumber to effect some measure of standardization which would correct some of the obstacles which beset the lumber buyer. However, owing to the fact that the industry covers widely separated territories with more or less diversified interests, the standards which have been set up are limited in their scope to the specific species of timber, consequently the grading rules established for one kind of lumber differ widely from those set up for competing species produced in other portions of the country.

It is in an effort to effect a further standardization of lumber practices that a movement has been started through the agency of the United States Department of Commerce under the leadership of Herbert Hoover. Actually, the efforts are being directed through a voluntary organization in the lumber industry, representing the manufacturers, wholesales and retailers. The Department of Commerce is a party to this project only insofar as it can be of assistance to the representatives of the industry in carrying out the work. Thus far, the deliberations of the committee are still in a preliminary stage and involve a determination of the degree of standardization to be attempted, the drafting of tentative specifications and rules and a thorough discussion of all the questions involved to insure a thorough understanding of the effects of any changes on the various interests concerned.

The progress being made indicates that the work will resolve itself into a simplification of grades, the standardization of sizes and the specification of quality and quantity through the branding of the lumber, the carding of cars and organized inspection. This development is of vital interest to the railroads because of the large amount of lumber that they consume, not only as direct purchasers but in the awarding of contracts for construction work involving the use of lumber bought by others. The movement will also accrue to the advantage of every lumber manufacturer and dealer whose business is founded on square dealing.

AMERICAN CITIZENS coming from Europe and landing at Quebec numbered in the month of September more than 4,000; and thus far during the present year passengers bound for the United States landing at Quebec totaled 16,841 which is more than 50 per cent above the number recorded for the corresponding period of 1921.

New Books

A Selection of Cases Under the Interstate Commerce Act. Second Edition. Edited by Felix Frankfurter, Byrne Professor of Administrative Law in Harvard University. 789 Pages. Size 6½ in. by 9½ in. Bound in cloth. Published by Harvard University Press, Cambridge, Mass.

This book brings up to date the first edition published in 1915. The preface to the former edition contained a statement that the selection of cases included in the volume had been prepared for use in the Harvard Law School. Presumably the second edition is primarily intended for law school students, a factor which, incidentally, rather has a tendency to emphasize how important a factor in legal and judiciary activity the law dealing with public regulation has long since become.

The book, of course, has a value considerably outside of that intended for the law school student who is studying the law relating to railroad or public utility regulation or for the member of a legal department of a railroad. Other railroad men frequently have reason to look up the law relative to federal railroad regulation, and a book of this kind —presuming that the outstanding and more interesting cases are included—would prove of considerable value as a book of reference.

The editor of the volume has included only the decisions themselves; there are no notations or comments on the decisions. The cases are arranged under four divisions, each divided into sub-divisions. They are: I Scope of Commerce Regulated by the Act, subdivided under (1) kinds of carriers, (2) kinds of commerce and (3) "railroad" and transportation; II Duties of Carrier Under the Act, subdivided under (1) services to be rendered, (2) equality of service and (3) maintenance of competition; III Functions of the Interstate Commerce Commission in the enforcement of the Act, subdivided under (1) constitutionality and (2) powers and duties. The fourth section, headed, Function of Courts in the Enforcement of the Act, is divided into (1) primary jurisdiction of the commission, (2) Judicial review and (3) proceedings for enforcement. The cases are almost entirely decisions of the United States Supreme Court, with the exception of the larger part of the third section, which consists of decisions of the Interstate Commerce Commission itself. Included among the decisions are a number of such as the Western Rate Advance Case, the Fifteen Per Cent Case, Increased Rates, 1920, etc.

Inasmuch as the book is a compilation of cases only, it seems hardly necessary to enlarge upon the manner of formulation or the importance of the principles which are embodied in the Interstate Commerce Act and the many court decisions relative to it. It is presumably generally enough understood that the law on the subject is to be found not only in the various acts themselves but also in the long series of decisions in the courts which have guided the workings of the legislative enactments and in truth the formulation of many of the things now contained in the legislation.

Sampling and Analysis of Pig Iron. By the Chemists' Committee of the United States Steel Corporation. 40 pages, 6 in. by 9 in., bound in paper. Published by the Carnegie Steel Company, Pittsburgh, Pa.

This book describes the accepted and approved methods used by the chemists of the constituent companies of the United States Steel Corporation for the sampling and analysis of pig iron, which have been revised to include the latest practices. The work is not only authoritative, but it is also very complete. In addition to methods for determining the more common elements, the determination of titanium and of copper are described.

Letters to the Editor

[The Railway Age welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

The Shipper Needs Information

Chicago.

To the Editor:

I have noted with a considerable degree of interest the article of Winthrop Martin in your issue of November 18. It seems surprising that an article of this type was able to overcome the rather conservative barriers of the *Railway Age*. However, as it no doubt represents the typical views of a large class of shippers, its publication may be of value in presenting in organized form the views of a disgruntled patron of the railroads.

In the first place this article represents the trend of the times—that trend so aptly expressed in the results of the late election. It represents an opinion, formed from personal contact, and with no further effort being made to ferret out causes, or to determine the reasons for conditions complained of. "That the conditions exist is sufficient," argues Mr. Martin. "Let's change them." No thought apparently is given to changing the causes.

Mr. Martin was not always handicapped thus. Perhaps he can remember the time when the Interstate Commerce Commission did not exist. Perhaps he can remember when the commodity tariff file consisted of letters from the general freight agent telling the forwarding agent to apply a certain rate, a rate that was often very agreeable to the shipper and would help him to develop his business. In those days, Mr. Martin would have no difficulty in obtaining any desired rate.

Another thing, has Mr. Martin ever wondered why "an auditor may drag an item from a mildewed file and an outraged law department may come roaring after me for the difference involved?" Has he ever speculated on the expense involved in maintaining that audit office and that high priced legal department? Does he think a carrier, as a business institution, could spend fifty dollars to collect an undercharge of fifty cents, unless it was compelled to? And who compels it? Why, Mr. Martin, himself, and his fellow shippers, through their regulatory measures, passed by their representatives in Congress, interpreted by the Interstate Commerce Commission and enforced by the courts. While a carrier must collect every cent due it by every means possible regardless of cost, until the item proves absolutely uncollectible, a business concern that is able to conduct its business unhampered by regulation would charge it to profit and loss if the expense and trouble were in excess of the benefit. Mr. Martin won't permit a railroad to do this. Its bills must be revised and checked until no chance for an error remains for fear he, himself, or his friends might be discriminated against.

While it is true that tariffs and rules are complicated and while railroad men have an "excessive passion for being on the safe side," what is the reason? Did Mr. Martin ever read the Interstate Commerce Act or the Transportation Act and has he ever taken the time to find out to what minute detail the provisions of these laws have been applied to railway practices? Let him read some of the conference rulings of the Interstate Commerce Commission if he wishes to find out why tariffs are complicated or have him review some of the court decisions based on the various regulatory acts if he has a real desire to find out why a railroad employee has "an excessive passion for being on the safe side." Mr. Martin and his fellow shippers have, through their agents, the Congress of the United States and the various state legislatures, ordered the carriers to be on the safe side. Why should he complain if his demands are lived up to?

Then, there's the cause for the numerous overcharges and undercharges. Here we meet again the same situation that prevented the rate being quoted right in the first place—the complexity of the tariffs. In his fear of being discriminated against, Mr. Martin has forced the carriers to go into such details and finesse in the application of their rates and regulations that, owing to the deficiency in the power of the English language to make a statement understandable, the rule or rate is often interpreted differently by every railway official or employee who attempts to apply it.

Mr. Martin complains about the delay in settling claims. Doesn't he know that he has forbidden a railroad to settle a claim without making a thorough investigation of its merits? To do so would be a violation of a law that he ordered passed. Why complain then of the delay, for it takes time to investigate such causes in such an extended organization as a railway company.

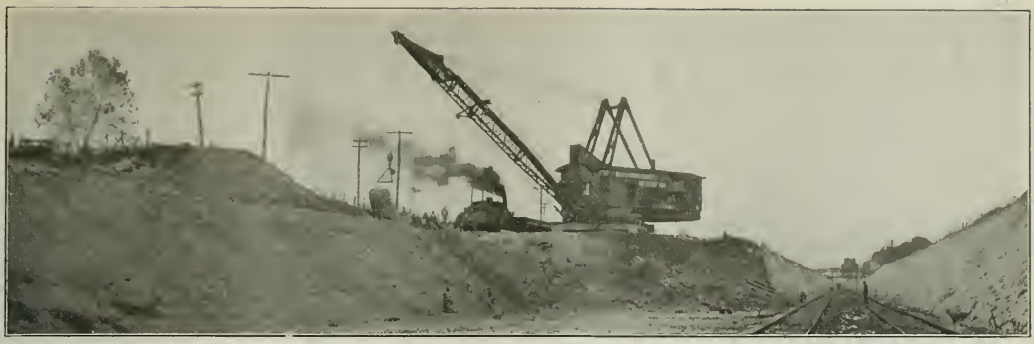
Space forbids going into the other subjects covered by Mr. Martin's article. It is quite evident that they are discussed by him only after a cursory examination of actual conditions or of conditions that exist at one station. But there is one message that his conclusions can convey. It can best be presented by a personal reference. In my ten years of intense reading and study of the transportation business, I have seen innumerable statements that the railroads were being overregulated and if let alone would work out their own salvation. I have read dozens of "panaceas" and "solutions" of the railway problem, but I have never yet seen in public print a concrete explanation or a concrete instance of overregulation. No one has ever taken the trouble to show by definite cases, for the understanding of shippers and railway employees, how railway operations are hampered by regulation. Everyone who speaks or writes an article on the subject seems to take it for granted that specific instances can be found only in the proceedings of investigation committees or in the personal experiences of officers and employees.

What is the result? First, we have the antagonistic attitude of a certain number of shippers as is typified by the article of Mr. Martin, who blame the carriers for conditions when in reality the two causes are something in which the carriers have no control—over-regulation in this case. Second, we have the lethargy of railway employees in seeking the true causes of conditions complained of. They are unable to understand the application of a general statement unless concrete cases come under their observation.

In the first case a little explanation would perhaps change a hostile shipper to a friend of the carrier, but because the employee is unable to explain, due to his ignorance of the true causes of the conditions complained of, he either agrees with the shipper or expresses his indifference. A proper presentation of the problems of the carriers will do more to allay ill-feeling on the part of shippers and promote loyalty on the part of employees than any other undertaking that the railroads could engage in.

C. E. Parks,
La Salle Extension University, Chicago.

Automobiles Exported from Canada now constitute a considerable freight movement. In the month of October, shipments were made to Australia, South Africa, New Zealand, Sweden, Switzerland, United Kingdom, Turkey and the United States. The total value of these exports in that month was more than 2½ millions.



The Drag Line at Monee Cut

Illinois Central Improves Line Near Chicago

Reduces Grades and Adds to Tracks Between Matteson, Ill., and Kankakee Under Heavy Traffic

WHEN IT BECAME EVIDENT early last spring that the mines in Southern Illinois would be closed by a strike on April 1, the management of the Illinois Central decided to take advantage of the expected lull in traffic to reduce the grades and construct additional main tracks between the south limits of the Chicago suburban zone at Matteson, Ill., and Kankakee, 25 miles further south.

Looking South at Matteson with the E. J. & E. Crossing in the Foreground

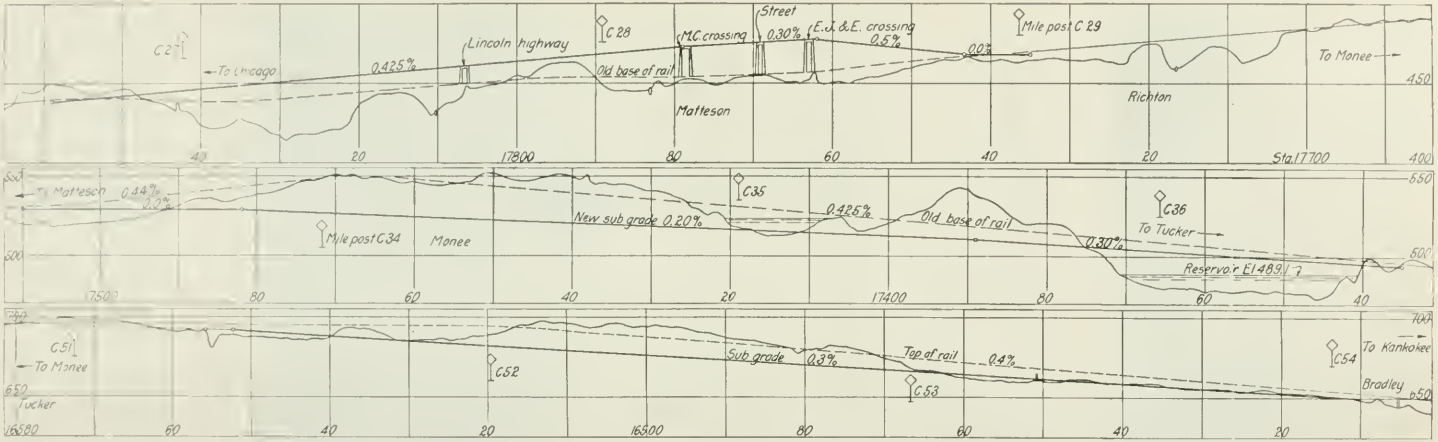
While the decline in traffic lasted only for a short time, owing to the movement of large quantities of coal into Chicago from the non-union fields in Kentucky, this work has been pushed actively throughout the season and is now nearing completion. It involves a total expenditure in the neighborhood of two and a half million dollars, comprises about 1,000,000 yd. of excavation, and when finished will afford marked relief in the section of the line which now constitutes the throat of the Illinois Central System.

Except for a secondary line extending west through Northern Illinois to Omaha, it is over this line that all Illinois Central business enters and leaves the city. It not only carries all of the traffic of this road between Chicago and southern points, including a heavy tonnage of coal from Southern Illinois, but also a considerable traffic from the St. Louis line which connects with the New Orleans line at Gilman, about 25 miles below Kankakee. The traffic is further enlarged at Kankakee by the business of the Big Four which is handled between that point and Chicago by the Illinois Central. This traffic has increased rapidly in recent years and averaged about 32 passenger and 58 freight trains a day during the period of construction.

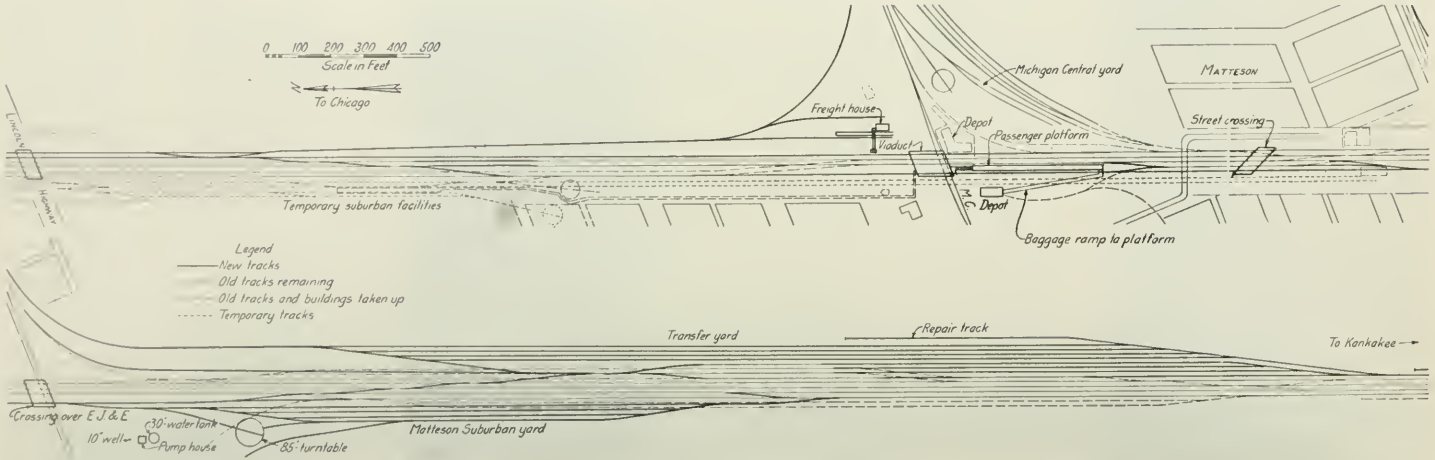
Adverse Grades an Obstacle to Traffic

While ample facilities are available for handling the traffic as well as the heavy suburban business between Matteson and Chicago in the presence of a long stretch of practically level track, increasing from four to eight tracks in the direction of the city, the conditions were not so favorable in the 27 miles between Kankakee and Matteson. In the first place, traffic over this section was confined to two tracks, except for a distance of 11 miles between Tucker, four miles north of Kankakee, and Peotone, where a third track was laid three years ago. The grades were also adverse over this section, especially for northbound tonnage. Almost immediately upon leaving Kankakee, a 0.4 per cent grade extended

Looking North Through the First Cut at Monee Showing the Elevators in Their New Location



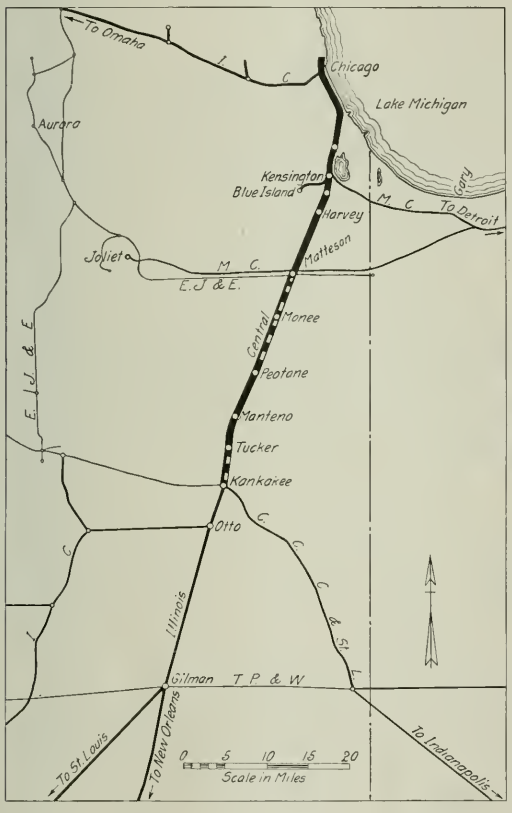
Profiles of the Grade Separation at Matteson, Upper; the Grade Reduction at Monee, Center; the Grade Reduction at Tucker, Lower



A Plan of the Layout at Matteson Showing the Final Arrangement of Tracks and Buildings Together with the Changes Made Preparatory to Grade Separation

for about 2½ miles to Tucker. Beyond this point more favorable grades were encountered until near Monee, where a 0.425 per cent grade extended for nearly two miles to the top of the hill, 160 ft. above Kankakee. This summit constituted a similarly formidable obstacle to trains proceeding southbound, as it was approached by long 0.4 per cent grades. Added to these obstacles were grade crossings with the Elgin, Joliet & Eastern and the Michigan Central at Matteson.

To improve conditions and give greater capacity, it was decided to extend the four track system from Matteson, south for about seven miles to Monee. As a third track was already in service between Peotone and Tucker, it was decided to continue this track north to the end of the four track section



The Illinois Central System and Tributary Lines Near Chicago

at Monee, and to Kankakee on the south and to install interlocking plants at intermediate stations to permit the diversion of trains from one track to another. It was also decided to reduce the 2½ miles of 0.4 per cent grade between Kankakee and Tucker to 0.3 per cent and to reduce the 0.425 per cent grade approaching Monee from the south to 0.3 per cent. As this involved heavy excavation through Monee a large amount of material was available beyond that required for the new tracks and it was further decided to separate the grade crossings at Matteson by carrying the Illinois Central tracks overhead.

The Monee Cut Was a Big Problem

Because of the distance between the two points at which it was decided to reduce grades, the size of the entire project, the necessity of conducting all work under traffic, and the premium placed on speed, the work was divided into two units, each under the supervision of an assistant engineer reporting to an engineer in charge. The larger of the two was the Monee-Matteson unit, the most spectacular feature of which was the work undertaken in the vicinity of Monee. As before stated, the problem at Monee consisted of reducing about three miles of 0.425 per cent grades to a maximum of 0.3 per cent. To accomplish this and to provide the additional trackage planned, necessitated making a cut directly through Monee which ran 20 ft. deep for about a mile, averaged about 100 ft. in width at subgrade and involved in the neighborhood of 700,000 yds. of excavation.

The proportions of the work suggested the advisability of using a dragline outfit, which was accordingly installed, together with two steam shovels. In order to provide for traffic during the progress of the work, the first step undertaken was that of making a cut 30 ft. wide at the bottom for the entire length of the cut on the east side. To do this the steam shovels removed the approaches at each end, after which the dragline completed the remainder of the heavy excavation in this first cut, utilizing the adjacent main line track for loading. A new track was built west of the main tracks which with the southbound main track were used by traffic. After this cut was completed, two main tracks were

Looking South from the Michigan Central Crossing at Matteson Prior to Grade Separation

laid in the bottom and the dragline returned to the south end of the heavy work where it again began working north, removing the remainder of the cut to the full width as it went.

The dragline proved particularly efficient in this work. Equipped with a five yard bucket operated from a 75-ft. boom, this machine cut a section for the full depth of the cut and 60 ft. wide at the bottom. It handled about 3,200 yd. per day of two shifts, the excavated material, which is of heavy clay, being carried to the dump by four contractor's trains, each containing 15 air dump cars of 12 yd. capacity. These trains were loaded on a temporary track laid along the top of the west slope and were hauled over the main tracks under the supervision of Illinois Central conductors to Matteson and to the Markham yard at Harvey, five miles north of Matteson. On account of the long haul (reaching a maximum of 12 miles and averaging six miles) and the necessity of operating over the main line, the trains constituted the limiting factor in the work, the dragline itself being capable of handling half again as much material.

Before beginning the work at Monee it was necessary to move two elevators to new positions across the track (no mean job in itself in the face of traffic) and two viaducts have been built to carry highways over the tracks. The work at this point also required the moving of the station to a new location and the building of several industry buildings. Another problem which arose by reason of the reduction of the grade at Monee involved two water supply reservoirs at the south end of the cut. The smaller of the two reservoirs, constituting the original source of water at this point, en-

croached upon the new roadbed, because of which it was decided to drain it. This was done by excavating a ditch in the cut sufficient to carry all water to the larger reservoir, which was located some distance down hill.

The Problem at Matteson Was Grade Separation

As stated before it was decided to utilize the material obtained from the Monee cut to separate grades at Matteson. To do this as well as to extend the four tracks through the town from the north required extensive changes in the existing layout at that point. Approaching Matteson from the south, were two main line tracks which extended through the town, crossing consecutively, the two tracks of the E. J. & E., a street and a crossing shared by the Michigan Central and a street adjacent to it, beyond which it merged into the four track section which crossed the Lincoln Highway, about a half-mile distant. Leaving the main line on the east side about a mile south of Matteson, was a track which also crossed the E. J. & E., and then continued north to within a short distance of the Michigan Central crossing, where it turned east to form a transfer connection with the Michigan Central. Leading off from this switch lead, in turn, at Richton, about a mile south of Matteson, was a yard of four tracks running parallel with the switch lead and providing northbound interchange facilities with the E. J. & E., with which it connected through a single track lead. To the south of the E. J. & E. crossing and to the west of the main line were three tracks which served as a southbound interchange yard with the E. J. & E.

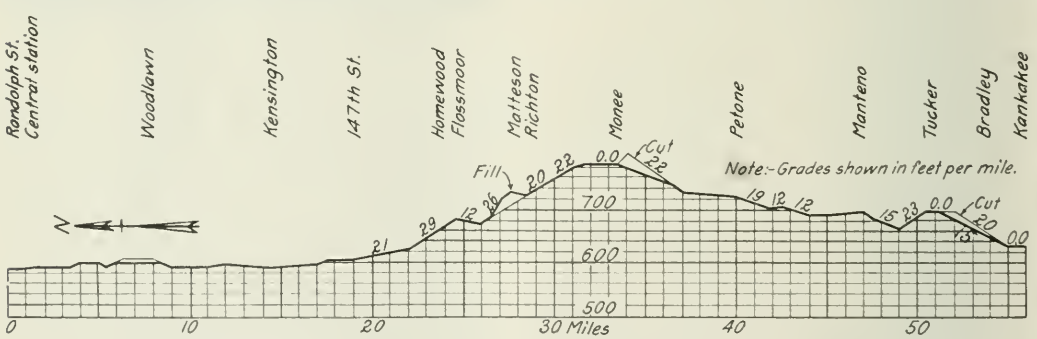
Further, in the short distance between the E. J. & E. crossing and the Michigan Central crossing was a lead extending from the switching lead to a yard of the Michigan Central. The Matteson freight and passenger station, a frame structure adjoining the switching lead on the east, was also located in this area. Extending for about one-half mile north of the Michigan Central crossing on the west side of the Illinois Central main line were the two tracks devoted to permanent work the transfer lead into the Michigan Central yard, situated just beyond the E. J. & E. crossing, was taken up and a new transfer track established north of the Michigan Central crossing by laying a track some distance east of the toe of the new slope and extending it north to a connection with the main line beyond the Lincoln Highway, this work requiring the removal of the pumping facilities for the suburban water supply from the east side of the main line to a new location on the west. At the same time the combination freight and passenger station was dismantled, the passenger section being moved west of the grade separation work where it was established at street level, and the freight station being moved north of the Michigan Central crossing in the vicinity of the new transfer track, just mentioned, an elevator later being installed to afford communication with the elevated tracks.

This done, the suburban tracks on the west were swung out of the way, through traffic was turned over two temporary tracks established west of the existing roadbed, the old main tracks were torn up, and a trestle was built to carry a single track over the entire length of the work with its deck 3 ft. below final grade. Earth was then hauled from the Monee cut over the newly laid eastbound tracks and dumped at the rate of about 350 cars a day continuously until a grade for three tracks was completed, when two tracks were opened to through traffic.

Considerable Concrete Work Was Involved

As the filling was being placed the concrete work was being pushed to completion. This involved the placing of about 12,500 yd. of concrete and consisted in building extensions to several culverts, a two span crossing over the two tracks of the E. J. & E., a street opening about 700 ft. north, a four span crossing over the Michigan Central and the adjacent street and a second crossing over the Lincoln Highway.

Both road crossings were built to give 21½ ft. clearance,



A Condensed Profile from Chicago to Kankakee Showing the New Work Which Was Undertaken

suburban service, together with the suburban station and turntable.

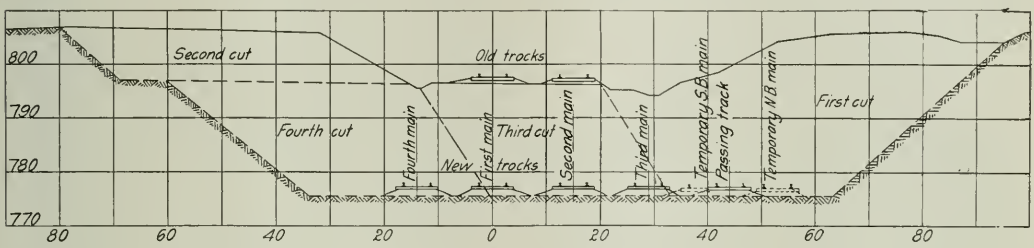
The first step in the construction program at this point consisted in converting the through switch lead into a third track, moving the station at Richton from the east side of the track to a location west of the future fourth main track and establishing a new switch lead, which was extended north to a point just beyond Richton station where it became the west track of a nine-track yard extending as far north as the E. J. & E. crossing and built to accommodate both north and southbound interchange business with this line, thus replacing the existing interchange yard on either side of the main line which encroached on the space required for the new work. To prepare the layout still further for the which clearance was secured at the Michigan Central crossing by lowering the tracks of this road 4 ft. These crossings consist of reinforced concrete abutments and intermediate columns, topped in the case of the Michigan Central by reinforced slabs, and, in the case of the E. J. & E., by concrete-encased I-beams. Of the two structures the Michigan Central was much the larger, requiring about 2,500 yd. of concrete and consisting of a four span structure designed to afford access from the street level to the passenger platform on the new grade by interior stairways.

Except for the extension of culverts, where hand mixers were used, and the construction of the Lincoln Highway subway about 1,000 ft. north of the Michigan Central crossing, where a half yard steam mixer was employed, this

concrete was all mixed and placed from a central plant situated between the Illinois Central main line and the Michigan Central yard. This plant consists of a steam-operated one yard batch mixer, a tractor crane for unloading aggregate from the cars, a stiffleg derrick for filling the mixer bins from the storage piles and a system of tracks over which one yard hopper cars were hauled to their destination by gasoline tractors, there to be hoisted to a point from which the concrete could be spouted into the forms or where, in the case of the slab construction carried on near the plant, the buckets could be picked up bodily by the tractor crane and emptied directly.

With the completion of the grade separation work at this point, which involved 750,000 yd. of fill, the remaining maximum depth of 10 ft. and produced 225,000 yd. of excavation. Since this was 100,000 yd. in excess of that required for the new third track on the east of existing main line, the remainder was wasted along the west side between Kankakee and Peotone to provide for a future main track.

This work, while lighter than that at Monee, was not without its problems, the most interesting of which was the encountering of a water pocket about 1,900 ft. long in the underlying rock when making the first cut. For a time this pocket presented a serious obstacle to the progress of the work, but it was completely drained by widening the cut 10 ft. and establishing a ditch along the top of the east slope. The excavation from the cut was handled by two contractors' trains averaging 15 cars apiece. As on the



A Typical Section Through the Monee Cut Showing the Old and New Tracks

work at Matteson consists only of removing the tracks which were laid temporarily for use by suburban and through service and to build a four track suburban yard south of the E. J. & E. crossing so that suburban trains might enter Matteson on the main line tracks and proceed down into the yard on a 1½ per cent grade.

As before mentioned, the work eliminated the necessity for interlocking towers at the Michigan Central and the Elgin, Joliet & Eastern crossings as well as watchmen at all street crossings. This separation of grades was not accomplished without increasing the gradients somewhat on both sides of the work. The new grade of 0.425 per cent on the north, however, does not exceed the ruling grade over the district while the grade on the south approach is so short that it presents no obstacle to traffic, which approaches it from Monee on a descending grade.

The Tucker Unit Was Also Interesting

The Kankakee-Tucker work was carried on contemporaneously with that between Monee and Matteson. As stated before, this work consisted of reducing about 2.5 miles of 0.4 per cent grade to 0.3 and extending a third track from Kankakee to connect with the existing third track at Tucker. This required several changes in the layout at Kankakee, consisting essentially in making a three track connection with the Big Four yard about four blocks to the east, converting the west track of the existing yard into a new third main track and moving this yard east, as well as moving the track scale to a new location and effecting other minor yard improvements.

The grade reduction work itself began about a mile north of Kankakee at Bradley and involved shovel work carried on in three stages. A cut 30 ft. wide at the bottom was first carried through to Tucker on the east side of the existing roadbed, the earth being carried back to form the grade for the new third track between Kankakee and Bradley, and a track laying gang following behind the shovel with two permanent tracks. Upon the completion of this cut through traffic was turned onto these tracks, the old main line taken up and a second cut was carried through for the new third track. Following this a third cut was then made to make room for a fourth track. This cut gradually increased to a Monee work these trains were in charge of Illinois Central conductors owing to the necessity at times of operating them upon or across the main operated tracks.

Interlocking Towers and Special Track Facilities

In addition to increasing the number of main line tracks and as a means of increasing their capacity still further, three interlocking plants were installed, one each at Tucker, Manteno and Monee, the latter at the end of the new four track section. For this purpose an old station was appropriated at Tucker while at Manteno, Peotone and Monee new towers were built which are of brick construction, fully equipped with heating facilities and modern interlocking equipment. These plants afford the means of diverting trains from one track to another at will. Passing tracks 4,000 ft. long were located at all stations, and at Tucker, Manteno, Peotone and Monee, besides the interlocking plants mentioned, there were also located additional 2,600 ft. passing tracks for use by local freight trains, thus providing the means of keeping them off the main line while doing switching service at these points. No. 18 frogs are installed at all facing crossovers between main tracks and all tracks are laid with 90 lb. rail.

Although the track work as well as the grading and concrete work were contracted originally, the track work was finally done by company forces, it having developed early in the progress of the work that delays both to through traffic and the construction work itself could be avoided only by company forces taking over the track work. The grading was begun on April 15, within three weeks after the contracts were let and the work has been pushed forward without interruption since that time with the result that all traffic has been carried on the new grade for several weeks.

The New Work Aids Traffic

The completion of the work will aid greatly from an operating standpoint. Aside from expediting the movement of trains, it enables the company to take advantage of an unusual and fortunate traffic condition at Kankakee. As mentioned in the early part of this article, the Illinois Central handles the Big Four business from Kankakee into Chicago. As the ruling grade between Kankakee and Matteson has

now been reduced below that between Kankakee and Champaign, the southern end of the district, it is now possible to load trains out of Champaign for the ruling grade south of Kankakee and fill them out at Kankakee with full tonnage for Chicago. The train rating over the section north of Kankakee has been increased from 3,800 tons to 4,400 tons.

Three contractors were engaged in the work, M. L. Windham, Centralia, handling the grading between Kankakee and Tucker, and the Walsh Construction Company, Davenport, Iowa, handling that between Peotone and Matteson, while the Bates & Rogers Construction Company, Chicago, placed all of the concrete involved in the latter unit. This project has been carried on under the direction of F. L. Thompson, chief engineer of the Illinois Central and F. W. Armstead, assistant to chief engineer, with T. H. Robertson as construction engineer in immediate charge.

Freight Car Loading

THE NUMBER of cars loaded with revenue freight during the week ended December 2, which included the Thanksgiving Day holiday, dropped to 845,219, which was a decrease of 110,000 cars as compared with the week before. This compares with 741,849 in the corresponding week of last year and 882,604 in the corresponding week of 1920, but in those years the holiday occurred during the preceding week. In the week which included Thanksgiving last year the loading was 673,465 and in 1920 it was 803,701. For six weeks, therefore, aside from the effect of the holiday, the loading this year has been in excess of that for 1920. Because of the effect of the holiday, comparisons are not particularly valuable, but grain and grain products loading showed a decrease of 5,000 cars compared with the week before; live stock decreased nearly 6,000; coal decreased nearly 16,000, to 186,158; coke loading showed only a slight decrease; forest products decreased 6,000; ore, 5,000; merchandise, 29,000, and miscellaneous, 43,000.

The freight car shortage had been reduced to 133,786 cars on November 30, a decrease of 18,781 compared with the total on November 23. The shortage in box cars amounted to 67,468, a reduction of 11,569, while the shortage in coal cars totaled 42,848, a reduction of 835. At the same time, 5,595 surplus freight cars of various classes were reported, an increase within a week of 289 cars.

Locomotives in need of repair on November 15 totaled 18,356 or 28.5 per cent of the number on line, according to reports filed with the Car Service Division. This was a decrease of ten locomotives as compared with the number

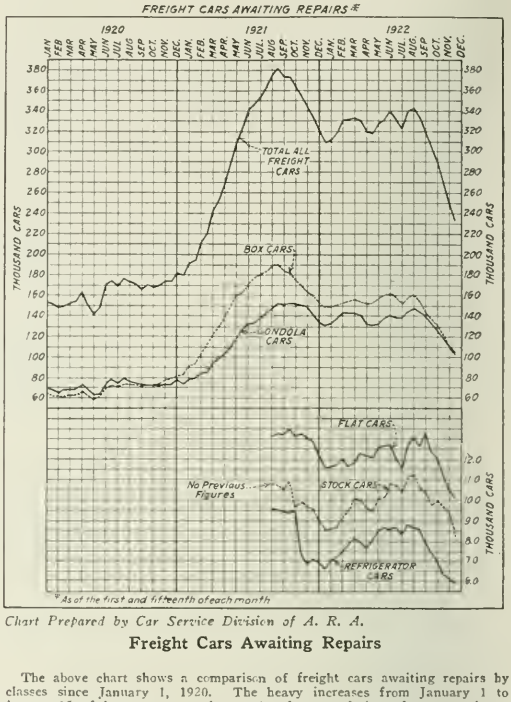


Chart Prepared by Car Service Division of A. R. A.

Freight Cars Awaiting Repairs

The above chart shows a comparison of freight cars awaiting repairs by classes since January 1, 1920. The heavy increases from January 1 to August 15 of last year was the result of accumulation of cars on home roads following heavy service during the previous year and a subsequent reduction in car requirements due to falling off in business during the first nine months of 1921.

As business increased after the middle of August, 1921, cars awaiting repairs decreased until January 1, 1922, after which time they remained practically the same due to labor difficulties until August 1, since which time they have steadily decreased.

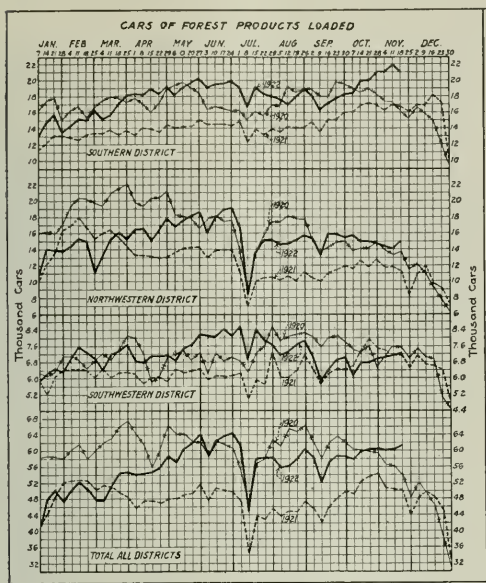
REVENUE FREIGHT LOADED

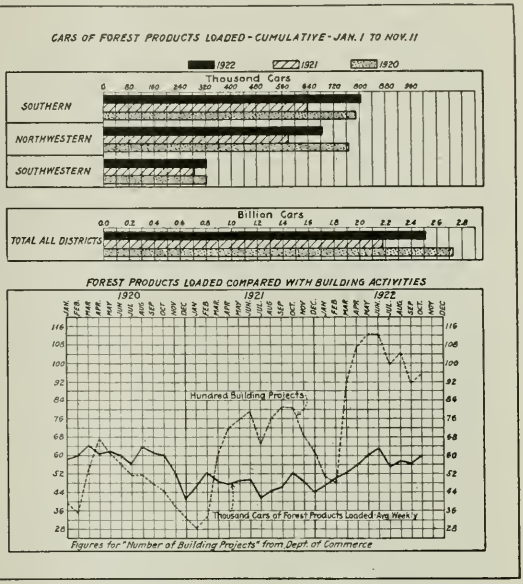
SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, DECEMBER 2ND, 1922.

Districts	Year	Grain and Grain Products	Live Stock	Coal	Coke	Forest Products	Ore	Misc. L. C. L.	Miscellaneous	Total Revenue Freight Loaded: This Year, 1922	Corresponding Year, 1921	Corresponding Year, 1920
Eastern	1922	9,508	3,529	54,322	2,609	5,405	2,420	56,122	77,853	211,858	.....	.....
	1921	9,452	3,737	42,524	1,550	4,805	735	62,710	65,165	.....	190,678	219,249
Allegheny	1922	3,297	3,504	56,148	6,186	3,116	2,248	41,708	65,165	181,372	.....	.....
	1921	2,756	3,169	41,243	3,095	2,566	2,375	46,555	50,901	.....	152,680	191,674
Pocahontas	1922	192	101	18,241	614	1,425	107	4,979	3,067	28,726	.....	.....
	1921	233	106	12,906	158	1,197	1	5,859	3,214	.....	23,674	31,654
Southern	1922	3,368	2,299	22,757	1,217	20,753	1,367	33,513	39,156	124,430	.....	.....
	1921	3,041	2,046	15,083	483	16,329	450	37,301	34,229	.....	108,962	128,106
Northwestern	1922	15,927	9,670	9,243	1,887	14,687	1,552	23,015	33,421	109,402	.....	.....
	1921	13,629	9,176	8,369	796	10,883	279	27,361	25,894	.....	96,387	110,063
Central Western	1922	12,451	12,385	20,413	292	7,305	2,306	26,988	45,669	127,809	.....	.....
	1921	13,115	10,400	13,503	164	4,836	664	30,406	35,575	.....	108,663	131,436
Southwestern	1922	4,509	2,893	5,034	270	7,319	550	13,392	27,656	61,622	.....	.....
	1921	4,609	2,552	2,956	99	7,025	673	16,472	26,419	.....	60,805	70,422
Total Western Districts	1922	32,886	24,948	34,690	2,449	29,311	4,408	63,395	106,746	298,833	.....	.....
	1921	31,353	22,128	24,828	1,059	22,744	1,616	74,239	87,888	.....	265,855	311,921
Total All Roads	1922	49,341	34,381	186,158	13,075	60,010	10,556	199,717	291,987	845,219	.....	.....
	1921	46,835	31,206	136,584	6,345	47,641	5,177	226,664	241,397	.....	741,849	.....
	1920	36,108	31,263	233,228	15,004	52,583	26,103	200,871	287,444	.....	.....	882,604
Increase compared with	1921	2,506	3,175	49,574	6,730	12,369	5,373	.....	50,590	103,370	.....	.....
Decrease compared with	1921	.....	.....	.....	.....	.....	.....	26,947	.....	.....	.....	.....
Increase compared with	1920	13,233	3,118	.....	.....	7,427	.....	.....	4,543	.....	.....	.....
Decrease compared with	1920	.....	.....	47,070	1,929	.....	15,553	1,154	.....	37,385	.....	.....
December 2nd	1922	49,341	34,381	186,158	13,075	60,010	10,550	199,717	291,987	845,219	741,849	882,604
November 25th	1922	54,790	40,217	202,032	13,234	66,046	15,052	228,771	335,353	955,495	673,465	803,701
November 18th	1922	55,204	40,735	205,024	12,431	61,403	32,780	228,922	332,595	960,094	790,363	889,138
November 11	1922	52,501	38,001	188,312	12,273	60,392	39,383	228,050	334,997	953,909	755,777	927,586
November 4th	1922	51,912	39,731	194,077	11,641	60,013	47,046	234,737	355,670	994,827	837,576	915,615

Compiled by the Car Service Division of the American Railway Association.

on November 1. Locomotives in need of heavy repairs totaled 15,120, an increase within 15 days of 19, while those in need of light repairs amounted to 3,236, which was a decrease of 29 within the same period. From November 1 to November 15, the railroads turned out of their shops 12,139 locomotives. The number of serviceable locomotives totaled 46,101 on November 15 as compared with 46,096, which was the total on November 1.





Charts Prepared by Car Service Division, American Railway Association

Large Building Program Stimulates Movement of Forest Products

The charts indicate the trend in the loading of forest products by different districts in the country, together with the cumulative loading in the entire country—the latter contrasted with the building projects now being undertaken.

It will be noted that the loading of the forest products in the Southern district has, with slight exception, been greater than during the years 1920 and 1921. At the present time the loading in that region is far in excess of the two prior years.

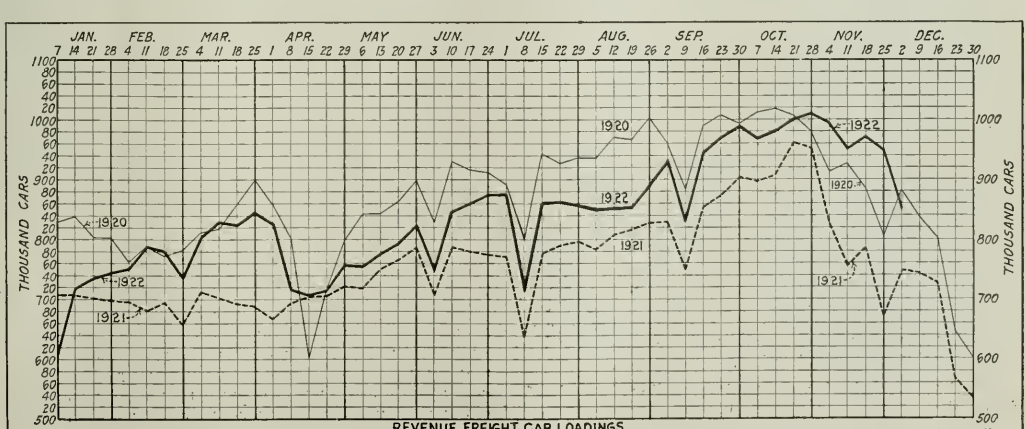
The loading in the northwestern district has not kept the even trend as has been prevalent in the South, and while it now exceeds the loading for corresponding periods of the past two years, this district was slower in recovering, compared with other regions, from the period of acute deflation which affected the industry as a whole, during 1920 and 1921. There has been, however, a large water-borne traffic from mills in this territory, which would partially account for the larger relative decrease in carloading.

Loading in the southwestern territory has exceeded the loading for 1921, but during the fall period of car shortage, has been less than that of 1920. The trend indicates that this section of the country is rapidly recovering however.

For all districts from January 1 to November 11, the loading during 1922 has exceeded the similar period of 1921, but still shows a decrease under the car-loadings during 1920. This is largely due to the fact that for the first five months of 1920 the lumber industry passed through one of the greatest periods of prosperity in its history, where orders far exceeded the ability of mills to cut or ship. The loadings during the first six months of 1920 greatly exceeded the last six months, whereas the reverse condition is generally true during 1922.

It will be noted that the loading of forest products is now on the upward trend, due, in part, to the very large building projects being undertaken which fact, coupled with the depletion of stock yards, should produce continued activity on the part of the milling industry.

For the 46 weeks of 1922, ending with the week of November 18th, the organized saw mill industry of the country shows a total of 10,159,212,045 board feet manufactured, 9,569,673,141 board feet shipped, and orders received for 10,200,834,464 board feet. For the entire year the industry, as a whole, has shipped in excess of 90 per cent of the footage manufactured.



Labor Board Removes Inequalities in Telegraphers' Pay

A DECISION, upholding the contentions of eleven of the largest western carriers as to the necessity for the eliminating of inequalities in the rates of pay of telegraphers and station employees, brought about through the application of an order of the Railroad Administration, was recently handed down by the Railroad Labor Board. The carriers involved, the Chicago & North Western, the Chicago, Burlington & Quincy, the Chicago, Milwaukee & St. Paul, the Chicago, Rock Island & Pacific, the Chicago, St. Paul, Minneapolis & Omaha, the Great Northern, the Illinois Central, the Minneapolis & St. Louis, the Minneapolis, St. Paul & Sault Ste. Marie, the Northern Pacific and the Southern Pacific (Pacific System), asked the Board for the right to correct inequalities produced by the application of Interpretation 8 to Supplement 13 to General Order 27, issued by the United States Railroad Administration. The Board decided that, effective January 1, 1923, "the inequalities * * * shall be eliminated by reducing the hourly rate of these employees an amount equivalent to the increase resulting from the application of Interpretation 8 to Supplement 13 to General Order 27."

The Labor Board, in discussing this dispute, pointed out that for some years prior to 1917 telegraphers employed by the carriers were paid a monthly salary to cover the full calendar days of the month, that is, 28, 30 or 31 days. In the latter part of 1917, telegraph employees in the service of these carriers received an increase in wages of approximately 12 per cent and in conjunction therewith the calendar month basis was changed to a working-day-month basis or 26 days, and thereafter the rate formerly applying for service performed on the calendar days of the month applied for the working days of the month and additional compensation was paid for service performed on other than working days, that is Sundays and holidays. Later the application of Supplement 13 to General Order 27 and its Interpretation 8 resulted was in some instances in the establishment of inequalities of the rates of pay of certain telegraph and station employees, which inequalities constituted the subject of this dispute. The Board's analysis of the case continues in part as follows:

> The carriers state that the application of Interpretation 8 as directed by the Railroad Administration not only created an additional expenditure of over $1,000,000 per annum but created a very disturbing and unsatisfactory situation; that agents, who previously received a substantial differential over telegraphers, are now receiving less than the telegraphers at a great many stations; and that telegraphers, who received rates in excess of other telegraphers working at the same stations, are receiving a lesser rate, notwithstanding the fact that the class of work and responsibility required are unchanged. It is stated that on some roads where, prior to Interpretation 8, there were 30 rates of pay, there are now 172 different rates of pay, and that on the lines represented in this controversy 11,008 employees received increases and 4,027 received no increases. The carriers contend that this has resulted in old experienced agents holding responsible positions taking assignments of less responsibility where rates of pay were increased under Interpretation 8, and agents of less experience accepting the more important stations, thereby impairing the efficiency of the service.
>
> It is the contention of the carrier that the language of Supplement 13 clearly shows that it was never intended to include compensation for Sunday and holiday service where such service was paid for as overtime in establishing the hourly rate to which the increases provided for in Supplement 13 should be added; furthermore, that there is no decision of record issued by the Railroad Administration which provides that overtime should be included in computing the basic rate to which increases prescribed by the various supplements should be added.

The Board upheld these contentions specifically stating in its opinion:

> The Labor Board finds that inequalities exist in the rates of pay of employees in telegraph and station service which are unjustified and detrimental to the service. It appears that the employees who have benefited by the inequalities resulting from the application of Interpretation 8 have received the full amount of the increase provided for in the orders and decisions of the Railroad Administration and the Labor Board, and that the higher rates of pay accruing to them through the application of Interpretation 8 have resulted from the inclusion in the monthly rate used as the basis for computing the hourly rate under Supplement 13, compensation for service which was paid for additional as overtime. This does not appear to have been contemplated by any decision of the Railroad Administration increasing the rates of pay of any class of employees.

A. O. Wharton Files Dissenting Opinion

Again a dissenting opinion was appended to the decision by A. O. Wharton, member of the labor group on the Board, who quoted extensively from the employee's testimony at the hearing in this case, his contention being "that the question now decided adversely to the employees was one which had the personal attention of the Director-General of Railroads; that it was also approved by the Director, Division of Operation, both of whom were experienced railroad officials; and that prior to the decision being rendered the Director-General had received the benefit of the judgment of the Director of the Division of Operation, Railway Board of Adjustment No. 3, and the Board of Railroad Wages and Working Conditions."

Mr. Wharton added that:

> The immediate effect of this decision—based on the figures submitted by the carriers—will reduce the annual earnings of these generally underpaid and highly skilled workers $1,255,680 per annum. In Wage Series Report No. 3, issued by the Labor Board, October, 1921, the average wages per month for telegraphers, et cetera, are shown to be $123.55 per month. The 11,008 directly affected will suffer an average reduction of $114 per annum by this decision, and while it may be said that these employees, as a class, are today under the Board's wage reduction Decision No. 147, effective July 1, 1921, receiving a wage 82 per cent above the miserably low wage rates in effect prior to the period of federal control, the fact remains that they are generally underpaid.
>
> The decision of the majority arbitrarily puts into effect differentials that were in effect during the year 1917, and every practical railroad man must admit that this decision will create a multitude of unjustifiable differentials in rates of pay, and that the existing dissatisfaction and discontent of these employees will be augmented by this impracticable decision, the only effect of which is to bring about another reduction in wages veiled by a thinly spread smoke screen which simply emphasizes the desire of the majority to deny the employees an opportunity to meet the respective carriers in conference and work out an equitable adjustment of any existing improper differentials.

W. L. McMenimen, member of the labor group on the Board, also appended a statement to the effect that while he voted against the decision he did not formally enter a dissenting opinion, adding, "as a rule dissenting opinions accomplish no practical purpose and merely encumber the record."

A resolution accompanying the decision proposed by Mr. McMenimen, and passed by the Board, ordered the retention upon its docket of various other applications from carriers for decreases and employees for increases in the wages of telegraphers. No action on these applications was, however, taken at this time.

GLANDS FIGURE, nowadays, in varied classes of news, front-page and other. The latest item is one concerning the endocrine gland of a woman who was injured by a switching locomotive of the Chicago & Alton, when it struck the automobile in which she was riding, and who is now suing the road in the Federal Court at Kansas City for $50,000. It is charged that, because of an injury to this gland the lady has grown to weigh 375 lbs., a degree of obesity which is very oppressive, and a misfortune for which compensation ought to be made.

A National Transportation Institute Advocated

First Steps Taken to Create An Organization to Develop Fundamental Facts Regarding This Industry

THE FIRST STEPS toward the establishment of a National Transportation Institute "for the purpose of accumulating, organizing and furnishing the people at large full, complete, impartial and unbiased information about transportation" were taken at a dinner at the Hotel La Salle, Chicago, on December 8, when 150 agricultural, railway and business men unanimously endorsed the plan and appointed a committee of 19 men to act in conjunction with Congressman Sidney Anderson, chairman of the joint committee of Agricultural Inquiry, United States Congress, J. R. Howard, president of the American Farm Bureau Federation, and Bird M. Robinson, president of the American Short Line Railroad Association, who are the leading advocates of the institute.

Following the addresses of Mr. Anderson, Mr. Howard, D. B. Hutchings, director of transportation of the American Farm Bureau Federation, and Mr. Robinson, the meeting unanimously adopted a resolution approving the establishment of the institute and urging the agricultural, banking, commercial and transportation interests of the country to participate in its organization. The committee appointed to arrange for an organization committee and to participate in the formulation of plans to be submitted to a representative meeting to be called by them for the purpose of establishing a permanent organization included: H. I. Drummond, chairman of the Board of Governors of the International Farm Congress; M. D. Campbell, president of the National Milk Producers Association; John W. Blodgett, president of the National Lumber Manufacturer's Association; E. B. Polleys, president of the Western Pine Association; A. B. Johnson, president of the Railway Business Association; Irvin T. Bush, president of the Chamber of Commerce of the State of New York; W. R. Skinner, secretary and general manager of the National Dairy Association; J. A. Edgerton, president of the National Association of Manufacturers; George C. Conn, director of traffic of the Buick Motor Company; Ralph Van Vechton, vice president of the Continental & Commercial National Bank of Chicago; J. W. Kerscher, president of the National Wholesale Grocers' Association; W. H. Manns, assistant to the president of the International Harvester Company; Francis Kemper, National Retail Grocers' Association; J. L. Lovett, general manager of the Michigan Manufacturers' Association; Harrison F. Jones, executive secretary of the National Poultry, Butter and Egg Association; W. L. Wagner of G. M. H. Wagner & Sons Company, Chicago; H. A. Palmer, editor of the Traffic World; S. O. Dunn, editor of the *Railway Age;* and William Butterworth, president of Deere & Co.

A tentative plan for organization, as submitted by Mr. Robinson, provides for a board of governors, of 15 prominent citizens, headed by Edward E. Clark, former chairman of the Interstate Commerce Commission, to direct research work, and to present its findings to the public. A board of 35 directors is to be selected upon suggestions of the leading national agricultural, banking, industrial and transportation organizations, thereby insuring that the important business industries in the country who participate in the financial support of the institute shall have an opportunity to participate in the administration of the business and to present to the board of governors their special points of view for consideration. Staff officers are to be employed in each state, whose duty it will be to give to the public information that the investigations of the institute develops. The institute will supplement the work of its staff officers by educating students in the fundamental principles of the various kinds of transportation, facts as to the present condition and the relative importance of each class of common carrier, the effect of present laws and regulations, and how the public and the carriers will be benefited or adversely affected by any attitude or action that may be taken with respect to their transportation problems.

It was estimated that during the research period, which will begin at once, the cost of maintaining the institute will be less than $250,000 per year and later when the staff officers are employed the cost will increase to over $1,000,000 per year. It is thought that when the institute becomes an active, educational one, it will receive a large number of students and the income from this source will aid in paying expenses, and that it possibly will become self supporting in the future.

The American farmer feels that a National Transportation Institute is highly desirable, according to Mr. Hutchings of the American Farm Bureau Federation. He stated that there are numerous problems now vexing the farmer in regard to transportation and that some responsible organization should be formed to sift the truth out of the present cloud of misinformation and malinformation. He declared that each should have full, accurate and unbiased information about the other's problems, what is being done to grapple with them, the methods being used and the success which is being met. Mr. Hutchings called attention to the fact that the executive committee of the American Farm Bureau Federation, at its meeting in June, 1922, adopted a resolution endorsing the movement and that it has since heartily supported it. The American farmer believes that such an organization as the National Transportation Institute would be extremely valuable, and that it should be set to work as soon as possible in order that it may help to cope with the problems now pressing for immediate solution.

The address of Mr. Robinson further pointed out the need for accurate transportation information and sketched a plan for the organization of a National Transportation Institute, including its research work and personnel. He declared that the magnitude of the problem and the work to be done is stupendous, and urged that the men present at the meeting join in the selection of men for a strong organization committee. In conclusion, Mr. Robinson appealed to his audience to join at once in an active, aggressive campaign to inform the public as to the facts of the present rail situation and what must be done to save the nation's transportation system.

Congressman Anderson Advocates Institute

Mr. Anderson urged the creation of a National Transportation Institute to establish sound public policies with respect to transportation and to create appropriate relations between industry, agriculture and transportation. He said in part:

"It has been my observation in the contacts which I have had during the past one and one-half years with almost every important industry in the country, that most of our troubles rise from a lack of understanding of the other fellow's problem and the relation which it has to our own. This meeting is an auspicious indication that we are coming to a realization of this fact.

"I assume that my presence here may be ascribed to the fact that I had the honor to be chairman of the Joint Com-

mission of Agricultural Inquiry, created by Congress in June, 1921. The resolution which created this commission was a very broad one; charging the commission with ascertaining among other things, the causes of the agricultural crisis of 1920; the reasons for the spread between the consumers' and purchasers' prices; the comparative condition of other industries; the adequacy of the credit, transportation, marketing and distributing machinery of the country. It was apparent from the outset that there was no hope of accumulating the basis of fact upon which sound conclusions could be predicated by the usual methods of congressional investigation. As I saw it, therefore, the job was one of organizing new agencies through which a basis of organized and correlated information could be obtained.

"Without going into detail as to the method of organizing the committees and organization which co-operated with them, I may say that altogether we established more than 200 committees and a co-ordinating organization of approximately 3,000 people. This organization included the best men and most constructive thinkers we were able to get in the fields of agriculture, industry, distribution and transportation. In the transportation organization alone, were comprised 115 committees and 200 sub-committees, and a co-ordinating organization of about 1,600 people. We sent out more than 200,000 questionnaires, asked more than 25 million questions, and made, or had made for us, more than 50 million mathematical calculations. I think I may say, after a year spent in this investigation, that the startling fact about transportation, as well as distributive economics, is not what we know, about the agencies and functions of transportation and distribution, but what we do *not* know.

"It is true that there is a considerable amount of data touching physical property and operation of railroads and other transportation agencies, but this data has not been organized with a view of bringing it together in such form as would make possible a sound judgment as to the relations of various factors of physical property and operation, and the drawing of sound conclusions from them.

"Transportation is a public function; it is not an end in itself, but a means to an end. It should be an efficient instrument in the conduct and development of the nation's agriculture, industry and commerce. It can continue to function under private management only if when so functioning it best serves the economic interests of the country.

"I have no personal interest in railroads or in other transportation agencies, but I have seen the economic relation of transportation and industry too thoroughly demonstrated, not to appreciate the fact that the problems of transportation are not merely transportation problems, but are problems in which the agriculture, industry and commerce of the nation are vitally interested. Transportation service and the cost of transportation service, in considerable measure, determine the location and prosperity of industry and agriculture. Transportation rates are as potent a force in determining this location and prosperity as taxes, and in many respects operate like taxes.

"The ability of the transportation agencies largely measures the amount of business that can be done by the country. We have concentrated our attention largely, heretofore, upon the operative and financial problems of transportation. The time has come when some attention must be given to the relationship of different forms of transportation to each other, and to the economic effects of transportation service or the lack of it, and transportation rates.

"There should be an agency representing the economic interests of the country, capable of accumulating the basis of fact upon which the economic effects of rates may be determined. Transportation costs on the whole are a far smaller element in consumers' prices than is generally supposed. It is probable that transportation costs less than wholesale distribution, and that the total cost of retail distribution in the United States is four or five times as great as the total cost of transportation. No accurate determination of the economic effects of transportation rates as to commodities or industries, can be obtained, except on the basis of more detailed information than is at present available.

"Retail associations, wholesale associations and associations of manufacturers, are beginning to realize that the cost of distribution has outrun the cost of production and manufacture; they are setting up agencies for study of the processes of distribution, and for the dissemination of sound principles upon which more effective and efficient methods of distribution can be predicated. If it is worth while for these agencies to undertake to inform themselves and the public in regard to their own business, is it not worth while for these agencies to combine to ascertain their relationship to transportation and the economic effects upon them and upon the country, of transportation rates and service?

"If the problems connected with transportation and distribution were not so practical; if they did not touch industry so closely; if they were not a part of the daily operating factors of every industry; if, in other words, they were more obscure and scientific, we would promptly recognize the necessity of securing a basis of fact from which sound conclusions could be reached.

"When a new bug appears in the country, departments of agriculture and scientific institutions study its life history from the cradle to the grave. If it is worth while to spend millions of public and private funds, in the accumulation and organization of information touching the obscure hazards of agriculture and industry, is it not worth while to set up an agency capable of accumulating and organizing the information touching transportation and its relations to the industry, agriculture and commerce, which so closely touch the prosperity and economic well being, not only of these agencies, but of the whole mass of population?

"Transportation more than any other agency or instrumentality of commerce, is dependent upon sound and favorable public sentiment, yet it is a fact which I think no one will question, that no industry has been at less pains to create favorable public opinion than railroad transportation. Railroads formerly spent millions in securing the adoption of sound public policies by national and state legislative bodies, and in defending these policies and their operating methods and performance before courts and commissions, only to find that these millions had been spent largely in vain, because they have not been supported by adequate public knowledge and favorable public opinion.

"The point I am trying to make is that those interested in the establishment of sound transportation policies, and who recognize relationship of transportation efficiency and service to the progress and prosperity of the nation, cannot expect that politicians or statesmen will be able to overturn public sentiment by unfavorable propaganda in the hectic excitement of a four or five weeks' political campaign. The men in public life who recognize the importance of transportation agencies, and the necessity of sound public policies with respect thereto, have a right to expect that agencies will be created by the industries interested in transportation to accumulate the facts and disseminate the information which will create favorable public opinion touching these policies.

"I know of no idea which has greater potentialities for the establishment of sound public policies with respect to transportation; the creation of appropriate relationships between industry, agriculture and transportation, and for the dissemination of the information which is essential to favorable public opinion, than the idea which is responsible for the proposal to create a National Transportation Institute."

Further efforts to enlist support for the institute will be made at a dinner to be held in New York City on January 18, 1923.

Great Need of Salesmanship in Transportation

"Day Is Approaching When Every Man Who Sells Railroad Tickets Must Be a Salesman, Not a Mere Ticket Clerk"

By C. A. Cairns
Passenger Traffic Manager, Chicago & North Western

THE BACKBONE of an organization like yours is the men who, through many years of experience and travel, have acquired an intimate and specialized knowledge of passenger traffic. Men who make the most of every opportunity to improve the service and who are entitled to be classed as representing the highest art of salesmanship in transportation.

Every time I go into a ticket office and hear the wide range of questions to be answered, it increases the admiration I have always had for the men behind the counter.

Rightly handled, you gentlemen all know his is no easy task. He has a real man's job for, if he is an expert in his profession, he must be a walking encyclopedia of information about travel matters all over and all around the world.

In commercial lines prices often vary for articles which correspond to a large extent and which contrast furnishes the salesman with strong talking points, but generally speaking, railroad fares are the same, likewise the train service via the several routes between principal competitive points, and it accordingly requires expert salesmanship to convince a prospective buyer why he should use one particular route in preference to another.

Some of you may have read an interesting article which appeared several months ago of a plan inaugurated by a certain line for greater salesmanship in its ticket offices. The article went on to say that their ticket men had quit being "Clerks," having acquired the title of "Salesmen" and were being required to live up to the new designation.

In considering the sales possibility, this company grouped prospectives into three classes:

FIRST: Those entirely sold when they enter the office.

SECOND: Those partly sold upon entry and requiring salesmanship in closing.

THIRD: Those shopping around yet susceptible of being sold.

With a view to finding out how much or how little salesmanship was being used in its offices, the company required each ticket clerk to keep a tally over a period of ten days of the number of prospective travelers who called. A comparison of the total prospects with the ticket sales showed a most disheartening situation. The clerks were not it appeared salesmen. They were courteous but did not make sales as often as they should. As a result, a contest was started with two or three prizes as rewards and there was at once a surprising jump in the number of sales in proportion to the number of prospects.

Commenting upon the sales methods of railroads, a former railroad man has this to say in a recent magazine of nation wide circulation: "The business of transportation is like every other business in that it has something to sell. That 'something' is transportation—transportation of goods or persons.

"Few, very few railroads, really *sell* transportation. Almost invariably it is *bought*. People do not go into the office of a railroad and buy a ticket or ship a car of livestock in anything like the frame of mind with which they enter a cigar or a man's furnishing store or a grocery. To all intents and purposes, the transactions are identical. They involve the exchange of money for goods or service, and a man from Mars might suppose that the methods of procedure would not differ. But they do. The cigar man or the haberdasher or the grocer is keen to make a sale. If what he first offers the prospective purchaser is not to the latter's liking, he offers something else. He points out its good qualities, anticipates criticism and objections, smiles, pleads, urges—in short, he *sells*.

"The railroad representative does not do any of these things. He is not curt or impertinent, but seldom does he give the man who does business with him the impression that his patronage is appreciated. It is, I suppose, in the nature of the business—a 'holdover' from the days when railroads were monopolies. They are not that today."

In view of the result of the investigation of sales conditions previously referred to and in light of this criticism, whether justified or not, have we not here food for thought of possible improvement in our sales methods.

Examples of Good Salesmanship

I was an interested spectator a short time ago at the Information Bureau in a ticket office not a thousand miles away from Savannah. A gentleman came in to make inquiry about service to California. He had in his hand a telegram which made it impossible to determine until he received a reply to same, whether he could start on a Thursday or Friday. He was given the desired information as to fares, service, etc., courteously and correctly by the young man at the counter, who proved to be a *poor* salesman, however, for when he finished answering the inquiries put up to him without volunteering any helpful suggestions of his own, the man started to leave the office. Fortunately, as he hesitated for a moment he was taken in hand by another employee who knew the art of salesmanship and he advanced the idea that it would be well for him to make his arrangements then and there for the day on which he was most likely to go, as by doing so he would be able to get a far better berth location than if he waited and if he found he had made a bad guess with respect to the date, he could bring back the tickets and they would be cheerfully exchanged to meet his requirements. The idea struck him favorably and as a result two tickets were sold to Los Angeles. You will agree the latter evidenced good salesmanship. Both had the same opportunity; one let his slip away, while the other applied good sales methods and secured the business as well as doing the purchaser a real service.

Expert salesmanship is well illustrated in a talk I had a few days ago with a representative of an important tourist agency. A lady came into their office inquiring for information about the Catskills. After a short preliminary talk he inquired if she would accept a suggestion from him as to her vacation plans. She replied that she would be very glad to do so, but that he must keep in mind two essentials—she had only a certain amount of money to spend and a given time to be away from her business. Beyond these limitations she was open-minded. It so happened that his company was interested in a tour to the Bermuda Islands, and seizing the opportunity, he began to tell her of the advantages of an exhilarating sea voyage and expatiated glowingly upon a country she had never seen. In short, he succeeded

* From an address before the American Association of Railroad Ticket Agents, Savannah, Georgia, November 13, 1922.

in a limited time in changing her from the Catskill to the Bermudas, and upon her return she called to tell him how satisfactory her vacation had been. This is simply illustrative of what can be done when proper salesmanship is applied and which efficiency all of our offices must aim to develop.

Salesmen Should Be More Carefully Employed

Recently I was deeply interested in a little pamphlet issued by one of the largest business organizations in the world and which gave an outline of the examination a salesman was required to submit to before his application would be given consideration for employment. As I read it the thought occurred, do we display the care we should in selecting our salesmen and might not the railroads follow with profit some such systematic pre-employment plan, for there is no doubt but that there are many men in ticket offices who have small ability for this important work and who, regardless of training, do not seem to develop into expert salesmen of transportation.

"I can sell three tickets to Joe's one," said a first-class ticket salesman to me a short time ago, and he could by actual count. There was not a circular in the office which did not bear his thumb marks of study and the contents of which he was not familiar with, nor was there a ticket in the case which he could not find as readily as a Scotchman can repeat the Catechism, while his co-worker floated along as easily as he could, having to ask someone else for detailed information in connection with practically every transaction other than that of a strictly local character.

You have all heard the story of the Hebrew who went into a ticket office and asked for a ticket to Springfield, and upon being asked by the polite salesman to which Springfield he desired to go—Springfield, O., Springfield, Mass., or Springfield, Mo., promptly replied, "Give me the cheapest." Unfortunately, this same kind of indifference is now and then noticed in some ticket offices—the easiest methods being employed to get by with, instead of a desire to raise the standard of service, but fortunately such offices are rare exceptions to the general rule.

May we now offer some thoughts which, if developed and worked out, might help solve some of the difficult ticket office problems that are encountered from day to day?

Sometime ago we had an analysis made of our ticket sales and were somewhat surprised to find that approximately 25 per cent of the total passenger revenue of the Chicago & North Western Railway Company was collected in our Chicago offices. When you consider that our total passenger revenue has run as high as $45,000,000 a year, you will appreciate how important it is that we have the right kind of salesmanship in these large offices.

First of all, it takes time and money to make an efficient ticket salesman and on account of the knowledge being largely technical and absorbed only after years of close study and application, frequent changes in the personnel of the office should be avoided and the salary should be made attractive to insure reasonable permanency.

And when changes are necessary, is enough time devoted to the direct tutelage of the new beginner? Are we not too prone to let him shift for himself rather than to put him through a course of study in ticket office problems that he may be educated to become a real salesman. He should be introduced to the tariffs—to the inside of them particularly—not to the outside cover only and furthermore that he absorbs the contents.

Study of Tariffs Needed

Tariffs are necessarily more or less complicated, but much of the mystery that surrounds them can be eliminated by a careful study of the parts that interest a particular office.

It is to be regretted that many ticket clerks make no comprehensive study of tariffs and do not think of looking at anything but the outside covers until someone is at the counter inquiring for information which they contain. There is then a wild scramble to find the information desired—haste often results in mistakes being made—not to mention delay in waiting upon the passenger, thus causing him to leave the office in an irritated mood with a very poor impression of its efficiency. As a matter of fact, the passenger gets the first and strongest impression of the character of the railroad he is patronizing from the manner in which he is served at the ticket counter, and if this service is not prompt, helpful and courteous, it is apt to discolor everything that follows.

Many of us have seen ticket clerks in busy offices do unnecessary work pasting together several pieces of tickets to make up a complete one when, if they had been acquainted with their stock, they would have found a printed form that would have served them all this trouble besides avoiding delay in waiting on the purchaser.

The railroads spend thousands of dollars each year in publishing booklets, exploiting different localities. These are eagerly read by the prospective traveler, but can the same always be said of the man behind the counter who is supposed to be an encyclopedia of information on subjects of travel?

Is it not frequently found that the prospective passenger knows more about what he wants than the man who is attempting to serve him? Some employes will tell you there is not time for study during office hours. This may be true to a certain extent, but there are times during the early and latter part of the day especially when a salesman so disposed can usually find time and furthermore should consider it his duty to read and digest every piece of travel literature that comes into the office, for that is part of his duties.

To illustrate this point, a friend of mine had occasion quite recently to call at a large city ticket office shortly after the opening hour and it happened at that particular time there was not a prospective passenger in the office. He desired some information about an eastern resort and evidently did not get much satisfaction. "Was any one of the six or seven men behind the counter studying the tariffs or reading something of use in connection with their work? No, they were not," he said with emphasis. "They were standing around in pairs, apparently discussing the relative merits of the Yankees and White Sox—all very well in its way, but this does not go very far towards giving satisfactory service to patrons, nor in increasing the size of their pay checks."

A feature of good salesmanship is to have the ticket forces kept familiar with the advertisements your company may be running in daily papers or national mediums of publicity, that they may post themselves on inquiries they are likely to have in connection therewith, and thus be prepared to answer same promptly.

The prompt and accurate handling of sleeping car matters is one of the most important features of good salesmanship in a well organized office and should have close inspection and supervision by the agent himself. An ideal condition in larger offices is to have this important position filled by a man who has had traveling experience and who knows the necessity for prompt and discriminating work. This is especially true when dealing with foreign line ticket agents who frequently control routings from promptness in replies and the satisfactory character of answers received.

A rapid firing and most important sales assistant is the telephone and every one in this room will agree with me that this service should also have close personal supervision. "A soft answer turneth away wrath." If you want to see how quickly your competitor will get the business away from you, put a grouch on this job. He is a twin brother of Delay and both go hand in hand in opening up the floodgates of complaints and consequent loss of traffic.

Work of Information Bureau

An Information Bureau is an indispensable help to good salesmanship if properly organized and harnessed up with the ticket organization. I think you will agree with me that no folder, booklet or other literature should be handed out without polite inquiry being made as to whether the recipient has a trip in view, and if favorable reply is received, opportunity is then afforded to volunteer further assistance in planning an itinerary. If a memorandum is taken of the name, address and telephone number and handed to the soliciting agent, experience proves excellent returns may be expected from such follow-up methods. Unfortunately both of these angles of salesmanship are frequently neglected.

Is enough attention being given by your association to the study and investigation of methods or mechanical appliances that will assist in the reduction of work and at the same time promote the efficiency of the office? Can cash registers be used to advantage in some ticket offices, by simplifying the making of change and methods of accounting, thus giving more time for the counter and adding to the efficiency of the sales force?

In the building of new terminals or in the installation of new city ticket offices, are you men who may be interested in same volunteering ideas and suggestions in connection with their constructions and operation that are based upon practical experience in the successful and rapid handling of traffic?

Has a committee from your organization investigated and passed judgment upon the merits of the so-called double-deck and also wicket counters for city ticket offices which came into existence during the railroad administration, the former being used in the Consolidated Offices at Washington and Cincinnati, and the latter at Denver, Detroit and San Francisco? Are transactions with the purchaser face to face better than the somewhat usual practice of making up tickets on a separate desk some distance removed from the counter with your back towards same so as to avoid interruptions and possible mistakes as a result therefrom?

Noting as you do from day to day the use and abuse of folders, is it not possible for your organization to take this subject in hand and after investigation, offer suggestions as to economies that might be practiced in supplies or improvements made in the make-up or in the distribution of same? Likewise would not the voice of your association be helpful in sounding a note against waste in various other forms of circulars and advertising matter of questionable value, with which your offices are now flooded and much of the information duplicated?

Could not a committee from your association with profit make a study of the simplification of tariffs and give the benefit of its finding from the viewpoint of the transportation salesman as well as the public, to those charged with the issuance of same?

The day is approaching when every man who sells railroad tickets will be required to be a salesman, not a mere clerk from whom tickets can be bought, as our critic has put it, and to know as much about the transportation goods he is selling as the expert clothing merchant does about his. When that day arrives the classification, "ticket clerk," will vanish from the payroll and "transportation salesman" will take its place.

The Executive Board of the Great Lakes-St. Lawrence Waterway Association adopted a resolution at its meeting on December 11, challenging the railroads of the United States to meet with the association and define their stand on the ocean-lakes waterway project. The resolution states that the railways have asked the public for fair treatment and an impartial attitude, and asks in return that the lines respond to a similar appeal from proponents of the deep waterways.

Annual Report of the Bureau of Safety

The Interstate Commerce Commission has issued, in a pamphlet of 43 pages, the report of W. P. Borland, chief of the Bureau of Safety, for the fiscal year ended June 30, 1922. This is a supplement to the annual report of the Commission, which was noticed in the *Railway Age* of December 9, which notice included a paragraph devoted to the principal points in Mr. Borland's report. Other features are here noted.

The number of freight cars inspected during the year under review was 1,046,964, of which 4.35 per cent were found defective; passenger cars inspected, 26,116, percentage defective, 0.97; locomotives inspected, 23,590, per cent defective, 2.40. The usual comparisons are given, with data under this head, for preceding years. More cars and locomotives were inspected than in 1920 and the record also discloses a gratifying decrease in the number found to be defective. Of all the defects found, 65 per cent are in connection with the air brake and hand brake mechanism, and among these, cut-out air brakes are prominent. The report calls attention to the duty of reducing this percentage of brakes cut out. Inspections during the past year have disclosed cars on which the hand brakes were unsatisfactory because of too long brake shafts; and in numerous instances it has been noted that sill steps on freight cars were not properly located under the ladders.

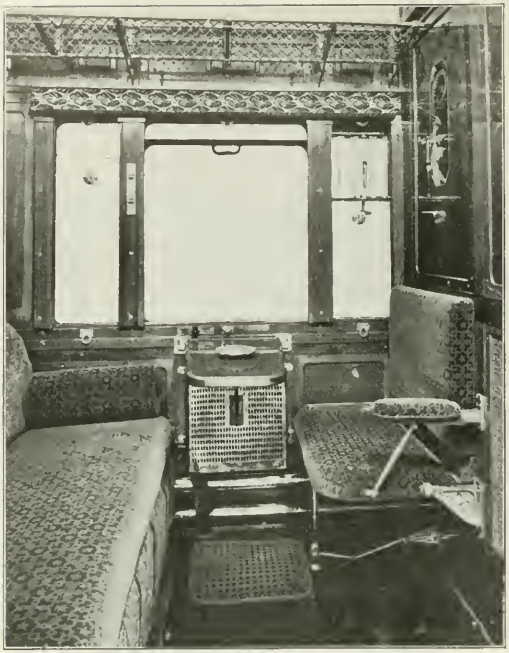
During the shopmen's strike in July, August and September, there was a large increase in the number of cars with defective safety appliances, and totals are given comparing the different months of the year.

The report of hours of service, covering cases where the regulations of the law were not strictly complied with show 31,682 instances of excess service, which is less than half the number reported in the year preceding. Of the 31,682 cases, 9,940 had to do with telegraphers in continuously operated offices; cases where the operators worked longer than nine hours; and there were 659 cases in daytime offices where the operators were on duty longer than 13 hours. The total number of instances of excess service of all classes has progressively decreased, each year, since 1918; due, it is believed, partly to light traffic conditions and also in a good degree to increased effort on the part of the roads to better observe the law.

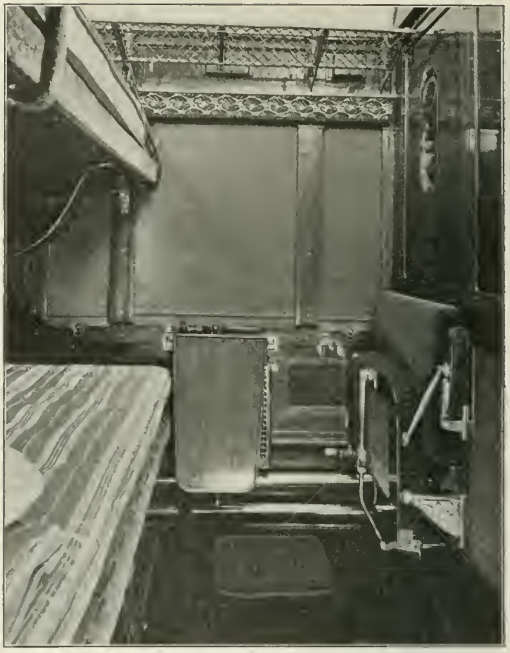
Inspectors have noticed an increasing tendency on the part of many roads to resort to the practice of temporarily releasing trainmen for short periods under circumstances where no rest could be secured, thus violating the intent and spirit of the law.

The inspections of cars and locomotives are reported in tabular form, in detail, as usual; and in the performance of their exacting duties the inspectors are credited with having displayed "marked ability, meriting special commendation."

In the County Court at Pittsburgh, Pa., the Pennsylvania Railroad has recovered a verdict of $106 in a suit against C. J. Ramsburg for damage to a gate, a shanty and other property when the defendant, disregarding the signals when he approached a crossing, near Dixmont early in the morning one day in December, 1921, broke the gate and was struck by eastbound passenger train No. 8. Mr. Ramsburg's automobile was wrecked, but he himself escaped. There was some snow flying in the air, but the locomotive bell was ringing and evidently the jurymen believed the railroad's statement that the driver had approached the crossing in a reckless manner. On February 11 of this year, Mr. Ramsburg brought a suit against the road for $2,500, the value of his automobile; and on April 15, the railroad brought the suit which has just been decided. Mr. Ramsburg's suit has not yet come to trial.



Double Compartment, Looking Outward



Compartment with Two Berths

Double Compartment, Looking Toward Corridor

View Along the Corridor

All-Steel European Sleeping Car Built by Leeds Forge Company, Ltd.

New Cars for International Sleeping Car Company

Leeds Forge Company Build 40 Steel Cars of Interesting Design, Handsome Appearance and Increased Comfort

THE CARS of the International Sleeping Car Company (Compagnie Internationale des Wagons-Lits et des Grands Express Europeens) are operated over many different railroads in France, Belgium, Germany, Austria and other European countries. Owing to the different requirements of the various lines in regard to couplers, brake systems, heating systems, signals, lamp brackets and other details and the fact that the runs are frequently long and cross the borders of several countries, the design of the cars necessarily is a much more complicated matter than would be the case were they to be operated only in a limited area.

The Leeds Forge Company, Ltd., of Leeds, England, are now completing the delivery of 40 new cars to the International Company. These are the first all-steel sleeping cars to be used in Europe and the longest and heaviest coaches ever built in England. In general appearance, beauty of interior finish and arrangements for the comfort of the passengers these cars are particularly noteworthy.

General Arrangement

The cars have been designed to carry 16 passengers in eight one-place compartments and four two-place compartments, six of the one-place compartments being provided with communicating doors capable of being locked from either side. The seats turn over to form the bed, the bedding being secured to the underside of the seat in dust-proof containers. The seat back of the two-place compartment is arranged to lift to a horizontal position to form an upper berth, being supported by pull-out brackets fixed to the body side and corridor partition and by safety straps suspended from the ceiling. The two-place compartments are each also provided with a tip-up seat at the window side and opposite to the main seat, a folding table being fixed to the body side between.

In the first six cars, which were for use on the Peninsula and Orient Bombay Express service of the Paris, Lyons and Mediterranean between Calais and Marseilles, the two-place compartments were fitted with corner wash basin cabinets instead of dressing rooms as provided in the remaining 34. These dressing rooms, of which there are two, are arranged one between each two-place compartment and are provided with locks operating simultaneously on the doors leading to each compartment. A porcelain wash bowl is fitted, both hot and cold water being provided, also mirrors, decanters, drinking glasses, brush boxes, towel rails and soiled towel baskets. The window to the dressing room in the corridor partition is of obscured glass of St. Gobian pattern. The interior of the dressing room is finished in white enamel, all metallic fittings being silver-plated.

Each single compartment is provided with a wash basin cabinet, the basin, which is of the tip-up type, being white-metal, silver-plated, as is also the casing. Hot and cold water are available at each basin. A hinged table forms the front of this portion of the cabinet. The upper portion of the cabinet forms a cupboard for the decanters and drinking glasses and the lower portion contains the chamber utensils.

The leading dimensions and weights of these cars are given in an accompanying table.

Construction of the Body

The structure of the body is entirely of steel, being built on jigs in units comprising full length compartment side, full length corridor side, body ends, platform ends, full length roof and canopies, thus insuring complete interchangeability as well as ease of production. These units, which largely consist of pressings and rolled sections, all made to templates, are readily assembled whole on the underframe, leaving the shell ready for the interior finish. To insure absence of vibration and drumming, the steel work has been covered on the inside with canvas and insulation from heat and cold has been provided. Free air circulation between the outer skin and inner finish is also arranged for the prevention of condensation.

DIMENSIONS AND WEIGHTS

Dimensions:		
Length over buffers	23.452 m.	76 ft. 11⅜ in.
Length over endsills	21.940 m.	71 ft. 11⅜ in.
Distance between truck centers	16.000 m	52 ft. 6 in.
Truck wheelbase	2,500 m	8 ft. 2⅞ in.
Diameter of wheels	1.040 m.	3 ft. 4⅛ in.
Journals	130mm by 280mm.	5⅛ in. by 11 in.
Height, rail to top of roof	4.000 m	13 ft. 1½ in.
Maximum Height	4.024 m.	13 ft. 2⅞ in.
Height, rail to center of buffers	1.050 m.	3 ft. 5⅞ in.
Maximum width	2.875 m.	9 ft. 5⅛ in.
Weights:		
In running order	54 English tons	121,000 lb.
Per axle	13½ English tons	30,250 lb.
Truck		15,230 lb.

The sides are constructed of ⅛-in. pressed steel side-posts of varying sections connected longitudinally at the base to rolled angles, which rest on the underframe, on the outside to a heavy belt-rail molding, and on the inside to a bulb section; at the top the posts are connected by two angle side-plates. The sides below the belt-rail are sheathed with ⅛-

in. steel plates of a special quality. The sheathing above the belt-rail is of ⅛-in. plate, pressed in to form the window openings, four windows being pressed in one piece. Steel moldings are used to cover the butt joints of the side-plates, the whole side being riveted together with rivets counter-sunk on the outside to give a clean appearance to the exterior. The sides thus become deep girders capable of supporting the whole of the superstructure.

The roof is a departure from the former clerestory type, being elliptical. It is constructed of rolled angle carlines riveted to upper partition plates, the latter extending down to the side-plate level across the compartments and shaped to suit the ceiling at the corridor, the angles carrying the ceilings being riveted to either side. These upper partitions are connected longitudinally by angle upper side-plates and by angle purlins, the whole being sheathed by 1/16-in. roof plates lined with canvas to prevent drumming.

The compartment partitions of 1/16-in. steel plate with angle framing are riveted to the underframe, body side and roof and upper partitions thus effectively preventing side swaying with resultant creaking of the woodwork. To the underframes and partitions is fixed a steel flooring on which is secured the wood partitions and floor covering.

The vestibule end is built up of ⅛-in. pressed steel channel section posts and cross rails, sheathed on the exterior with ⅛-in. plates and on the interior with 1/16-in. plates with steel cover moldings. Incorporated with the vestibule ends are cupboards for ice and wine, utensils and coal, with linen cupboards in the ceiling—all of steel—the cool wine cupboard being insulated with asbestos and zinc lined.

The vestibule is provided with two doorways at the sides, a door to the corridor and a communicating door to the next coach through the collapsible vestibule. These doors are of teak.

Underframes

The underframes are of unusual design and consist of a small number of parts, this result being obtained by the use of large steel castings for the ends of the frames. These castings were supplied in a machined condition by the Commonwealth Steel Company, St. Louis, Mo., to the designs of the Leeds Forge Company. Although somewhat similar castings have been used for some time on heavy coaches in America, this is the first occasion on which they have been used in conjunction with side buffers. The castings dispense with a large number of individual parts which would be necessary with the type of buffing and drawgear adopted for these cars. Tail pieces extend from the end castings towards the center of the car in such a manner as to give a thoroughly strong connection with the remainder of the frame. The cast steel construction for the ends of the underframes give great resistance in the event of a collision.

The central portion of the frame consists of a fish-bellied girder built up of two web plates. The depth of this main girder at center of frame is 2 ft. 3 in. and at the part connecting to the end casting 10 in.

The four main crossbearers extend from side to side of the car passing through slots in the web plates of the center girder, other pressed crossbearers and floorbearers being built into the frame.

The side frames are made of rolled Z-sections connected firmly to the tail pieces of the end castings and arranged to form landings for the bottom angles of the body sides.

The buffing gear is of the equalizing type, the ends of the buffer shanks being fitted with shoes bearing on large laminated springs and connected by equalizing bars.

Trucks

The truck frame consists of one steel casting of which the pedestals, bolster suspension brackets, brake hanger brackets, etc., are cast to form integral parts, thus reducing the number of pieces to a minimum. The wear of pin holes is taken care of by the insertion of hard steel bushings and the pedestals and bolster wearing surfaces are faced with liners. The bolsters and spring planks are also of cast steel, having been manufactured, together with the frames, by the Commonwealth Steel Company. The trucks are of the equalizing beam type with double elliptic and helical springs, designed to obtain the easiest possible riding.

Interior Finish

The floors are covered with felt, cork-lino and carpet in the compartments and with cork, linoleum and carpet in the corridors. Bronze handrails are fitted over the fixed windows in the corridor, straps and handrails are provided to enable the dropping windows to be used as a means of exit in an emergency. In the corridor are also boxes for literature, notice frames, thermometer, candle lamps and cupboards for soiled linen and spare parts.

A seat and bed for the conductor or porter is fixed at one end of the corridor. The lavatories are situated one at each end, one being provided with a water closet and tip-up wash basin, the other with a water closet only, all fittings for both being white-metal, silver-plated or polished. The ceilings are removable for access to the water tanks and piping. The lavatories are finished in white enamel, the floor composition being cement and white marble chippings.

A signal alarm apparatus is fitted, capable of being operated from each compartment and from both ends of the corridor, the alarm valve being situated in the vestibule. Each compartment has also a push-button which operates a semaphore fixed above the door in the corridor partition, the bell being at the conductor's end of the corridor. Ventilators of the torpedo extractor type are fitted to the roof, communicating to the corridor and lavatories.

The woodwork of the compartments and corridor is of polished mahogany, constructed in sections ready for fitting into position. The steel compartment partitions are covered on each side with a one-piece section while the corridor partition is made up of several sections. The portions of interior finish fixed to the body sides in the compartments and corridor are also made in sections of suitable size. The wash basin cabinets are each made as one unit, as are also the cupboards in the corridor. The dressing rooms consist of two units, ready for fixing in position, thus ensuring the minimum of time actually spent finishing the inside of the car where working space is limited.

The scheme of decoration for the woodwork of the compartments is inlaid veneered panels above the window sills and figured velvet panels below, that for the corridor being embossed leather above the window sills and plain leather and lincrusta below.

The ceilings are composed of impermeable millboard to which is secured a border pattern of Anaglypta, the whole painted white and secured in position with polished mahogany moldings. The roof steel upper partitions are also covered with a frame to which is secured impermeable millboard with a border corresponding to that on the ceilings and painted white, with polished mahogany securing moldings.

The seats which have comfortable, high backs are upholstered in figured velvet, the material being supplied by the Wagons-Lits Cie., to their own design, as are also the inlaid panels and embossed leather.

The double compartments are provided with three windows of the frameless, balanced type, two dropping to the full extent, the other dropping to the extent of a top glass louvre ventilator operated from inside or out. The single compartments are provided with two windows, one dropping full, the other to the ventilator. The corridor is provided with both dropping and fixed windows. All windows are fitted with roller curtains.

The exterior of the coach sides and ends are finished in royal-blue decorated with gold lining. The roof is painted black as is also the underframe. The vestibule interiors are finished to match teak. The outside lettering on the sides is of bronze.

Heating, Water and Lighting Systems

High and low pressure steam pipes pass through the underframes, the former having connections to a reducing valve placed in the body and the latter to the individual steam heaters.

There are two heating systems, one the usual through steam heating by means of serpentine radiators in the compartments and straight piping in the corridors, the other by hot-water circulation. For the latter a heating chamber is provided at one end of the corridor, in which is fixed a coal-fired boiler. Circulating pipes of copper are run from the boiler to a hot-water tank in the roof and from thence round both sides of the car. The hot-water tank is divided into two portions, the water in one portion being heated by radiation from the water in the other portion which is heated by the boiler, the water thus warmed being used for the wash basins. The cold-water tanks fixed in the roof are also provided for supplying the wash basins. These tanks are filled from connections at the side of coach on the side sills. All tanks and piping, other than for high pressure steam, are of copper.

The electric lighting installation is of the Dick system. The current is generated by a dynamo slung from the underframe and driven by a belt from a pulley attached to one of the axles, the current passing to a pair of battery boxes slung on the frames and thence to the switchboards. Each compartment has a triple electrolier, two bulbs of 27 volts each being used for lighting, a single light with blue globe being provided as a night light. In addition there are reading lamps situated at the head of each berth. The lavatories have each one light, the corridor four lights, the vestibules one each, and one is provided in the roof over and outside each platform entrance door. The switchboard and regulator are placed at the end of corridor near the conductor's bunk.

Brakes

As these cars are run over many railway systems, some of which use the vacuum and others a compressed air brake, it has been necessary to arrange the brake rigging for use with either system. When the cars are operated in trains having the vacuum system two 24-in. diameter cylinders operate a pair of brake shafts from which the power is transmitted to the brake shoes by suitable foundation brake rigging, and when the Westinghouse compressed air system is in use, the power is obtained from a 17-in. diameter brake cylinder. Furthermore, the vacuum brake is fitted with rapid action valves while the Westinghouse brake is fitted with a double pipe line so that the system may be either automatic or controlled.

The foundation brake rigging is necessarily somewhat complicated as the brakes must be applied by either the vacuum or the compressed air cylinders, or by the hand brake controlled by a wheel placed in the vestibule at one end of the car. The trucks are equipped with a clasp brake, the shoes being suspended only 2 in. below the center of the axle. All brake-rigging is elevated well above the track.

The appearance of the end of the car is complicated by the unusual number of hose connections required for the vacuum brake, the automatic and control pipes of the air brake and the high and low-pressure steam heat hose.

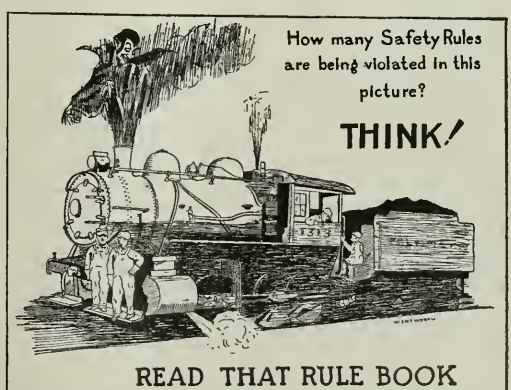
Delivery of the Finished Cars

The question of transportation of the cars to the coast and then of the shipment to France was a difficult one as the cars were larger than allowed by the loading gages of English roads. To obviate the necessity of dismantling the cars for shipment and consequent re-erection on the continent, it was arranged with the railway companies concerned for the cars to travel to the port of shipment on their own wheels complete, excepting for the removal of a few parts of minor importance. Stations were passed at dead slow speeds as the clearances were practically nil.

Once at the port of embarkation it was highly desirable that the cars should be shipped without the necessity of slinging them onto the decks of the ship. Channel ferry-steamers had been built during the war for the purpose of carrying rolling stock to the continent, but the terminals for these boats were at Richborough and Southhampton, however, and to neither of these ports could the cars be run conveniently, owing to their exceptionally large overall dimensions which would have necessitated alterations to the track in places, in order to avoid damage to the cars and to railway property. Negotiations were entered into with the Great Central for a new ferry-steamer terminal to be made on their line at Immingham, within 80 miles of the Leeds Forge Works, and with the Midland, which had charge of the transportation from the works at Newlay, Leeds, to Immingham port. The problem of the actual loading was settled by the provision of ramps over which the cars were run onto the tracks on the ferry-boat deck direct from the quay, an ingenious arrangement taking care of the rise and fall in the dock water-level, and thus preventing delay in loading. On the other side of the channel the delivery was made at Calais.

Work on the Moffat Tunnel of the Denver & Salt Lake has been delayed at least six months by a petition for a rehearing on the case involving the constitutionality of the Moffat Tunnel Act before the Colorado Supreme Court. The unanimous opinion of the State Supreme Court sustaining the Act was reported in the *Railway Age* of December 2.

A new type of Pullman car has been put in service on the Northwestern Limited of the Chicago & Northwestern operating between Chicago, Minneapolis and St. Paul. Permanent partitions extending from the side of the car half way across the backs of the seats provide greater privacy for the occupants of the berths during the daytime. The outer surface of the upper berths is flatter than usual, which gives the interior of the car an appearance of greater width. Other conveniences for the travelers, such as additional coat hooks in the upper berths and more easily operated berth lights, are also provided.



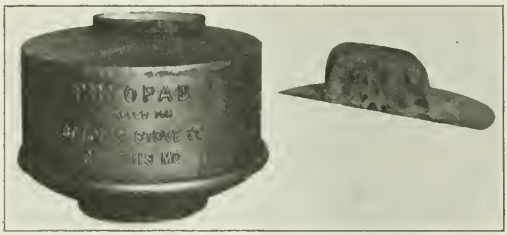
From Tyrone Division Safety Bulletin, Pennsylvania Railroad

An Improvement in Railroad Stoves

DURING THE PAST YEAR and particularly during the last few weeks, with the approach of cold weather, a number of railroads have evinced considerable interest in a recent development in stove design which appears to offer, at a small initial expense, the means of effecting substantial economies in the fuel consumed in stations, cabooses, engine-houses, pumping plants and other places employing coal stoves, and materially to reduce the danger from fire as well as to improve the service obtained from heating facilities at these points.

The development takes the form of a two-piece diaphragm which is supported in the upper part of the stove, one piece consisting of a semi-circular plate which extends horizontally across the fire compartment a few inches below the smoke flue and the other piece projecting from this place vertically to the top of the stove and occupying a position midway between the smoke flue and the front edge of the stove, in which position it leaves a space at each side for smoke and gases to pass from the stove to the flue.

The purpose of this arrangement is so to deflect the path of the flames as to keep them in direct contact with the sides of the stove, instead of allowing them to proceed directly up the center of the stove toward the flue under the influence of the draft. The principle underlying the construction is that by thus eliminating the air space between the flames



The Pyropad Drum (at left) and Pyropad

and the stove, the maximum of heat produced by the combustion is transmitted to the room instead of passing up the stack.

That the device accomplishes the purpose for which it is designed is indicated by several observations made at demonstrations. When fired up with open drafts and with only a small amount of fuel in the fire pot, the stove assumes a cherry red much more quickly than the same stove fired up under similar conditions but not equipped with the device.

It is to be observed also that under any conditions of firing, the intensity of the heat is generally uniform over the sides of the stove, a condition unlike that usually encountered in which the fire pot is red hot and the remainder of the stove quite cool. It is also observed that the heat may be maintained over an unusually long period without replenishment of fuel and with comparatively few coals upon the grate; an observation brought out particularly well in the case of an 800-lb. cast iron roundhouse type stove in which a red heat was secured with Illinois bituminous coal with only a third of an ordinary size scuttle full of coal and maintained even when the grate could be seen through the coals. It has also been observed that a red hot condition of the stove is not accompanied by overheating of the flue, the Fire Underwriters' Laboratories, in fact, having conducted tests on the stove above mentioned in which it was found, among other things, that tissue paper wrapped around the stack experienced no more than a slight turning of color at points where heavy paper would ordinarily have ignited in a short time.

The advantages claimed for the device are several. It appears that much less fuel is required to obtain a given amount of heat, or that more heat can be obtained for a given amount of fuel, or that it is possible to use a smaller stove for any installation designed to afford a specified amount of heat. It also appears that by reason of more perfect combustion less attention is required to keep up the heat and because of the more uniform heating of the metal, less trouble is encountered from cracking and buckling of the bowl or from the burning of grates. It is further advanced that because of more perfect combustion obtained by use of the device, as well as its ability to catch any soot arising during periods of imperfect combustion in the stove, soot troubles are largely eliminated, and finally it appears from the fact that the smoke flue does not become overheated under any condition of firing, a decided protection

The Pyropad Roundhouse Stove

from danger of fire is afforded, since it is a well recognized fact that most fires from stoves arise from the overheating of the flue.

The development is called the Pyropad and is a product of the St. Louis Stove Company, St. Louis, Mo., which not only incorporates it in special types of stoves for railway service called the Pyropad stoves, but also manufactures Pyropad drums which may be adapted to stoves already in service. A number of railroads are now using the device or have it under test. Of these roads the Missouri Pacific recently made an interesting test of the roundhouse type of stove in sand drying in which the Pyropad stove is reported to have dried 50 per cent more sand with approximately 25 per cent less coal than other stoves in service fired under the same conditions.

Telegraph and Telephone Section Holds Meeting

The Use of Concrete Poles, Electrolysis, Message Traffic and the Adoption of Radio Discussed

THE SIXTH SESSION of the Telegraph and Telephone Section of the American Railway Association was held at the La Salle Hotel, Chicago, on December 12, 13 and 14, with an attendance of approximately 150 railroad members and 50 affiliated members. This was the annual meeting which had been scheduled to be held at Colorado Springs, Colo., on September 19, 20 and 21, but which was postponed because of the strike of the shop crafts employees, as many of the telegraph departments were affected by the strike. The strike caused a postponement of a number of committee meetings which prevented the completion of several reports for presentation at that time. The meeting was called to order by the Chairman W. H. Hall, general superintendent of telegraph, Missouri, Kansas & Texas lines, at 10 a. m. on Tuesday, December 12.

Talk Results, Says Mr. Aishton

R. H. Aishton, president of the American Railway Association, in addressing the meeting on Tuesday morning, said that the world was full of railroad saviors at Washington, and this could be expected as long as the feeling existed that the railroads were walking around on crutches. "There has been enough talk of the 'crime of 1918' and of the railroads breaking down. The railroad men themselves can do much to counteract such ideas," Mr. Aishton said, "by getting before the people the tremendous things the railroads are doing." There was never a greater necessity for this than at the present time. Mr. Aishton pointed out that the railroads have done a wonderful work during the past year in spite of the handicaps such as the thousands of idle cars and locomotives during the first part of the year followed by the coal strike, which upset the normal railroad service. This was followed by the shopmen's strike which started on July 1 leaving 18 per cent of the cars in the country in bad order, and on top of this there was a tremendous demand for transportation facilities during the fall. In spite of all these handicaps Mr. Aishton said that the car service division shows that during the first 46 weeks this year, which extended from January 1 to November 18 last, 2,161,522 cars were loaded with grain and grain products, which is the largest number of cars ever loaded with grain and grain products during a similar period in the history of the railroads. Compared with the same period last year this was an increase of 112,583 cars, or 5½ per cent. Loadings of all kinds during the 46 weeks' period this year exceeded the corresponding period in 1920 by 513,059 cars, or 31 per cent.

In speaking of the work done by the Telegraph and Telephone section, Mr. Aishton said it was necessary that all sections show that they are functioning properly. He felt, if the section had done nothing else, the Manual alone was well worth to the railroads all the money spent. He advised all the members continually to look into the future, as radio with all of its possibilities and telephone developments, etc., must be watched closely and the railroads kept informed so that greater economy and efficiency can be obtained. "Get hold of your general managers, presidents and even your subordinates, and tell them of the wonderful things the section has accomplished and the good results to be obtained through the adoption of recommended practices, and you will become one of the most important branches in the association." Mr. Aishton expressed his appreciation to Chairman Hall for the splendid cooperation, and also to Mr. Hulatt for what he had done for the American railways while chairman of the section and he extended to him the best wishes of the American railways for his success in his future work abroad.

One pleasing feature of the meeting was a "Dinner to Dick" which constituted a personal farewell to H. Hulatt from the members of the T. & T. section. The dinner was held on Wednesday evening and was featured with music and songs. Mr. Hulatt was chairman of the section in 1921 and has resigned as manager of telegraphs of the Grand Trunk System to engage in other business in England.

Outside Plant—Construction and Maintenance

In view of the increasing cost of wooden pole lines the report of Sub-committee A of Committee 1, including an outline of a proposed specification on the construction and maintenance of wood pole lines is of interest. The finished portion of the specification establishes definitions of all terms used in this work and includes 22 drawings of proposed layouts and standards.

Concrete telegraph poles were used on the Panama Railroad in 1856 and numerous test installations have been made both in Europe and the United States, the most important being on the Pennsylvania and the Baltimore & Ohio. More recent designs have increased the strength and reduced the weight and material required. Sub-committee A-2 presented a complete specification for these reinforced concrete poles together with photographs and charts showing results of tests made. It is recommended that where permanency is of first importance, concrete poles offer a solution well worth experiment and development.

In May, Sub-committee A-3 decided that the American Engineering Standards Committee should be requested to include in its work specifications for telegraph and telephone cable. However, it was thought that specifications to be drafted by the Standards Committee would not be completed for some time. Therefore, as the Telegraph & Telephone section was desirous of securing specifications as quickly as possible, the committee proceeded at once to prepare an outline; and a sample portion of a proposed specification of paper-insulated lead-covered telegraph and telephone cable which was presented for discussion at the meeting.

By providing a kit of tools according to the lists prepared by Sub-committee A-4, the construction crews and linemen can be held accountable for first class work and a full outfit of equipment. A complete written agreement between the railroads and power companies crossing railroad pole lines with power lines is essential, therefore a new form of agreement was presented by Sub-committee B.

Where tile or fibre conduit is used for underground conduit systems crossing under tracks, at least 2 ft. 8 in. clearance between the top of the conduit protection and the base of the rail is required. If this clearance cannot be obtained it was recommended in the report of Sub-committee C that iron or mild steel conduit be used. Manholes, handholes and terminal poles where practicable, shall have a horizontal clearance of not less than 12 ft. from the nearest track rail. Drawings showing the recommended cross sectional area of conduit and concrete protections are included as a part of the specification.

On account of difficulties in transposing train dispatching circuits, such circuits should be kept in pin positions away

from long distance telephone circuits, according to the report of Sub-committee D—Transpositions, which included a specification covering the assignment of pin positions for phantom telegraph circuits. The end position on the top cross-arms and the lower cross-arms have a slight advantage in being somewhat less subject to cross talk and noise as compared with other pin positions. Transposition poles are to be marked by stenciled letters painted on the poles five feet from the ground.

Inside Plant—Construction and Maintenance

In order to establish standards for switchboard plugs, jacks and cords, Sub-committee B—Apparatus, Material and Tools, has prepared specifications on these three articles for the guidance of manufacturers. Where telegraph, telephone and interlocking equipment is to be housed in the same building, as in interlocking towers, it was recommended by Sub-committee H that the apparatus be located according to typical plans presented with the report and that full information on requirements be furnished from officers responsible for the construction and maintenance of all classes of this equipment.

Instructions for the use of bridge testing sets with variable ratio arms; a 28-page explanation on the theory of simultaneous telegraphy and telephony; and a set of instructions for the maintenance of polar relays were included in the report of Sub-committee J—Circuits and Current Supply.

Specifications for the installations and maintenance of stationary storage batteries, both the lead type and the nickel-iron-alkaline type were given in detail together with sketches in the report of Sub-committee K—Installation and Maintenance. Directions for the circuit cross connection records for wire chiefs and specifications for soldering were also included in the report of this sub-committee.

Message Traffic

A form was presented by Committee 6 for the recording of requests for, and the completion of, long distance telephone calls over railroad telephone circuits. It was recommended that each telegraph message be assigned a number, adding a dash and a suffix number to indicate the number of addresses when more than one person is to receive a copy. On private exchange telephone systems the limiting of the length of conversations to three minutes was recommended. On account of the continual changes in traffic it was not recommended that an "efficiency unit" be established for relay office performance.

Telegraph and Telephone Development

One road has developed a novel and convenient telephone switching device for use in towers and offices where there are numerous circuits to which the operator has occasion to connect his telephone. The "Superphone" is a new telephone invented by R. D. Duncan Jr., chief engineer of the Signal Corps Research Laboratory. This apparatus is said to provide a means for absolute secrecy of communication without possibility of being overheard or interrupted by any one else on that particular line. The system is an outgrowth of the "wired-wireless." The Northern Pacific has installed an extra push button at the long distance operator's position to operate the calling circuits, thereby preventing undesirable "ring backs."

The protector ground connection wire for lightning arresters should be either of copper, not smaller than No. 6. A.W.G. or galvanized steel strand. These wires, according to Committee No. 4, should follow the most direct practicable route and be free from splices, spirals and unnecessary sharp bends.

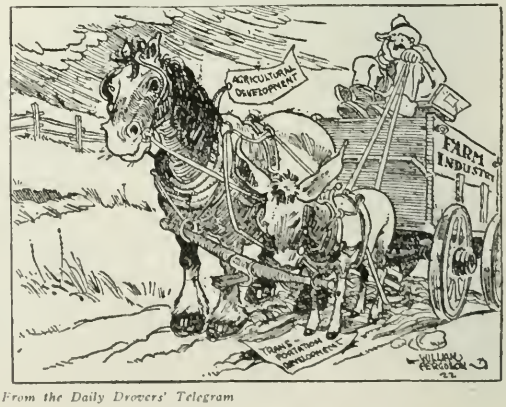
The most common causes for the electrical unbalances to ground on telephone circuits are the transposition irregularities and local leaks due to contact with limbs of trees or loose joints in the wires. The elimination of such troubles and also the transposition of metallic circuits and cables was explained in the reports of Committee 7—Inductive Interference.

Efforts are continually being made to improve transmission by expensive changes in line circuits, switchboards and sub-station equipment. However, the results so accomplished are in many cases equivalent to only a few miles of standard cable, whereas by educating the users of the telephones to talk with the lips practically against the rim of the mouthpiece, additional saving can be made equivalent to many miles of standard cable, and at no expense. *"Place the lips close to the mouthpiece and speak in a firm tone of voice"* were the instructions recommended by Committee 11, and should be supplemented by a logical educational campaign to teach railroad employees of the more satisfactory service so easily obtained.

A paper on "Electrolysis Mitigation" together with photographs and a map was presented by Edward Entelman, superintendent of telegraph, Southern Pacific. The paper related several occurrences where cable sheath and pipe lines were damaged, the trouble being eliminated by insulating the pipe into sections and using drain connections. A form on which to record the enrollment, qualifications, employment, and progress in studies and advancement of employees was presented by the Committee on Education and Training of Telegraph and Telephone Employees. The first instruction pamphlets are to be for elementary mathematics and for elementary electricity. The books are to be of a pocket size so that a man can use them in the field.

Negotiations were under way with the manufacturers for the construction and tests of several radio sets applicable to railroad needs according to the report of Committee 12—Radio and Wire Carrier Systems. Radio sets for communication between the head and rear end of long freight trains or with nearby stations, using the conductors on adjacent pole lines in a carrier-current system were considered as of first importance. Short range sending and receiving sets to be used in case of pole lines being torn down or in case of accidents are also needed. Patent litigations are delaying progress on the developments of such equipment.

CANADIAN PACIFIC STEAMERS have brought to Montreal this past season 16,722 cabin passengers and have carried out 12,668 cabin and 8,565 third class passengers. These figures represent the passenger business of 59 steamship trips.



From the Daily Drovers' Telegram

An Unmatched Team

New York Railroad Club Celebrates Golden Jubilee

2,200 Attend Banquet Commemorating Club's Fiftieth Year— More Public Relations Work Urged

THE NEW YORK RAILROAD CLUB celebrated its fiftieth anniversary on December 12 by a dinner at the Hotel Commodore, New York. About 2,200 attended. The speaker of the evening was Ex-Governor John J. Cornwell of West Virginia, now general counsel of the Baltimore & Ohio, who called attention to the growth of anti-railroad sentiment in the country and urged the roads to devote more time and money to their public relations work.

Other speakers were H. H. Vreeland, vice-president of the Interborough Consolidated Corporation, who was the toastmaster; George A. Post, chairman of the Railroad Committee of the Chamber of Commerce of the United States, and Daniel M. Brady, president of the Brady Brass Company, who was the only one present who had been a member of the club since its inception.

The three last named speakers devoted their remarks to reminiscences of the earlier days of the club, its accomplishments and to eulogizing those who by their devotion to the work of the club have made it a success.

H. H. Vreeland Reviews Club's History

"The New York Railroad Club," said Mr. Vreeland, "came into being about December 21, 1872, on which date what was perhaps its first regular meeting was held at 111 Liberty street, New York. Its inception, however, dates back to December 12 of that year in the beginning of what had for some time in the minds of men of affairs in the Master Car Builders' Association and to whom Leander Garey, affectionately remembered and honored to this day, was the leader, who was even then a veteran in railroad service and of whom the Hon. Chauncey M. Depew, our only honorary member, in an address given 25 years ago before this club, said, 'an able, industrious, energetic and conscientious railroad man,' and the organization of the New York Railroad Club with Mr. Garey as its first president, 'a happy omen of its permanent success'."

The club, which is now celebrating its golden anniversary, has at the present time 2,000 active members, Mr. Vreeland pointed out. These include men in all ranks of railroad service as well as representatives of the railway manufacturing and supply companies. There are now in this country seven technical railroad clubs, he said, and two in Canada, all modeled after the New York Railroad Club which "is pleased to recognize them all as her own prosperous, successful and well-behaved children."

"It is of still further pride," Mr. Vreeland continued, "that upon our membership list will be found the names of W. J. Harahan, president of the Chesapeake & Ohio; James H. Hustis, president of the Boston & Maine; W. C. Besler, president of the Central Railroad of New Jersey; Elisha Lee, vice-president of the Pennsylvania System; Ralph Peters, president of the Long Island; W. H. Williams, vice-president of the Delaware & Hudson; Frank Hedley, president and general manager of the Interborough Rapid Transit Company; Dr. W. F. M. Goss, president of the Car Manufacturers Association; P. E. Crowley, vice-president of the New York Central; W. C. Thompson, general superintendent of rolling stock of the New York Central and secretary of the Traveling Engineers Association; W. K. Vanderbilt; Daniel R. MacBain, assistant general manager of the New York Central at Cleveland; Robert M. Lovett, chairman of the board of the Union Pacific; George W. Wildin, general manager of the Westinghouse Air Brake Company; Col. B. W. Dunn, chief of the Bureau of Explosives, who has done great work in the cause of safety in railroad travel and transportation of property, and many others so numerous that time will not permit of their individual mention. You will find that all or nearly all of those referred to are here tonight, the 'elder statesmen' being revered for their companionship and helpful co-operation."

Presentation of Cup to Retiring President

Another feature of the program of the evening was the presentation of a silver loving cup to John A. Droege, general superintendent of the New York, New Haven & Hartford, the retiring president of the club. Presentation was made by W. G. Besler, president of the Central of New Jersey. The evening's program was opened by F. T. Dickerson, secretary and treasurer of the Central of New Jersey, the new president of the club. Arthur N. Dugan, vice-president of the Bronze Metal Company, was chairman of the dinner committee in charge of all arrangements.

Mr. Cornwell's Address

With the end of the shopmen's strike, the railroads would have entered a more peaceful period, politically and so far as legislation and a demand for more stringent regulation go, had it not been for the unfortunate condition of the farmer.

This country cannot become really and truly prosperous, or if it has become prosperous it cannot long remain so, unless the farmer has his proper share of that prosperity. Beside being the food producer, the purchasing power of the farmer, in normal times, is almost as great as that of all the balance of the people. If the farmer is crippled or his purchasing power is impaired for long, the balance of the country and all other industries, including the railroads, will soon be affected.

The farmer's products have been deflated to a greater extent than those of anybody else, while he is competing, when he employs labor, with wages of other groups of employees that have not been deflated. The coal miner is getting the highest wage that was paid as a result of war conditions.

So, what are many farmers doing? Taking their boys and their girls out of college, and preparing to cultivate only the land they and the members of their family can till. They find it impossible to sell their farm products at prices which will let them out on the cost of production. And what else is the farmer doing?

He is getting in a bad temper, an ugly frame of mind. He looks around to see what is the matter and is told that the trouble is that the freight rate is so high to market that it eats up the profit and the crop. Naturally, a large percentage of them believe the statements. When a man is in hard luck in business it is not a difficult matter to convince him that he has not had a fair deal; that somebody has robbed him, and when a man has been robbed, or thinks he has, and a seemingly respectable man points out the robber, what is the man going to do? Is it not natural that he should go after the robber, real or supposed?

That is what the farmers seem to have thought they were doing in the recent election in some of the agricultural

states. They have been convinced that the railroads have unjust and exorbitant freight rates and they have prepared, not exactly to go after them, but like the old farmer I once knew was about going to church. He said he would either go or send. Those western farmers are sending. They have sent Mr. La Follette back with a record breaking majority. They have done the same with Mr. Johnson in California. They have elected the Non-partisan League, recalled governor, Mr. Frazer, from North Dakota, and they have commissioned Mr. Brookhart, of Iowa, to come to Washington with a brand new crop of ideas. That is all significant.

The next Congress will, in all probability, seek to do some very decisive things. Instead of putting teeth into the Transportation Act, as some of you railroad men have been talking, they are liable to cut the very gizzard out of it, if indeed it is not scrapped entirely. When these western farmers had the railroads pointed out as the malefactors in the recent campaign, the voters were reminded of all the malodorous things done by the railroads in the old days when rebating was a custom, when discrimination in favor of the big shipper as against the little one was popular and when the general business standards and morals were on a very different plane from what they are today.

Other Shippers Also Dissatisfied

The car shortage is making socialists, temporarily, out of a good many shippers of other classes of freight. That is particularly true of the coal operators. The non-union operators have made little complaint, I think, probably because they got theirs while the coal strike was on and not because they have any more patience or sympathy for the railroads in their troubles than the union operators. The latter, who had a 100 per cent strike for five months, who were able to shut up shop and eliminate all the expense possible by not attempting to run their mines, having sustained heavy losses during the strike, naturally now want to recoup—to get some of the money back, and they want an ample car supply. Some of them forget that the railroads were not allowed to make any huge profits during the war, out of which they might have purchased cars they did not need, for just such an emergency as we have been having; they forget that the railroads also had a strike and could not close down their plants, but had to keep operating, no matter what the sacrifice. They forget that the railroads are now attempting to handle a full year's supply of coal in a few months—that is, some of them do, and they are not only severe in their criticism, but—some of them—are standing around saying: "Well, if this is the best the railroads can do, I am for government ownership."

I suppose it would be a queer doctor who would come and diagnose a case and go away without prescribing a treatment, but I have no patent-medicine chest with me. I have no cock-sure scheme to cure any of the ills with which the body politic is afflicted. I do not know any way by which Mr. La Follette or Mr. Frazer or Colonel Brookhart can be brought to look through your spectacles.

It does, however, occur to me that there are some things the railroads, their officers and their employees can do right now that would be, or at least *might* be, helpful. Very briefly, I am going to tell you what they are. In doing so, I am giving you merely my personal opinions. They are not the opinions or impressions of a railroad man, of the general counsel of the Baltimore & Ohio, but rather the impressions of one who was but lately one of the general public and only a little while ago a public official who was having his troubles dealing with some very acute industrial disturbances.

Need for Vigorous Public Relations Campaign

I would put on a tremendous publicity campaign to put the facts as to the railroad situation before the country. I would tell the railroad story in every conceivable way and to everybody in the country. The railroads have not fallen down as the people think and as the politicians and the demagogues have been telling them. You and I know that but the people don't know it generally. The country is simply outgrowing the transportation facilities just as the big railroad men of the country were predicting a score of years ago would be the case and why?

We know but the people don't know that it is chiefly because railroads have been over-regulated and over-restricted and limited in their operations and limited in their earnings until it really is a great tribute to the men who have been handling them to say that they are operating at the peak, as they have been the past two months and just following a strike.

Probably you are saying to yourselves the railroads already are doing that kind of publicity work. You are, in a way, but a great deal of it does not get anywhere. You are collecting and printing a lot of statistics and bulletins and sending them around to your own officers and employees and to the officers of other railroads. I get a lot of it. I read it, too, for I have not been in the game long enough to lose interest in the subject. But the public is not getting it.

Another thing: If there are any unfair rules or practices being engaged in, anywhere on the part of the railroads, they should be cut out, regardless of whether they are strictly permissible under the laws. The public does not understand that among the hundreds of agents and officers of a single system there are bound to be a few men, here and there, who will occasionally do things not exactly right and that are not in line with the policy of the management which may be trying ever so hard to be on the level. I sometimes wonder whether the executive officers are, themselves, always alive to those facts and whether they are just as alert and as careful to investigate and ascertain whether the under-officials, or all of them, are always playing the game square.

I got a training while a public official which did me a lot of good. I read vicious criticisms, soon after I took office, based upon misinformation, sometimes, I might properly say, gross ignorance of the law or of the facts, or both. A fine opportunity offered occasionally to soak a fellow and soak him hard, but the man who wielded the editorial pen would have the last word. He could keep on talking after I had stopped and gotten absorbed with something else, so, instead of writing him a nasty letter or giving out a statement to his competitor in which I sought to expose his ignorance, I wrote him a polite note and assured him of my confidence in his desire to be fair and accurate in his statements; that I thought he would be willing for me to point out to him that a slight error had crept in and that the facts were as follows. Rarely ever, indeed I can recall but one case, where that kind of letter did not meet a proper response and in at least three instances I made fast friends of influential newspaper editors who belonged to the opposite political party.

There Are Still Opportunities in the Railroad Business

And you young men: I assume most of you are in the railroad game for life. I do not entirely agree with the thought that because railroads are regulated and unduly hampered by governmental agencies that all opportunities for young men in the railroad profession are gone. Genius, energy, common sense, diplomacy, and keeping everlastingly at it will count today and will continue to count in the railroad world.

If the railroads can get through the period they are now approaching and if the coming Congress can be persuaded not to take away the only safeguards left and turn the forty-eight states loose on them to tear them into pieces and make them a patch work, then, with reasonable prosperity ahead for a few years, they will settle down into a more peaceful state and federal ownership will be avoided. But, it is going to take a fight to stave off those things and you should begin now, not wait until the thing is upon you.

Effect on Ton-Mile Cost of Reducing Train Loads

Illinois Central Tests for U. S. R. A. Show Greatest Economy with Full Tonnage Freight Trains

DURING THE PAST 20 YEARS much attention has been given to the rating and loading of locomotives in freight service and it is recognized as one of the most important factors in keeping down the direct ton-mile cost of freight train operation. The most economical loading until recently has generally been considered as the maximum which the locomotive could handle over the ruling grades with a margin of capacity only large enough to prevent stalling under the most adverse conditions likely to be encountered. During this period there has been an increase in the revenue tons per train greater in proportion than the increase in the average tractive effort of the locomotives in freight service.

In the development of accurate tonnage ratings little attention has been given to the element of time, although in many cases it has been taken into account in the practical adjustment of ratings to meet the requirements of local conditions or traffic of special character. With the present character of train service wage agreements, however, the importance of the element of time has been materially increased. With the passage of the Adamson law in 1916, the trip unit was decreased from ten hours to eight hours and in 1919 punitive rates for overtime were established by the Railroad Administration.

Character of the Tests

During the early summer of 1919 a series of freight train tests were conducted on five divisions of the Illinois Central System under the direction of the United States Railroad Administration to determine the best combination of train load and corresponding practicable speed from the standpoint of economy in the two most affected direct costs, that is, fuel and crew wages. The combined effect of tonnage and speed was measured in ton-miles per train hour, in which the train load in tons and the speed in miles an hour are factors of equal weight, and the direct costs were computed on the gross ton-mileage basis. No account of these tests has been published previously, but the results are of fully as much general interest and value now as they were at the time the tests were conducted.

Tests were run on the Champaign district of the Illinois division, the Paducah district of the Kentucky division, the Fulton district of the Tennessee division, the McComb district of the Louisiana division and the Tallahatchie district of the Memphis division of the Yazoo & Mississippi Valley. The tests consisted in the observation of the performance of trains of regular make-up, without special equipment, some of which were given the regular loading in accordance with the tonnage ratings then in force and others of which were given a loading reduced considerably below the regular rating. The observations were made in May, 1919, under exceptionally favorable conditions and on each district were under the personal supervision of a traveling engineer who was given competent assistance in keeping all records accurately.

The coal consumption was arrived at by careful measurements on all districts with the exception of the Paducah district of the Kentucky division, where actual weights were used. Accurate records were made of the time in motion and of all delays. The tonnage hauled was arrived at by taking the scale weights from the way-bills for loaded cars and using the stenciled weights for empty cars.

On the Champaign district the observations were confined to northbound trains only, owing to the fact that the traffic on this district is unbalanced, with the heavy movement from the south. This is a double track district 130 miles long, and is divided into two sections for rating purposes, one 84 miles long with ruling grades of 31 ft. per mile and the other 46 miles long with ruling grades of 18 ft. per mile. The tests included 30 full tonnage trains and 9 reduced tonnage trains.

On the Paducah district of the Kentucky division the results of the operation of 25 full tonnage trains northbound were recorded. With the exception of 10 miles of double track, this is a single track district 99 miles long. It has two tonnage sections, one 58 miles long with ruling grades of 66 ft. per mile and the other 43 miles long with ruling grades of 26 ft. per mile. No reduced tonnage trains were operated on this district because, with its comparatively heavy grades and large number of trains, overtime is the

result of interference by other trains and is not due to slow running speeds.

The Fulton district of the Kentucky division, which is 128 miles long, is double tracked throughout and has ruling grades of 26 ft. per mile. On this district observations of 9 full tonnage and 32 reduced tonnage trains were recorded, the movements being about equally divided between north and south.

The McComb district of the Louisiana division is a double track district 96 miles long with ruling grades of 21 ft. per mile. It compares in a general way with the Fulton district except that it is 32 miles shorter. Records were kept of the performance of 7 full tonnage trains and 9 trains with reduced tonnage, operating in the direction of heavy traffic only.

The Tallahatchie district of the Memphis division is a single track line with the exception of 28 miles of double track and is 144 miles long northward and 145 miles long southward. This is a low grade line, the ruling grade not exceeding 13 ft. per mile southbound and 17 ft. per mile northbound. On this district the tests included 32 trains of full tonnage and 20 trains of reduced tonnage, in each case evenly divided between the two directions.

As has already been stated, only fuel and crew wages were taken into account in the test records and the results were computed to show the cost of each and the total cost per 1,000 gross ton-miles and per train hour with straight time overtime, and the total cost per 1,000 gross ton-miles and per train hour with time and one-half for overtime.

In addition to these direct expenses, however, enginehouse expense is also affected by any change in operating conditions which changes the number of train miles required to produce a given number of gross ton-miles. It is, therefore, necessary to add pro rata to the direct unit costs for the reduced tonnage trains, a proportion of the cost of handling an engine through a terminal equal to the per cent of the increase in the train miles. Furthermore, in cases where the traffic is not balanced any improvement in operating costs derived from the running of lighter trains will be effective in the direction of heavy traffic only, and the cost of fuel and wages as well as the additional enginehouse expense incidental to the balancing movement of the additional locomotives required in the direction of heavy traffic must be added pro rata to the direct unit costs in the heavy direction.

Lower Costs With Heavy Train Load

The effect of these additional items of cost on the relationship of total costs per 1,000 gross ton-miles with reduced tonnage to the total costs with full tonnage are included in Table I, in which is presented a brief summary of the results of the tests. This table shows that in every case where comparisons were made between full and reduced tonnage operation, the lower ton-mile costs, considering the additional items, were obtained with the heavier train loading.

The effect of the lighter train loading on the cost of balancing power is a practical consideration of general importance, since it is exceptional to find the ton-mile movement in opposing directions equalized for more than short periods at a time. This effect alone was sufficient to throw the advantage in favor of the heavy train loading in the only case where the reduction of tonnage effected a reduction in the fuel and wage costs.

Analysis by Districts

In Table II is shown the average performance and direct costs of operation of the full and reduced tonnage trains on each district. It will be observed that, with the exception of the Champaign district, in every case the reduction of the train load resulted in a decrease in the number of gross ton-miles per train hour and an increase in both the wage and fuel costs per 1,000 gross ton-miles.

On the Fulton district, with an average reduction in the train load of 6.5 per cent, there was an average increase in speed between terminals of 1.4 per cent, from 14.6 miles an hour to 14.8 miles an hour, while the average running speed increased from 17.6 miles an hour to 18.3 miles an hour, or 4 per cent. The average delays per trip increased from 1 hr. 26 min. to 1 hr. 47 min. The gross ton-miles per train hour decreased from 48,364 to 45,419, or 6.1 per cent, and the direct expense increased from $.156 to $.162 per 1,000 gross ton-miles, or 3.8 per cent. In this case the difference in the average total time between terminals for the full and reduced tonnage trains was so slight that a change from the straight time to the one and one-half time overtime rate had no effect on the wage cost. The increase in wage cost alone was 6.7 per cent and in the fuel cost, 1.2 per cent.

Table I—Comparative Costs Per 1,000 Gross Ton-Miles of Full and Reduced Tonnage Trains

	Champaign District Tons	Fulton District Tons	McComb District Tons	Tallahatchie District Tons
Train load—full tonnage	3,750	3,308	3,192	3,547
Train load—reduced tonnage	3,271	3,091	2,389	2,948
Per cent reduction	12.7	6.5	25.1	16.9
Cost per 1,000 gross ton-miles: (Pro-rata overtime)				
Full tonnage trains	$.165	$.156	$.202	$.161
Reduced tonnage trains	$.150	$.162	$.228	$.174
Reduced tonnage trains incl. cost of engines and crews returning light and additional enginehouse expense	$.173	$.174	$.300	$.209
Cost per 1,000 gross ton-miles: (Time and one-half O. T.)				
Full tonnage trains	$.173	$.156	$.207	$.167
Reduced tonnage trains	$.151	$.162	$.229	$.180
Reduced tonnage trains incl. cost of engines and crews returning light, and additional enginehouse expense	$.174	$.174	$.301	$.215
Per cent of increase in cost of reduced tonnage trains:				
Pro-rata O. T. ..... Decr.	9.1	3.8	12.8	8.0
Pro-rata O. T. incl. cost in light direction and increase enginehouse expense	4.8	11.5	48.5	29.8
One and one-half overtime..Decr.	12.7	3.8	10.6	7.7
One and one-half overtime incl. cost in light direction and increased enginehouse expense	0.5	11.5	45.4	28.7

On the McComb district the average train load of the light trains was 25.1 per cent less than the average load of the full tonnage trains. The average speed between terminals was increased from 10.6 miles an hour to 12.6 miles an hour, or 19 per cent, while the average speed in motion was increased from 13.6 miles an hour to 16.2 miles an hour, or 19.1 per cent. The average delayed time per trip was reduced from 1 hr. 56 min. to 1 hr. 37 min. The gross ton-miles per train hour decreased from 34,102 for the full tonnage trains to 30,361 for the reduced tonnage trains, or 11 per cent, and the total direct costs per 1,000 gross ton-miles increased from $.2025 to $.2280 on the straight time basis and from $.207 to $.229 on the punitive overtime basis, or 12.8 per cent and 10.6 per cent, respectively. On the straight time basis the increase in wage cost was 20.5 per cent, and the increase in fuel cost was 6.2 per cent.

The average reduction in the light trains on the Tallahatchie district, as compared with the full tonnage trains, was 16.9 per cent. The average speed between terminals increased from 11.4 miles an hour to 12 miles an hour, or 5.3 per cent, and the speed while in motion increased from 15 miles an hour to 16.5 miles an hour, or 10 per cent. There was a slight increase in the average delayed time per trip, which amounted to 3 hr. 5 min. for the heavy trains and 3 hr. 18 min. for the light trains. Gross ton-miles per train hour decreased from 40,144 to 35,075, or 12.6 per cent. The increase in direct ton-mile costs was 8 per cent

on the basis of straight time overtime and 7.7 per cent on the basis of one and one-half time overtime. For the heavy trains the total cost per 1,000 gross ton-miles was $.1612 with straight time and $.167 with time and one-half overtime, while the reduced tonnage trains averaged $.174 and $.18, respectively. On the straight time overtime basis the wage cost increased 14.7 per cent and the fuel cost .5 per cent.

The tests on the Champaign district were the only ones in which the reduction of tonnage was accompanied by an increase in gross ton-miles per train hour and a decrease in both the fuel and wage unit costs. Here, however, there was a marked decrease in the average delayed time for the reduced tonnage runs, amounting to slightly over one-half of the total reduction in time between terminals. On this district the average reduction in tonnage was 12.7 per cent. This was accompanied by an increase in the speed between terminals from 10.8 miles an hour to 13.4 miles an hour, or 24.1 per cent, and an increase in the average running speed from 15.8 miles an hour to 18.4 miles an hour, or 16.5 per cent. Delays were decreased from an average of 4 hr. 1 min. per trip to 2 hr. 41 min. per trip. The gross ton-miles per train hour increased from 39,201 to 43,468, or 10.9 per cent, while the total direct unit costs showed a decrease of 9.5 per cent from $.1656 to $.15 for straight time overtime and 12.7 per cent from $.1735 to $.151 for time and one-half overtime. Wages showed a unit decrease of 8.4 per cent on a straight time basis and fuel a decrease of 10.5 per cent.

When, however, the additional enginehouse expense incidental to the additional train movements required to take care of the 12.7 per cent reduction in average train load and the cost of returning the additional engines and crews in the direction of light traffic are taken into account, the ton-mile costs are in favor of the heavier train loading, even on this district. The net increase in the cost per 1,000 gross ton-miles of the reduced trains was 4.8 per cent with straight time rates and .5 per cent with one and one-half time overtime rates.

After taking into account these same additional items on the other districts, the unit costs of operating the reduced tonnage trains show increases on the straight time basis of 11.5 per cent, 48.5 per cent and 29.8 per cent, respectively, on the Fulton, McComb and Tallahatchie districts, and 11.5 per cent, 45.4 per cent and 28.7 per cent, respectively, with the one and over-half time rate for overtime, in comparison with the cost of operating the full tonnage trains.

Road Delays and Gross Car Weights

A fact of considerable interest disclosed by the averages in Table II is that there is no marked relation between the delayed time and the train load or speed except in the case of the Champaign district. An analysis of the individual runs also bears out this conclusion. On the Fulton district, for instance, the delays vary from less than one hour to 3½ hours per trip throughout the range of train loads up to about 3,400 tons, or 95 per cent of the full tonnage rating. For the trains which were heavier than this there seems to be a tendency towards a higher average of delays, although the number of such trains for which data are available is not sufficient to establish this relationship conclusively. On the Tallahatchie district, a single track line, the trend of delays is constant throughout the entire range of train loads.

Table III—Average Gross Car Weights

District	Tonnage trains	Reduced trains
Champaign	52 tons	46.7 tons
Fulton	57 tons	45.5 tons
McComb	37.1 tons	27.2 tons
Tallahatchie	40.3 tons	42.1 tons

On the Champaign district, where the average delayed time showed a marked reduction for the reduced tonnage group, the variations in the amount of delays between trains in each group is so wide as to raise some doubt as to whether the relationship indicated by the averages would hold if more trains had been included in the light tonnage group.

Another variable condition which in a measure affects the direct comparability of the light and heavy train operation is the average weight per car. An examination of the relation of the average number of cars per train and the average train loads in Table II shows that with the exception of the Tallahatchie district, the car weights are favorable to

TABLE II—COMPARATIVE RESULTS OF OPERATING FULL AND REDUCED TONNAGE TRAINS ON FIVE DISTRICTS OF THE ILLINOIS CENTRAL SYSTEM

District	Champaign		Paducah	Fulton		McComb		Tallahatchie	
Length, miles	130		99	128		96		So. 145 / No. 144	
Direction of tests	North		North	North and south		One direction		North and south	
Ruling grade, ft. per mile	31 and 26		66 and 26	26		21		So. 13 / No. 17	
Line	Double track		Single track	Double track		Double track		Single track	
	Full load	Reduced load	Full load	Full load	Reduced load	Full load	Reduced load	Full load	Reduced load
Number of trains	30	9	25	9	32	7	9	32	20
Ratings, gross ton-miles	526,600	.....	236,700	457,832	.....	364,800	.....	So. 551,000 / No. 547,200	.....
Ratings, gross ton-miles per train mile	4,051	.....	2,401	3,577	.....	3,800	.....	3,800	.....
Average actual gross ton-miles	487,453	425,280	228,908	423,452	395,721	306,435	229,397	513,188	425,915
Average train load, tons	3,750	3,271	2,314	3,308	3,091	3.192	2,389	3,547	2,948
Per cent of rating hauled	92.5	80.8	96.6	92.5	84.1	84.0	62.9	93.3	77.5
Gross ton-miles per train hour	39,202	43,468	27,299	48,364	45,419	34,102	30,361	40,144	35,075
Average number of cars per train:									
Loads	69	65	50	55	59	62	33	67	51
Empties	3	5	5	3	9	24	55	11	19
Average time between terminals, hrs., min.	12-26	9-47	8-23	8-45	8-43	8-59	7-33	12-47	12-08
Average delays, hrs., min.	4-01	2-41	2-32	1-26	1-47	1-56	1-37	3-05	3-18
Average speed in motion, m.p.h.	15.8	18.4	16.9	17.6	18.3	13.6	16.2	15.0	16.5
Average speed between terminals, m.p.h.	10.8	13.4	11.8	14.6	14.8	10.6	12.7	11.4	12.0
Costs per trip:									
Wages	$41.77	$33.41	$26.80	$31.13	$31.03	$27.73	$25.09	$43.41	$41.57
Fuel	$38.95	$30.25	$24.83	$34.95	$33.09	$34.32	$27.29	$39.32	$33.17
Total	$80.73	$63.66	$51.63	$66.08	$64.12	$62.05	$52.38	$82.73	$74.74
Lb. coal per 1,000 gross ton-miles	68.59	61.02	93.1	70.8	71.8	96.1	102.1	65.8	66.9
Lb. coal per train hour	2,689	2,659	2,544	3,426	3,260	3,281	3,102	2.640	2,345
Cost per 1,000 gross ton-miles:									
Wages	$.0857	$.0785	$.1170	$.0735	$.0784	$.0905	$.1090	$.0846	$.0970
Fuel	$.0799	$.0715	$.1084	$.0825	$.0836	$.1120	$.1190	$.0766	$.0770
Total	$.1656	$.1500	$.2254	$.1560	$.1620	$.2025	$.2280	$.1612	$.1740
Cost per train hour:									
Wages	$3.36	$3.42	$3.20	$3.56	$3.56	$3.09	$3.32	$3.395	$3.42
Fuel	$3.13	$3.09	$2.96	$3.99	$3.79	$3.82	$3.61	$3.076	$2.73
Total	$6.49	$6.51	$6.16	$7.55	$7.35	$6.91	$6.93	$6.471	$6.15
Total cost with 1½ time overtime:									
Per 1,000 gross ton-miles	$.1735	$.151	$.231	$.156	$.162	$.207	$.229	$.167	$.18
Per train hour	$6.80	$6.58	$6.315	$7.55	$7.36	$7.14	$6.98	$6.73	$6.34

the operation of the heavy trains in every case. The comparison is shown in Table III. Had the train load been expressed in terms of adjusted tons rather than actual tons, the effect of these differences in average car weights would have been to decrease the proportionate amount of the reduction shown in the average loading of the light trains on all except the Tallahatchie district, where the proportional reduction would have been increased. The most important effect of this difference in conditions is on ton-mile costs. An examination of the data for the individual runs on the Champaign district disclosed a well-defined tendency toward increasing ton-mile costs as the average car weights decreased throughout the whole range of train loads and speeds. Considering the individual trains, the relationship between this factor and ton-mile costs is more consistently observable than that of any other single condition directly affecting either the fuel or wage accounts.

In each case the lower average ton-mile costs were obtained with the higher average gross ton-miles per train hour. The relationship of train load to ton-miles per hour, however, is not at all clear and it is evident that under the test conditions the speed between terminals is not generally affected in a sufficiently marked degree by the tonnage reductions to increase the ton-miles per train hour. The road delays, which in the main are unaffected by reductions in the train load or by the average running speed, appear to be the controlling factor. In this connection it is pertinent to note that the test trains were run during a period when the gross ton-miles handled were from 15 per cent to 34 per cent below normal on the districts where the comparisons were made and that, in the opinion of the officers in charge, greater reductions would have been necessary under heavy traffic conditions in order to have secured the same effect on the average time between terminals.

Conclusions

The following are the conclusions of the Division of Operation of the Railroad Administration, based on the results of these tests:

(1) There is no general agreement as to the percentage of tonnage rating which will bring the lowest cost. In the majority of cases this is effected by a load of 100 per cent, but in others the most economical load (considering the cost in one direction only) is about 85 per cent. Each division is governed by its own operating characteristics and no general law appears in the results before us in this study.

(2) The cost per ton-mile decreases as the gross car load increases, due probably to the lower train resistance per gross ton. * * *

(3) The cost per ton-mile increased with the delay on the road. This is illustrated well by the results on the Memphis division. With two hours delay, the cost per 1,000 gross ton-miles was 14.2 cents; at three hours it was 15.8 cents; at four hours it was 17.4 cents, and at five hours it was 19 cents.

(4) Up to a certain critical point the cost per ton-mile decreases as the ton-miles per train hour increases. The cost is stationary or rises slightly, as the ton-miles per train hour increase beyond that point. The critical point is reached only by trains running so far above the normal average speeds for trains of their weight that the increased fuel consumption offsets the saving in wages.

(5) There appears to be no distinct relation between the train load and the hours of delay on the road.

(6) The delay on the road apparently has more effect on the gross ton-miles per train hour than variations in speed while in motion. The element of road delay is probably the most important single factor in the equation.

The practical application to that road of the facts developed by the tests is summarized by the following general conclusions in the report of the Federal manager of the Illinois Central:

(1) It is not practicable to reduce the train load to avoid overtime because of the increased cost incident to the operation of the necessary additional trains in the direction of heavy traffic to handle the same tonnage and in the direction of light traffic to balance power.

(2) To a large extent the cost of handling the most economical train load includes considerable overtime.

(3) Increased cost resulting from overtime, like any other wage increase, must be met by increasing facilities instead of by reducing train load. This reduction, on a good many districts, would add train units in excess of present capacity

One of the Philadelphia & Reading New Coal Cars

Two thousand of these cars have been delivered by the American Car & Foundry Company, Midvale Steel Company, Pressed Steel Car Company and Standard Steel Car Company. They have a capacity of 70 tons and are equipped with empty and load brake and vent valve.

President Discusses Transportation Problem

Proposes Abolition of Labor Board and Creation of a Labor Division of the I. C. C.

WASHINGTON, D. C.

WHILE PRESIDENT HARDING devoted a considerable part of his address to Congress on December 8 to a discussion of the railroad situation, referring to the problem of transportation as an outstanding one demanding the most rigorous consideration of Congress and the country and saying he knows of no problem exceeding it in importance, it is not understood that he was in any sense outlining a program of railroad legislation for immediate consideration. While he made several more or less definite suggestions, including one that the membership of the Interstate Commerce Commission be increased by four to constitute a labor division as a substitute for the Railroad Labor Board, and that power should be conferred either upon the present board or the suggested substitute to require its rulings to be accepted, no change has been indicated in the policy of the administration leaders recently expressed in the announcement by Chairman Cummins that he does not intend to press, although he may introduce, at the present session the bills he has at least tentatively prepared which would carry out some of the President's recommendations, and it is also understood that there has been no alteration of the President's determination not to call an extra session after March 4 if it can be avoided.

With this understanding, therefore, it is apparent that the address was intended mainly as a compliance with the constitutional duty of the President to lay before the Congress from time to time the state of affairs in the nation and that he was making a report to Congress and inviting its consideration of his reactions from his contact during the past year or so with the subject in connection with the controversies over rates, wages and car supply. The President finds much in need of improvement in the transportation situation and he has various ideas, derived from various sources, as to what should be done about it, but while he urged a "prompt enactment at the present session" of legislation for the relief of the farmers, he did not apply the same language to his suggestions regarding transportation and the administration forces are anticipating sufficient difficulty in obtaining action at this short session on even the present program of the Administration.

In his first address to Congress after his inauguration President Harding declared that railway rates and the cost of transportation must be reduced. He is still urgent that this be brought about but he has come to an appreciation that "rates horizontally increased, to meet increased wage outlays during the war inflation, are not easily reduced." When he refers to the "five per cent horizontal reduction" made last year it is understood that he has in mind the fact that the ten per cent horizontal reduction of July 1 did not apply to some rates that had previously been reduced and, therefore, effected less than a ten per cent reduction in total freight revenues at the time, although it has usually been estimated at more than five per cent, and the total reduction from the high level established in Ex Parte 74 was more than ten per cent.

As to how to effect better and cheaper transportation the President is clear that "government operation does not afford the cure." He sees advantages to result from plans to coordinate all transportation facilities and agrees with most railway officers that the motor truck should be turned "into a railway feeder and distributor instead of a destroying competitor," but he wants the government to point the way to reduced freight costs and looks for "genius" among the railway managers to find new economies and new efficiencies in co-operation. The merger of lines into systems, which the Transportation Act invites but temporarily postpones pending the completion of an artificial plant, is suggested as one means, and the President apparently has been impressed with the proposals of Mr. Warfield, some of which found their way into the report of the Joint Commission of Agricultural Inquiry, in the direction of car pooling under a central agency, and the consolidation of facilities.

The President is strongly convinced that the strike is a weapon of organized labor that must be abandoned because its effects are felt more directly by the public than by the railroad companies but he attempts to balance his censure of those responsible for the shop strike by dividing the blame with "heedless forces of reaction" that "sought the pre-war levels" of wages, although the wage reductions that were followed by the strike, which he elsewhere characterizes as "very moderate," were ordered by the Labor Board.

The President introduced the subject of transportation in his address in connection with his recommendations for the relief of the farmer, whose difficulty, he said, has been accentuated by the railway strike. "Had we escaped the coal and railway strikes, which had no excuse for their beginning and less justification for their delayed settlement, we should have done infinitely better," he said. "But labor was insistent on holding to the war heights, and heedless forces of reaction sought the pre-war levels and both were wrong. In the folly of conflict our progress was hindered and the heavy cost has not yet been fully estimated. There can be neither adjustment nor the penalty of the failure to readjust in which all do not somehow participate."

Various measures are pending for the assistance of the farmer, the President said, and the best judgment of Congress ought to be expressed in prompt enactment at the present session, but "permanent and deserved agricultural good fortune depends on better and cheaper transportation." He then continued:

Text of the President's Address

Here is an outstanding problem, demanding the most rigorous consideration of the Congress and the country. It has to do with more than agriculture. It provides the channel for the flow of the country's commerce. But the farmer is particularly hard hit. His market, so affected by the world consumption, does not admit of the price adjustment to meet carrying charges. In the last half of the year now closing the railways, broken in carrying capacity because of motive power and rolling stock out of order, though insistently declaring to the contrary, embargoed his shipments or denied him cars when fortunate markets were calling. Too frequently transportation failed while perishable products were turning from possible profit to losses counted in tens of millions.

I know of no problem exceeding in importance this one of transportation. In our complex and interdependent modern life transportation is essential to our very existence. Let us pass for the moment the menace in the possible paralysis of such service as we have and note the failure, for whatever reason, to expand our transportation to meet the Nation's needs.

The census of 1880 recorded a population of 50,000,000. In two decades more we may reasonably expect to count thrice that number. In the three decades ending in 1920 the country's freight by rail increased from 631,000,000 tons to 2 234,000,000 tons; that is to say, while our population was increasing less than 70 per cent, the freight movement increased over 250 per cent.

We have built 40 per cent of the world's railroad mileage, and yet find it inadequate to our present requirements. When we

contemplate the inadequacy of today it is easy to believe that the next few decades will witness the paralysis of our transportation-using social scheme or a complete reorganization on some new basis. Mindful of the tremendous costs of betterments, extensions, and expansions, and mindful of the staggering debts of the world today, the difficulty is magnified. Here is a problem demanding wide vision and the avoidance of mere makeshifts. No matter what the errors of the past, no matter how we acclaimed construction and then condemned operations in the past, we have the transportation and the honest investment in the transportation which sped us on to what we are, and we face conditions which reflect its inadequacy today, its greater inadequacy tomorrow, and we contemplate transportation costs which much of the traffic can not and will not continue to pay.

Manifestly, we have need to begin on plans to coordinate all transportation facilities. We should more effectively connect up our rail lines with our carriers by sea. We ought to reap some benefit from the hundreds of millions expended on inland waterways, proving our capacity to utilize as well as expend. We ought to turn the motor truck into a railway feeder and distributor instead of a destroying competitor.

A Motor Age

It would be folly to ignore that we live in a motor age. The motor car reflects our standard of living and gauges the speed of our present-day life. It long ago ran down simple living, and never halted to inquire about the prostrate figure which fell as its victim. With full recognition of motor-car transportation we must turn it to the most practical use. It can not supersede the railway lines, no matter how generously we afford it highways out of the public treasury. If freight traffic by motor were charged with its proper and proportionate share of highway construction, we should find much of it wasteful and more costly than like service by rail. Yet we have paralleled the railways, a most natural line of construction, and thereby taken away from the agency of expected service much of its profitable traffic, which the taxpayers have been providing the highways, whose cost of maintenance is not yet realized.

The federal government has a right to inquire into the wisdom of this policy, because the national treasury is contributing largely to this highway construction. Costly highways ought to be made to serve as feeders rather than competitors of the railroads, and the motor truck should become a co-ordinate factor in our great distributing system.

This transportation problem can not be waived aside. The demand for lowered costs on farm products and basic materials can not be ignored. Rates horizontally increased, to meet increased wage outlays during the war inflation, are not easily reduced. When some very moderate wage reductions were effected last summer there was a 5 per cent horizontal reduction in rates. I sought at that time, in a very informal way, to have the railway managers go before the Interstate Commerce Commission and agree to a heavier reduction on farm products and coal and other basic commodities, and leave unchanged the freight tariffs which a very large portion of the traffic was able to bear. Neither the managers nor the commission saw fit to adopt the suggestion, so we had the horizontal reduction too slight to be felt by the higher class cargoes and too little to benefit the heavy tonnage calling most loudly for relief.

Railways are not to be expected to render the most essential service in our social organization without a fair return on capital invested, but the government has gone so far in the regulation of rates and rules of operation that it has the responsibility of pointing the way to the reduced freight costs so essential to our national welfare.

Government operation does not afford the cure. It was government operation which brought us to the very order of things against which we now rebel, and we are still liquidating the costs of that supreme folly.

New Efficiencies in Co-operation Needed

Surely the genius of the railway builders has not become extinct among the railway managers. New economies, new efficiencies in co-operation must be found. The fact that labor takes 50 to 60 per cent of total railway earnings makes limitations within which to effect economies very difficult, but the demand is no less insistent on that account.

Clearly the managers are without that intercarrier, co-operative relationship so highly essential to the best and most economical operation. They could not function in harmony when the strike threatened the paralysis of all railway transportation. The relationship of the service to public welfare, so intimately affected by state and federal regulation, demands the effective correlation and a concerted drive to meet an insistent and justified public demand.

The merger of lines into systems, a facilitated interchange of freight cars, the economic use of terminals, and the consolidation of facilities are suggested ways of economy and efficiency.

I remind you that Congress provided a Joint Commission of Agricultural Inquiry which made an exhaustive investigation of car service and transportation, and unanimously recommended in its report of October 15, 1921, the pooling of freight cars under a central agency. This report well deserves your serious consideration. I think well of the central agency, which shall be a creation of the railways themselves, to provide, under the jurisdiction of the Interstate Commerce Commission, the means for financing equipment for carriers which are otherwise unable to provide their proportion of car equipment adequate to transportation needs. This same agency ought to point the way to every possible economy in maintained equipment and the necessary interchanges in railway commerce.

In a previous address to the Congress I called to your attention the insufficiency of power to enforce the decisions of the Railroad Labor Board. Carriers have ignored its decisions, on the one hand, railway workmen have challenged its decisions by a strike, on the other hand.

The Labor Board

The intent of Congress to establish a tribunal to which railway labor and managers may appeal respecting questions of wages and working conditions can not be too strongly commended. It is vitally important that some such agency should be a guaranty against suspended operation. The public must be spared even the threat of discontinued service.

Sponsoring the railroads as we do, it is an obligation that labor shall be assured the highest justice and every proper consideration of wage and working conditions, but it is an equal obligation to see that no concerted action in forcing demands shall deprive the public of the transportation service essential to its very existence. It is now impossible to safeguard public interest, because the decrees of the board are unenforceable against either employer or employee.

The Labor Board itself is not so constituted as best to serve the public interest. With six partisan members on a board of nine, three partisans nominated by the employees and three by the railway managers, it is inevitable that the partisan viewpoint is maintained throughout hearings and in decisions handed down. Indeed, the few exceptions to a strictly partisan expression in decisions thus far rendered have been followed by accusations of betrayal of the partisan interests represented. Only the public group of three is free to function in unbiased decisions. Therefore the partisan membership may well be abolished, and decisions should be made by an impartial tribunal.

I am well convinced that the functions of this tribunal could be much better carried on here in Washington. Even were it to be continued as a separate tribunal, there ought to be contact with the Interstate Commerce Commission, which has supreme authority in the rate making to which wage cost bears an indissoluble relationship. Theoretically, a fair and living wage must be determined quite apart from the employer's earning capacity, but in practice, in the railway service, they are inseparable. The record of advanced rates to meet increased wages, both determined by the government, is proof enough.

The substitution of a labor division in the Interstate Commerce Commission, made up from its membership, to hear and decide disputes relating to wages and working conditions which have failed of adjustment by proper committees created by the railways and their employees, offers a more effective plan.

It need not be surprising that there is dissatisfaction over delayed hearings and decisions by the present board when every trivial dispute is carried to that tribunal. The law should require the railroads and their employees to institute means and methods to negotiate between themselves their constantly arising differences, limiting appeals to the government tribunal to disputes of such character as are likely to affect the public welfare.

This suggested substitution will involve a necessary increase in the membership of the commission, probably four, to constitute the labor division. If the suggestion appeals to the Congress, it will be well to specify that the labor division shall be constituted of representatives of the four rate-making territories, thereby assuring a tribunal conversant with the conditions which obtain in the different rate-making sections of the country.

I wish I could bring to you the precise recommendation for the prevention of strikes which threaten the welfare of the people and menace public safety. It is an impotent civilization and an inadequate government which lacks the genius and the courage to guard against such a menace to public welfare as we experienced last summer. You were aware of the government's great concern and its futile attempt to aid in an adjustment. It will reveal the inexcusable obstinacy which was responsible for so much distress to the country to recall now that, though all disputes are not yet adjusted, the many settlements which have been made were on the terms which the government proposed in mediation.

Public interest demands that ample power shall be conferred upon the labor tribunal, whether it is the present board or the

suggested substitute, to require its rulings to be accepted by both parties to a disputed question.

Let there be no confusion about the purpose of the suggested conferment of power to make decisions effective. There can be no denial of constitutional rights of either railway workmen or railway managers. No man can be denied his right to labor when and how he chooses, or cease to labor when he so elects, but, since the government assumes to safeguard his interests while employed in an essential public service, the security of society itself demands his retirement from the service shall not be so timed and related as to effect the destruction of that service. This vitally essential public transportation service, demanding so much of brain and brawn, so much for efficiency and security, ought to offer the most attractive working conditions and the highest of wages paid to workmen in any employment.

In essentially every branch, from track repairer to the man at the locomotive throttle, the railroad worker is responsible for the safety of human lives and the care of vast property. His high responsibility might well rate high his pay within the limits the traffic will bear; but the same responsibility, plus governmental protection, may justly deny him and his associates a withdrawal from service without a warning or under circumstances which involve the paralysis of necessary transportation. We have assumed so great a responsibility in necessary regulation that we unconsciously have assumed the responsibility for maintained service; therefore the lawful power for the enforcement of decisions is necessary to sustain the majesty of government and to administer to the public welfare.

Southern Pacific-Central Pacific Hearing

Union Pacific Charges Discrimination Against Ogden Route and Ask that Central Pacific Be Made Independent

WASHINGTON, D. C.

PRESENTATION of the Union Pacific side of the controversy over the application of the Southern Pacific for permission by the Interstate Commerce Commission to retain control of the Central Pacific was begun at the hearing before Commissioners Meyer and Potter on December 7 by Robert S. Lovett, chairman of the Union Pacific. Since November 21 the hearing had been devoted to the Southern Pacific testimony and that of the intervening shippers and state railroad commissioners in favor of or against its application. Mr. Lovett took the position that the continued possession of the Central Pacific by the Southern Pacific would not only be inimical to the Union Pacific, but also to the public interest, because of the policy which it had "gradually" and "discreetly" adopted, he said, since 1915 or 1916, of diverting traffic wherever possible from the Ogden route to its longer El Paso route in violation of the provisions of the Pacific railroad acts against discrimination by either of the two Pacific railroads which built the transcontinental route against or in favor of either company.

The Union Pacific case was completed on December 9, after which some rebuttal testimony was heard, and the hearing was practically concluded on December 13 as far as the two roads most directly involved were concerned, but the Western Pacific was expected to present evidence on the following day. The testimony taken at the hearing amounts to nearly 4,000 pages and there are over 100 exhibits. The commission allowed until January 15 for the filing of briefs and arguments will be heard by the commission on January 19 and 20.

The Interest of the U. P. in the Transcontinental Route

Mr. Lovett went into the history of the Pacific railroad acts to show that "the Union Pacific has a clear and unmistakable interest in the Central Pacific, the manner of its control and the method of its operation, which must be recognized and dealt with if constitutional rights are still to be respected. Now that the Central Pacific is required to be released from control of a competitor the Union Pacific asks that the Central Pacific be allowed to keep faith and fulfil its obligation as the owner of the western half of this one continuous line of railroad from the Missouri river to the Pacific ocean. If this western half is merged by authority of this commission with some other railroad company, then we insist it be with the Union Pacific, which owns the other half of the same railroad which the national laws under which both were constructed, mostly with government money, require to be operated as one continuous line of railroad. We insist that it would be not only a perversion of the Pacific Railroad Acts but a gross violation of the rights of the stockholders and the security holders of the Union Pacific to turn the Central Pacific, the western half of this government-built railroad, over for all time to a company that is not interested in sending a ton of transcontinental traffic over it which it can send over its lines via other gateways, which give it a longer haul and larger revenue, and allow it to switch, as it were, to another gateway, the western end of the line, which is just as essentially a part of this great railroad project as the eastern end of it."

Mr. Lovett said the tentative consolidation plan of the commission was regarded by the Union Pacific "with the gravest apprehension, from the first," and that it had begun preparation immediately, and before the decision of the Supreme Court, to show the "injustice and disastrous effects" of its application to the Union Pacific. If the plan is approved, he said, he had no doubt that the Southern Pacific would buy the Rock Island, if it could acquire it at the price indicated by the prices at which its securities had been selling. And the Southern Pacific, he said, would send all the traffic it could through the El Paso gateway, whether it kept the Central Pacific or not, for that way would be its long haul. After acquisition of the Rock Island the Southern Pacific would use the Union Pacific, the Denver & Rio Grande or the Denver & Salt Lake for such traffic as it routed via Odgen, only as far as Denver, where the traffic would be again turned over to the Rock Island, the Union Pacific and its connections at the Missouri river would be bottled up at Odgen and the traffic would be diverted from its natural channel. "Nothing but a purpose to cripple one of the most important and most efficient transportation agencies of the United States, and the one that yielded the government the largest net return during the war year of 1918, of all the railroads under government control, could justify such a policy," he said.

U. P. Dependent on C. P. for California Traffic

"The Union Pacific has been and is dependent almost wholly upon the Central Pacific for transcontinental traffic to and from central and northern California, to serve which was the purpose of the government in constructing the lines. It has never solicited or sought to send a ton of traffic between the Missouri river and San Francisco or central California via Portland or through Los Angeles, to which some references have been made in Southern Pacific propaganda as competitive routes. The Union Pacific could not buy the Western Pacific, as I believe it might have done at some time, because of the inconsistency of such purchase with the obligation under the Pacific railroad acts. We have felt obliged to work with the Central Pacific as if it were a part of the

Union Pacific. We have no interest or connection inconsistent with the interest of the Central Pacific."

When Mr. Harriman obtained control of the Central Pacific, the witness said, at a time when the Southern Pacific had no ready means for raising large sums of money, he had plunged ahead with improvements on the Central Pacific, providing more than $20,000,000 through advances by the Union Pacific, although he understood that "but scant credit has been given him by some Southern Pacific officers before this commission for his work upon the Central Pacific." He did not dispute that many of the improvements, even the Salt Lake cut-off, may have been planned by Southern Pacific officers long before Harriman made them, but he asserted that such plans were mere dreams until Harriman got control, and that it was Harriman who gave the order for the work and provided the money.

"I understand officers of the Southern Pacific testified that the 'cloud' on their title to the Central Pacific is the reason why double tracking and other increases in the capacity of the Central Pacific ceased with Union Pacific control some ten years ago," said Mr. Lovett. "One might suggest in reply that improvements might be realized in an increased price in case the Southern Pacific were forced to surrender the Central Pacific, but the really surprising thing is that now that the cloud has swept down the chairman of the Southern Pacific appeared before this commission last week and avowed his purpose to proceed at once with the necessary improvements to the Central Pacific if—note the *if*—this commission grants the pending application for the lease which the Supreme Court has just declared illegal! The least that can be said about this proposition is that it is unique.

"We must expect the Southern Pacific officers to do what is lawfully for the best interests of the Southern Pacific Company. If they lawfully can get traffic for their longer haul, they should and will do so. If they can persuade this commission to allow them to retain the Central Pacific and their grip on the Odgen gateway, they should do so. I would do the same if in their place.

Diversion of Traffic

"For a number of years following its completion in 1869 the Central Pacific paid handsome dividends. From the time of the acquisition by the Southern Pacific of the stock of the companies owning the Sunset Route and from the lease of said lines and of the Central Pacific in 1885 until Union Pacific control, the Central Pacific never paid a dividend. The Sunset Route became the preferred route because it afforded the long haul. I have no doubt that the effect on the Union Pacific was very bad, but just how serious I do not know. How much this diversion of traffic had to do with the receivership I do not know, but that it had much there can be no doubt. From 1901 until 1913 the Union Pacific and Southern Pacific were under common control. The rules with respect to the routing of traffic were changed, according to my understanding, so as to send it the way that afforded the most revenue to the combined lines. Very little change followed immediately the unmerging of the Union Pacific and Southern Pacific, according to my information. The full force and power of the Southern Pacific as a competitor of the Odgen-Central Pacific line has not been exerted since 1913. The government had challenged the Southern Pacific's control; but during the long appeal of the government before the decision of the Supreme Court the activity of Southern Pacific solicitors against the Odgen gateway was greatly increased, according to the information coming to me from Union Pacific representatives. If unconditional control of the Central Pacific by the Southern Pacific is in any way finally perpetuated, my opinion is that no San Francisco or other California freight traffic to or from points east of the Missouri river which the Southern Pacific can persuade through the El Paso gateway will ever go through the Odgen gateway unless forced that way by shippers or by competition in time or by the perishable character of the freight. In saying this I am making no criticism of the Southern Pacific or any of its representatives. They are doing precisely what the Supreme Court has many times, and in this very case only recently, recognized as the natural and inevitable effect of placing one line under the control of a competitor.

"If they succeed this important transcontinental line of railroad cannot make a rate or fix a train schedule to or from San Francisco and central California without the consent and concurrence of its rival and competitor, the Southern Pacific Company. We are asserting our rights under the Pacific railroad acts because our opponents are in effect asserting that this country has already, and as I believe, most unexpectedly to the people, arrived at the recall of decisions of the United States Supreme Court.

Judge Lovett Says Difficulties of Separation Exaggerated

"I understand that testimony has been given here indicating that many Californians have been frightened by predictions and testimony of Southern Pacific officials as to what will happen in the way of interrupted and inferior train service and increased rates if the Southern Pacific is required, like all other corporations and people heretofore have been, to obey the decision of the Supreme Court. Of course if the Southern Pacific is to be allowed by the circuit judges when they come to enter their decree and by the California Railroad Commission to absolutely run amuck and do whatever it can to make good its threats, it may do much to inconvenience the public. I assume that these railroad companies will be prevented from interrupting or interfering with the continuity of the train service or in any wise increasing the existing rates except with the consent and approval of proper state and interstate regulatory authority. Trains which now run over portions of both lines should continue to run and the apportionment of the through and joint expenses and revenues can be easily adjusted by agreement of the interested parties in the ordinary way or can be determined by the court or commission if they fail to agree. With great respect for my friends on the other side, I am, nevertheless, bound to say that these lions they have put in the way are very tame and harmless. In the agreement of February 8, 1913, between the Southern Pacific, Central Pacific and Union Pacific, no difficulty was found in providing for this difficulty which the Southern Pacific now presents as so frightful. Once it is settled that the Supreme Court decision is to be carried out all these difficulties will disappear. The Southern Pacific will face about and begin to talk up the Central Pacific to enhance its price if it concludes to sell, for I know the Southern Pacific officers and know something of their great ability as business men.

"Much has been said about the disastrous effects of cutting the Southern Pacific off from its lines in Oregon which are reached only over the Central Pacific. Certainly I should favor the granting of full and equal joint use to the Southern Pacific of the Central Pacific line between Tehama and the connection with the Oregon lines which would assure the Southern Pacific substantially the same use it now has. By the agreement of 1913 the entire use of this part of the Central Pacific was leased to the Southern Pacific, but the government's bill and the Supreme Court's decision seem to contemplate that there shall be competition by the Central Pacific and Southern Pacific lines between San Francisco and Portland.

"Apparently many people in California are in favor of this procedure. Being myself a consistent believer in the principle of competition in service and facilities, I fail to appreciate the reasons why these people oppose it in this in-

stance. However, the plan which this commission is about to lay out for the permanent establishment of the great transportation groups and channels of commerce for this country should be settled by consideration of the permanent welfare of the country and of the people and not by public clamor or the agitation of particular agencies and particular communities in which both parties must almost necessarily resort to propaganda and even ordinary political campaign methods.

"The time has been when the Southern Pacific, its officers, management and the operation of its lines were damned as a grinding monopoly and otherwise by a majority of the people in San Francisco and central California, at least as much as they are now praised. I am sure they were wrong then, for I believe the Southern Pacific almost made California and has been the greatest agency for the development of California that ever existed in that state. I believe the people of California were mistaken in opposing the Southern Pacific then, and I believe they are mistaken in falling in with the Southern Pacific's plans now. They changed their opinion before and I believe they will change it again. Hence I say it is not the fluctuating and more or less cultivated opinion of a community for the time being that should govern, but the deliberate judgment of this commission looking to the future as well as the present that should prevail in settling these important and enduring transportation lines."

Cross-Examination

Mr. Lovett was subjected to a long cross-examination by F. H. Wood, commerce counsel of the Southern Pacific, who asked how much tonnage it was claimed the Southern Pacific had diverted. Mr. Lovett said he had no figures, but that he was interested in the principle and knew that if allowed the Southern Pacific would adopt a more vigorous policy than it had while the litigation was pending. He said that numerous reports had been made to him by B. L. Winchell, while he was traffic director of the Union Pacific, and since by President C. R. Gray and Vice-President H. M. Adams, that the Southern Pacific agents were working against the Ogden gateway in the territory where it had originally been the announced policy to work through that gateway. He said that this had been done to such an extent that he had determined to resort to litigation under the terms of the Pacific railroad acts as a remedy if the Supreme Court had not decided the Southern Pacific-Central Pacific case in the way it did. Asked if he had expected to be successful, he replied: "There is always a chance in a lawsuit." Whereas since its separation from the Union Pacific the Southern Pacific had not added a mile of double track to the Ogden line, he said, on the contrary he knew of no railroad on which the standard of maintenance had been so improved as on the Sunset Route. When Mr. Wood asked if that were a matter of great concern in this case as long as the Central Pacific had been kept in a condition to be able to handle its business effectively, he replied that the necessity for double tracking had been lessened because the Southern Pacific had tried not to send business that way. Referring to the geographical line which L. J. Spence, traffic director of the Southern Pacific, had described as governing the Southern Pacific solicitation as between the Ogden and El Paso routes, Mr. Lovett said that Mr. Winchell had reported that the line had been gradually moving west and his last information was that it had about vanished. The solicitors who formerly had reported to local offices, he said, had been put under Mr. Spence and had been given oral instructions under which the solicitation encountered by the Union Pacific traffic solicitors was "practically Sunset Route everywhere."

Referring to Mr. Spence's testimony that he had explained the plan of Southern Pacific solicitation to Mr. Lovett soon after the unmerger and that he had pronounced it satisfactory, Mr. Wood asked the witness if he had not advised at the time that it would be unwise for the Southern Pacific to give the Union Pacific a memorandum on the subject so soon after the dissolution. He replied that he had said that of course the two companies could not agree not to compete but that it would be wise to continue the territory from which traffic had been solicited preferentially for each of the two lines, and that agreement on this subject had been made public as a part of the dissolution plan.

Mr. Wood asked how the Union Pacific solicited southern California and north Pacific coast business. Mr. Lovett replied that it ought to solicit via the Salt Lake route for southern California and that he certainly hoped it solicited Portland business via the Oregon Short Line and O.-W. R. & N. Asked if this represented any violation of the Pacific railroad acts, he said that the Central Pacific does not run within 400 miles of Portland or 500 miles of Los Angeles and that business for those points was legitimately handled by Union Pacific system lines. Asked who should be the judge of the legitimacy of a route, he said that when the question is raised a judge would have to determine. When Mr. Wood mentioned a reference in the Supreme Court decision to a movement to San Francisco via the Union Pacific to Portland, Mr. Lovett retorted with some energy that the Interstate Commerce Commission's agents had combed the United States and that every Union Pacific agent who had lost his job by the consolidation of agencies after the merger had been questioned, but they had not succeeded in showing that a ton of freight had ever been solicited by the Union Pacific that way and they had shown only one shipper who had sent freight that way. "I feel quite strongly on that point," he said. "We think we are complying with the Pacific railroad acts. If we are not it is our policy to do so and we think the Central Pacific ought to."

Mr. Wood tried to show an inconsistency between Mr. Lovett's present position and his testimony before the California commission in 1913 that so far as immediate results were concerned it might be better for the Union Pacific for the Southern Pacific to keep the Central Pacific because then traffic from central California would continue to go to the Union Pacific at Odgen. He said this statement was predicated on the Southern Pacific's policy remaining the same as it had been and also applied only to the immediate results because the Union Pacific expected to have to build extensive lines in California to supplement the Central Pacific lines before it would be independent of the Southern Pacific. He declined to admit any inconsistency and said that the Union Pacific now would probably lose traffic for a while after a separation of the Central Pacific from the Southern Pacific. He denied that the Union Pacific ownership of stock in the Illinois Central constituted a control of routes between the Missouri river and Chicago and between Chicago and New Orleans, saying that it represents only an investment and that the North Western is the preferred connection at the Missouri river. He said he had argued strenuously with Professor Ripley that the Union Pacific ought to be left at the Missouri river to interchange with several routes rather than linked up with one line to Chicago.

"It is very difficult for me to conceive of the commission's nullifying the decision of the Supreme Court," said Mr. Lovett, "even pending the action of the lower court on the mandate. According to my view of it, the Supreme Court has decided this proposition, and I do not want to take any position that would indicate that the Union Pacific takes any other attitude."

"What is your position as to an independent Central Pacific?" asked Mr. Wood.

U. P. Not Seeking to Buy C. P.

"Our position is outlined in a public statement given out on June 10 by President Gray that we were not seeking to buy the Central Pacific, but that we would buy it if fair and reasonable terms could be agreed upon," said Mr.

Lovett, "and if it could be separated from the Southern Pacific under conditions that would allow it to live. All the Union Pacific is contending for is that it be made independent of the Southern Pacific."

Mr. Lovett was then questioned by Mr. Scandrett as to the ability of the Central Pacific to finance itself if separated. He said it ought to be a self-sustaining property, assuming that it would be treated fairly by the court in the dissolution decree, although a great deal may depend on the conditions under which the lines are separated. At the end of Union Pacific control, he said, the Central Pacific had a surplus of about $25,000,000 and the Southern Pacific owed it approximately $30,000,000. The surplus was reduced by a 20 per cent special dividend which transferred much of it to the treasury of the Southern Pacific and dividends have since been paid on both preferred and common stock while the surplus has again been increased. He said he did not criticize the action in declaring the special dividend; that it was proper and wise. He also went into the subject of the Central Pacific bond issues and said that it owns a very valuable land grant which might be made the basis for some financing. While it has been the practice of the Southern Pacific to take title to the equipment allocated to the Central Pacific, he said that in case of a separation it would be fair for the Central Pacific to buy it at its depreciated value and pay for it in equipment obligations, as the types are better adapted for use on the Central Pacific than on the Southern Pacific. If this were not done, he said, there would be no difficulty in the Central Pacific buying all the equipment it needed in the usual way, by equipment trust obligations, which, as they are secured largely by the equipment itself, can be sold, he said, without much reference to the financial credit of the railroad company.

Propaganda

In reply to a request from Mr. Scandrett that he say something about the publicity work and so-called propaganda that has been criticized, Mr. Lovett said he thought mistakes along this line had been made by both sides. Almost immediately after the Supreme Court decision, he said, a very active propaganda was started on the Pacific coast in favor of the commission's tentative consolidation plan, which allocated the Central Pacific to the Southern Pacific, and against the carrying out of the Supreme Court decision. For a time the Union Pacific said nothing, but the movement spread so rapidly that he and President Gray had conferred and decided they should let the public know what the Union Pacific conceived to be its rights in the case and the course it intended to pursue, that it was opposed to the tentative plan and expected to do what it could to oppose it. He and Mr. Gray then prepared jointly a public statement and decided they ought to take any legitimate means to get their views to the public. Mr. Gray was to handle it in the west and Mr. Lovett said he had authorized the expenditure of whatever might be necessary for the purpose with only the limitation that nothing illegal should be done. They had both agreed that there should be no criticism of Southern Pacific officers because, he said, "they were only doing what we would do if in their place." "The fight got started," he said, "and many agencies were employed. I didn't keep up with the details, but Mr. Gray used to tell me a good deal. Whatever he did within that limitation I endorse and approve, but I realize that in carrying on a work of that kind with so many agencies, some of them strangers to us, mistakes might be made and some things were done which we wouldn't do. I also saw some things on the other side that I thought the Southern Pacific officers would not have approved. But it was a good deal like a war or a political campaign.

At this point Commissioner Meyer remarked that the commission now has some responsibility as to operating expenses and asked Mr. Lovett whether he would say that these expenditures for publicity were warranted. Mr. Lovett said that it was agreed at the outset that they ought not to be charged to operating expenses and they have been carried in a suspense account with a view to charging them to profit and loss—that is to the stockholders rather than to the public, but he thought they were perfectly legitimate and necessary to protect the interests of the company.

On cross-examination Mr. Wood said he had not intended to question Mr. Lovett about propaganda, but since Mr. Scandrett had raised the question he asked whether he had seen any statements from the Southern Pacific prior to that issued by Mr. Gray. Mr. Lovett said he did not recall any during that period in the name of the Southern Pacific, but there were many reports in the newspapers regarding the position of various commercial organizations, etc., which he had no doubt were inspired by the Southern Pacific. When Mr. Wood asked if the Union Pacific had not organized a publicity bureau in Washington in the name of the California Producers' and Shippers' Association, he said that Mr. Gray had told him that he had heard of it recently and had disapproved it. When Mr. Wood said that this bureau had issued a statement by Mr. Gray on the opening day of the hearing Mr. Scandrett stated that Mr. Gray had not authorized it and had merely given the interview to a Sacramento newspaper. "When you employ a lot of people to conduct a hard fight, especially some enterprising newspapermen, you don't always know all they'll do," said Mr. Lovett.

Commissioner Potter then said he would like to hear expressions on the propriety of the commissioners reading propaganda. He had received a pamphlet in the mail sent out by a Mr. Edgerton and wondered whether he ought to read it. Mr. Wood promptly expressed the opinion that the commissioners may with propriety read anything, but that he was sure their decision would be based on the evidence. E. O. Edgerton, director of the California shippers' committee against dismemberment, said he did not know that the pamphlet had been sent to the commissioner but that he thought it was based on facts. Mr. Potter said he would plead guilty of reading it, but wondered if he had so opened the door that he was now obligated to read the so-called Union Pacific propaganda. Mr. Scandrett said he thought the discussion of propaganda had no place in the hearing, but he had asked Judge Lovett to state his views because of the attack that had been made by the other side.

Adams Says S. P. Discriminates Against Ogden Route

H. M. Adams, vice-president in charge of traffic of the Union Pacific, said that an independent Central Pacific would create an additional active competing route between central California and the East and would foster intensive development of that part of California and other states served by its rails, to the material aid and betterment of the several states. There would be an added incentive to increase the interchange of commodities between Utah and Idaho and contiguous territory on the one hand, and points served by the Central Pacific on the other. It may be assumed, he said, that if the two railroads are separated they will be managed by men of experience and broad vision, who will not undertake to circumvent the purpose of the separation or unnecessarily inconvenience the public. With reasonable arrangements for joint use of tracks and terminals, proper through service and rates can be maintained without difficulty, as President Sproule of the Southern Pacific stated it was the intention of the Southern Pacific to do under the contract of 1913.

The Central Pacific, through the Odgen gateway, with the Union Pacific and its connections, forms in comparison with the Southern Pacific through El Paso, the shorter line between central and northern California and the greater part

of the United States east of Denver and Pueblo, Mr. Adams said, and he presented a map and mileage figures to show that only a small part of the territory from which Mr. Spence stated that the solicitation of the Southern Pacific is preferentially via New Orleans or the Texas gateways is within the district where the distances are in favor of such solicitation. "It is thus shown conclusively," he said, "that the division of eastern territory for preferential soliciting and routing purposes, even as stated by Mr. Spence, creates an undue discrimination and prejudice against the Ogden gateway which the decision of the Supreme Court seeks to correct. Attention might well be called to the waste in transportation service which must result in the movement of traffic via circuitous and longer routes. The influence of the originating carrier upon the shipper is very great, and where the relations are cordial, the shipper is generally quite willing to favor the through route suggested or preferred by such originating carrier."

Mr. Adams said he had had great difficulty in obtaining an understanding with the Southern Pacific as to its solicitation policy, although co-operation by the parties to the through route via Ogden was important, but that experience had indicated that the Southern Pacific representatives directed their efforts toward securing for the Southern Pacific the longest possible haul, the route via Ogden being favored only when the nature of the traffic, the train service, or the preference of the shipper was such that they considered it unwise to undertake to prevail upon the shipper to use other routes. He illustrated this by actual instances. He said that the tonnage figures used in the Southern Pacific exhibits, to show the small proportion of traffic which could be diverted from one route to the other, were for 1921, which did not represent a normal condition because of the general business depression and the amount of traffic diverted from rail lines by the Panama Canal.

Joint Use of Facilities Declared Feasible

E. N. Finch, general superintendent of the Oregon-Washington Railroad & Navigation Company, described the joint operation of tracks and terminals in which that company participates with the Southern Pacific, Great Northern, Northern Pacific, Spokane, Portland & Seattle, and Chicago, Milwaukee & St. Paul, to show that joint use of facilities can be worked out on a satisfactory basis. This company participates in joint use of 550 to 560 miles of track.

W. A. Whitney, general manager of the Utah-Idaho Central, and formerly for some five years a division superintendent of the Southern Pacific, testified regarding operating conditions on the California lines as they would result from a separation of the Central Pacific from the Southern Pacific. He described in detail how joint use of facilities could be worked out and expressed the opinion that it would be entirely practicable to effect the separation without disruption or impairment of the present service to the public. He said that joint trackage arrangements would permit a service to the public so nearly identical with the present service that the interests of shippers and passengers would not be affected. He replied in detail to testimony given by F. L. Burckhalter of the Southern Pacific, contending that his estimate of increased operating expenses and capital investment were excessive. He said the problem could be worked out very simply by the operating officers of the two companies with proper co-operation. The routing would have to be changed somewhat in some cases, but the public would not be prejudiced, he said. Commissioner Potter asked questions as to how the operation could be worked out if the Ogden line were separated and the California lines given to the Southern Pacific.

J. E. Muhlfeld, consulting engineer, testified that in his opinion joint operation under neutral management could be applied to the Sacramento shops and various engine houses, etc., in a way that would be feasible and practicable and result in operation as efficient as that of a single company.

N. D. Ballentine, superintendent of transportation of the Union Pacific, testified as to the effect of a separation of the Central Pacific on car service, saying that only an insignificant increase in equipment would be required to handle the business.

C. R. Gray, president of the Union Pacific, said in part:

"It has been charged that the Union Pacific attitude with respect to the Central Pacific has not been consistent throughout. The first announcement of our position with respect to this matter was made under date of June 10, 1922. This position has never changed, and is the same now. The Union Pacific is not primarily, nor fundamentally, asserting a desire to extend its ownership into central and northern california. Our contention is that we are entitled, however, to a connection on the part of the Central Pacific which will work with us whole-heartedly, and has no conflicting interests on account of an additional route through other gateways.

"It is admitted that the long association of the Southern Pacific and Central Pacific in central California has produced a character of community of interests which must have consideration. The shipping and traveling public should not suffer as a result of conditions for which it is not in any way responsible, nor should there be any increase in rates over the basis which has been applied heretofore. Neither should it be deprived of any essential service. The Supreme Court clearly recognized the possibility of these disruptions, and expressly provided that there should be an accommodation of such matters.

"There is ample precedent for the joint use of lines and such joint use is conventional throughout the country. There are many arrangements which are customary, some of which have individual features, due to unique and unusual local conditions, but they are all composed of elements of similarity. Probably the one most prevalent is the so-called 'bridge' arrangement, by which through trains of a tenant line are routed between given points without any intermediate traffic rights. Another is to give the tenant the right to handle freight and passengers to and from its own lines, having origin and destination at stations on the joint line, and still a third is where the tenant has full, free and equal traffic rights.

"Still other methods of joint use comprehend the use of pieces of line by a tenant upon a train-mile basis, with varying traffic rights, and still another limits the use to passenger or to freight train service, as the case may be.

"Still another limits the use to a commodity, and another method is in vogue by which the operation of a certain line is joint throughout, one of the users being entitled to the full haul on all traffic going to its line and *vice versa*, the general and operating expenses being divided upon the basis of benefits received. Still another provides for through operation of trains and engines, each line retaining its individual earnings, and assuming the expense of through trains and locomotives on mileage basis. It can be seen that there are very many precedents for the practical operation of joint trackage between railroads, and any of them could be used in the final disposition of particular parts of this problem, and could be negotiated so as to insure the practical compliance with any detail of the court decree, which would unquestionably have as its basis, the public interest."

Mr. Gray also replied in detail to some comparisons between the respective operations of the Southern Pacific and Union Pacific made by Mr. Kruttschnitt.

The relative business efficiency of each as a common carrier, depends, in the last analysis, upon all of the service performed, and not upon isolated and selected statistics, he said.

Just preceding Mr. Lovett's testimony a number of traf-

fic managers of large shippers located in Detroit, Fort Wayne, Rockford, Chicago and St. Louis had been placed on the stand to explain the character of the solicitation of their freight by the Southern Pacific and Union Pacific agents. Most of these witnesses were asked by H. A. Scandrett, counsel for the Union Pacific, whether the Southern Pacific agents had solicited their traffic via Ogden. The usual answer was that in recent years they had merely solicited their business for a Southern Pacific route, but that the business for central and northern California was generally routed via the Ogden gateway by the shipper. Mr. Wood asked questions to bring out that they were not preferentially solicited by the Southern Pacific agents for the southern routes and also that they usually routed the freight to suit themselves regardless of the solicitation. Senator Gooding of Idaho made a statement in which he bitterly criticized the practices which he said resulted from the monopoly of the Union Pacific system in Idaho and urged that it should not be made more complete by Union Pacific dominance over the Central Pacific. He said that if the Southern Pacific were confined in its control of the Central Pacific it might build competing lines into Idaho.

Rebuttal

After the Union Pacific had rested its case the Southern Pacific put on the stand a large number of traffic managers of middle western shippers and general agents of the Southern Pacific who testified in rebuttal regarding solicitation by the Southern Pacific for the Ogden route.

Monday and Tuesday of this week were devoted to rebuttal testimony on behalf of the Southern Pacific and cross-examination and considerable time was devoted to a discussion of just what lines were meant by the Supreme Court when it directed that the several terminal lines and cut-offs leading to San Francisco Bay, which have been constructed or acquired during the unified control of the two systems for convenient access to the bay, should be dealt with either by way of apportionment or by provisions for joint or common use. Commissioner Potter asked that maps be filed giving this information and said it was important to have all the available facts in the record on this point. He also asked for information to show just how much of the lines to Southern California and toward Portland were to be considered as included in the original Central Pacific project. Mr. Wood filed three maps, with an explanation of the questions arising as to just what is to be considered as Central Pacific property, and said that it is at last questionable whether the court referred to any period prior to the acquisition of stock control by the Southern Pacific in 1899. He said he understood that in anti-trust cases the Supreme Court has never ordered a separation of properties except with reference to lines of corporate ownership. The Union Pacific also filed a map. Mr. Potter said that the commission might conclude that construction since the control was just as much for the account of the Central Pacific as for the Southern Pacific.

Finances of the C. P.

A. D. McDonald, vice-president and comptroller of the Southern Pacific, went into the finances of the Central Pacific in considerable detail to show the financial inability of the Central Pacific to stand successfully as an independent road. The testimony of Mr. McDonald was largely directed at rebutting the earlier testimony of Judge Lovett. "The credit of the securities of the Southern Pacific Company, and of its constituent companies," he said, "rests in a large degree on the value of the Central Pacific as a part of the Southern Pacific transportation system. The market value of the Southern Pacific Company's securities, particularly its stock, is based on the value placed upon that company's equities in the Central Pacific. Deprive the Southern Pacific Company of the Central Pacific, and the market value established by the Southern Pacific Company for its securities since its organization in 1885, will have to be re-established and adjusted to the financial results ex-Central Pacific.

"I think it should be obvious to any one with a sense of justice and fair play, who will make an impartial examination of the affairs of the Southern Pacific Company and the resources of the Central Pacific that it is only through the continued ownership of the Central Pacific by the Southern Pacific that the holders of the securities of both companies will be fully protected and safeguarded and that the traveling and shipping public will be given the service they expect and should receive. I cannot bring myself to believe that the business interests of the communities served by the Southern Pacific Company's Lines should be unsettled, if not jeopardized, by the separation sought for by the Union Pacific and others. Great harm to a great many persons will certainly be done by the separation, while the good expected therefrom is problematical and remains to be ascertained."

Mr. McDonald was questioned about Judge Lovett's reference to the credit position of an independent Central Pacific. He presented an income account of the Central Pacific for the ten years from 1912 to 1921. For that period he said the net income applicable to the payment of interest and dividends averaged $12,695,000. The interest on the funded debt for 1921 amounted to $7,684,000. The balance remaining over the interest amounted to $5,011,000, which is slightly less than six per cent on the common and preferred stock.

Says C. P. Would Lose Traffic

"If no dividends had been paid by the Central Pacific during the ten year period the amount remaining after paying for the additions and betterments which cannot be capitalized, would be $2,711,000, which is equivalent to four per cent on the preferred stock and about three per cent on the common stock. This amount would entirely disappear under independent operation of the Central Pacific. Mr. Burckhalter has testified that if the Central Pacific is separated from the Southern Pacific the present operating expenses will be substantially increased. Moreover, Mr. Spence testified that under independent operation the Central Pacific would lose about 500,000 tons of freight annually."

Mr. McDonald stated that "if and when these things happen the Central Pacific instead of being a self-supporting property able to earn its fixed charges and a reasonable dividend with a margin for ordinary additions and betterments, which cannot be capitalized, would be unable to pay all its fixed charges. If the Southern Pacific's application to retain the Central Pacific is not granted, the Southern Pacific, because of its guarantee of the bonds of the Central Pacific, would have to make good any fixed charges the Central Pacific was unable to pay."

Westbound passenger train No. 5 of the Erie railroad was derailed near Tusten, N. Y., on the night of December 11 and the locomotive fell down a bank. The fireman was killed and the engineman injured.

At Hanahan, S. C., on December 9, a northbound passenger train of the Atlantic Coast Line, No. 80, second section, ran into the rear of passenger train No. 52, crushing a sleeping car of the last-mentioned train. One person was killed and 19 were injured. This collision occurred in a dense fog.

On the Philadelphia & Reading at Port Clinton, Pa., on December 12, the derailment of a freight train resulted in the death of two passengers of train No. 9, a part of the wreck having fallen against the passenger train as it stood at the station. Two coaches were overturned and a number of passengers were injured.

General News Department

The annual meeting of Division VI—Purchases and Stores—of the American Railway Association will be held in Chicago on May 22, 1924.

The Tenth National Foreign Trade Convention of the National Foreign Trade Council will be held in New Orleans from April 25 to 27, 1923.

Examiners Borland and Mullen of the Interstate Commerce Commission have concluded hearings in the general air brake investigation and briefs are to be filed by February 10.

In a fire at East Somerville, Mass., on Sunday, December 10, the Boston & Maine lost a wooden storehouse with large quantities of electrical and signal apparatus and other roadway material; estimated total loss, $250,000.

The American Railway Association announces that by action of the board of directors Alfred P. Thom has been appointed general counsel of the association. Mr. Thom already holds the position of general counsel of the Association of Railway Executives.

The Boston & Maine has been authorized by the Interstate Commerce Commission to install automatic train-stop or train-control upon one full passenger-locomotive division between Boston, Mass., and Greenfield, Mass., in lieu of the installation required in the order of June 13.

General increases in pay ranging from one cent an hour to five cents an hour have been granted by the Pennsylvania Railroad to maintenance of way employees. It is said that the total annual addition to the payrolls which will result from this order will be $1,800,000. The increases are retroactive to November 1.

Senator-elect Shipstead, of Minnesota, appearing before a sub-committee of the Senate judiciary committee last week, opposed the appointment of Pierce Butler to the Supreme Court, presenting a letter referring to Mr. Butler's activities as a corporation lawyer and as counsel for western railroads in valuation proceedings.

The Association of Railway Executives, at a meeting in Chicago on December 7, acting on a report presented by a special committee, Robert S. Lovett, chairman, adopted resolutions under which henceforth the functions of the Association will be confined to questions of National legislation, Governmental action and policies and legal matters of large importance which affect all or substantially all of the railroads of the country. The position of chairman of the association, recently vacated by the untimely death of Mr. Cuyler, is discontinued for the present, and the affairs of the association will be directed by the executive committee. After the first of January, the association will be administered from the office of the general counsel, in Washington, and the New York office will be discontinued. Stanley J. Strong, of New York, formerly executive Assistant, was elected secretary and treasurer.

Disastrous Collision at Humble, Texas

Press dispatches of December 13 report a collision on the Southern Pacific (Houston, East & West Texas) at Humble, Tex., 18 miles north of Houston, on the evening of that day, in which 10 persons were killed and 30 or more injured. Northbound passenger train No. 28 collided with a switching engine in front of the station. Because of the rupture of a steam pipe many passengers were scalded. It is said that the switching engine had drifted afoul of the main track while the engineman and fireman had gone to supper.

"Boring From Within"

Plans for amalgamating the 16 existing railroad labor organizations were discussed at a three-day convention at Chicago, which ended on December 11. A manifesto was adopted and a committee of 50 appointed to carry on the work advocated at this meeting. Reports indicate that of the 360 persons present the majority were former shop employees who are still on strike.

The leaders of the larger railway labor organizations did not participate in this meeting and several of them warned the members of their organizations not to attend. The presence of William Z. Foster and other advocates of the "one big union" idea, indicated that the purpose of the convention was to perfect plans for "boring from within" the existing organizations in order to bring about their dissolution.

Railway Revenues and Expenses for October

The net operating income of the Class I railroads in October totaled $85,234,000, equal to a return, on an annual basis of 4.05 per cent on their tentative valuation. The same roads in October last year reported $105,425,600 or 5.01 per cent; and in September this year $58,457,000, or 2.88 per cent.

Operating revenues now reported aggregate $549,284,800, an increase of 2½ per cent; operating expenses $428,265,000, an increase of 7.8 per cent.

While expenditures for maintenance of way and structures in October totaled $68,800,000, or 5 per cent less than in October last year, expenditures for maintenance of equipment were $130,212,000, or an increase of 16.2 per cent; and the number of freight cars in need of repairs was reduced by 41,694. There was a reduction of 1,361 in the number of locomotives in need of repairs.

During the first 10 months this year net operating income was $614,627,000, compared with $499,346,000 during the corresponding period last year. This is at the annual rate of return of 3.97 per cent, compared with 3.23 per cent in 1921.

Twenty-six railroads in October had operating deficits, of which 15 were in the Eastern district, one in the Southern and 10 in the Western. In September 44 roads reported deficits.

Senator Capper Asks Report on Excess Earnings

A resolution calling upon the Interstate Commerce Commission to furnish detailed information in a report to the Senate as to the amount of earnings in excess of 6 per cent of Class I railroads for the years 1920 and 1921, was introduced in the Senate on December 8 by Senator Capper of Kansas. The resolution says that it is reported that many railroads have earned in excess of 6 per cent, but have failed to make report of the same to the commission; "in disregard of the trust created by said section 15-a. have devoted all of said excess to their own uses" and that 13 great railroad systems will increase their dividends this year. The commission is asked to report its regulations for the determination and recovery of excess income, with a calculation of the excess and the reasons offered by any railroad which has failed or refused to make a report.

The commission, in its annual report submitted to Congress the day before this resolution was introduced, had explained the steps it had taken to get returns from the roads and that it had received only approximately $25,000 of excess earnings so far. It showed that the recovery of excess earnings was being delayed by the necessity for having valuation figures and declared that reducing its appropriation for valuation more rapidly than it had planned would probably defer recovery of excess earnings.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1922

Name of road.		Average mileage operated during period.	Operating revenues			Operating expenses					Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
						Maintenance of									
			Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Akron, Canton & Youngstown	Oct.	170	$186,039	$901	$196,796	$30,337	$19,280	$7,153	$60,266	$7,516	$124,552	63.30	$72,244	$61,215	$33,361	$36,934
	10 mos.	170	1,726,868	13,055	1,821,853	219,056	193,269	59,654	519,650	84,820	1,076,036	59.10	745,817	645,189	379,381	210,014
Alabama & Vicksburg	Oct.	141	191,802	58,298	270,802	42,227	64,787	8,607	94,345	11,895	223,971	82.70	46,831	28,762	36,285	98,416
	10 mos.	141	1,718,382	571,437	2,470,525	460,557	469,287	83,498	957,385	118,096	2,107,902	85.30	362,533	170,675	217,986	188,670
Vicksburg, Shreveport & Pacific	Oct.	171	204,215	92,102	326,914	41,697	73,633	8,937	125,244	12,716	264,842	81.00	62,072	44,737	39,665	67,345
	10 mos.	171	1,869,507	903,037	2,998,652	520,745	538,971	98,103	1,184,123	134,814	2,499,776	83.30	498,876	310,415	236,573	326,905
Aon Arbor	Oct.	293	398,063	40,771	463,028	64,904	108,893	8,651	169,524	19,116	371,100	80.10	91,928	69,487	36,600	120,268
	10 mos.	293	3,530,133	428,538	4,154,798	519,649	765,461	93,435	1,824,017	158,365	3,361,058	80.90	793,740	577,595	329,625	361,205
Atchison, Topeka & Santa Fe	Oct.	8,855	14,731,649	3,366,336	19,561,746	2,530,892	4,292,068	267,018	5,945,824	319,091	13,335,697	67.10	6,526,049	4,335,649	4,561,577	5,648,383
	10 mos.	8,856	106,002,398	34,979,370	153,656,745	25,691,300	35,764,007	2,630,843	48,294,243	3,308,590	115,481,153	75.20	38,175,592	25,365,403	26,803,081	38,409,342
Gulf, Colorado & Santa Fe	Oct.	1,907	2,031,634	386,411	2,571,774	273,157	450,329	45,564	770,248	68,273	1,605,531	62.40	966,243	882,618	839,805	762,359
	10 mos.	1,907	14,492,587	3,399,471	19,158,857	3,579,890	4,484,895	429,260	6,205,916	675,110	15,359,754	80.20	3,799,103	3,066,071	2,464,603	6,018,578
Panhandle & Santa Fe	Oct.	857	710,545	129,075	888,765	188,688	234,546	7,746	264,992	18,351	712,737	80.20	176,028	153,090	120,639	406,665
	10 mos.	857	4,874,630	1,161,509	6,455,816	1,652,479	1,916,703	70,837	2,102,985	187,891	5,221,632	91.70	534,184	307,397	—1,815	1,803,299
Atlanta & West Point	Oct.	93	157,411	74,366	268,757	39,854	54,135	8,715	88,141	10,443	204,588	76.10	64,169	48,689	38,344	5,136
	10 mos.	93	1,100,672	715,144	2,095,853	279,006	438,653	79,295	795,058	102,988	1,731,370	82.60	364,483	246,629	167,995	118,768
Western of Alabama	Oct.	133	201,405	73,936	304,043	25,462	56,688	8,883	87,493	10,341	191,701	63.00	112,342	92,836	90,962	48,854
	10 mos.	133	1,298,699	659,506	2,196,371	265,163	457,900	85,043	711,558	106,184	1,656,817	75.40	539,554	412,978	417,023	222,173
Atlanta, Birmingham & Atlantic	Oct.	639	307,377	47,546	382,801	66,887	89,016	22,771	182,435	14,501	375,675	98.10	7,126	—6,530	—6,118	—82,206
	10 mos.	639	2,583,813	397,049	3,241,862	596,713	867,690	212,219	1,619,560	157,316	3,454,318	106.50	—212,456	—353,653	—439,408	—1,504,116
Atlantic Coast Line	Oct.	4,929	4,265,972	1,157,037	6,118,955	739,348	1,313,305	101,016	2,260,560	132,766	4,564,877	74.60	1,554,078	1,103,121	1,258,875	743,239
	10 mos.	4,923	39,655,365	12,936,594	57,583,462	6,781,523	11,572,849	1,042,977	21,249,710	1,370,926	42,305,418	73.50	15,278,044	12,235,029	12,098,483	3,716,530
Charleston & Western Carolina	Oct.	342	206,923	40,025	267,945	34,099	53,269	7,827	112,413	8,158	215,766	80.50	52,179	41,179	33,801	8,083
	10 mos.	342	2,154,220	381,836	2,688,061	432,130	400,672	67,295	1,102,754	67,262	2,070,103	77.10	617,958	507,036	427,964	—222,098
Baltimore & Ohio	Oct.	5,235	15,850,210	2,405,474	19,702,229	1,900,730	5,643,858	311,379	7,346,391	475,943	15,791,328	80.20	3,910,901	3,792,723	3,081,157	3,422,497
	10 mos.	5,235	126,075,208	22,314,007	160,049,024	19,306,407	39,313,396	2,966,828	66,198,802	4,732,039	133,938,516	83.70	26,690,508	19,645,065	15,572,377	18,693,694
Baltimore & Ohio Chicago Term	Oct.	91	.....	.....	304,063	33,519	64,676	1,856	160,690	9,952	374,200	90.20	29,863	—21,534	89,751	137,121
	10 mos.	91	.....	.....	2,545,576	356,106	360,076	18,775	1,453,444	102,212	2,337,028	91.80	208,548	—279,648	836,536	523,094
Staten Island Rapid Transit	Oct.	23	74,831	92,237	193,720	51,506	40,039	2,513	129,099	13,043	236,200	121.90	—42,480	—63,575	—79,132	—59,670
	10 mos.	23	749,943	1,041,358	2,044,135	521,135	337,569	19,935	1,193,662	135,956	2,208,247	108.00	— 164,112	—340,918	—476,674	—273,092
Bangor & Aroostook	Oct.	616	492,213	72,914	592,857	122,976	134,265	4,222	175,568	20,013	459,336	77.50	133,511	88,313	132,372	248,900
	10 mos.	624	5,336,999	739,516	6,310,230	1,247,815	1,251,531	39,773	1,803,186	193,434	4,549,306	72.10	1,760,924	1,300,929	1,483,142	878,391
Belt Ry. of Chicago	Oct.	32	.....	.....	610,752	55,110	50,355	2,600	249,992	10,326	368,383	60.32	242,368	208,988	167,608	133,956
	10 mos.	32	.....	.....	4,977,538	481,117	483,016	21,829	2,213,110	97,818	3,296,890	66.23	1,680,947	1,330,737	1,387,285	1,335,497
Bessemer & Lake Erie	Oct.	225	2,120,241	28,218	2,276,595	106,199	383,373	15,751	511,564	26,039	1,047,915	48.10	1,128,680	1,091,771	1,227,963	386,102
	10 mos.	225	11,185,316	320,641	11,733,576	1,088,940	3,171,953	148,716	3,545,435	257,502	8,269,042	70.50	3,463,534	3,146,031	3,626,904	1,878,696
Bingham & Garfield	Oct.	34	26,537	18	27,094	7,915	6,297	1,392	5,664	4,280	25,667	94.70	1,427	—1,175	12,179	—34,731
	10 mos.	34	178,217	877	181,328	152,757	39,978	13,677	50,115	42,202	299,387	165.10	—118,059	—162,773	—52,869	—245,061
Boston & Maine	Oct.	2,287	4,619,090	1,893,884	7,474,118	868,029	1,577,856	64 532	3,414,384	207,371	6,168,196	82 50	1,305,922	1,052,697	624,245	829,346
	10 mos.	2,237	39,719,727	18,947,366	65,949,045	9,630,327	13,023,469	555 529	29,667,142	2,126,257	55,280,968	83.80	10,668,077	8,548,727	5,749,110	—1,377,353
Brooklyn Eastern District Term	Oct.	9	114,285	.....	124,582	5,535	14,930	160	48,759	4,209	73,593	59.60	49,989	43,777	43,777	37,046
	10 mos.	9	1,230,296	.....	1,309,776	56,375	174,661	1,554	497,761	47,263	777,614	59.40	532,162	467,988	467,988	266,925
Buffalo & Susquehanna	Oct.	253	167,450	3,759	175,348	39,660	74,227	2,722	61,906	8,644	187,159	106.70	—11,811	—21,515	36,664	61,714
	10 mos.	253	1,119,434	54,184	1,213,120	325,238	398,966	21,711	451,329	89,185	1,286,429	106.00	73,309	—115,635	97,636	20,780
Buffalo, Rochester & Pittsburg	Oct.	589	1,966,824	123,353	2,154,502	255,809	765,766	23,702	874,267	43,718	1,916,471	89.00	238,031	222,993	287,448	33,930
	10 mos.	589	10,437,233	1,355,868	12,401,803	1,941,633	4,901,454	190,896	5,134,504	391,036	12,572,915	101.40	—171,142	—506,200	—89,098	509,703
Canadian Pacific (Lines in Maine)	Oct.	233	125,945	28,784	169,852	30,558	44,214	4,829	92,933	3,817	176,351	103.80	—6,499	—22,499	—24,790	5,879
	10 mos.	233	1,636,016	330,510	2,122,574	351,419	424,345	43,718	1,041,036	37,475	1,897,993	89.40	224,581	64,581	—30,765	—135,276
Carolina, Clinchfield & Ohio	Oct.	309	573,551	43,942	643,432	80,062	128,877	23,473	182,323	18,242	432,742	68.30	200,590	140,460	211,099	302,359
	10 mos.	297	5,770,282	395,943	6,293,675	743,598	1,334,792	218,443	1,614,849	192,832	4,101,289	65.20	2,192,386	1,746,607	2,472,438	1,977,137
Central of Georgia	Oct.	1,920	1,562,471	432,042	2,194,087	253,589	381,064	65,426	782,237	73,170	1,560,076	71 10	633,111	503,884	532,215	424,845
	10 mos.	1,918	12,847,830	4,195,269	18,913,304	2,462,859	3,574,183	650,607	7,160,027	740,157	14,658,172	77.50	4,255,132	3,265,753	3,476,211	1,036,317
Central of New Jersey	Oct.	691	4,081,656	757,289	5,152,697	462,736	1,067,431	52,101	2,187,755	103,312	3,872,394	75.20	1,280,303	909,487	965,151	575,273
	10 mos.	691	29,274,080	8,095,349	40,105,672	4,586,192	10,116,303	340,039	17,472,012	1,039,676	33,724,553	84.10	6,381,149	3,681,630	3,414,164	6,356,566
Central Vermont	Oct.	532	672,490	97,860	791,590	88,157	89,137	13,685	369,012	20,233	584,610	73.50	209,980	192,410	114,269	121,057
	10 mos.	532	4,377,849	1,022,760	6,006,912	898,833	940,258	130,084	3,044,706	227,977	5,254,750	87.50	752,162	575,517	249,218	—828,217
Chesapeake & Ohio	Oct.	2,550	5,380,435	911,915	6,693,743	855,043	2,548,859	79,081	2,549,470	163,644	6,215,747	92.90	477,996	210,003	229,682	1,797,964
	10mos.	2,548	56,896,660	8,811,920	69,198,700	8,624,705	18,415,242	780,498	24,933,395	1,600,773	54,601,419	78.90	14,597,281	11,912,846	12,293,935	11,063,383
Chicago & Alton	Oct.	1,050	1,769,390	470,971	2,439,707	456,488	761,951	46,845	956,335	59,440	2,302,693	94.40	137,014	60,925	—22,724	676,593
	10 mos.	1,050	15,152,394	5,011,418	22,136,817	3,117,880	6,228,627	547,933	9,203,411	568,600	19,782,703	89.40	2,354,114	1,598,759	453,388	1,698,259
Chicago & Eastern Illinois	Oct.	945	1,792,094	377,218	2,371,433	226,235	715,408	47,334	912,670	66,327	1,976,060	83.30	395,373	285,167	448,077	687,343
	10 mos.	945	14,631,829	3,780,518	19,936,499	2,348,523	5,240,149	426,902	8,411,167	655,200	17,189,207	86.20	2,747,292	1,813,137	1,908,350	1,760,918
Chicago & North Western	Oct.	8,403	11,076,339	2,187,548	14,864,079	2,017,925	3,253,708	155,024	6,160,524	313,795	11,948,333	80.40	2,915,746	2,082,124	1,808,430	2,557,396
	10 mos.	8,403	83,257,863	24,449,179	121,255,715	16,170,942	24,506,740	1,523,033	52,313,324	3,107,742	98,276,695	81.00	22,979,020	15,454,149	14,543,962	7,171,532
Chicago, Burlington & Quincy	Oct.	9,393	13,187,089	2,446,275	17,093,728	2,188,586	3,607,108	168,040	6,397,756	356,878	12,730,541	74.50	4,363,187	3,525,435	3,269,334	3,576,123
	10 mos.	9,393	98,359,622	23,676,106	134,239,029	17,961,576	28,337,083	1,889,583	51,836,684	3,499,983	104,262,278	77.70	29,976,751	20,744,188	19,159,631	24,735,710
Chicago Great Western	Oct.	1,496	1,781,970	363,796	2,345,274	325,421	736,663	69,050	995,600	54,358	2,195,595	93.60	149,679	71,047	—120,661	156,443
	10 mos.	1,496	14,562,289	3,599,189	19,925,452	3,205,846	4,705,759	641,100	8,474,617	553,206	17,716,082	88.90	2,209,370	1,400,889	8,028	1,215,483

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Chicago, Indiana & Louisville	Oct.	654	$1,104,040	$257,714	$1,524,651	$135,446	$337,365	$30,082	$554,898	$33,317	$1,104,790	72.50	$419,861	$350,688	$243,034	$312,382
	10 mos.	654	9,306,277	2,530,784	13,111,981	1,374,489	2,857,264	322,994	4,952,421	348,358	9,989,590	76.20	3,122,391	2,485,404	1,439,290	809,956
Chicago, Milwaukee & St. Paul	Oct.	11,030	12,283,048	1,956,246	15,888,955	1,924,203	4,458,302	196,961	5,513,021	274,162	12,420,278	78.20	3,468,677	2,745,346	2,224,314	2,510,148
	10 mos.	11,030	94,472,812	20,168,187	128,434,131	17,018,338	29,781,289	1,864,699	53,837,204	3,144,164	106,278,965	82.70	22,155,166	14,075,179	10,205,385	5,080,894
Chicago, Peoria & St. Louis	Oct.	246	153,076	14,019	178,033	25,675	49,729	4,082	94,338	9,633	183,457	103.00	—5,424	—16,324	—33,655	—32,567
	10 mos.	246	1,452,681	179,915	1,747,642	281,222	356,149	43,760	1,024,731	104,634	1,810,496	103.60	—62,854	—160,853	—394,931	—460,641
Chicago River & Indiana	Oct.	38	.....	.....	632,595	46,873	77,875	1,199	252,583	12,123	390,653	61.80	241,942	194,397	285,831	.....
	10 mos.	38	.....	.....	3,090,926	310,925	340,381	4,230	1,214,093	52,722	1,922,351	62.20	1,168,575	935,048	1,382,724	.....
Chicago, Rock Island & Pacific	Oct.	7,635	8,094,854	2,256,254	11,249,119	1,358,795	2,504,226	170,940	4,468,932	253,535	8,815,776	79.10	2,433,343	1,894,610	1,522,828	2,076,573
	10 mos.	7,658	69,046,780	22,266,118	98,841,937	12,351,272	20,773,205	1,770,366	41,648,063	2,320,142	79,353,790	80.30	19,488,147	14,122,802	11,187,294	13,054,663
Chicago, Rock Island & Gulf	Oct.	461	392,266	75,340	505,847	80,180	79,297	12,993	252,429	14,606	439,091	86.80	66,756	53,617	39,666	132,176
	10 mos.	461	3,643,769	775,423	4,813,605	723,487	739,921	133,448	2,176,215	137,911	3,917,036	81.40	896,569	775,337	598,252	1,196,925
Chicago, St. Paul, Minn. & Omaha	Oct.	1,749	1,842,994	483,470	2,537,965	349,718	541,132	34,186	1,057,343	69,224	2,060,003	81.20	477,962	326,632	334,835	546,911
	10 mos.	1,749	16,340,215	5,080,572	23,146,827	3,011,866	4,117,999	334,796	10,355,114	713,334	18,626,049	80.50	4,520,778	3,169,021	2,886,209	1,384,897
Cincinnati, Indianapolis & Western	Oct.	347	392,079	40,746	460,556	50,071	98,838	10,234	173,638	18,955	353,328	76.70	107,228	87,120	28,645	—36,843
	10 mos.	347	2,872,291	458,418	3,538,558	453,520	755,915	109,940	1,522,781	195,028	3,057,371	86.40	481,187	319,510	65,356	—699,189
Colorado & Southern	Oct.	1,099	947,617	164,776	1,200,578	224,772	352,017	9,971	516,310	41,683	1,153,349	96.10	47,229	—24,893	—68,575	288,697
	10 mos.	1,099	8,297,274	1,721,521	10,819,039	1,630,512	2,367,533	133,915	4,056,694	435,684	8,706,845	80.50	2,112,194	1,438,877	1,091,882	1,582,515
Ft. Worth & Denver City	Oct.	456	681,764	203,800	953,746	101,401	280,943	10,425	304,163	33,189	737,942	77.40	215,304	160,218	130,201	396,118
	10 mos.	456	5,459,134	1,891,839	7,848,756	682,423	1,599,604	114,798	2,530,010	351,414	5,331,789	67.90	2,516,967	2,081,164	1,972,490	2,911,234
Wichita Valley	Oct.	256	133,449	29,244	173,538	19,752	15,113	35	61,902	1,500	98,295	56.60	75,243	68,821	42,468	94,659
	10 mos.	256	750,355	228,918	1,055,720	200,024	90,552	433	439,274	14,439	741,145	70.20	314,575	251,374	121,146	306,761
Columbus & Greenville	Oct.	167	102,426	34,547	145,914	30,390	13,068	2,527	48,914	8,522	103,421	70.90	42,493	38,474	40,426	29,940
	10 mos.	196	921,163	284,869	1,270,384	289,769	118,300	31,719	461,057	85,939	986,731	77.70	283,653	235,034	129,954	—408,451
Delaware & Hudson	Oct.	887	3,441,795	285,884	3,972,663	379,707	1,527,271	39,493	1,608,631	156,986	3,734,961	94.00	237,702	151,979	119,372	836,886
	10 mos.	887	24,406,587	3,252,687	30,432,304	14,445,342	9,182,774	438,868	12,735,532	1,475,004	28,731,255	94.40	1,701,049	835,787	745,373	6,407,274
Delaware, Lackawanna & Western	Oct.	994	5,358,544	1,213,069	7,475,022	604,426	2,187,774	119,356	3,204,999	151,329	6,325,595	84.60	1,149,427	712,350	799,762	1,514,049
	10 mos.	994	41,896,040	11,743,818	61,245,545	6,867,798	14,642,191	1,144,549	27,100,258	1,571,714	51,857,343	84.70	9,388,202	5,257,851	5,858,263	11,339,145
Denver & Rio Grande Western	Oct.	2,593	2,634,588	441,616	3,397,224	591,830	1,017,817	43,219	1,246,956	82,256	3,036,411	89.40	360,813	193,637	216,058	755,920
	10 mos.	2,593	20,257,724	4,758,916	27,218,189	4,211,497	5,637,860	451,551	9,157,616	828,993	20,784,047	76.40	6,434,142	4,825,527	5,121,012	3,072,571
Denver & Salt Lake	Oct.	255	199,598	20,384	233,764	58,713	80,134	841	79,399	5,728	224,815	96.20	8,949	—73	2,571	10,514
	10 mos.	255	918,449	177,130	1,178,978	442,713	345,325	9,785	415,547	59,608	1,272,978	108.00	—94,000	—184,052	—160,218	—59,324
Detroit & Mackinac	Oct.	385	147,890	24,415	190,387	31,881	45,059	1,210	62,055	6,037	146,106	76.70	44,281	34,205	35,913	1,295
	10 mos.	385	1,162,754	294,016	1,580,725	256,589	501,115	21,690	587,010	57,515	1,422,974	90.00	157,751	54,909	42,435	43,626
Detroit & Toledo Shore Line	Oct.	61	333,635	.....	338,999	24,578	27,513	2,303	119,068	5,711	179,173	52.80	159,826	132,825	52,863	136,482
	10 mos.	61	2,899,925	.....	2,929,832	276,787	222,431	22,751	844,765	70,633	1,437,367	49.10	1,492,465	1,326,405	686,529	500,747
Detroit, Toledo & Ironton	Oct.	454	751,692	11,385	780,033	269,362	145,615	6,985	326,796	22,361	771,119	98.90	8,914	—4,367	—174,457	—7,139
	10 mos.	454	7,245,480	104,864	7,467,782	1,552,757	1,803,328	59,850	2,712,242	201,108	6,328,875	84.70	1,138,907	1,011,934	—168,807	345,308
Duluth & Iron Range	Oct.	278	633,157	18,388	732,705	113,527	176,626	807	193,231	16,074	500,710	68.30	231,995	173,362	171,126	86,115
	10 mos.	281	5,651,324	163,658	6,317,042	984,137	1,061,277	12,163	1,710,514	175,402	3,946,139	62.50	2,370,903	1,918,404	1,938,372	690,116
Duluth, Missabe & Northern	Oct.	304	1,520,427	28,645	1,775,056	153,508	183,313	2,960	418,651	20,585	780,672	44.00	994,384	839,679	838,247	607,298
	10 mos.	306	12,224,878	370,455	13,687,250	1,652,889	1,488,352	31,628	2,974,297	198,556	6,362,870	46.50	7,324,380	6,021,933	5,991,859	4,416,921
Duluth, South Shore & Atlantic	Oct.	591	980,278	91,278	432,548	72,954	55,701	7,270	202,683	10,226	352,594	81.50	79,954	46,929	43,113	—38,141
	10 mos.	591	2,407,242	881,348	3,669,668	645,792	543,979	66,445	1,861,063	111,820	3,281,395	89.40	388,273	69,976	28,090	—505,158
Duluth, Winnipeg & Pacific	Oct.	178	142,866	21,738	170,997	54,731	31,908	2,935	67,197	7,402	164,134	95.90	6,863	—3,353	—5,710	—54,329
	10 mos.	178	1,385,198	203,887	1,642,707	326,286	407,228	41,330	734,820	56,507	1,556,108	94.70	86,599	—4,508	—33,360	—159,641
Elgin, Joliet & Eastern	Oct.	459	1,903,207	19	2,095,680	156,280	599,530	11,178	647,116	43,192	1,457,033	69.50	638,647	550,314	397,546	466,455
	10 mos.	459	15,305,510	59	17,140,196	1,484,815	3,289,578	120,698	5,512,421	349,476	10,754,123	62.70	6,386,073	5,599,579	4,277,714	2,476,320
El Paso & Southwestern	Oct.	1,139	702,246	136,219	902,851	174,059	186,034	31,300	252,434	41,649	694,263	76.90	208,588	137,600	161,899	194,530
	10 mos.	1,139	7,005,292	1,568,091	9,251,820	1,558,354	1,481,949	282,637	2,428,865	484,971	6,316,966	68.30	2,934,854	2,024,068	1,833,559	984,259
Erie	October	2,039	7,790,938	1,011,966	9,504,959	1,100,457	2,940,742	146,177	4,092,984	281,848	8,576,747	90.20	928,212	541,053	549,253	2,072,618
	10 mos.	2,039	58,224,975	11,063,399	75,588,414	9,165,491	24,479,821	1,356,244	35,080,258	2,837,569	73,319,139	97.00	2,269,275	—608,888	650,119	6,083,508
Chicago & Erie	Oct.	269	1,010,422	57,596	1,146,951	141,047	102,943	21,265	452,621	33,830	841,866	73.40	305,085	270,068	—67,860	—335,803
	10 mos.	269	8,021,955	595,604	9,265,339	1,124,941	1,607,655	195,280	4,048,035	337,973	7,314,573	78.90	1,950,766	1,432,355	—1,426,014	—2,409,303
New Jersey & New York	Oct.	45	23,273	100,291	130,555	24,113	42,613	1,595	68,811	3,454	140,586	107.70	—10,031	—12,433	—38,919	—28,748
	10 mos.	45	188,950	1,008,860	1,249,242	165,354	229,136	13,530	697,557	34,131	1,139,705	91.20	109,537	79,913	—179,368	—143,795
N. Y., Susquehanna & West'n	Oct.	135	325,085	58,686	431,782	60,775	81,605	4,320	237,944	10,682	395,326	91.60	36,456	15,437	28,239	32,135
	10 mos.	135	2,330,764	613,397	3,364,808	478,928	620,643	36,224	2,035,787	100,189	3,271,894	97.20	92,914	—156,049	—256,615	—13,230
Florida East Coast	Oct.	764	607,611	209,842	934,202	171,402	240,063	13,257	305,616	27,035	759,614	81.30	174,588	100,000	67,921	13,339
	10 mos.	764	6,651,857	3,158,442	11,147,440	1,813,327	2,007,675	132,705	3,471,777	279,554	7,797,077	69.90	3,350,363	2,696,704	2,244,322	905,529
Fort Smith & Western	Oct.	240	133,266	27,992	173,722	31,158	25,157	4,797	54,420	6,413	122,591	70.50	51,131	45,249	36,855	29,134
	10 mos.	240	1,017,161	236,215	1,348,706	263,990	239,370	47,833	469,037	68,205	1,096,442	81.30	252,264	192,662	108,295	—91,154
Galveston Wharf	Oct.	13	.....	.....	223,403	39,369	3,091	611	51,987	3,020	111,822	50.10	111,581	95,751	96,310	3,813
	10 mos.	13	.....	.....	1,295,385	479,712	36,403	7,544	302,211	39,876	1,031,020	79.60	264,365	94,389	96,384	820,681
Georgia	Oct.	328	395,727	102,200	541,319	45,573	93,316	21,441	222,597	19,005	402,071	74.30	139,248	131,990	132,455	79,325
	10 mos.	328	2,911,332	901,538	4,226,160	411,564	737,868	199,031	2,012,504	191,740	3,554,763	84.10	671,397	595,745	609,257	151,512
Georgia & Florida	Oct.	405	100,743	17,730	128,726	19,126	13,932	8,599	45,466	7,047	94,385	73.30	34,341	27,812	25,724	—8,685
	10 mos.	405	900,028	133,787	1,111,583	169,726	166,066	81,606	437,302	64,130	920,969	82.90	190,614	127,274	63,857	—196,862

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Grand Trunk Western	Oct.	347	$1,[illegible]2[illegible]5	$194,614	$1,400,041	$161,162	$327,084	$25,596	$613,058	$51,239	$1,185,316	64.70	$214,725	$137,507	$21,431	—$129,531
	10 mos.	347	11,088,886	1,641,921	13,505,456	1,359,697	2,947,533	273,455	5,460,432	500,250	10,604,322	78.50	2,901,154	2,208,515	496,993	—982,828
Atlantic & St. Lawrence	Oct.	166	187,018	37,502	239,532	100,688	51,761	7,437	128,462	12,104	301,528	125.90	—61,996	—71,896	—123,463	—91,702
	10 mos.	166	1,684,111	391,078	2,257,076	625,235	340,999	50,638	1,210,446	119,374	2,364,939	104.80	—107,863	—73,080	—87,317	1,207,738
Chic., Det. & Canada Gr. Tr. Jct	Oct.	59	184,936	6,964	208,583	18,266	14,759	2,940	61,948	3,546	99,438	47.70	109,145	95,832	80,262	53,304
	10 mos.	59	1,595,154	84,973	1,837,127	141,378	127,124	34,450	656,467	35,522	994,765	54.10	842,662	739,811	563,181	251,483
Detroit, Grand Haven & Milwaukee	Oct.	189	505,182	50,701	576,287	70,287	57,210	7,602	251,827	15,293	402,957	69.00	173,780	170,000	119,088	78,028
	10 mos.	189	3,748,326	364,712	4,427,924	495,805	480,564	85,013	2,142,751	161,197	3,368,172	76.10	1,059,752	1,005,752	380,727	—463,645
Great Northern	Oct.	8,255	9,250,827	1,337,308	11,605,480	1,380,339	2,146,369	132,552	4,419,124	194,487	8,418,984	71.70	3,286,496	2,456,976	2,721,327	3,987,774
	10 mos.	8,261	63,508,919	12,470,769	84,415,554	11,369,912	16,453,510	1,368,935	33,927,177	2,073,272	65,672,727	77.80	18,742,827	11,906,357	12,805,569	8,200,409
Green Bay & Western	Oct.	262	105,533	9,986	124,989	20,612	26,198	2,865	48,335	2,549	100,502	80.40	24,487	16,487	15,869	22,105
	10 mos.	262	898,248	153,156	1,136,245	213,645	171,200	24,500	435,433	26,086	870,735	76.60	265,510	185,199	146,792	119,200
Gulf Coast Lines	Oct.	....	705,430	157,329	937,847	139,643	143,638	23,124	258,216	34,084	600,736	64.00	337,111	296,445	294,568	210,294
	10 mos.	....	6,416,297	1,562,528	8,561,450	1,368,147	1,324,727	262,969	2,368,204	348,398	5,761,477	67.30	2,799,973	2,414,894	2,317,922	1,763,796
Gulf & Ship Island	Oct.	307	186,900	41,216	248,738	55,582	35,182	8,549	81,733	11,657	193,071	77.60	55,667	30,409	30,944	48,182
	10 mos.	307	1,914,821	392,348	2,464,983	449,472	370,145	77,234	757,514	115,652	1,773,516	71.90	691,467	504,551	464,219	204,137
Gulf, Mobile & Northern	Oct.	436	3[illegible]4,429	32,832	403,782	55,525	63,257	17,204	133,643	15,889	285,515	70.70	118,267	81,398	79,936	76,343
	10 mos.	436	3,182,661	336,450	3,674,169	544,032	611,237	142,383	1,257,280	154,333	2,699,999	73.40	974,170	746,881	626,745	340,426
Hocking Valley	Oct.	348	1,282,066	102,112	1,503,820	141,841	660,648	13,216	485,406	31,310	1,332,311	88.60	171,509	86,296	82,909	515,405
	10 mos.	348	9,330,855	881,736	11,174,715	1,132,066	3,077,415	117,116	3,816,435	308,969	8,441,258	75.50	2,733,457	1,844,605	1,937,238	829,357
Illinois Central	Oct.	4,784	12,335,765	2,146,274	15,595,017	2,233,858	3,719,096	210,244	5,218,272	292,866	11,747,305	75.30	3,847,712	2,855,049	2,889,921	2,009,250
	10 mos.	4,784	97,402,219	19,756,859	126,023,025	16,581,809	29,065,358	1,879,319	45,596,371	3,036,286	96,588,609	76.60	29,434,416	20,073,669	20,513,287	15,694,398
Yazoo & Mississippi Valley	Oct.	1,380	1,579,174	382,525	2,097,365	491,141	368,706	31,035	707,397	45,116	1,643,340	78.40	454,025	336,675	414,536	294,703
	10 mos.	1,381	11,503,241	3,212,127	15,686,008	3,698,258	3,110,988	263,207	6,245,256	482,007	13,788,718	87.90	1,897,290	715,238	662,834	430,219
International & Great Northern	Oct.	1,159	1,299,218	213,173	1,654,293	271,646	345,744	28,101	614,994	46,677	1,311,723	79.30	342,570	308,662	198,976	157
	10 mos.	1,159	8,734,596	2,057,194	12,016,867	1,792,133	2,174,460	266,222	5,153,291	468,849	9,909,853	82.50	2,107,014	1,766,271	1,187,723	214,392
Kansas City, Mexico & Orient	Oct.	272	85,919	7,449	102,335	23,211	23,530	5,244	63,170	2,889	118,044	115.40	—15,709	—24,029	—23,569	8,499
	10 mos.	272	935,777	100,649	1,109,348	251,865	234,678	47,198	602,201	59,524	1,195,466	107.80	—86,113	—167,486	—173,038	213,744
Kans. City, Mex. & Orient of Tex.	Oct.	465	122,070	14,852	145,656	31,369	22,931	4,631	73,996	4,117	127,044	87.20	18,612	12,546	—3,379	—6,600
	10 mos.	465	1,039,706	111,675	1,226,105	240,328	295,456	47,025	718,925	64,218	1,365,952	111.40	—139,847	—200,719	346,747	545,296
Kansas City Southern	Oct.	767	1,321,715	179,907	1,631,247	205,989	384,802	36,179	551,786	63,413	1,241,800	76.10	389,447	282,422	213,315	346,196
	10 mos.	767	11,818,285	1,671,268	14,842,173	1,936,722	3,052,660	363,212	5,308,740	672,409	11,327,276	76.30	3,514,897	2,536,387	2,317,162	3,535,615
Texarkana & Ft. Smith	Oct.	81	188,798	14,399	221,625	19,784	22,525	5,635	54,228	8,334	110,095	49.70	111,530	100,558	73,325	60,693
	10 mos.	81	1,444,732	143,571	1,736,564	178,343	197,596	52,102	505,201	86,198	1,018,094	58.60	718,470	611,549	437,895	372,432
Kansas, Oklahoma & Gulf	Oct.	314	251,177	14,612	275,280	43,992	31,457	6,310	89,808	11,015	182,749	66.40	92,531	82,954	66,618	36,211
	10 mos.	314	2,146,165	124,053	2,362,475	443,143	240,610	55,389	839,652	101,808	1,682,328	71.20	680,147	581,933	452,301	—49,797
Lake Superior & Ishpeming	Oct.	33	103,957	48	122,872	23,146	13,909	293	25,590	2,910	65,848	53.60	57,024	51,538	54,275	45,837
	10 mos.	33	855,838	652	1,020,337	207,424	98,964	2,271	220,700	26,133	555,492	54.40	464,845	408,573	421,841	154,435
Lake Terminal	Oct.	13	.....	.....	100,498	12,683	1,317	.....	52,652	1,761	68,353	68.00	32,145	27,977	32,654	43,297
	10 mos.	13	.....	.....	879,486	94,685	90,819	.....	444,709	16,538	646,751	73.50	232,735	178,030	252,108	114,768
Lehigh & Hudson River	Oct.	96	268,540	3,800	284,826	28,177	53,569	1,458	117,755	8,165	209,124	73.40	75,702	63,523	47,051	50,158
	10 mos.	96	1,830,153	39,158	1,974,461	269,221	363,976	14,673	891,682	77,246	1,616,653	81.90	357,808	224,407	58,764	366,395
Lehigh & New England	Oct.	235	546,881	1,918	555,834	56,556	62,726	7,532	169,495	15,436	311,745	56.10	244,089	195,350	187,790	85,385
	10 mos.	236	3,346,090	18,924	3,437,504	548,395	918,369	94,430	1,259,919	159,710	2,980,125	86.70	457,379	325,834	391,029	857,161
Lehigh Valley	Oct.	1,335	4,469,202	552,647	5,488,912	706,824	2,165,479	96,228	2,764,924	118,971	5,876,901	107.10	—387,989	—480,063	635,865	1,110,934
	10 mos.	1,334	41,523,669	5,892,117	51,322,044	6,093,621	16,147,660	1,044,773	23,990,180	1,255,863	48,772,119	95.00	2,549,925	789,200	104,967	3,824,233
Los Angeles & Salt Lake	Oct.	1,137	1,258,767	482,758	1,894,327	347,085	447,738	39,085	582,788	42,497	1,510,231	79.70	384,096	274,983	231,875	297,460
	10 mos.	1,140	10,341,005	4,399,972	16,147,335	3,339,135	3,613,815	462,251	5,279,857	425,041	13,587,088	84.10	2,560,247	1,452,582	1,062,367	1,193,760
Louisiana & Arkansas	Oct.	302	218,974	34,078	263,529	58,608	48,649	7,961	85,949	8,465	209,130	79.40	54,399	29,252	28,194	90,407
	10 mos.	302	2,304,750	324,994	2,707,184	537,936	387,663	76,593	837,254	83,032	1,917,371	70.80	789,813	570,551	559,959	290,470
Louisville & Nashville	Oct.	5,038	7,876,696	1,982,557	10,622,310	1,333,649	2,523,942	220,095	4,057,261	221,679	8,408,614	79.20	2,213,696	1,709,051	1,969,317	2,148,480
	10 mos.	5,038	75,670,093	18,651,022	100,757,149	14,234,783	25,248,328	2,124,058	38,343,375	2,256,036	82,642,973	82.00	18,114,176	14,213,474	14,932,484	3,139,773
Louisville, Henderson & St. Louis	Oct.	199	215,282	60,20[illegible]	299,341	58,838	29,360	6,325	103,161	7,993	205,577	68.70	93,764	71,077	55,162	66,447
	10 mos.	199	1,923,491	591,737	2,723,475	539,924	327,141	61,980	921,597	82,396	1,933,038	71.00	790,437	647,110	497,649	263,738
Maine Central	Oct.	1,194	1,209,985	350,343	1,697,855	275,423	247,382	16,401	825,797	51,041	1,417,899	83.50	279,956	192,340	162,150	192,473
	10 mos.	1,194	11,787,127	3,884,164	16,997,159	2,736,255	3,111,962	138,109	7,492,629	472,323	13,970,104	82.40	2,987,055	2,040,575	2,030,665	277,057
Midland Valley	Oct.	383	341,646	78,851	442,836	122,648	45,000	5,542	135,680	14,530	322,787	72.90	120,049	103,309	98,450	178,568
	10 mos.	383	2,968,021	708,817	3,845,482	638,413	448,871	49,273	1,154,681	148,015	2,440,084	63.50	1,415,398	1,166,549	1,167,551	708,526
Minneapolis & St. Louis	Oct.	1,649	1,395,434	141,024	1,626,675	183,822	276,500	24,521	735,556	41,852	1,260,631	77.50	366,044	290,375	245,388	332,480
	10 mos.	1,649	10,681,731	1,521,584	12,912,434	1,768,234	2,267,748	237,873	6,091,425	395,778	10,759,308	83.30	2,153,126	1,474,975	964,855	—105,577
Minneapolis, St. Paul & S. S. Marie	Oct.	4,383	4,042,683	625,029	5,025,351	717,599	920,097	58,137	2,038,085	107,477	3,862,768	76.90	1,162,583	914,897	876,708	825,997
	10 mos.	4,383	28,709,893	6,128,398	38,322,298	5,644,210	6,126,038	608,721	16,070,250	1,041,618	29,613,959	77.30	8,708,339	6,183,384	5,770,968	—658,183
Mississippi Central	Oct	258	110,899	18,197	135,462	23,755	35,334	5,764	46,898	6,903	118,654	87.60	16,808	10,566	20,144	—609
	10 mos.	259	1,013,483	166,395	1,231,253	197,795	313,768	57,205	430,152	69,678	1,068,598	86.80	162,655	100,177	121,968	—99,951
Missouri & North Arkansas	Oct.	344	97,396	20,890	128,802	9,592	9,217	1,853	57,858	3,007	81,527	63.30	47,275	45,121	39,065	.....
	10 mos.	311	368,021	89,473	491,781	42,998	54,016	10,040	260,762	19,214	387,030	78.70	104,751	97,410	39,000	.....
Missouri, Kansas & Texas	Oct.	1,670	2,467,169	461,174	3,218,571	353,756	775,505	39,208	981,508	79,794	2,236,909	69.50	981,662	755,887	855,543	567,784
	10 mos.	1,670	18,895,831	4,659,803	25,939,290	2,828,081	5,295,251	456,761	7,814,861	881,703	17,346,239	66.90	8,593,051	6,867,546	7,448,885	5,058,671
Mo., Kansas & Texas of Texas	Oct.	1,737	1,750,255	422,849	2,392,821	340,163	514,377	38,505	800,142	68,024	1,754,130	73.30	638,691	582,369	312,214	752,896
	10 mos.	1,737	11,796,656	4,167,116	17,531,249	2,819,099	2,941,519	401,231	6,878,094	738,632	13,752,486	78.40	3,778,763	3,250,043	1,353,271	2,429,934

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or less).	Net after rentals.	Net after rentals 1921.
Wichita Falls & Northwestern	Oct.	329	$139,341	$20,489	$171,602	$35,587	$17,113	$731	$49,190	$6,993	$109,175	63.60	$62,427	$51,538	$24,487	$61,710
	10 mos.	329	959,456	221,566	1,279,167	285,930	169,681	9,019	520,433	83,281	1,064,917	83.30	214,250	97,541	—94,632	494,288
Missouri Pacific	Oct.	7,149	6,787,245	1,394,411	9,187,213	1,511,305	2,084,579	156,009	3,756,688	250,125	7,775,812	84.60	1,411,401	1,054,137	668,525	1,756,078
	10 mos.	7,274	60,990,614	13,764,508	82,310,143	14,411,426	16,851,028	1,541,005	33,804,555	2,582,161	69,418,016	84.30	12,892,127	9,208,611	6,013,204	8,816,922
Mobile & Ohio	Oct.	1,165	1,406,695	171,913	1,676,524	175,094	396,258	45,564	585,752	45,741	1,249,051	74.50	427,473	338,418	307,496	378,072
	10 mos.	1,165	12,281,142	1,446,677	14,494,081	1,743,960	3,050,848	433,250	5,544,391	471,416	11,253,166	77.60	3,240,915	2,643,073	2,113,796	895,979
Monongahela	Oct.	106	328,785	43,525	382,016	46,563	75,240	1,274	121,243	9,045	253,365	66.30	128,651	120,651	59,699	230,782
	10 mos.	106	2,530,329	318,172	2,900,122	406,689	503,793	14,345	842,067	92,996	1,859,890	64.10	1,040,232	960,068	558,902	459,480
Monongahela Connecting	Oct.	7	.....	.....	162,707	25,665	28,281	517	92,674	4,885	152,022	93.40	10,685	8,582	—4,023	4,921
	10 mos.	7	.....	.....	1,344,688	186,186	243,504	5,248	643,062	68,988	1,146,988	85.30	197,700	176,265	134,239	—87,879
Montana	Oct.	56	211,030	477	213,355	29,196	32,637	1,042	35,597	6,927	105,399	49.40	107,956	95,622	112,949	11,509
	10 mos.	56	792,841	6,956	809,624	189,090	256,682	10,101	199,896	61,789	717,558	88.60	92,066	60,351	151,129	172,707
Nashville, Chattanooga & St. Louis	Oct.	1,258	1,611,712	396,523	2,159,604	306,791	450,490	53,428	825,839	67,526	1,707,753	79.10	451,851	416,189	413,335	447,337
	10 mos.	1,258	13,132,860	3,837,987	18,286,321	2,820,997	4,585,552	669,018	7,225,226	584,869	15,930,544	87.10	2,355,777	1,989,350	2,306,612	1,291,862
Nevada Northern	Oct.	165	66,216	5,125	76,176	10,974	6,152	425	12,236	3,033	32,820	43.10	43,356	35,821	34,045	618
	10 mos.	165	379,008	43,867	463,411	98,971	41,317	4,317	87,599	29,112	261,316	56.40	202,095	137,954	151,986	—93,440
Newburgh & South Shore	Oct.	7	.....	.....	171,051	38,654	47,363	.....	78,005	4,462	168,484	98.50	2,567	—9,852	—12,386	61,590
	10 mos.	7	.....	.....	1,587,065	140,161	371,958	.....	635,356	36,953	1,184,428	74.60	402,637	277,249	250,006	100,506
New Orleans Great Northern	Oct.	274	180,271	34,206	227,741	31,897	23,689	5,976	70,352	7,537	139,042	61.10	88,699	73,555	74,050	—54,804
	10 mos.	274	1,657,518	360,544	2,111,704	316,400	295,510	52,496	670,724	97,819	1,434,982	68.00	676,722	525,472	484,006	10,217
New York Central	Oct.	6,914	24,032,009	7,492,034	35,733,437	4,114,989	9,738,430	358,913	13,102,088	752,046	28,464,727	79.70	7,268,710	5,456,556	5,362,344	6,018,202
	10 mos.	6,914	180,293,627	76,436,202	291,754,285	34,395,139	77,259,576	3,350,254	109,745,308	7,902,901	236,110,241	80.90	55,644,044	38,384,865	39,997,455	39,867,711
Cincinnati Northern	Oct.	244	304,758	10,578	324,409	47,694	67,833	4,387	122,772	7,689	250,349	77.20	74,060	61,371	50,805	60,155
	10 mos.	244	2,539,821	148,932	2,766,666	563,409	534,474	50,244	969,968	80,933	2,194,527	79.30	572,139	421,377	221,888	655,837
Cleve., Cin., Chic. & St. Louis	Oct.	2,406	5,744,267	1,393,820	7,815,894	904,135	1,952,751	96,153	3,054,735	169,634	6,236,326	79.80	1,579,568	1,278,491	1,028,727	491,989
	10 mos.	2,409	50,224,623	13,518,823	69,195,581	8,020,633	14,680,945	101,989	26,470,783	1,712,362	52,502,745	75.90	16,692,836	12,839,079	11,264,218	6,166,388
Indiana Harbor Belt	Oct.	119	.....	.....	1,168,737	106,357	142,896	3,985	471,976	18,270	743,484	63.60	425,253	374,587	230,344	233,613
	10 mos.	119	.....	.....	8,472,273	1,012,311	941,420	41,308	3,324,647	191,828	5,511,514	65.10	2,960,759	2,567,613	1,676,935	395,283
Kanawha & Michigan	Oct.	Included in New York Central.														
	10 mos.															
Michigan Central	Oct.	1,862	5,565,085	1,663,826	8,255,638	905,837	2,094,938	93,879	2,717,188	137,785	6,021,608	72.50	2,234,030	1,759,716	1,668,703	2,156,059
	10 mos.	1,862	44,904,855	15,903,755	67,610,184	7,151,661	14,896,707	908,607	23,456,551	1,410,364	48,522,781	71.80	19,087,403	15,073,634	14,152,000	11,970,641
Pittsburg & Lake Erie	Oct.	227	2,975,945	258,574	3,338,714	277,310	896,177	18,893	885,662	60,474	2,140,721	64.10	1,197,993	1,042,876	1,315,503	132,333
	10 mos.	227	19,193,092	2,291,417	22,258,238	2,692,100	8,791,250	201,182	7,666,411	615,066	19,987,914	89.80	2,270,324	1,371,985	2,683,767	1,422,063
Toledo & Ohio Central	Oct.	Included in New York Central.														
	10 mos.															
New York, Chicago & St. Louis	Oct.	1,242	3,394,612	149,691	3,697,433	418,094	810,127	76,885	1,430,602	115,826	2,858,639	77.30	838,794	622,303	573,027	455,356
	10 mos.	1,242	29,813,761	1,473,249	32,337,457	3,998,009	6,342,719	769,947	12,248,461	1,130,420	24,550,550	75.90	7,786,907	5,971,321	5,698,920	3,584,829
New York, New Haven & Hartford	Oct.	2,000	5,888,693	4,191,769	11,542,713	1,518,686	2,338,809	60,561	4,766,566	275,808	9,132,831	79.10	2,409,882	1,993,949	1,121,631	1,485,951
	10 mos.	2,003	49,233,804	40,773,605	101,487,178	14,102,441	21,076,697	555,711	41,556,141	2,825,063	81,666,235	80.50	19,820,943	15,951,132	10,982,099	—1,533,228
Central of New England	Oct.	295	615,131	19,934	669,220	140,013	140,079	4,968	247,661	10,195	542,916	81.10	126,304	104,127	71,508	76,362
	10 mos.	295	5,067,973	192,882	5,539,200	1,217,222	916,392	43,108	2,024,375	111,653	4,305,826	77.70	1,233,374	1,008,630	622,888	949,388
New York, Ontario & Western	Oct.	569	810,762	120,718	1,106,625	171,699	316,190	18,855	640,849	32,758	1,181,590	106.80	—74,965	—114,974	—149,086	59,192
	10 mos.	569	5,784,210	2,805,599	10,300 579	1,469,287	1,929,855	157,728	4,972,215	390,612	8,847,329	85.90	1,453,250	1,095,971	690,249	1,221,060
Norfolk & Western	Oct.	2,237	6,088,987	839,587	7,302,396	1,202,899	2,880,713	76,789	3,749,926	149,600	7,084,075	97.00	218,321	—232,128	—39,076	2,012,239
	10 mos.	2,237	66,314,329	7,532,448	76,637,774	10,234,420	18,806,268	782,567	23,750,430	1,474,298	55,166,666	72.00	21,471,108	16,362,927	18,152,418	10,809,004
Norfolk Southern	Oct.	930	594,753	119,837	770,714	94,672	125,453	21,838	308,559	26,790	578,009	75.00	192,705	160,891	131,468	124,864
	10 mos.	930	5,293,442	1,217,166	6,893.007	1,008,315	1,101,708	218,717	2,868,970	294,894	5,489,408	79.60	1,403,599	1,093,433	851,798	516,028
Northern Pacific	Oct.	6,630	7,924,293	1,196,449	10,005,134	1,196,590	2,345,564	143,125	3,641,819	208,891	7,583,692	75.80	2,421,442	1,694,823	2,182,746	3,892,578
	10 mos.	6,642	58,115,230	12,991,993	78,299,890	10,894,501	18,531,275	1,396,346	29,735,032	2,124,554	63,566,365	81.20	14,733,525	7,470,748	10,569,489	7,120,573
Northwestern Pacific	Oct.	496	512,228	200,699	791,157	95,697	130,486	7,095	264,130	14,910	513,954	65.00	277,203	228,063	214,461	213,964
	10 mos.	501	3,765,186	2,265,883	6,817,526	1,005,877	907,193	71,036	2,572,919	146,776	4,719,178	69.20	2,098,348	1,621,217	1,468,339	1,594,851
Pennsylvania	Oct.	10,537	43,203,046	13,454,536	62,950,906	7,749,364	17,676,526	563,535	26,082,936	1,311,607	54,236,538	86.20	8,714,368	5,766,189	4,190,096	6,154,236
	10 mos.	10,537	359,863,373	122,032,931	529,497,176	65,630,790	135,868,254	5,753,073	206,923,538	13,343,808	435,513,530	82.30	93,983,846	68,913,427	61,245,197	29,629,799
Baltimore, Chesapeake & Atlantic	Oct.	87	87,243	36,935	130,886	17,739	20,155	1,837	95,740	3,678	139,149	106.30	—8,263	—10,363	—10,820	21,014
	10 mos.	87	894,587	403,457	1,354,628	143,674	333,568	19,163	796,220	37,534	1,330,164	98.20	24,464	—23,296	—24,958	95,016
Cumberland Valley & Mart	Oct.	Included in Pennsylvania.														
	10 mos.															
Grand Rapids & Indiana	Oct.	Included in Pennsylvania.														
	10 mos.															
Long Island	Oct.	398	909,571	1,461,072	2,608.127	304,207	544,953	25,954	1,214,056	60,680	2,169,758	83.20	438,369	298,153	185,746	340,648
	10 mos.	398	7,298,050	16,582,609	26,195,602	2,761,919	4,247,899	180,295	11,279,510	571,202	19,249,568	73.50	6,946,034	5,421,487	4,708.999	3,149,829
Maryland, Dela. & Va	Oct.	82	71,178	25,925	101,979	12,347	17,831	2,471	83,486	2,588	118,723	116.40	—16,744	—16,744	—17,735	—18,419
	10 mos.	82	641,591	320,988	996,696	98,220	238,594	19,097	668,694	24,902	1,049,507	105.30	—52,811	—73,218	—85,282	—59,364

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses					Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of—Way and structures.	Maintenance of—Equipment.	Traffic.	Transportation.	General.	Total.					
New York, Phila. & Norfolk.....Oct.	Included in Pennsylvania.													
10 mos.														
West Jersey & Seashore.....Oct.	359	$516,322	$538,462	$1,168,692	$211,840	$222,577	$19,205	$541,503	$29,730	$1,036,610	88.70	$132,082	$117,847	$88,007	—$57,368
10 mos.	359	4,192,249	6,932,054	12,058,932	1,693,027	2,110,272	171,399	5,381,597	284,138	9,767,514	81.00	2,291,418	1,437,276	1,214,863	565,980
Peoria & Pekin Union.....Oct.	19	29,870	2,149	180,995	35,003	11,126	404	77,931	8,619	133,083	73.50	47,912	27,912	53,471	18,530
10 mos.	19	152,031	37,254	1,500,624	260,749	139,533	2,554	632,931	89,473	1,125,240	75.00	375,384	223,884	478,426	165,670
Pere Marquette .....Oct.	2,212	2,888,104	343,161	3,602,421	371,376	618,440	51,472	1,357,955	104,945	2,502,324	69.50	1,100,097	943,937	756,588	803,766
10 mos.	2,217	24,475,805	4,168,213	31,587,005	3,723,464	6,139,324	517,387	11,972,015	1,040,207	23,451,852	74.20	8,135,153	6,668,449	5,367,016	5,227,427
Philadelphia & Reading.....Oct.	1,126	7,497,414	866,935	8,862,560	746,623	1,342,758	59,924	3,093,684	138,487	5,400,003	60.90	3,462,557	3,292,573	3,288,631	2,201,277
10 mos.	1,127	52,676,167	8,204,362	64,554,342	7,405,596	16,467,913	621,422	24,624,521	1,452,441	50,637,568	78.40	13,916,774	11,982,867	10,029,907	8,901,725
Atlantic City .....Oct.	176	131,095	159,740	307,113	92,439	33,006	8,916	241,372	4,315	379,632	123.60	—72,519	—92,583	—138,109	—76,852
10 mos.	176	1,238,893	2,743,590	4,106,416	640,082	369,648	67,602	2,303,797	47,176	3,426,528	83.40	679,878	480,469	78,646	220,480
Perkiomen .....Oct.	41	106,360	6,589	117,465	6,480	3,919	106	39,894	798	51,217	43.60	66,248	61,436	56,676	21,943
10 mos.	41	954,020	83,846	1,074,782	73,686	41,610	1,079	434,880	9,115	560,723	52.20	514,059	463,101	403,909	369,277
Port Reading .....Oct.	21	132,108	.....	169,059	20,036	6,466	229	63,902	1,244	91,877	54.30	77,182	62,472	10,179	18,630
10 mos.	21	1,048,473	.....	1,462,264	186,811	112,880	2,290	533,224	17,211	852,414	58.30	609,850	463,444	—3,110	119,789
Pittsburg & Shawmut.....Oct.	102	62,185	3,508	69,836	22,357	36,085	1,676	32,082	6,380	98,580	141.20	—28,744	—28,909	13,748	49,085
10 mos.	102	763,766	48,256	835,478	252,571	338,158	16,752	299,696	66,863	974,046	116.60	—138,562	—147,533	17,914	179,109
Pittsburg & West Virginia.....Oct.	85	214,979	8,791	252,036	41,629	61,761	4,560	82,226	13,536	214,789	85.20	37,247	725	64,341	—349,506
10 mos.	85	1,916,122	87,886	2,299,579	331,827	598,691	36,169	597,138	147,636	1,805,736	78.50	493,843	213,375	631,629	—573,961
Pittsburg, Shawmut & Northern...Oct.	210	137,526	5,053	146,162	26,881	41,128	2,328	58,376	5,615	134,332	91.90	11,830	9,342	29,894	15,238
10 mos.	210	877,128	62,744	976,926	210,041	426,365	16,961	427,852	65,987	1,147,257	117.40	—170,331	—194,112	—172,485	—160,166
Quincy, Omaha & Kansas City ....Oct.	252	118,597	23,808	153,186	26,218	30,661	887	76,884	2,049	136,658	89.20	16,528	12,603	1,935	—13,557
10 mos.	252	645,903	236,039	975,427	295,082	165,259	8,186	486,512	22,402	975,434	100.00	—7	—39,312	—95,916	—197,873
Richmond, Fred. & Potomac.....Oct.	117	475,403	294,205	965,594	98,019	144,744	7,420	343,924	31,296	639,574	66.24	326,020	272,298	231,021	130,239
10 mos.	117	4,638,211	2,926,450	9,050,343	1,076,207	1,242,741	80,361	3,138,034	274,196	5,994,050	66.23	3,056,293	2,549,608	2,104,330	1,031,874
Rutland .....Oct.	415	299,969	110,328	509,138	98,400	115,885	8,423	202,764	13,119	440,244	86.50	68,894	43,463	54,256	78,523
10 mos.	415	2,561,417	1,255,311	4,789,973	940,263	910,437	83,058	2,137,936	131,793	4,218,997	88.10	570,976	355,446	406,041	348,029
St. Louis-San Francisco.....Oct.	4,760	4,390,947	1,532,749	6,429,608	961,142	1,121,887	81,456	2,701,642	191,392	5,026,599	78.20	1,403,009	1,230,462	1,045,349	1,929,164
10 mos.	4,760	45,346,623	15,090,866	65,320,897	9,677,599	12,300,323	831,953	24,506,464	1,881,196	48,943,528	74.90	16,377,369	13,192,073	12,470,490	15,349,298
Ft. Worth & Rio Grande.....Oct.	235	103,319	33,457	149,831	31,149	36,269	2,934	64,865	7,405	140,981	94.10	8,850	5,342	—8,089	—6,892
10 mos.	235	725,814	292,187	1,124,344	400,925	244,925	27,255	520,566	57,993	1,247,733	111.00	—123,389	—160,614	—237,971	—204,742
St. Louis, San Francisco & Texas..Oct.	134	133,832	16,015	158,031	27,293	21,280	3,349	59,044	6,971	117,908	74.60	40,123	38,255	13,697	1,695
10 mos.	134	1,192,897	151,061	1,406,885	292,595	230,299	36,783	573,729	68,433	1,200,927	85.40	205,958	186,244	—35,594	—265,203
St. Louis Southwestern.....Oct.	968	1,665,667	124,609	1,842,404	202,594	330,945	41,279	498,782	52,786	1,130,881	61.40	711,523	621,146	534,890	717,548
10 mos.	968	12,888,688	1,256,466	14,714,201	1,987,312	2,125,189	417,747	4,058,106	528,324	9,166,846	62.30	5,547,355	4,810,018	4,385,871	4,236,877
St. Louis Southwestern of Texas..Oct.	807	644,864	99,810	796,552	157,523	239,281	20,958	370,665	35,115	823,507	103.40	—26,955	—51,009	—58,133	111,610
10 mos.	807	4,888,156	874,821	6,155,746	1,703,679	1,551,777	199,078	3,162,577	311,653	6,919,069	112.40	—763,323	—1,004,352	—949,154	—790,925
San Antonio & Aransas Pass.....Oct.	739	522,883	82,207	646,115	100,027	129,812	11,595	218,076	27,616	486,700	75.30	159,415	145,916	144,817	98,524
10 mos.	739	3,746,549	731,849	4,792,782	904,612	1,093,717	96,294	2,044,926	259,775	4,353,184	90.80	439,598	299,777	199,075	115,868
San Antonio, Uvalde & Gulf.....Oct.	317	61,488	19,475	88,638	17,365	13,541	2,558	32,353	9,235	75,052	84.70	13,586	9,564	894	—6,498
10 mos.	317	624,148	177,016	889,286	151,204	116,003	28,315	337,659	68,425	700,705	78.70	188,981	158,190	46,276	88,495
Seaboard Air Line.....Oct.	3,563	3,054,746	674,779	4,203,614	504,228	897,674	123,594	1,547,067	168,439	3,266,144	77.70	937,470	762,044	500,918	461,122
10 mos.	3,563	25,859,381	7,156,262	36,938,134	4,194,358	6,623,801	1,215,141	15,443,024	1,579,779	29,353,626	79.50	7,584,508	5,849,665	3,225,099	1,351,183
Southern .....Oct.	6,971	8,905,346	2,557,321	12,553,134	1,471,883	1,885,855	210,347	4,750,117	306,752	8,705,381	69.40	3,847,753	3,342,484	2,711,990	2,603,036
10 mos.	6,971	71,205,402	24,701,413	104,088,939	14,511,388	17,717,985	2,062,323	41,425,019	3,138,283	79,649,115	76.50	24,439,824	19,637,462	15,513,954	9,799,229
Alabama Great Southern.....Oct.	318	493,236	169,977	718,544	88,004	114,749	16,109	261,145	22,726	508,486	70.80	210,058	177,847	201,405	156,815
10 mos.	318	4,893,058	1,507,436	6,806,975	859,744	1,393,921	178,695	2,700,369	241,044	5,430,057	79.80	1,376,918	964,470	952,833	654,705
Cin., New Orleans & Tex. Pacific..Oct.	338	1,160,928	290,400	1,537,950	175,693	370,140	26,461	545,030	40,732	1,167,045	75.90	370,905	321,526	218,693	202,381
10 mos.	338	10,001,542	2,674,359	13,365,977	1,639,719	3,498,511	281,788	4,979,766	414,585	10,906,607	81.60	2,459,370	1,767,561	1,223,147	1,608,789
Georgia, Southern & Florida.....Oct.	402	233,842	100,400	371,733	60,854	73,592	8,469	153,480	11,848	310,524	83.50	61,209	40,522	41,967	—17,130
10 mos.	402	2,452,599	985,960	3,730,676	621,434	644,249	86,767	1,633,407	122,439	3,135,617	84.00	595,059	411,816	258,353	—587,697
New Orleans & Northeastern.....Oct.	207	323,487	95,523	483,270	66,249	116,648	9,326	220,738	15,416	432,607	89.50	50,663	19,369	53,592	8,661
10 mos.	207	3,070,640	783,195	4,361,453	683,433	1,036,301	104,533	2,085,301	167,183	4,113,147	94.30	248,306	—126,089	—156,318	—235,312
Northern Alabama .....Oct.	110	135,139	12,942	151,334	16,896	10,180	1,353	56,332	2,876	87,640	57.90	63,694	59,722	36,359	—7,626
10 mos.	110	997,739	116,439	1,141,307	176,578	61,240	12,770	451,543	29,496	731,625	64.10	409,682	369,385	121,845	—76,692
Southern Pacific .....Oct.	7,118	13,004,566	3,719,634	18,593,941	2,118,398	2,974,056	264,328	5,210,292	474,434	11,320,276	60.90	7,273,665	6,206,413	6,046,614	5,989,697
10 mos.	7,118	99,660,457	37,121,400	151,278,291	19,732,601	25,955,524	2,377,298	50,639,957	4,369,587	105,808,882	69.90	45,469,409	33,100,705	31,813,524	31,449,779
Arizona Eastern .....Oct.	382	242,915	27,639	286,117	39,832	38,292	3320	77,190	17,162	177,612	62.10	108,505	84,133	68,854	—14,704
10 mos.	382	2,206,362	280,937	2,592,584	341,313	306,868	31,575	747,812	183,997	1,620,368	62.50	972,216	729,353	584,486	—3,107

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF OCTOBER AND TEN MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues			Maintenance of		Operating expenses				Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
			Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Atlantic S. S. Lines	Oct.	...	$1,074,155	$61,559	$1,199,461	$16,927	$257,244	$24,997	$696,068	$29,433	$1,024,669	85.40	$174,792	$163,145	$162,680	$132,874
	10 mos.	...	8,731,522	531,112	9,758,518	132,416	1,974,557	197,546	5,629,629	274,074	8,208,222	84.10	1,550,296	1,427,260	1,429,620	248,741
Galv., Harris. & San Antonio	Oct.	1,379	1,656,316	388,121	2,158,831	317,548	451,917	38,058	756,550	72,353	1,633,133	75.60	525,698	454,964	384,043	247,544
	10 mos.	1,379	13,375,457	3,745,035	18,127,408	3,331,802	3,570,963	371,617	7,133,727	723,051	15,209,023	83.90	2,918,385	2,377,776	1,922,451	1,874,499
Houston & Texas Central	Oct.	932	1,203,094	303,861	1,596,878	315,933	294,416	25,085	412,693	43,260	1,090,747	53.30	506,131	456,733	399,520	672,451
	10 mos.	932	8,552,978	2,915,981	12,235,944	2,240,598	2,327,960	238,835	4,167,985	425,546	9,380,957	76.70	2,854,987	2,405,194	2,040,281	1,158,343
Houston East & West Texas	Oct.	191	250,017	42,648	308,534	43,747	68,783	3,615	101,331	7,675	223,426	72.40	85,108	75,816	56,054	58,097
	10 mos.	191	2,056,025	417,214	2,594,547	504,557	528,348	34,890	1,012,526	80,910	2,142,761	82.60	451,786	385,421	226,255	212,759
Louisiana Western	Oct.	207	270,523	83,740	382,825	13,143	111,780	4,530	103,945	16,146	253,712	66.30	129,113	101,818	98,732	135,294
	10 mos.	207	2,345,734	862,814	3,447,569	601,325	683,482	84,350	1,010,915	174,810	2,595,074	75.30	852,495	600,329	612,410	635,147
Morgan's Lt. & Tex. R. R. & S. S.	Oct.	400	610,457	146,205	814,876	158,509	240,543	8,206	288,040	30,286	730,456	89.60	84,420	38,204	18,330	77,595
	10 mos.	400	4,553,025	1,507,022	6,576,767	1,392,209	1,578,794	152,339	2,621,882	329,355	6,122,310	93.10	454,457	—11,642	—158,003	—373,744
Texas & New Orleans	Oct.	507	570,295	149,486	772,937	224,214	106,031	11,666	286,477	24,146	657,895	85.10	115,042	83,351	35,832	124,435
	10 mos.	507	5,212,549	1,523,946	7,171,702	1,520,465	1,787,681	108,219	2,749,022	255,268	6,773,067	90.30	698,635	455,406	114,511	—315,305
Spokane International	Oct.	165	89,633	19,412	116,241	16,412	11,150	3,208	35,379	5,699	72,604	62.50	43,637	38,037	31,687	3,408
	10 mos.	165	794,676	135,627	980,494	148,548	86,607	31,150	341,587	59,040	674,086	68.70	306,408	251,397	183,511	151,195
Spokane, Portland & Seattle	Oct.	551	454,231	133,136	662,128	60,940	104,361	9,297	220,229	22,538	426,591	64.40	235,537	175,498	177,852	324,502
	10 mos.	551	3,980,207	1,432,491	5,985,589	574,380	897,836	101,330	2,003,473	202,021	3,865,739	64.60	2,119,850	1,326,025	1,226,746	1,291,077
Tennessee Central	Oct.	292	207,707	39,623	264,313	44,221	41,835	6,967	112,896	9,635	215,372	81.10	48,940	43,832	19,330	.....
	10 mos.	292	1,396,893	364,919	1,877,872	301,860	269,750	51,882	810,226	75,695	1,509,134	80.30	368,737	328,404	105,482	.....
Terminal R. R. Assn. of St. Louis	Oct.	37	.....	.....	398,633	88,466	37,282	1,031	116,034	27,345	273,541	68.60	125,092	65,104	169,094	281,454
	10 mos.	37	.....	.....	3,723,525	813,016	413,521	10,549	1,248,684	78,561	2,598,798	69.80	1,124,727	562,205	1,694,880	1,603,233
East St. Louis Connecting	Oct.	1	.....	.....	192,530	13,793	7,840	293	55,901	2,402	80,229	41.70	112,301	104,220	94,224	68,213
	10 mos.	1	.....	.....	1,697,976	133,344	74,831	3,049	565,148	25,771	802,143	47.20	895,833	790,971	703,611	294,672
St. Louis Merchants' Bridge Term.	Oct.	9	.....	.....	459,475	43,241	31,841	910	132,886	5,801	214,679	46.70	244,796	219,129	205,392	145,436
	10 mos.	9	.....	.....	3,244,736	413,111	281,844	9,364	1,382,532	47,482	2,134,333	65.80	1,110,403	907,535	1,033,694	594,401
St. Louis Transfer	Oct.	6	.....	.....	68,292	10,954	4,954	168	33,188	1,606	50,870	74.50	17,422	16,526	6,875	64,923
	10 mos.	6	.....	.....	614,688	103,124	45,554	1,761	330,428	16,315	497,182	80.90	117,506	111,375	29,575	386,676
Texas & Pacific	Oct.	1,952	2,086,947	681,432	3,022,568	392,467	790,173	51,265	1,104,448	85,857	2,446,429	80.90	576,139	475,641	370,690	811,037
	10 mos.	1,952	17,158,823	5,948,502	25,044,162	4,276,276	5,192,658	486,045	9,494,862	917,473	20,562,818	82.10	4,481,344	3,403,171	2,685,601	3,206,342
Toledo, Peoria & Western	Oct.	247	116,736	36,871	166,495	38,860	37,265	2,357	79,535	7,415	165,432	99.40	1,063	—9,937	—11,112	12,360
	10 mos.	247	837,496	418,854	1,376,997	267,890	316,286	27,493	711,989	77,143	1,400,718	101.70	—23,721	—134,201	—158,541	—330,216
Toledo, St. Louis & Western	Oct.	454	1,206,277	30,014	1,289,499	159,863	143,723	20,676	336,460	218,444	879,136	68.20	410,363	348,638	263,953	272,696
	10 mos.	454	8,524,144	297,307	9,231,973	1,140,783	1,355,318	214,166	2,855,283	630,493	6,195,901	67.10	3,036,072	2,492,472	2,116,198	1,145,055
Trinity & Brazos Valley	Oct.	368	205,454	22,535	237,333	38,057	27,683	3,942	79,386	15,440	164,508	69.30	72,825	65,579	40,397	87,019
	10 mos.	368	2,052,590	211,733	2,352,150	535,439	429,959	32,749	845,127	134,302	1,972,255	83.80	379,895	309,429	—63,923	139,197
Ulster & Delaware	Oct.	128	77,179	15,486	126,865	27,580	33,517	2,060	75,149	8,526	147,162	115.90	—20,297	—26,300	—30,350	85
	10 mos.	128	616,605	452,181	1,414,235	235,383	232,612	31,785	721,503	81,484	1,307,326	92.40	106,909	46,849	8,522	69,568
Union	Oct.	45	.....	.....	1,037,166	74,819	169,742	257	468,343	6,742	719,903	69.40	317,263	323,263	451,683	285,069
	10 mos.	45	.....	.....	9,357,987	733,762	1,763,688	2,318	3,894,354	70,049	6,464,171	69.10	2,893,816	2,793,071	3,530,371	1,952,703
Union Pacific	Oct.	3,707	10,243,137	1,508,966	12,688,907	1,385,745	2,611,076	117,499	3,536,705	273,314	8,124,785	64.00	4,564,122	3,970,269	3,822,503	4,468,655
	10 mos.	3,690	65,310,500	14,562,761	87,701,096	10,716,401	18,222,492	1,343,510	25,528,315	3,017,738	60,586,553	69.10	27,114,543	21,305,775	20,862,678	24,649,628
Oregon Short Line	Oct.	2,366	3,415,287	473,212	4,146,858	469,172	652,678	41,462	1,263,196	109,561	2,600,142	62.70	1,546,716	1,288,540	1,240,733	1,382,677
	10 mos.	2,360	23,025,262	4,637,962	29,837,593	4,582,679	5,530,074	443,364	9,962,763	1,151,658	22,277,097	74.70	7,560,496	4,830,118	4,593,541	4,366,991
Oregon-Wash. R. R. & Nav.	Oct.	2,237	2,189,720	466,214	2,903,010	607,390	483,780	54,877	1,207,704	121,994	2,509,478	86.40	393,532	212,398	111,463	305,804
	10 mos.	2,230	16,535,491	4,777,906	23,402,733	5,179,146	4,359,712	595,111	10,326,059	1,242,794	22,003,329	94.00	1,399,404	—412,640	—1,232,771	—234,278
St. Joseph & Grand Island	Oct.	258	259,494	26,681	305,303	88,208	70,542	2,776	123,156	11,251	275,933	90.40	29,370	17,775	6,718	166,289
	10 mos.	258	2,169,241	254,879	2,594,241	483,098	510,496	25,640	1,147,506	119,330	2,286,079	88.10	308,162	139,237	49,094	142,218
Utah	Oct.	102	159,116	752	160,688	32,290	34,208	334	53,560	4,805	125,166	77.90	35,522	29,378	27,469	19,528
	10 mos.	102	1,383,842	7,466	1,404,635	243,451	362,802	3,702	357,241	48,616	1,015,286	72.30	389,355	325,926	205,224	—19,401
Virginian	Oct.	540	1,358,671	71,083	1,523,991	192,346	452,829	12,636	480,575	32,518	1,168,231	76.70	355,760	204,645	248,805	406,529
	10 mos.	528	14,355,392	679,990	16,066,983	1,827,927	3,907,701	117,172	3,943,135	312,459	10,092,480	62.80	5,974,503	4,741,027	4,914,534	4,367,030
Wabash	Oct.	2,472	3,860,563	728,941	5,000,891	761,763	1,239,613	108,328	2,046,177	144,540	4,318,523	86.40	682,368	491,476	238,548	970,887
	10 mos.	2,472	36,491,391	7,572,310	47,741,878	7,019,963	9,700,878	1,143,309	20,169,921	1,486,254	39,725,205	83.20	8,016,673	6,108,461	3,482,904	3,559,906
Western Maryland	Oct.	804	1,779,448	79,004	1,949,103	301,818	472,283	38,782	724,854	45,286	1,601,001	82.10	348,102	288,102	268,165	276,504
	10 mos.	804	13,042,152	821,221	14,857,126	2,063,080	3,195,335	349,216	5,344,982	457,889	11,627,436	78.30	3,229,690	2,730,690	2,540,851	2,478,060
Western Pacific	Oct.	1,045	1,282,066	176,072	1,569,773	215,967	222,127	33,908	476,732	33,205	1,003,680	63.90	566,093	489,884	490,420	298,769
	10 mos.	1,044	7,657,892	1,917,557	10,299,018	1,704,671	1,803,470	328,682	3,754,919	369,706	8,173,562	79.40	2,125,456	1,301,710	1,458,172	1,249,940
Wheeling & Lake Erie	Oct.	511	899,875	47,655	1,074,344	190,931	460,125	18,338	437,759	32,512	1,142,199	106.30	—67,855	—150,380	—170,566	308,593
	10 mos.	511	9,396,470	667,354	11,004,773	1,860,847	2,696,311	178,633	4,148,714	340,348	9,256,441	84.10	1,748,332	693,610	419,476	1,625,867

Teachers of Transportation to Meet

A meeting of university teachers of transportation will be held in connection with the annual convention of the American Economic Association, to be held in Chicago on December 27-30.

The following sessions have been arranged:

Congress Hotel, December 29, 2 P. M.—Business Meeting and Round Table Discussion. Organization of the Association. Formation of plans and policies. "The Aims of College Courses of Transportation."

Congress Hotel, December 30, 2 P. M.—Business Meeting and Round Table Discussion. Election of officers. Adoption of a constitution. "The Methods Used in Presenting Transportation Courses."

University Club, December 30, 8 P. M.—Dinner. Special speakers on current transportation problems.

Consolidation Hearings to Be Resumed

Hearing on the Interstate Commerce Commission's consolidation plan will be resumed before Commissioner Hall and Examiner Healy at Washington, January 17. Evidence will be received with respect to carriers which, under the tentative plan, should be considered in connection with the following proposed systems as there outlined, or in connection with such alternative systems as may be proposed:

System No. 13—Union Pacific—North Western
- Union Pacific
  - St. Joseph & Grand Island
  - Oregon Short Line
  - Oregon-Washington Railroad & Navigation Company
  - Los Angeles & Salt Lake
- Chicago & North Western
  - Chicago, St. Paul, Minneapolis & Omaha
- *Lake Superior & Ishpeming
- Wabash lines west of the Mississippi River

System No. 16—Santa Fe
- Atchison, Topeka & Santa Fe
  - Gulf, Colorado & Santa Fe
- Colorado & Southern
  - Fort Worth & Denver City
- *Denver & Rio Grande
- *Western Pacific
- *Utah Railway
- *Northwestern Pacific.
- *Nevada Northern

System No. 17—Southern Pacific Rock Island
- Southern Pacific Company
- *Nevada Northern
- Chicago, Rock Island & Pacific
  - Chicago, Rock Island & Gulf
- Arizona & New Mexico
- El Paso & Southwestern
- *San Antonio & Aransas Pass
- *Trinity & Brazos Valley
- *Midland Valley
- Vicksburg, Shreveport & Pacific
- Chicago, Peoria & St. Louis.

It is expected that the main affirmative case in respect of each carrier, particularly the documentary evidence, will be presented at the hearing in Washington. Carriers starred in the above list, and other carriers not listed, may introduce all their evidence at the western hearings if the commission is so advised in advance. The western hearings will be held primarily to afford state commissions, communities and the public an opportunity to present evidence and to cross-examine witnesses, provided the commission is advised in season to recall witnesses.

The existing Union Pacific and Southern Pacific systems will not be expected to present their evidence at this hearing. Opportunity will be given them later.

Certain respondents tentatively included in systems No. 14—Burlington-Northern Pacific and No. 15—Milwaukee-Great Northern, are to present their further evidence at the hearing commencing on January 17. Due notice will be given of the time and place of western hearings.

Respondents named in systems No. 18—Frisco-Katy Cotton Belt and No. 19—Chicago-Missouri Pacific, have been asked to be prepared to make their main affirmative cases at Washington upon short notice at any time after January.

Traffic News

A bill to reduce all freight rates on agricultural products and live stock by 33⅓ per cent or to the level existing on June 24, 1918, was introduced in the Senate on December 11.

The Transcontinental Passenger Association has announced the same summer excursion round trip fares from California, Nevada, Oregon, Washington and British Columbia to eastern destinations for the summer of 1923 as were in effect this year. The excursion fares from Chicago, St. Louis, Memphis, New Orleans, etc., to California and the north Pacific coast in effect in 1922 will also be maintained next summer.

Hearing on Proposed Grain Rate Reductions

A hearing was begun before Examiner Hunter of the Interstate Commerce Commission at Washington on December 11 on the complaint of the Public Utilities Commission of Kansas against the western railroads, asking a further reduction in the rates on grain and hay. Henry J. Waters, formerly president of the Kansas Agricultural College, spoke for Kansas and the farmers, declaring that agricultural products are bearing more than their share of the cost of transportation.

Priority Orders Vacated

The Interstate Commerce Commission on December 8 issued Amendment 4 to Service Order No. 25 and Amendment 2 to Service Order No. 24, which vacated and set aside those service orders, effective December 11, removing all restrictions on the use of open top cars east of the Mississippi river and canceling the priority accorded coal and certain other specified commodities, both east and west of the Mississippi river. The orders state that the emergency has been "measurably relieved."

Service Order No. 22 is still outstanding. This requires all railroads to forward traffic to destination by the routes most available to expedite its movement and relieve congestion, with appropriate provision for the protection of the rate over the route designated.

Coal Production

The total estimated output of soft coal in the week ended December 2, including coal coked, mine fuel, and local sales, was 10,336,000 net tons, according to the Geological Survey. As Thanksgiving Day reduced the working time during that week to about 5¼ days the average daily production was 1,969,000 net tons, the highest rate attained in any week this year. Preliminary reports of cars loaded during the first 4 days of the week December 4-9 indicate nearly the same rate of production and a total output of about 11,100,000 tons.

The estimated cumulative production of bituminous coal this year to December 2, inclusive, stands at 365,387,000 tons which is 3 per cent less than in the corresponding period of 1921.

Shipments of bituminous coal from lower Lake Erie ports declined in the week ended December 3, and the season virtually came to a close on that date. Reports furnished by the Ore and Coal Exchange show that 554,525 net tons were dumped, of which 535,505 tons were cargo coal and 19,020 tons were vessel fuel. Cumulative dumpings during the present season to December 3, stood at 18,991,482 tons, a decrease of 18 per cent when compared with the average for the three years preceding. Of the 18,171,965 tons of cargo coal dumped to date, 1,149,063 tons, or 6.3 per cent, were consigned to destinations not ordinarily taking Lake coal.

More freight cars were loaded with bituminous coal on Monday, December 11, than on any one day in the last three years, which is as far back as the Car Service Division of the American Railway Association has any daily record. The total was 45,886 cars. This exceeded by 429 cars the best previous record which was attained on November 22, 1920, at which time 45,457 cars were loaded. This also exceeded by 588 cars the total loading on October 30 last which was the highest for any one day since April 1 last, when the strike of bituminous miners began.

Commission and Court News

Interstate Commerce Commission

The commission has suspended until April 6, the operation of schedules which propose to reduce rates on petroleum and its products to Western Trunk Line destinations, from points in Texas on the Texas & New Orleans and the Houston East & West Texas, which include among others Beaumont, Houston, Orange and Port Arthur; also schedules which propose to extend proportional rates on petroleum from Shreveport and group to Vicksburg and to Natchez to shipments destined to points beyond.

State Commissions

The Kansas Public Utilities Commission has denied the petition of the Leavenworth & Topeka Railroad for permission to discontinue freight service between Leavenworth and Meriden.

The State Utilities Commission of Ohio has dismissed for want of jurisdiction the application of the Detroit, Toledo & Ironton for authority to issue $1,000,000 employees' improvement certificates to be sold to employees of the company. The commission held that its supervision over utility financing extends only over securities issued for construction and betterments. While the application specified that the certificates were to be used for the purpose of promoting cordial relations between employees and the company, it was not established definitely what was to be done with the money derived from their sale.

Personnel of Commissions

L. E. Gettle, member of the Railroad Commission of Wisconsin, has been elected chairman of the commission succeeding Carl T. Jackson, who has been acting chairman. Mr. Jackson will continue as a member of the commission.

Court News

Failure to Warn Passenger of Danger of Riding on Platform Not Negligence

The Texas Court of Civil Appeals holds that where a passenger who had been smoking in a car where smoking was prohibited and after being told by the porter that if he wanted to smoke he would have to go out on the platform, went upon the platform, where he slipped and fell off the train and was injured, the porter was not negligent in failing to warn the passenger of the danger of going on the platform.—Rhodes v. Houston, E. & W. T. (Tex. Civ. App.) 242 S. W. 263.

Injury by Defective Car on Private Siding

A railroad company left a loaded car on an industry track in such a defective condition that a drawhead pulled out while in use. The consignee's employees substituted a chain, which broke. Some days later its inspector, knowing this, used a wire cable to couple it into a short train. This broke with the first strain of a reverse movement and the car, with another car, broke away, but was stopped. The engineer, not knowing his train had parted, collided with the cars in making a run for a grade, and a brakeman in the consignee's employ was thrown from the top of the car and injured. The Circuit Court of Appeals, Sixth Circuit, holds that, under these facts, the negligence of the consignee, its inspector and engineer were not merely intervening causes in ordinary and natural sequence that should have been anticipated by the railroad company, but, on the contrary, the supervening, efficient and proximate cause of the collision and consequent injury, and that the railroad company was not liable for negligence in delivering the defective car as being the proximate cause of the injury.—Lanz v. Pennsylvania, 281 Fed. 796.

Equipment and Supplies

Locomotives

The Union Pacific is inquiring for 5 Mallet type locomotives with 12,000-gal. tenders, and for 73 Santa Fe type locomotives.

The Illinois Central is reported to be considering the purchase of 15 Mountain type locomotives and a number of Pacific type locomotives.

The Imperial Japanese Government Railways have ordered through Mitsui & Co., New York, two 9-ft. cut rotary snow plows from the American Locomotive Company.

The Central of New Jersey, reported in the *Railway Age* of December 2 as inquiring for five, 6-wheel switching locomotives, has ordered this equipment from the American Locomotive Company.

The Chicago, Burlington & Quincy, reported in the *Railway Age* of November 18 as inquiring for 15 Mikado type and 10 Santa Fe type locomotives, is expected to place orders for this equipment this week.

The Chicago & North Western is inquiring for 18 Mikado type superheater freight locomotives, with a total weight of engine in working order of 312,000 lb.; 20, 0-6-0 type superheater switching locomotives, with a total weight of engine in working order of 184,000 lb., and 12 Pacific type superheater passenger locomotives, with a total weight of engine in working order of 294,000 lb.

Freight Cars

The Minarets & Western is inquiring for 200, 40-ton flat cars.

The Bengal & Northwestern (India) is inquiring for 250 freight cars.

The Summers Steel Car Company, Pittsburgh, is inquiring for 500 ore cars of 75 tons' capacity.

The United Gas Improvement Company, Philadelphia, Pa., is inquiring for 150, 50-ton coal cars.

The Muscle Shoals, Birmingham & Pensacola is inquiring for 50, 40-ton box cars and 50 flat cars.

The Illinois Central is reported to be considering the purchase of a large number of freight cars.

The Atlantic Coast Line is inquiring for 500 sets of 40-ton trucks for cars to be repaired in its own shops.

The Steamship Fuel Corporation, 33 Rector street, New York City, is inquiring for 100 hopper cars of 70 tons' capacity. The company may increase the number of cars when the order is placed.

The Pere Marquette, reported in the *Railway Age* of December 2 as having ordered 1,000 box cars from the Western Steel Car & Foundry Company, ordered 1,500 box cars from this company instead of the 1,000 as reported.

The Baltimore & Ohio is inquiring for 2,000 box cars. This is in addition to the inquiry for 2,000 hopper cars and 1,000 gondola cars, mentoned in the *Railway Age* of November 18 and November 25. It is expected that contracts for the hopper and the gondola cars will be placed this week.

Passenger Cars

The Long Island, reported in the *Railway Age* of October 21 as inquiring for 40 motor cars, 20 electric trailer cars, 20 trailer coaches for steam suburban service, 10 coaches for steam service and 2 combination baggage and mail cars, has ordered this equipment from the American Car & Foundry Company.

The Southern Pacific, reported in the *Railway Age* of December 9 as contemplating coming in the market soon for about

140 passenger train cars, will order 15 steel coaches for main line through service, 60 steel coaches for local service, 10 steel diners, 11 steel buffet baggage cars, 35 steel combination mail and baggage cars and 10 steel baggage cars.

Iron and Steel

THE NEW YORK CENTRAL has received bids for 1,300 tons of steel for bridges.

THE GREAT NORTHERN is in the market for 3,345 tons of structural bridge steel for delivery in 1923.

THE BALTIMORE & OHIO has ordered 750 tons of steel for bridges from the American Bridge Company.

THE MISSOURI PACIFIC has ordered 549 tons of structural steel for turntables at St. Louis, Mo., from the American Bridge Company.

THE NORTHERN PACIFIC has ordered 115 tons of structural steel from the American Bridge Company for Center avenue bridge, Minneapolis, Minn.

THE ILLINOIS CENTRAL has ordered 509 tons of structural steel for 387 ft. 6-in. plate girder spans for Simpson, Ill., from the American Bridge Company.

THE ATCHISON, TOPEKA & SANTA FE has ordered 176 tons of structural steel from Joseph E. Ryerson & Son for an addition to its ice plant at Bakersfield, Cal.

THE LAKE SUPERIOR & ISHPEMING has ordered 193 tons of structural steel from the Wisconsin Bridge & Iron Company to be used in its car repair shop at Marquette, Mich.

Machinery and Tools

THE NORFOLK & WESTERN is inquiring for a 20-in. engine lathe, 6-ft. between centers.

THE PENNSYLVANIA, reported in the *Railway Age* of October 28 as inquiring for a list of heavy machine tool requirements, has ordered from various builders about 35 tools, including lathes, grinders and horizontal borers.

THE GREAT NORTHERN is inquiring for one steam operated locomotive crane, 30-ton capacity, 50 ft. boom, 8 wheel car, self-propelling, equipped with enclosed cab, also for two Bucyrus 30-B or similar gasoline shovels with caterpillar mounting with one yard dipper, two 35 ft. booms complete with cable and two one yard clam shell buckets.

Signaling

THE NEW YORK, NEW HAVEN & HARTFORD will install the Union Switch & Signal Company's continuous inductive system of train control on its double track line from the west end of its Providence (R. I.) passenger station to Auburn, R. I., five miles. This territory will be divided into 17 blocks of which 11 are in automatic territory and six within interlocking limits.

THE UNITED ELECTRIC RAILWAYS, Providence, R. I., will have automatic block signals on the line between Providence and Woonsocket, about 15 miles. An order has been given to the Union Switch & Signal Company for 32 color light signals, style N; also for ten "automatic flagmen," showing three aspects. All of this apparatus is to be energized by a current of 2,300 volts, 25 cycle. All installation work will be done by the signal company.

THE ANN ARBOR RAILROAD in connection with its improvements at Manhattan Junction, Toledo, Ohio, to provide for the accommodation of the trains of the Pennsylvania Railroad, running to and from Detroit, is enlarging the interlocking. The present machine, 44 levers, will have electric levers added, and electric detector locking will be provided on the Ann Arbor tracks. The signals on the Ann Arbor will be of the position-light type. Similar improvements will be made at the Hallett interlocking, at the junction of the Ann Arbor with the Toledo Terminal. The apparatus for all this work is furnished by the Union Switch & Signal Company.

Supply Trade News

The **Willamette Iron & Steel Works**, Portland, Ore., will begin the manufacture of gear type locomotive designed for use on logging railways, on January 1. The company expects to build one locomotive a month.

R. M. Chissom, formerly chief clerk to the purchasing agent of the Chicago, Indianapolis & Louisville at Chicago, has been appointed special representative in the railroad department of the **Lehon Company**, Chicago.

William N. Shaw, vice-president of the **New York Air Brake Company**, of New York City, has resigned and in future will devote all his time to the Eisemann Magneto Corporation, Brooklyn, N. Y., of which he has been president for the past four years, and to other interests.

John J. Kehoe, who represented Warren, Corning & Co., no longer handles this account. Mr. Kehoe continues to represent the **Lehigh Railway Supply Company** at 1 Madison avenue, New York City, and all his time in the future will be devoted to this work. This company is the selling representative of manufacturers serving the railway, industrial and marine trade.

Frank N. Phelps was recently placed in charge of railroad sales of Baker industrial tractors and trucks, manufactured by the **Baker R. & L. Company**, Cleveland, Ohio. Mr. Phelps was born at Boston, Mass., on December 14, 1878. He received a mechanical engineering education at Massachusetts Institute of Technology and has been identified with the electric vehicle industry since 1911, when he took over the sale of Baker road trucks in New England. Mr. Phelps now becomes special railroad representative of the same company as noted above.

F. N. Phelps

E. T. Fishwick, formerly sales manager of the Worthington Pump & Machinery Corporation, New York, has been elected vice-president in charge of sales to succeed F. H. Jones, resigned. William Goodman, assistant to vice-president, has been elected vice-president in charge of engineering and manufacturing to succeed J. E. Sague, resigned. Both Mr. Jones and Mr. Sague will remain with the corporation in a consulting capacity. **James C. Barnaby**, plant engineer of the Staten Island Shipbuilding Company, is now in charge of certain engineering work in the Diesel oil engine division of the Worthington Pump & Machinery Corporation.

W. L. Allen, vice-president and general manager of the Laclede Steel Company, St. Louis, Mo., has resigned to become associated after January 1, 1923, with Frank H. Johnson of Chicago, Ill., in the sale of Laclede Steel and other steel companies' products. After leaving college as a metallurgist, Mr. Allen spent several years in the operating departments of blast furnace, open hearth and finishing mill, and was one of the sales engineers of the Carnegie Steel Company. He later acted as commercial engineer of the R. D. Nuttall Company in the development of heat treated gearings. Mr. Allen was president of the Valley Steel Company of East St. Louis, Ill., until that company was taken over by the Laclede Steel Company in 1918.

Alfred B. Carhart has resigned as vice-president and sales manager of the Crosby Steam Gage & Valve Co., to become president and general manager of the **Precision Instrument Company, Inc.**, Newark, N. J. Mr. Carhart was for more than ten years works manager of the Crosby factory. He is a mechanical and electrical engineer and a graduate of Princeton University. The Precision Instrument Co., Inc., has acquired control of the Precision Instrument Co., of Newark, N. J., and the present executive officers will retain their connection with the company. The company's New York City office will be at 114 Liberty street, and the factory will later be moved to New York.

W. E. Caldwell has been appointed sales manager of the **Cleveland Twist Drill Company**, Cleveland, Ohio, succeeding E. G. Buckwell, retired. **Harry Jenson** has been appointed assistant sales manager; **Robert G. Berrington**, sales representative in the Philadelphia district, and **George Kast**, treasurer, has taken on the duties of secretary. Mr. Caldwell, who has been with the Cleveland Twist Drill Company since 1901, was appointed assistant sales manager in 1916. Mr. Jenson was for more than 15 years a representative of the company in the Philadelphia territory, and Mr. Berrington, for 13 years a representative of the sales department in the central states and Canada, has returned to the Cleveland Twist Drill Company after resigning two years ago to act as sales agent for a line of machine tools in the Cleveland territory. Mr. Buckwell, retired secretary and sales manager, previous to 1899 was a traveling salesman for the Sargent Company and later a member of the retail hardware company of McClung, Buffat & Buckwell at Knoxville, Tenn.

W. E. Caldwell

Obituary

W. B. Everest, general traffic manager of the Westinghouse Electric & Manufacturing Company, died on December 5 at his home in Pittsburgh, Pa. Mr. Everest was born July 3, 1868, at Newark, N. J. After completing his high school education he entered the employ of the United States Electric Company at Newark; this company was later merged with the Westinghouse Electric & Manufacturing Company. While at the Newark works of the electric company, he served as chief clerk to the general superintendent of the works. In May, 1884, he was transferred to the East Pittsburgh works, retaining his position of chief clerk. In 1885 he was transferred to the auditing department, in charge of cost, and was later appointed storekeeper and shipper, and then traffic manager of the East Pittsburgh works. In 1914 he was made general traffic manager of the company, which position he held at the time of his death.

W. B. Everest

Railway Construction

Atchison, Topeka & Santa Fe.—This company has awarded a contract to Sharp & Fellowes, of Los Angeles, for the construction of second track on the Arizona division for 40 miles between Griffith, Ariz., and Topock, and for 65.1 miles between Bagdad, Cal., and Daggett. Between Bagdad and Lavic, the double track will follow a new line. This company also contemplates the construction of second track on the Albuquerque division for 8.6 miles between Dalies, N. M., and Rio Puerco, and for 32.6 miles between Perea, N. M., and Defiance.

Atchinson, Topeka & Santa Fe.—This company has awarded a contract to R. E. McKee, El Paso, Tex., for the construction of a brick and steel passenger station at Phoenix, Ariz., to be built in conjunction with the Southern Pacific at a cost of approximately $300,000.

Belt Railway of Chicago.—This company has closed bids for the construction at Chicago of a brick freight house, 40 ft. by 220 ft., with a wood platform 300 ft. long, the total cost of which will be approximately $75,000.

Chicago, Burlington & Quincy.—This company will construct a new double track line two miles long, to cost approximately $185,000, at Weston, Mo., to replace track which has been damaged by high water. This road is also contemplating the construction of a new freight and passenger station at Weston.

Cleveland, Cincinnati, Chicago & St. Louis.—This company has awarded a contract to the Ogle Construction Company, Chicago, Ill., for the construction of a 400-ton, three track, concrete coaling station at Hillsboro, Ill.

Great Northern.—This company contemplates the construction early in 1923 of a new engine house and repair shop at St. Cloud, Minn.

Great Northern.—This company has awarded a contract to the Roberts & Schaefer Company, Chicago, for the construction of a 500-ton fireproof, three track, automatic electric roller skip type locomotive coaling plant at Havre, Mont.

Gulf, Colorado & Santa Fe.—This company has awarded a contract to Doullutt & Williams, of Galveston, Tex., for the construction of two, 400 ft. steel and concrete train sheds at Galveston, to cost approximately $30,000.

Longview, Portland & Northern.—This company will receive bids at its headquarters at Kelso, Wash., until January 1, 1923, for the construction of roadbed, bridges and culverts for approximately 8½ miles of railroad in Cowlitz county, Wash. Twenty-three miles of track are expected to be laid in 1923.

Louisiana & Arkansas.—This company, through its agents, Harrington, Howard & Ash, consulting engineers of Kansas City, Mo., has awarded a contract to the Herman & McCain Construction Company, Little Rock, Ark., for the building of a one story, brick and reinforced concrete locomotive shop to cost approximately $150,000, at Minden, La. The shops of the company were previously at Stamps, Ark.

Oregon, California & Eastern.—This company has awarded a contract to the Eschbach-Bruce-Nettleton Company, Seattle, Wash., for the construction of 14 miles of line from Hildebrand, Ore., to the Sprague river to cost approximately $100,000. Further construction plans of this company were reported in the *Railway Age* of September 23, page 589.

Pennsylvania.—This company is revising the plans for the elevation of its tracks at Garfield boulevard near Leavitt street, Chicago, which were made several years ago, and will begin construction in the spring.

St. Louis-San Francisco.—This company has closed bids for the construction of a five-stall, one-story, frame roundhouse, 70 ft. by 92 ft. to be built at Muskogee, Okla., to replace one recently destroyed by fire.

Railway Financial News

ALABAMA & MISSISSIPPI.—*Operation May Be Resumed.*—See Mississippi Export.

ATLANTIC & NORTH CAROLINA.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $325,000 of first mortgage 20-year, 6 per cent gold bonds.

BALTIMORE & OHIO.—*Income for 1922.*—The preliminary income account for the year ended December 31, 1922, shows net railway earnings of $22,703,709 and a surplus after the 4 per cent dividend on the preferred stock of $1,117,110, compared with a surplus for 1921 of $3,885,806.

Commenting on the results for 1922, President Daniel Willard, said:

That the results of the year are not materially better is due, first, to the suspension of a large proportion of the coal operations on the company's lines from April to September, and, second, and more particularly, to the effect upon the earnings of the company for the three months to September 30, during which period the strike of the shopmen was in progress.

For the first six months of the year to June 30 the net railway operating income was $14,580,295, an increase compared with the same period of the previous year of $6,950,000.

For the three months to September 30 there was a deficit of $2,089,075, a decrease compared with the same period of the previous year of $9,729,000.

For the three months to December 31 (December estimated) the income aggregates $10,212,489, an increase compared with the same period of the previous year of $3,630,000.

Total net railway operating income for the year $22,703,709, an increase compared with the previous year of $850,000.

By the provisions of the $35,000,000 loan of July 1, 1919, there is to be set aside out of the income before dividends a sum equal to $3,500,000 per annum, to be devoted to capital expenditures. The total appropriations made under these provisions, to and including the year 1922, aggregate $12,250,000, on account of the total of $17,500,000 to be so appropriated during the five years beginning with July 1, 1919.

BANGOR & AROOSTOOK.—*Authorized to Issue Equipment Trust Certificates.*—The Interstate Commerce Commission has authorized an issue of $250,000 of equipment trust certificates to be sold at not less than 98.

CAROLINA, CLINCHFIELD & OHIO.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $50,000,000 of first and consolidated mortgage bonds.

CHICAGO & ALTON.—*Asks Authority for Receivers' Certificates.*—The receivers have applied to the Interstate Commerce Commission for authority to issue $2,000,000 of 6 per cent receivers' certificates.

CHICAGO, MILWAUKEE & ST. PAUL.—*Loan Extended.*—The Interstate Commerce Commission has approved this company's application for a loan of $10,000,000 from the revolving fund, to mature March 1, 1930, for the purpose of meeting at maturity on January 1, 1923, a previous loan of like amount.

CHICAGO, PEORIA & ST. LOUIS.—*Suggested Plans for Reorganization.*—The patrons of this road are making strenuous opposition to the proposal of the bondholders to dismantle the line. Herbert A. Tuohy of Springfield, Ill., chairman of the recently organized Patrons' Committee has addressed a letter to the Illinois Commerce Commission and the Interstate Commerce Commission, calling attention to the value of the property and its potential earning capacity. The Circuit Court at Springfield, Ill., acting on a petition for authority to discontinue the operation of trains has decided that the receivers must make their application to the Interstate Commerce Commission, "or any other government body deemed by them to have jurisdiction." About 500 citizens representing 70 towns which would be adversely affected by the abandonment, were present at the hearing. The attorney for the patrons declared that many towns in the best farming regions in the state will be left entirely without railroad service if the road ceases operation.

CINCINNATI, INDIANAPOLIS & WESTERN.—*Asks Authority for Equipment Trust.*—This company has applied to the Interstate Commerce Commission for authority to assume obligation and liability for $300,000 of preferred stock of the Cincinnati, Indianapolis & Western Car Equipment Company.

DENVER & RIO GRANDE WESTERN.—*Asks Authority to Issue Receivers' Certificates.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell $5,000,000 of 6 per cent receivers' certificates for the purpose of making improvements to its property.

DENVER & RIO GRANDE.—*Extend Time for Deposit.*—The Sutro protective committee has issued a notice to holders of the first and refunding mortgage 5 per cent gold bonds and 7 per cent cumulative adjustment gold bonds and certificates of deposit therefor, announcing that the time within which deposits of these securities may be made with the committee has been extended to and including January 10 next.

FORT SMITH & WESTERN.—*To Be Sold.*—The sale of this road at public auction will be held on January 16, 1923, at Ft. Smith, Ark. The entire property of the company, which operates a single track line between Ft. Smith, Ark., and Guthrie, Okla., and Oklahoma City, a total mileage of approximately 250 miles, will be disposed of to the highest bidder. C. T. O'Neal, Ft. Smith, Ark., is the receiver for the road.

GRAYSONIA, NASHVILLE & ASHDOWN.—*Asks Authority to Issue Securities.*—This company has applied to the Interstate Commerce Commission for authority to issue $300,000 of stock, $300,000 of first mortgage bonds and $300,000 of second mortgage bonds.

ILLINOIS CENTRAL.—*Asks Authority for Lease.*—This company has applied to the Interstate Commerce Commission for authority to lease the Chicago, Memphis & Gulf.

INTERNATIONAL-GREAT NORTHERN.—This company on December 1 acquired and began the operation of the property formerly owned by the International & Great Northern Railway and operated by that company and its receiver.

As a final step in the reorganization of the International and Great Northern, there have been registered in the secretary of state's office at Austin, Tex., three temporary bonds, one for $17,250,000, one for $750,000 and a third for $17,000,000. They will be exchanged for definitive bonds of $1,000 each later and $7,500,000 in stock issued. Evidence has been introduced showing that the owners of the property had put up $4,350,000 in cash as a working fund, which is to be included in the capital stock. A final order has been entered by the Railroad Commission of Texas fixing the valuation of the property at $44,939,000, and the cash deposit was included in that. Among the cancellations were $159,000 of bonds covering the bridge across the Colorado River at Austin. There were also cancelled $11,135,000 of bonds and $2,400,000 of receiver's certificates, besides certain equipment obligations.

Capital Stock Purchased.—See St. Louis-San Francisco.

INTERSTATE.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $1,200,000 of equipment trust certificates to be issued by the Fidelity Trust Company of Philadelphia.

KENTWOOD & EASTERN.—*Authorized to Abandon Line.*—The Louisiana Public Service Commission has authorized this company to abandon operation and dismantle its line from Kentwood, La., on the Illinois Central, southeasterly to Scanlon, 16 miles. The application states that the line was opened for operation in 1905 and practically its entire tonnage has been forest products. The timber holdings in the vicinity are exhausted and the traffic of the line has disappeared. Hard surface highways now practically parallel the road.

MICHIGAN CENTRAL.—*Dividends.*—This company has declared an additional dividend of 6 per cent and the regular semi-annual dividend of 4 per cent, both payable January 29 to stock of record December 29.

MISSOURI-KANSAS-TEXAS.—*Asks Authority to Acquire Lines and Issue Securities.*—This company has applied to the Interstate Commerce Commission for authority to acquire lines and leaseholds in connection with the reorganization of the M. K. & T. system and for authority to issue $51,260,650 of general mortgage 6 per cent bonds and $1,400,000 of common stock.

MISSOURI, KANSAS & TEXAS.—*Sold.*—This road was sold on December 13 for $28,000,700 to Randolph & Blumenthal, representatives of the reorganization managers, J. & W. Seligman & Co., and Hallgarten & Co., New York.

OSAGE.—*Authorized to Issue Stock.*—The Interstate Commerce Commission has authorized an issue of $197,000 of capital stock to be sold at not less than par and the proceeds used to pay existing indebtedness.

PITTSBURGH & LAKE ERIE.—*New Directors.*—Edward S. Harkness and Robert S. Lovett have been elected directors to succeed William Rockefeller and A. T. Hardin, deceased.

SALT LAKE & UTAH.—*Authorized to Issue Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $600,000 of first mortgage 6 per cent bonds by pledging them with the Secretary of the Treasury as partial security for a government loan.

SOUTH GEORGIA.—*Authorized to Issue Stock.*—The Interstate Commerce Commission has authorized an issue of $199,000 of preferred stock to be exchanged at par for a similar amount of first mortgage 5 per cent bonds which mature on January 1, or to be sold at not less than par, the proceeds devoted to the payment of the bonds.

SOUTHERN.—*Authorized to Procure Authentication and Delivery of Bonds.*—The Interstate Commerce Commission has authorized this company to procure the authentication and delivery of $5,000,000 of development and general mortgage 4 per cent gold bonds to be held in the treasury until the further order of the commission.

ST. LOUIS-SAN FRANCISCO.—*Acquires I.-G. N. Capital Stock.*—E. N. Brown, chairman of the board of the St. Louis-San Francisco, announced on December 13 that his company has purchased the entire capital stock of $7,500,000 of the International-Great Northern and will operate its 1,159 miles of line, if approval is given by the Interstate Commerce Commission. The price of the sale is such as to net the certificate holders of the International-Great Northern $26.75 a share.

Asks Authority to Issue Bonds.—This company has applied to the Interstate Commerce Commission for authority to issue and sell or pledge $5,644,700 of prior lien mortgage 5½ per cent gold bonds and $1,047,900 of adjustment mortgage 6 per cent gold bonds.

Railroad Administration Settlements

The United States Railroad Administration reports the following final settlements, and has paid out and received from the several roads the following amounts:

Georgia, Florida & Alabama Railway Co.	$ 120,000
Akron and Barberton Belt Railroad Co.	$ 70,000
Kansas, Oklahoma & Gulf Railway Company paid Director General	$1,410,000

Dividends Declared

Albany & Susquehanna.—Common, extra, $2.00, payable January 6 to holders of record December 21.

Chicago, Burlington & Quincy—5 per cent, semi-annually, payable December 26 to holders of record December 16.

Chicago, Indianapolis & Louisville.—Common, 1½ per cent; preferred, 2 per cent; both payable January 10 to holders of record December 30.

Chicago, St. Paul, Minneapolis & Omaha.—Common, 2½ per cent, semi-annually; preferred, 3½ per cent, semi-annually; both payable February 20 to holders of record February 1.

Cleveland, Cincinnati, Chicago & St. Louis.—Common, 1 per cent, quarterly; preferred, 1¼ per cent; both payable January 20 to holders of record December 29.

Joliet & Chicago.—1¾ per cent, quarterly, payable January 1 to holders of record December 15.

Mahoning Coal Railroad.—Common, $10.00, semi-annually, payable February 1 to holders of record January 15; common, extra, $15.00, payable December 29 to holders of record December 16.

Michigan Central.—6 per cent, extra, and 4 per cent, semi-annually, payable January 29 to holders of record December 29.

New York Central.—1¼ per cent, quarterly, payable February 1 to holders of record December 29.

Philadelphia, Baltimore & Washington.—3 per cent, semi-annually, payable December 30 to holders of record December 15.

St. Louis, Rocky Mountain & Pacific.—Common, 1 per cent, quarterly; preferred, 1¼ per cent quarterly; both payable December 30 to holders of record December 16.

Troy Union.—6 per cent, annually, payable January 15 to holders of record December 29.

Western Pacific.—Preferred, 1½ per cent, quarterly, payable January 2 to holders of record December 18.

Trend of Railway Stock and Bond Prices

	Dec. 12	Last Week	Last Year
Average price of 20 representative railway stocks	64.84	64.53	57.15
Average price of 20 representative railway bonds	85.31	85.19	80.87

Railway Officers

Financial, Legal and Accounting

J. R. Turney, acting general solicitor of the St. Louis-Southwestern, with headquarters at St. Louis, Mo., has been appointed general solicitor, with the same headquarters. **A. H. Kiskaddon** has been appointed assistant general solicitor, with the same headquarters.

Operating

W. A. Fitton has been promoted to assistant to the general manager of the Southern, with headquarters at Cincinnati, Ohio.

J. E. Smith has been promoted to assistant district superintendent of the Pullman company with headquarters at Cincinnati, Ohio, succeeding C. W. Lewis, deceased.

E. Flynn, whose promotion to general manager of lines west of the Missouri river of the Chicago, Burlington & Quincy, with headquarters at Omaha, Neb., was reported in the *Railway Age* of December 2, was born on May 19, 1873, at Bement, Ill. He entered railway service as a trackman on the Chicago & Eastern Illinois in April, 1900. Until November 15, 1906, he was employed in the track department of the Wabash, as a brakeman on the Southern Pacific and the Wabash, and as a brakeman and conductor on the Chicago, Burlington & Quincy. He was promoted to trainmaster on the latter road, with headquarters at Omaha, Neb., on November 15, 1906, and was again promoted to assistant superintendent, with headquarters at Lincoln, Neb., in 1908. In April, 1909, he was promoted to superintendent, with headquarters at Omaha, Neb., and was transferred to McCook, Neb., in May, 1911. He was transferred to LaCrosse, Wis., in 1913, and to Chicago in June, 1917. He was promoted to general superintendent of the Nebraska district, with headquarters at Lincoln, Neb., in April, 1918, and held this position until his recent promotion to general manager.

E. Flynn

T. Rodger, superintendent of telegraph, the Eastern Lines of the Grand Trunk, with headquarters at Montreal, Que., has been promoted to superintendent of telegraphs and telephones with jurisdiction over the entire system, with the same headquarters succeeding H. Hulatt, manager of telegraphs, whose resignation was reported in the *Railway Age* of December 9.

W. A. Card, whose promotion to general superintendent of the Iowa district of the Chicago, Burlington & Quincy, with headquarters at Burlington, Iowa, was reported in the *Railway Age* of December 2, was born on June 22, 1870, in Rochester, N. Y. He entered railway service with the Chicago, Burlington & Quincy on September 10, 1887, as a telegraph operator. He was promoted to chief clerk to the trainmaster at Aurora, Ill., in August, 1894, and held this position until August, 1903, when he was promoted to trainmaster, with headquarters at Beardstown, Ill. He was transferred to Chicago in September, 1905, and was promoted to assistant superintendent, with headquarters at Galesburg, Ill., in July, 1908.

In February, 1909, he was promoted to superintendent, with headquarters at Creston, Iowa, and in July, 1913, was transferred to the St. Joseph division, with headquarters at St. Joseph, Mo., which position he held at the time of his recent promotion to general superintendent.

Walter H. Towne, whose appointment as superintendent of transportation of the Boston & Maine was reported in the *Railway Age* of December 9, was born on July 6, 1884, in Portland, Me., and was educated in the public schools. He entered railway service in 1903 and served as receiving clerk for the Boston & Maine at Salem, Mass. Shortly thereafter he was promoted to assistant cashier and in 1906 was transferred to Peabody, Mass., as cashier. In 1907 he entered the office of the general manager at Boston as a stenographer and shortly thereafter was transferred to the office of the general superintendent in the same capacity. In 1910 he became a clerk in the office of the chief engineer and served in the same capacity in the office of the engineer, maintenance of way, and in the purchasing department. In 1913 he was promoted to inspector of transportation and in 1914 again became cashier at Peabody, Mass. In 1916 he entered the president's office as clerk and stenographer and in 1917 became a transportation clerk in the office of the superintendent of transportation. In 1918 he was appointed assistant to the superintendent of transportation which position he held at the time of his recent promotion.

Traffic

W. J. Farrell has been appointed general agent of the freight department of the Great Northern, with headquarters at Kansas City, Mo., succeeding B. R. Persels.

J. H. Garrity has been appointed western freight agent of the Buffalo, Rochester & Pittsburgh with headquarters at Cincinnati, O. **J. C. Gross** has been appointed division freight agent at Pittsburgh, Pa.

Everett D. Davis has been promoted to general freight agent of the Buffalo, Rochester & Pittsburgh with headquarters at Rochester, N. Y. **W. H. Francis** has been promoted to assistant general freight agent.

Edward A. Niel has been appointed freight traffic manager of the Buffalo, Rochester & Pittsburgh. Mr. Niel was born at Selma, Ala., and was educated at Dallas Academy of that city. He entered railway service as an office boy for the Selma, Rome & Dalton (Southern Railway). A short time thereafter he became a telegraph operator for the same road, which position he left to enter the service of the Western Union Telegraph Company. From 1883 to 1888 he was a stenographer in the office of the superintendent of the East Tennessee, Virginia & Georgia (Southern Railway) at Selma. From 1888 to 1895 he was chief clerk to the assistant general freight agent of the Southern in the same city. He then became general freight and passenger agent of the Mobile & Birmingham (Southern) and served in that capacity until 1899 when he was appointed eastern general freight agent of the Southern. Shortly thereafter he was promoted to general freight agent and in 1904 to traffic manager of the Atlantic & North Carolina (now Norfolk Southern). From 1905 to 1911 he was traffic manager of the Buffalo & Susquehanna and from 1912 to 1920 he was coal freight agent for the Buffalo, Rochester & Pittsburgh. In 1920 he was promoted to general freight agent and held that position until the time of his recent promotion.

E. A. Niel

Mechanical

E. M. Brockmayer has been promoted to road foreman of engines on the Detroit-Canadian division of the Pere Marquette with headquarters at Detroit, Mich.

J. F. Sheahan has been appointed mechanical engineer of the Atlanta, Birmingham & Atlantic with headquarters at Atlanta, Ga. **A. W. Kirkland** has been appointed superintendent of motive power with headquarters at Fitzgerald, Ga.

Engineering, Maintenance of Way and Signaling

R. C. Bardwell, engineer of water service of the Missouri Pacific, with headquarters at St. Louis, Mo., has been appointed superintendent of water supply of the Chesapeake & Ohio, with headquarters at Huntington, W. Va.

G. W. Koontz, roadmaster on the Delaware & Hudson, with headquarters at Carbondale, Pa., has been appointed division engineer of the St. Louis-San Francisco, with headquarters at Ft. Worth, Tex., succeeding P. J. Neff, whose resignation to become assistant to the president of the International-Great Northern was reported in the *Railway Age* of December 9.

Obituary

John T. Chamberlain, for a number of years master car builder of the Boston & Maine, died on December 12 at Medford, Massachusetts. Mr. Chamberlain was born at Eckington, England, on May 21, 1849, and came to this country with his parents shortly thereafter, locating at New York City. At the age of 18 he went to Kent, Ohio, to learn car building. In 1870 he entered the service of the Boston & Albany in its Allston (Boston) shops. In 1888 he left the Boston & Albany to go to Wichita, Kan., as superintendent of the Burton Stock Car Company. Two years later he returned to New England as master car builder of the Boston & Maine. He served in this position until the time of his retirement in 1907. Mr. Chamberlain was president of the Master Car Builders' Association in 1901.

J. T. Chamberlain

F. E. Batturs, assistant passenger traffic manager of the Southern Pacific, with headquarters at San Francisco, died suddenly on December 7 at a hotel in Washington, where he had been attending the hearing before the Interstate Commerce Commission on the Central Pacific case.

J. L. Barnes, general agent for the Atchison, Topeka & Santa Fe, with headquarters at Chanute, Kan., died in that city on November 30. Mr. Barnes was born in Duchess county, New York, in 1835. He entered railway service September 1, 1859, as a conductor on the first Pullman car ever built, taking the car from Bloomington, Ill., to Chicago. He later became superintendent of the Kansas City, Ft. Scott & Gulf, and when that road was taken over by the Atchison, Topeka & Santa Fe in 1888, he became superintendent of the Southern Kansas division. He held this position until his retirement from active service in 1910. A few years later he was appointed general agent for the Atchison, Topeka & Santa Fe, with headquarters at Chanute, Kan., and he held this position until his death.

EDITORIAL
Railway Age

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Are You Making Friends for the Railroads?

PERHAPS THE MOST important fact that needs to be brought home to every railway officer is that the future of the railways is in the hands of their own officers. We do not mean merely in the hands of their chairmen and presidents, but in the hands of their officers from the chairmen and presidents down to the trainmasters, the road foremen of engines, the traffic solicitors and other subordinate officers.

Too long have railway officers complained that the railways are being ruined by public sentiment and public regulation without themselves putting forth the efforts that they could make and must make to change public sentiment and improve government regulation. A man may lose a fight even though he fights the best he can. But he always stands some chance of winning it if he fights, while he is sure to lose it if he defaults. The railways have lost struggles repeatedly within recent years because they have defaulted when, if their officers generally had stood up and defended them, they could have won.

The railways cannot, however, win important fights unless they have many friends to help them. They never will have enough friends unless their officers of all ranks take trouble and make efforts to make friends for them. The *Railway Age* published in its issue for December 9 an editorial entitled "Making Friends for the Railroads." In that editorial we tried to point out a few of the things that the officers ought to do to make friends for their railroads. We have received a letter regarding this editorial from one of the leading railway officials of the United States—a man who came up through the operating department and whose opinions upon all important railway matters are universally respected. He says:

"I have just taken a good deal of pleasure in reading your editorial in the *Railway Age* of December 9, 'Making Friends for the Railroads.' This is, in my opinion, one of the main things towards which the energies of the railroad organization should be devoted. There is a great lack of the realization of the importance of it. I hope your editorial stirs up some interest in the matter."

One question which every railway officer and every railway employee who desires to see private operation and private ownership maintained, who desires to see the railways prosper, and who desires to see the railroad business continue to afford opportunity for a successful career is: "Am I really trying every day to make friends for my railroad and for the railroads as a whole?" Any railway officer, or for that matter any employee, who cannot answer that question in the affirmative, is not doing his duty to his railroad or himself. The plain truth is that there are many men connected with the railways who are constantly engaged, not in making friends, but in making enemies for them. This is true of every official and every employee who fails to give the public the best service practicable, or who fails patiently, courteously and intelligently, when opportunity offers, to explain the reasons why it is not always possible to give the public the service which it wants or the rates for which it asks.

The successful running of a railroad involves much more than maintaining tracks, making up and running trains and collecting freight and passenger charges. The failure of many people on the pay roll of the railroads to recognize this fact and act accordingly is responsible for a large part of the troubles of the railroads. There are many railway men, and even many railway officers, who steadily perform their regularly assigned duties, but who make no effort to do anything more. They do not try to so participate in the business and other activities of their communities as to make the people of the communities feel that the railway is just as much interested in their welfare as any other business concern. They do not try to acquire broad information respecting the work of their own departments so that they can answer the reasonable and natural inquiries of shippers and travelers. They do not inform themselves as to the facts regarding such matters as alleged "over-capitalization" and excessive valuation of railroads, so-called "guarantees" of net return, the reasons why freight and passenger rates are higher than they used to be, the reasons why the railways cannot furnish all the freight cars wanted promptly, etc., in order that they may impart this information to others. How can railway men expect the public to get correct information regarding these matters unless railway men will inform themselves concerning them and give the information to the public?

We do not mean to suggest that railway officers and employees should engage in acrimonious controversies with patrons who may complain about service or rates, or that they should cram facts about valuation, the decline of railroad development, etc., down unwilling throats. Far from it. What we do mean is that there are millions of people who earnestly desire information regarding these and other railway matters, and that railway officers, and employees who are interested in the welfare of the railways, should make a real effort to inform themselves concerning them, and should, when good opportunities offer themselves, give people the information they desire and will welcome.

Where can railway officers and employees get the information they must have in order intelligently to discuss those problems of their industry in which the public is so much

interested? The public is interested in the facts about each individual railroad, but even more in the facts about the railroads as a whole. Railway men can get or should be able to get from their own higher officers all the information they need about their own railroad. There are many sources from which they can get information regarding the railroads as a whole. They can write to the Bureau of Railway Economics in Washington and get any information for which they may ask regarding the railways as a whole. We believe that without unseemly immodesty the *Railway Age* can truly say that if railway officers and men would carefully read the articles and editorials dealing with railway public problems that are published in every issue of this paper, they could soon equip themselves to discuss intelligently all the questions regarding the railways in which the general public is interested.

It is a fact that is only too well known that hundreds of thousands of railway employees have, under the leadership of the heads of their unions, become enemies of private ownership and are actively disseminating propaganda against private management in every community in the country. These employees get the information or misinformation they disseminate by reading the weekly and monthly publications issued by their labor unions. Can any railway officer or any loyal employee believe he is doing his whole duty to his railway as long as he lets literally hundreds of thousands of employees do more to destroy public confidence in the management of his railway and in the entire policy of private management than he does to defend the management of his railway and private management as a policy?

There is crying need for a great awakening of all railway officers and all loyal employees with respect to this matter. Every management ought to adopt a policy of encouraging and stimulating its officers and loyal employees to do all they can to make friends for the railways by treating the public well, and by speaking out in answer to the misrepresentations and defamations of railway management which are constantly being spread abroad. The managements of some railways have adopted the practice of sending at intervals to many of their officers literature called "talking points," which gives facts and arguments that may be used to refute misrepresentations. Why should this not be done by the management of every railway? Undoubtedly many officers have not spoken out in defense of the railways when they have been attacked because they have feared that they would be criticised by their superiors or because they have not been furnished information which they could use in answering misrepresentations.

The practice of a great majority of railway officers of remaining silent when the railways have been under attack from innumerable unfriendly sources has been followed too long. No industry can year after year allow such false, malicious and extensive propaganda against it to go on virtually unanswered in innumerable communities without finally paying a terrible price for the timidity and silence of those who ought to defend it.

Six New Records Made by the Railways

Severe winter weather has come in the larger part of the country and is interfering in a normal way with railroad operations. Before it came, however, the railroads succeeded in breaking almost every record ever made in the movement of freight. Since there are likely to be unusual complaints regarding deficiencies of transportation during the winter, it is well now to record certain facts. In spite of the shop employees' strike and other difficulties, the railways within recent months have made the following new records:

1. They moved more freight in November than in any previous November in history and thus far have broken all records for December. The four weeks ended on December 2 correspond roughly with the month of November. In these four weeks the number of carloads of freight moved was 483,000 more than in 1918, 530,000 more than in 1919, 221,000 more than in 1920 and 763,000 more than in 1921. In the week ended December 9 they moved 81,875 more carloads than in the same week of any previous year.

2. The week ended November 25 terminated a period of ten consecutive weeks in every one of which the railways moved more than 950,000 carloads of freight. This is the first time in history that they ever moved so many carloads for more than seven consecutive weeks.

3. The amount of freight moved in November and December has so greatly exceeded all previous records that it has made the total carloads handled in the 16 weeks ended December 9 larger than the amount ever moved in the corresponding 16 weeks of any other year. To state the matter in another way, the total number of carloads of freight moved since the coal mines began to open late in August is 156,245 greater than in 1920, the previous record year.

4. In 34 out of 35 weeks ended on December 2 the railways moved more carloads of "miscellaneous freight" than they ever did in the same weeks of any previous year. Transportation experts regard the amount of miscellaneous freight shipped in any given period as the best indication of what general business activity and the total amount of freight business offered to the railways in the months immediately ahead will be. If the loadings of miscellaneous freight during the last nine months are any criterion, the railroads will be called upon to handle a record-breaking business for months to come.

5. The railways on Monday, December 11, loaded 45,886 cars with bituminous coal. This is the largest number of cars ever loaded with bituminous coal on any one day.

6. During six consecutive weeks the total "car shortage" reported exceeded the largest car shortage ever reported in any single week of any previous year. The largest net shortage ever reported before was on September 1, 1920, when it was 146,070 cars. In the six weeks ended on November 23 the net car shortage was never less than 147,259 cars, and went as high as 175,523 cars. On November 30 the net shortage was 128,191. This figure represents a substantial reduction, but it shows that in spite of the fact that the railways within recent weeks have broken all records

with respect to the number of cars loaded and moved at this time of year, the inadequacy of transportation is still almost unprecedented.

If ever any forecast could safely be based upon railway statistics the following two predictions may safely be based upon the foregoing facts:

First, the railways will be offered and will handle more freight in 1923 than in any previous year in history, unless prevented by another coal strike or railway strike.

Secondly, the demand for railroad transportation will in 1923 exceed the amount of it that can be furnished by a larger margin than in any previous year.

The lesson the foregoing facts suggest to the railways is that they should put forth every effort to secure greater utilization of the existing facilities and to improve and enlarge their facilities as rapidly as possible.

The moral for the shippers is, first, that they should ship all the freight they can as soon as practicable, and that, secondly, they should co-operate with the railways in increasing the efficiency with which existing transportation facilities are used by loading cars to their maximum capacity, by loading them and unloading them as promptly as possible, and by delaying them in case of reconsignment as little as possible.

The moral for law makers and regulating commissions is that they should help the railways in every reasonable way to increase the net return earned by them in order that they may be able to raise the large amounts of new capital which must be invested if the capacity of the railways is to be increased anywhere near in proportion to the demands that will be made upon them by industry and commerce.

Much Consolidation Activity

There is complaint in some quarters that the American railroads are not making as much progress with consolidations as they ought to be making or as much as the railways in some other countries have been making. There may be some ground for complaint on this score, although it can be suggested that there might be drawbacks in a consolidation program carried out too suddenly or that there might be reasons for delay incident to the method whereby the Interstate Commerce Commission has to draw up and hold discussions on a plan upon which the consolidations program is to proceed. However, we trust that those who are suggesting the desirability of more rapid process will be satisfied with the amount of work accomplished in the second week of December. In that week there continued the consideration which is being given in New England official circles to the treatment which should be accorded the roads of that district in the consolidation plan. There was also a great deal additional said before the commission in Washington by representatives of the Southern Pacific and Union Pacific concerning the disposition of the Central Pacific. The third development was the announcement that the International-Great Northern had, subject to the approval of the Interstate Commerce Commission, become a part of the St. Louis-San Francisco which, whatever else it may be, is one of the most important steps in the way of consolidations that has thus far taken place. Of course, no one talks much about consolidations without mentioning the Van Sweringens of Cleveland. They came through with the fourth development of the week and likewise a most important one, namely with the news that the Van Sweringen interests had secured an option on H. E. Huntington's Chesapeake & Ohio stock which indicates that the Nickel Plate-Lake Erie & Western-Clover Leaf system possibly has its mind on including also the C. & O.-Hocking Valley lines with the latter's valuable coal traffic and outlet to the Atlantic seaboard. All of this means that progress in consolidations is now finally becoming a much more practical matter than it hitherto has been. Probably it is not by chance that we are hearing fewer extravagant rumors about this than was the rule a few months ago; the real developments supply news enough in themselves.

Shop Operation and Management

During the last few years the Mechanical Division of the American Railway Association has made a commendable start on the consideration of problems of shop operation and management. The Committee on Scheduling and Routing has presented valuable reports which have become even more important since the strike. Many railroad shops have functioned fairly well in the past with little direction of individual workmen because a large proportion of the men were old employees familiar with local conditions. Detailed supervision is more necessary now because many of the new men taken into the organizations have little knowledge of railroad practice. Probably scheduling systems could profitably be extended to include practically every important railroad repair plant. Labor turnover is now considerably greater than in former years and it may continue to be high for some time to come. Under such a condition the systematic planning and assignment of work, which scheduling systems provide, would unquestionably increase shop output to a very marked degree. It is probable too that further developments along the same general line would be advantageous. The instruction of machine operators in the details of their work, providing charts showing methods of setting up machines and the proper speeds and feeds to use for maximum production, would relieve the foremen of a large amount of work and would enable them to get far better results from inexperienced mechanics. Such methods are widely used in industrial plants because they have demonstrated their value in reducing costs. Some railroads have applied similar systems with satisfactory results. Even if there is not time for the preparation of an exhaustive report on this subject for the meeting next June, it would certainly be worth while for the Mechanical Division to arrange for individual papers telling what results have been obtained by roads that have introduced special methods of instruction and supervision in shops.

Like Figures Should Agree

In last week's issue of the *Railway Age* it was suggested that the monthly reports of railway revenues and expenses would prove more valuable if the figures given in them were comparable in better fashion than they now are with the figures which finally appear in the annual reports issued after the close of the year's business. Three reasons were given which in part explain much of the present lack of complete comparability: (1) correction of the figures, (2) the showing of different mileage in the monthly report from that in the annual report, due usually to the inclusion of subsidiary lines in the latter and not in the former, and (3) the failure in the annual report to show the figure of net railway operating income. There are many railroads which are giving proper regard to these considerations, so it must be understood that we are making no attempt to present any particularly new and novel idea. The purpose of the monthly or the annual report, as we see it, is to furnish necessary

information to the management, to managements of neighbor roads, to the Interstate Commerce Commission, to the stock and bond holders, and to the public generally. Each of these has a different use for the statistics and to each they are important although, of course, to varying degree. It is one of the features of railway operations that those interested in railways are given more information concerning the properties in which their interest lies than is the case of any other group of properties—public utility, industrial or whatever they may be. This is a point which must always be borne in mind by the railway accounting officer. It seems to follow that the earnings figures issued should, therefore, be as informative as they can consistently be made. It is very much of a question, however, whether figures can be termed adequately informative which, as is frequently the case, differ for one reason or another although the respective figures purport to cover the same line for the same period. It is sometimes extremely difficult to ascertain the proper figure of a railway's operating net for a particular period because of the manner in which one has to try to select the proper one of several figures, all of which purport to represent the same thing. The present too common manner of supplying different figures purporting to cover the same thing adds a degree of inconvenience that seems hardly necessary in view of the state of the art of railway accounting.

The Frisco I.-G. N. Consolidation

The St. Louis-San Francisco's purchase of the entire capital stock of the newly reorganized International-Great Northern from the latter's voting trustees is, of course, subject to the approval of the Interstate Commerce Commission. The purchase, as it happens, is not in line with the commission's tentative plan of consolidations. The commission's plan puts the I.-G. N. in a Chicago-Missouri Pacific system with the Texas & Pacific, the Missouri Pacific, etc., thereby, among other things, maintaining in one system the so-called Sunshine Route from Houston and from Laredo and San Antonio through Longview Junction and Texarkana to St. Louis. The Frisco in the tentative plan is put with the Katy and Cotton Belt and various smaller lines to form a so-called Frisco-Katy-Cotton Belt system. It is, of course, a question how much importance the commission may place upon its own tentative plan. It is presumed that the plan was offered only as a starting point for discussion and was meant to offer some practical suggestions around which the discussion could take place to greatest advantage. The International-Great Northern should prove of great value in the Frisco system. The road has not a high grade physical plant and its net earnings have not been extremely good. On the other hand, it serves an expanding territory and an analysis of the growth of its gross earnings over a period of years will show that it is a property of possibilities. As a part of the Frisco system, if that result comes to fruition, the I.-G. N. should be better able to realize on these possibilities. It will offer to the Frisco an advantageous outlet to the Gulf of Mexico at both Houston and Galveston, a factor which should prove of leading importance because of the former's position in the petroleum industry and to a lesser extent in the lumber business and because of the latter's standing as a grain port. Laredo, Tex., reached by the San Antonio division, exceeds in importance as a point of interchange for business with Mexico, all the other cities on the Rio Grande combined. There used to be a great amount of business between the United States and Mexico and presumably the time will eventually come when there will be again. The I.-G. N. should be able to realize on this business to a greater extent than any other road this side of the border. The I.-G. N. needs, it is true, a great amount of physical rehabilitation but considering the low price the Frisco has paid for it and the possibilities of the property, it looks, on the whole, as if the Frisco had taken a wise step in effecting the proposed purchase.

Foreign Railways in 1922

The year 1922 has been an eventful one for railways the world over and the *Railway Age*, in its Annual Statistical Number, to be issued on January 6 of the new year, will publish a number of articles covering developments of the year in leading countries of the world. In most countries the railways have in 1922 been somewhat more successful financially than in 1921 and some steps have been taken to renew programs for extensions and betterments which were curtailed during the war. Many changes in management and organization have either been made or seriously projected. The railways of Great Britain have been consolidated into four regional systems. The French railways have been closely co-ordinated. China has had to face a railroad labor problem for the first time in history. In Canada all the government-owned lines have been united under the management of Sir Henry Thornton, who has served in important executive positions both in this country and in England. The war-worn railways of Central Europe have made rapid progress in restoring at least some measure of their former efficiency. Even in unhappy Russia the railways, with the co-operation of Americans, were made to function with the efficiency necessary to distribute thousands of carloads of foodstuffs to the starving people. Many important construction projects have been begun during the year. The railways of most countries find themselves beset with many perplexing problems—in Australia it is the unification of gage, in India the adoption of a more satisfactory method of management and so on. The labor problem has been dealt with in some countries and, in at least one important instance, it must be admitted, in a manner much more satisfactory to all concerned than has been the case in America. These developments, we feel, are of interest to American railroad men who wish to keep well informed about railroading the world over and who may find in the achievements of their foreign confreres suggestions for the solution of some of their own problems. The manufacturer of railway equipment and supplies who is interested in foreign markets for his products should likewise find this information of value. The foreign section of our Annual Statistical Number for last year was, we have reason to feel, a welcome addition to the other material presented in that issue, and in our opinion this section of our forthcoming statistical number will be none the less so.

On a Five Per Cent Basis

In 1922 Great Northern stockholders have received one quarterly dividend of 1¾ per cent and one semi-annual dividend of 3½ per cent. Ostensibly the stock has been kept on a 7 per cent basis but the change from a quarterly to a semi-annual basis, resulting as it did in the omission of one of the quarterly payments, made the total dividend payments for the year only 5¼ per cent. On Monday of this week, the directors declared a semi-annual dividend of 2½ per cent. This dividend is payable February 1 and it results in putting the stock on a 5 instead of on the 7 per cent basis which had been maintained unbroken since 1899.

The reduction in the dividend had in great measure been expected, and apprehension that it would take place has existed at least as far back as the spring of 1922 when the quarterly dividend was omitted and the change made to a semi-annual basis. Great Northern earnings have been rather poor since the beginning of federal control. In the

three years 1918, 1919 and 1920 combined, net railway operating income was only slightly in excess of the standard return for one year and 1921 was not a great deal better, although in these years standard return, guaranty and extra Burlington dividends assisted in maintaining the corporate net. In 1922, prior to the railway shopmen's strike, conditions were beginnng to look much brighter. In July the road operated with a ratio of only 64. At the end of August net railway operating income for the eight months was $8,248,122, or about $7,250,000 better than for the same period of 1921, and the Great Northern's best months were still ahead of it. It appeared then that the company would in all likelihood be able to maintain its 7 per cent rate.

This promising progress was not continued. Increased maintenance of equipment charges due to the railway shopmen's strike and higher fuel costs helped to increase operating expenses. At the same time, difficulties were experienced in getting a proper car supply, and ore traffic which had been running very heavy slumped off rather badly and somewhat earlier in the season than usual. The result was that the September and October earnings were not as good as had been hoped. For the first ten months the net railway operating income of $12,805,569 compared with $8,200,409 for the same period last year and the operating ratio was 77.8. The 1922 earnings have been better than those for 1921 but not sufficiently better to be what one could term at all satisfactory. The Great Northern, in company with several of the other roads in the northwest, has been making a very slow recovery from war conditions; it is now completing its fifth lean year in succession. Under the conditions, it was quite in order that the directors should have decided to take the conservative course in reducing the dividend rate.

New Books

Freight Traffic Red Book for 1923. *By H. G. Williams and C. J. Fagg.* 582 *pages.* 8 *in. by* 11 *in. Cloth. Published by The Traffic Publishing Company,* 150 *Lafayette Street, New York City.*

This well-known book contains about 100 more pages than that issued one year ago, and includes new sections on storage, transit privileges, payment of freight charges, rules of practice before the United States Shipping Board, and parcel post. There is also much other new matter. The great mass of freight traffic information contained in this book comprises nearly everything that could be put into a book of its size and which is wanted for reference on the desk of the local freight agent or the shipper. For shippers it is called an "everyday guide," and it justifies the name. Each detail is treated with great care and evidently with scrupulous attention to accuracy. The Interstate Commerce Act, with rules of practice before the commission and other cognate matter, fills 73 pages; and the forms and tables at the end of the book fill 83 pages. This gives an idea of the completeness of detail which characterizes the book. The publishers promise to issue supplements free, as may be needed, to keep subscribers informed concerning important changes in railroad freight laws or practices. In the 12 months now past five supplements were issued.

Proceedings of the American Railway Engineering Association. 1,370 *pages, illustratcd. 6½ in. x 9½ in. Published by the Association,* 431 *South Dearborn street, Chicago.*

In this volume are included the reports of the 23 standing and special committees presented at the twenty-third annual convention of this association in Chicago on March 14-16, 1922, inclusive, together with the discussions thereon. This convention maintained the high standard for constructive work which has long characterized this association. Among those reports which are of special interest and value are those on "Warehouses in Connection with L.C.L. Freight Houses," "Specifications for Movable Railway Bridges," "Ash Pits," "Engine Terminal Layouts," "Methods for Training and Educating Employees in Engineering and Maintenance Work," "The Economical Operation of Trains Against the Current of Traffic on Multiple Track Railways," "Specifications for Buildings for Railway Purposes," "Freight House Design" and "Pacific Coast Marine Piling." This volume also contains a monograph on "The Flat Disk Center for Turntables" by B. R. Leffler, bridge engineer, New York Central Lines West of Buffalo, Cleveland, Ohio, and a complete report of a special committee on Electrolysis.

American Malleable Cast Iron. By H. A. Schwartz, 416 *pages. 6 in. by 9 in., illustratcd, bound in cloth. Published by the Penton Publishing Company, Cleveland, Ohio.*

The American "black heart" malleable iron industry, which now has an annual capacity for one and a quarter million tons of castings, dates back to the discovery of this process in 1826 by Seth Boyden in a small foundry in Newark, N. J. The process is quite different from that employed in Europe for making "white heart" iron, which was first described by Reaumur in 1722. This book, which is the first complete treatise on "black heart" malleable, has been written by a recognized authority on the subject. There are chapters on the history of the industry, methods of manufacture, principles of metallurgy, procedure for tests and an outline of properties. It is made more comprehensive by the addition of a bibliography of nearly 200 references to chapters and articles in English and foreign books and periodicals, and by a well-prepared index.

From its scope, the book has evidently been written to meet the needs of the user, as well as those of the practical foundryman and the metallurgist. For the producer there are chapters on melting stock, fuel, refractories, furnaces and their operation, annealing practices, molding, pattern-making, cleaning and finishing. Inspection, tests and metallurgy are well covered, together with information relative to physical, thermal and electrical properties.

As a handbook of modern malleable practice, a record of past and present metallurgical investigation, and a compendium of information on the permissible uses of the product, it should be of value to the many railroad men responsible for the design, purchase or use of malleable castings.

The Hot Springs of Japan. 504 *pages;* 196 *illustrations and* 15 *maps.* 4½ *in. x* 6¼ *in. Bound in cloth. Issued by The Japanese Government Railways, Tokio, Japan.*

This is a very complete guide book, printed in English. It has been compiled by F. de Garis, evidently an experienced and accomplished editor in this field. The book covers Korea (Chosen), Formosa and South Manchuria, as well as Japan; and includes also the principal cold springs; though, from a statement in the text, it would appear that the Japanese people, of all classes, including farmers, make a practice of bathing in the hottest water they can find, and usually several times a day. This book, however, is made for foreigners, for whom it explains everything in great detail.

The mineral springs of Japan number more than 1,100, and they are to be found in the mountains, in the valleys, at the sea coast and everywhere. Some railroad lines reach a large variety of springs (classified by their chemical or medicinal qualities), while some of the important springs are reached only by using a motorbus or a jinrikisha, or both. In these pages travelers are instructed as to all these conveyances, in connection with each spring, with the same care and detail as in the case of railroad trains and hotels.

A notice in the front of this book says that the official guide books of the Japanese Railways are for sale at the best book stores in the United States, Canada and Great Britain.

Letters to the Editor

[The Railway Age welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about 250 words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.]

Signaling Busy Terminals

Cleveland, Ohio.

To the Editor:

The articles on "Signaling Busy Terminals" by T. Holt, signal engineer, Chicago Union Station Company, which appeared in your issue of November 11, 1922, is of value to railroad managements having to pass on this question. In this connection it is interesting to note the similarity existing between the indications which have been decided on for use on the Cleveland Union Terminal and those which Mr. Holt proposes to use on the Chicago Terminal.

The indications I have proposed conform very closely with those suggested by Mr. Holt; the name, however, is different and necessarily the control of train movements must be different. In each case the proposed indications conform with existing rules in the book of rules for the government of the operating department. They are:

Color Light	Name	Indication
 Red	Stop Signal	Stop
Yellow 	Slow-Speed Signal	Proceed at slow speed prepared to stop.
Green 	Clear-Slow-Speed Signal	Proceed at slow Speed.
Yellow  Red	Approach Signal	Approach next signal prepared to stop.

A comparison of the two schemes follows:

1. Red light displayed: The name "Stop signal" and indication "Stop" are the same.

2. Yellow light displayed: The name "Slow-speed signal" and "Caution signal" have similar meaning; however, the indications proposed "Proceed at slow speed prepared to stop" checks more closely with indication No. 4 proposed by Mr. Holt, *i. e.*, "Proceed with caution prepared to stop short of train or obstruction."

3. Green light displayed: The name "Clear-slow-speed signal" checks closely with "Clear signal" proposed by Mr. Holt, especially when considered with the indications proposed, *i. e.*, "Proceed at slow speed" and "Proceed at authorized terminal speed."

4. Yellow light displayed above red light vs. yellow light displayed below red light. The indication "Approach next signal prepared to stop" checks with Mr. Holt's No. 2 indication.

In my opinion Mr. Holt's No. 2 and No. 4 indications should be transposed, for, although, in the scheme suggested above, the display of a red light in connection with the display of a yellow light gives a more favorable indication, the indication given is along the line of safety, because if the red light for some reason should not be displayed, the lone yellow light will give the more restricted speed indication, whereas, with Mr. Holt's scheme, it will give a less restricted speed indication so that instead of receiving the indication "Proceed with caution prepared to stop short of train or obstruction," the indication displayed will be "Approach next signal prepared to stop." Furthermore, the scheme I propose conforms with what is in use on other portions of the line, *i. e.*, a lone yellow light displayed by a dwarf signal indicates "Proceed at slow speed prepared to stop" and is also in accord with the Standard Code; see Rule 601 G.

F. F. Wiegand,
Consulting Signal Engineer, Cleveland Union Terminals Company.

Railway Performance and Business Conditions

New Haven, Conn.

To the Editor:

I have no wish to burden your columns with an argument which obviously cannot lead to definite conclusions. However, the following comments may be pertinent as an answer to Mr. Snow's comments on page 972 of the *Railway Age* of November 25. Naturally Mr. Snow has several objections to my statements, but I regret especially that apparently I did not make sufficiently clear the one important point which I believe he overlooked in his freight comparison, *i. e.*, that selected units of performance are not in themselves indicative of either better or worse performance, when made as these have been, under differing business conditions.

The fact that Mr. Snow's basic figures were not all based on the month of July, 1919, 1920 and 1921, doubtless explains the inability to check his figures. However, the fact makes no difference in my conclusions because there were no summer months in 1919, 1920 and 1921 which are comparable one year with another, so far as volume of business offering is concerned, the basis of my argument. It is believed that Mr. Snow feels that comparable months depend only upon weather conditions.

While there was no intention to cast aspersion on Mr. Snow's average cost of 30 cents per passenger car mile, I do, however, challenge his use of that cost figure as applied to the usual business car movement. Of course in such a case as he so humorously describes in his original article where an additional engine was required to handle a train because of two business cars of officers on their way to a fuel conservation meeting, the cost of the movement was far more than 30 cents per car mile. But surely Mr. Snow is familiar with the customary handling of such cars. On all railroads certain trains do not handle their full capacity. There are none more keen than railroad officers not to overload trains with the business cars necessary for their use under the high pressure and heavy load of present day railroad operation.

As there is no additional engine or train crew expense on such trains, these being important element. of expense, there is no possible method of arriving at so high a figure as 30 cents per car mile for the cost of the additional car movement. In fact, in nine out of ten business car movements the additional expense is negligible.

I am unable to follow the reasoning in Mr. Snow's final paragraph where he refers to the futility of ranking football teams by comparative scores, to which I sadly agree. However, my figures on miles per car day did not show what might have been, but indicated the actual performance of freight cars which were in use. On that basis, 1921 car performance was considerably better than that of 1919, although Mr. Snow, because of failure to take into account important affecting conditions, has the contrary view.

Don M. Neiswanger.

Once did the skies before Thee bow:
A virgin's arms contain Thee now;
While angels who in Thee rejoice
Now listen to Thine angel voice.

A little child, Thou art our guest,
That weary ones in Thee may rest;
Forlorn and lowly is Thy birth
That we may rise to heaven from earth.

Thou comest in the darksome night,
To make us children of the light,
To make us, in the realms divine,
Like Thine own angels, round Thee shine."

Yard Tracks at Left. The Loading and Crane Tracks in the Background

Treating Plant Solves New Haven's Tie Problem

New Installation at Cedar Hill Renders Possible the Use of Hitherto Unused New England Timbers

THE NEW YORK, NEW HAVEN & HARTFORD has recently started the system use of creosoted ties in order to reduce its present annual requirements and to insure a greater local supply. The treatment is being performed at Cedar Hill, near New Haven, Conn., at a modern plant

A Well-Lighted, Well-Ventilated Interior

built by the American Creosoting Company, Louisville, Ky., with a capacity of 1,500,000 ties annually. Through the adoption of timber preservation, the New Haven has made it possible to utilize many more species of local woods, thus stimulating the timber business in New England, while at the same time securing economy in the maintenance of its tracks.

New Haven's Tie Renewals Steadily Growing

The new plant, which is the first in New England territory, is located in the north end of the large freight terminal at Cedar Hill and connects with the receiving, classification and departure yard tracks at that end. It is of the most recent design, being of concrete and brick construction with steel sash and superstructure and embodies many interesting features of equipment and operation.

At the present time there are approximately 15,500,000 cross ties in the tracks of the New Haven, the renewal requirements of which have averaged about 2,000,000 annually. With the gradual depletion of New England's more durable grades of timber such as oak and chestnut, the annual needs threatened to increase to 3,000,000 ties. With the treating plant in operation and the consequent use of treated ties at the rate of about 1,000,000 a year in conjunction with the continued use of chestnut, it is expected to reduce

A Modern Electric Locomotive Handles the Ties

the yearly requirements nearly to one-half of what they now are.

It is estimated that the supply of chestnut and white oak is sufficient to last from five to eight years more. The inauguration of timber preservation has, however, made it possible to use many native woods such as beech, birch, maple, red oak, ash, hickory and hemlock, the supply of which is sufficient to furnish tie wood for the next 15 to 20

years or more. Much of this timber has not been marketable heretofore, chiefly because of the fact that no one grade grows in sufficient quantity in one location to make sawmill operations profitable. It will now be possible to log a tract of mixed timbers with profit and thus in addition to being an economic advantage to the railroad, the inauguration of timber preservation will provide some measure of stimulus to the timber business of that section.

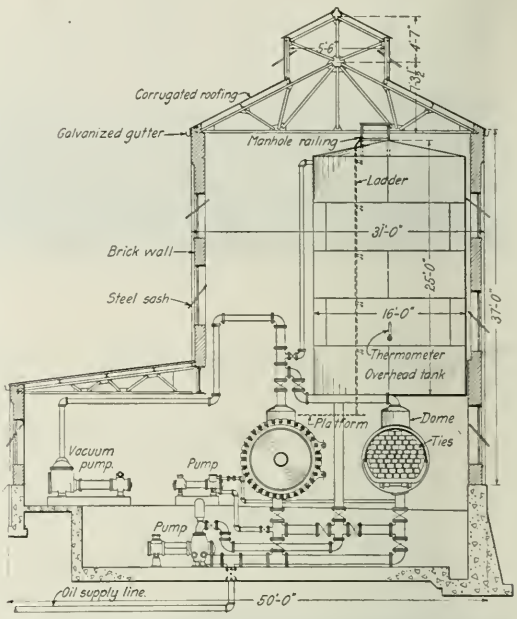
General Layout at the Plant

In a general way, the plant consists of a large well-lighted retort house, a boiler and enginehouse, an office building, storage tanks, tie storage yards, an adzing machine building and a system of narrow gage tram tracks over which a modern electric mine locomotive operates. The chief points of interest in regard to this plant are the design of and permanence of construction of the buildings, the arrangement of the equipment and the refinements in detail and improvements in construction of much of the equipment to secure easier and more economical operation.

About 47 acres of land have been utilized for the plant and attendant tie storage yard. This tract adjoins the Quinnipiac river and the Air Line receiving and northbound departure yards at Cedar Hill. The buildings and narrow gage tracks serving the buildings are located next to the terminal tracks mentioned with the storage yard beyond. When ties are received in a solid train the cars are immediately set in upon receiving tracks at the plant and later distributed throughout the tie yard. In all other cases the cars are cut out in the classification yards and then moved in to the plant's receiving tracks.

Process Used Is the "Improved Lowry"

The treatment given at this plant is the Improved Lowry process. It differs essentially from the straight Lowry process in that the oil is not dropped to an underground tank on the completion of the pressure cycle and the vacuum then pulled, but the oil is pumped out directly from the retort to the charging tanks and a vacuum pulled at the same time. This gives a bigger recovery and a quicker vacuum. Following this method a vacuum of 15 in. is secured in about 5 min., and of 22½ in. in about 10 min., less time than would be taken ordinarily in draining the retort. A normal working pressure of 175 lb. at a temperature



Cross Section of Cylinder Building

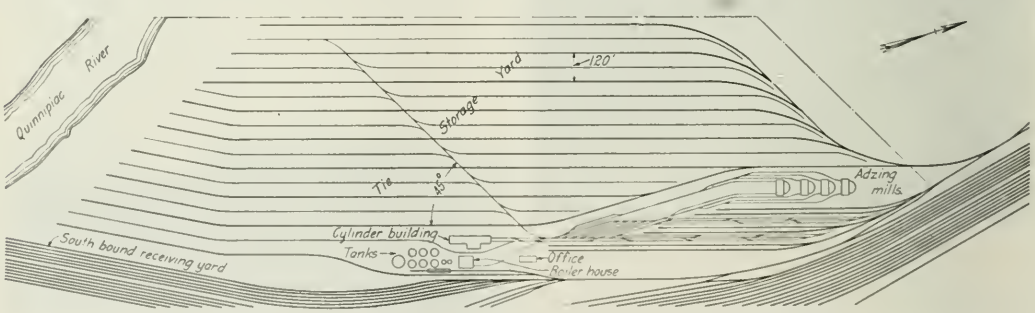
of 175 deg. F. is used and a following vacuum of 26½ in. The average retention for a 6-in. by 8-in. by 8½-ft. tie is 2½ gal. and for a 7-in. by 9-in. by 8½-ft. tie, 3½ gal.

Electrically Operated Narrow Gage System

The tie storage yard consists of a series of alternate narrow and standard gage tracks having an average length of about 2,400 ft. There are nine standard gage and eight narrow gage tracks laid alternately on 60-ft. centers. These standard gage tracks stub end at the river, while the opposite ends are connected through a ladder track with the inbound and receiving tracks and the outbound tracks from the loading docks, etc. A 24-in. narrow gage line crosses the yard at a 45 deg. angle at about the center, connecting with each of the narrow gage yard tracks.

The layout is arranged to secure an easily controlled movement to and from the retort house, either direct from cars, direct from the seasoning yards or via the adzing and boring mill. To do this the cross lead is connected in to the main leads to and from the retort house which in turn connects with a six-track narrow gage storage yard, the adzing mill tracks and the two three-track sets of loading tracks, as shown. All narrow gage tracks have an overhead catenary, furnishing power to an electric locomotive for handling the trams. The locomotive is insulated at the retort end to prevent any possible grounding through the retort.

The retort house is a modern building of marked permanence of construction as stated. The foundations are of



Plan of the Yard and Building Layout

concrete with brick walls, steel sash windows, steel roof trusses and sheet iron roofing with the exception of a lean-to which serves as an engine and generator room. This has a tar and gravel roof laid on cement tile. The building is 174 ft. 8 in. long and 31 ft. wide with a 19-ft. by 62-ft. lean-to.

It is of the monitor type with a height to the eaves of about 13 ft. The center section, housing the charging tanks, is in the form of a tower measuring 31 ft. by 36 ft. with a height to the eaves of 37 ft. Pilasters in the brick walls are spaced about 17 ft. apart. Large steel sash are installed between each pilaster in the walls of the building proper in addition to which there are two upper lines of sash in the center or tower section. Additional lighting is obtained by an extensive system of electric lights, all housed in vapor-proof fixtures and conduits.

The Storage Tanks Are Well and Conveniently Arranged

Retort Heating Coils Reduce Condensation Losses

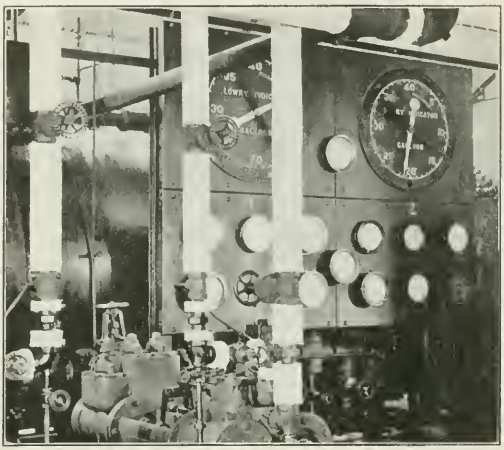
The treating cylinders are two in number, 7 ft. in diameter by 150 ft. long with a capacity of 18 trams of 8-ft. ties and 17 trams of 8½-ft. ties. They have a ¾-in. shell of triple riveted, butt-joint construction designed for a working pressure of 200 lb. The pitch of the rivets was designed to secure tightness of joints at working pressures rather than high pressure resistance. The cylinders are anchored on two saddles at the center and carried upon roller bearing supports for expansion. The doors are of steel plates with cast-steel rims, thus securing a light construction with no loss in strength or tightness.

The heating coils consist of lines of pipe so arranged as to secure a flow of steam in both directions from a center casting and return with an absence of air pockets and condensation losses. Each pipe line from the central casting consists in reality of two lines, an inner and an outer pipe, respectively ¾ in. and 2 in. diameter. Steam is admitted to the inner line at the center casting, flows through the ¾-in. pipe to the far end and returns through the 2-in. pipe to a separate chamber in the center casting. The installation is covered by a perforated plate and is most satisfactory.

The "Working" End of the Retort House

The door rails are controlled through a lever by one man, the arrangement being such that little effort is required to swing them up out of the way or down into place for the

movement of trams. The counterbalance is a compensating one and operates by means of a cable and drum on the supporting shaft, the former passing over a grooved cam controlled by a lever, to a counterweight. Another labor saving installation is two balanced platforms, one for each retort, which drop before the doors to permit the workmen to reach the nuts on the upper half easily and quickly. These platforms are so designed that they will remain safely in either the raised or lowered position, a force of about 20 lb. being required to start and move them from either of these two positions. Between points of about 3 ft. from either extreme position they are in an almost perfect balance, requiring little or no effort to move them.



Two-Pointer Indicators Give Quick and Accurate Readings

Improved Direct Reading Charging Indicators

A pit in the center of the building houses the pumps which handle the charges, as well as a considerable amount of the necessary piping. The vacuum pumps are on the floor level and are installed near the retorts. A large indicator board is installed centrally and below this are situated the control valves. An interesting feature of this indicator board are two large gages, one for each charging tank, which are equipped with two hands, one reading by thousands and the other by hundreds of gallons. Subdivisions permit of reading to units of five gallons. This indicator is accurate to plus or minus 20 gal. It is of the float and cable drum type. The thousand-gallon indicator hand is painted white and the other yellow, thus making them readily distinguishable. The charging tanks are two in number, 16 ft. in diameter and 25 ft. high, each with a capacity of 37,000 gal. The outside storage facilities consist at the present time of four 30 ft. by 30 ft., 150,000 gal. tanks, with provision for two additional to be installed later. Provision has also been made for a contemplated main storage tank of 450,000 gal. capacity. The outside tanks are connected for heating both by live and exhaust steam from the boiler house. The tanks from which oil is being withdrawn steadily for use are kept at or about a temperature of 120 deg. F. A separate pump house handles oil from a 5-ft. by 100-ft. receiving tank located in a concrete pit under a siding, to the storage tanks and circulates the ingredients in the mixing

The Door Rail and Platform Arrangement

The Permanent Form of Construction is Clearly Evident Here

tank. The installation consists of a steam driven pump and an electrically driven centrifugal pump, one being held in reserve.

Modern Equipment for the Boiler House

The boiler house is a concrete and brick building measuring 49 ft. by 62 ft. 6 in. It is equipped with three 150-hp. boilers fed by automatic stokers. Coal is elevated to three overhead hoppers which feed the stokers by gravity. The office building now under construction will be 26 ft. 10 in. by 71 ft. 10 in. in area and of the same general type of construction. It will contain offices for the superintendent and his staff, chemical laboratories, lockers, lavatories, etc. Electric current for the plant is furnished by a 75-kw. generator delivering direct current at 220 volts, located in a room adjoining the retort house and forming a part of it.

Provision has been made for four adzing, boring and branding units, which are now under construction. Each of these units is served by single tracks on both the inbound and outbound sides, the grade of the tracks being such as to insure gravity operation of the trams and the length sufficient to take care of two tram trains on each.

The narrow gage track layout in addition to that already mentioned consists of a two-track storage for inbound tram trains, and a six-track storage yard for adzed ties ready for treatment. This latter yard has a ladder at each end and the switches are interlocked. Two sets of three tracks each on 11-ft. centers are provided for outbound treated ties. One set runs on a loading dock at car door height, the other at grade. Numerous crossovers provide the necessary flexibility of operation. The tracks at grade are flanked by locomotive crane tracks, one 20-ton crane being used at present for the loading of ties into open top cars.

The new plant was constructed under the supervision of the purchase and stores department of the New Haven, N. M. Rice, general purchasing agent, by the American Creosoting Company, Louisville, Ky., A. L. Kuehn, president, and R. H. Mansfield, superintendent at Cedar Hill.

State Commissioner Urges Constructive Regulation *

Emphasizes Necessity of Sane Control if Best Interests of the Public Are to Be Promoted

By Carl D. Jackson
Member, Railroad Commission of Wisconsin, Madison, Wis.

MANY PEOPLE BELIEVE that the sole object of the establishment of regulatory commissions was to bring about the reduction of rates to the consumer, and as a matter of fact in the early history of regulation, reduction of rates rather than the exercise of other functions of regulation did absorb a large part of commission activities. While it is true that regulation was first established largely as a protest against abuses and practices which the public had rightfully found to be against the public interest, it is now beginning to be generally understood that regulation must have in mind the fact that its principal purpose is to bring real service to all of the people upon terms not only fair and equitable to the consumer, but also to the utility and carrier furnishing the service. Regulation must proceed in accordance with economic laws, and any system of regulation which hampers or makes impossible the service which the utility was established to perform is not in the public interest but directly opposed to that interest.

The steam railroads of this country perform a service absolutely vital to our welfare. It is probably safe to say that nothing could more adversely affect our welfare or more seriously threaten the very form of government under which we live, than the complete breakdown of our transportation system. The steam railroads are the arteries supplying the vital elements of our life as it is now lived. An unwarranted attack upon transportation affects industrial welfare and the welfare of our farmers and workmen just as vitally as would a direct attack upon industry itself. The situation of the railroads today is such as to demand not unthinking or unreasonable criticism, but serious and constructive consideration. We are today having a practical experience of what inadequate service in transportation means. The present car shortage comes at a time when the demands for transportation service are not nearly what they will be when industry is again in full swing throughout the country. This means that we must bring about conditions that will insure the necessary increase in railroad facilities to keep pace with our industrial development, for transportation limits are also the limits of production. Inadequate transportation facilities necessarily mean the loss or stoppage of business, the tying up of money in both raw materials and manufactured products, frozen credits and the curtailment of available capital for the business of the country. They mean a direct loss and discouragement to the farming community, which after all is the basic industry upon which all of our prosperity is founded. Our present situation is due to a failure to increase our railroad facilities adequately during the last five or ten years, and this failure, of course, is based on a lack of foresight in the past. I shall not discuss how far it may be due to a short-sighted policy on the part of the carriers, to the war, to government control, to restrictive laws like the Sherman Act or how far there may have been a failure to measure up to the full responsibilities of regulation. I do believe, however, that undue emphasis was placed upon the desirability of lower rates and lower prices for service rendered, very often to the exclusion of consideration of those economic conditions and necessities for revenue upon which alone adequate service could be based. The public had not come to realize the full effect of the existing economic policy; and that failure to meet the situation in a far-seeing way during this period was a mere reflection of the general public attitude toward utilities and carriers. But we are faced with a present problem and this demands not only a study of the past but a careful survey of the future. It is far preferable that we foresee and prevent disaster, than that we cure it after it has come upon us.

There is much discontent today, and some of this discontent is focussed on the railroads. Of this latter discontent, much is wholly unreasonable and unreasoned. Very often it is based on an entire disregard or misunderstanding of facts. Here and there we find a tendency to ignore the actual services now being performed by the railroads or a failure to comprehend their importance or meaning to the country. It is true that transportation service is being performed by

*Abstracted from an address before the Chicago Association of Commerce on December 14.

other agencies than the steam roads, but the slightest knowledge of the actual facts would show that the service performed by the carriers is not of less importance today than it formerly was, but on the contrary, that service is greater today than ever before. The increase in tonnage hauled (service performed), has been steady for 30 or 40 years. We are today doing about the same amount of transportation that was done in the banner year of 1920—the greatest year of transportation service in the history of the country. The amount of freight hauled by the carriers in 1920 is almost seven times that hauled in 1890. It is nearly three times that hauled in 1900, and it is over 70 per cent greater than it was in 1910. No prewar year approaches 1920 in the amount of freight hauled by the railroads. There is no reason to expect a decline in the service that must be rendered, and there is every reason to expect a great increase in it; and it is perfectly idle to suggest or think of other forms of transportation replacing or performing the service now performed by the steam carriers of this country. I believe that this will be so even though we take advantage of every economic form of transportation, including waterways, which should be developed.

The facilities for the performance of this service must be available if this country is to prosper and industry is not to be stifled. The problem, therefore, is one of the greatest in this country. In part, at least, the regulatory bodies will be responsible for its proper solution. That means that the regulatory commissions must be courageous enough to regulate as their vision and judgment dictate although it may be contrary to political expediency or public prejudice at the particular moment.

One of the helpful things that can be done is to continue the attempt already started to bring home to every person in the United States the facts in regard to the situation. If in the end these facts can be brought home to the public and the people can be made to understand how their own welfare is dependent upon the proper solution of the transportation problem, there will no longer be any political advantage to that type of politician whose sole stock in trade consists of unreasonable attacks upon the railroads. I believe that every effort should be made to restore better public relations between the railroads and the patrons and shippers. When this is accomplished, a great step will be made toward solving the problem. Also, the people should come to understand that regulation does not consist always of the reduction of rates, that regulation with this sole object in view is not in the public interest and that unwarranted reductions in rates may be directly against their own interests, leading in the end to an increase in our transportation difficulties. Another great help would be an endeavor on the part of the carriers to bring about the ultimate object of the Transportation Act—the elimination of unnecessary, unreasonable or wasteful competition among themselves. As yet no advantage has been taken or perhaps could be taken of the provisions of the Transportation Act permitting consolidation or pooling as a means of doing away with unnecessary or wasteful competition. The carriers should come to think of the transportation system as a whole and as one transportation facility, and not as made up of a heterogeneous number of individual railroads. It seems to me that the wise policy on their part would be the encouragement of co-ordination between their own and other means of transportation, to the end that there should always be available the cheapest, most economic and adequate service possible.

THE CANADIAN PACIFIC reports that its new line being built between Foremost, Alberta, and Weyburn, is nearly completed, the laying of track on the last 25 miles being now almost finished. The operation of one train each way, three times a week, will probably be begun within two or three weeks.

A "Y" Building and Loan Association

ORGANIZED on July 1, 1919, and having at the present time—three and one-half years later—over 1,000 shareholders with over 5,000 shares subscribed, is the record made by the P. R. R. Y. M. C. A. Building and Loan Association of Jersey City, N. J. The Association has at the present time over $150,000 in assets and its monthly receipts total over $6,000. It has issued 38 loans, 34 to railroad employees to assist them in the purchase of homes.

The officers and board of directors represent a large number of the departments of the Pennsylvania Railroad organization at Jersey City. The president is A. M. Reynolds, assistant master carpenter; the secretary, M. S. Pine, is chief clerk at the Jersey City freight station; the treasurer, J. M. Watson, is chief clerk at Pier K. Among the directors are the ferry station master, the assistant freight train master, the assistant supervisor of stations, and a captain of a Jersey City-New York ferry boat.

The formation of the P. R. R. Y. M. C. A. Building and Loan Association of Jersey City followed as a result of activities at the Y. M. C. A. in connection with the 1919 thrift week campaign. A committee appointed to consider the best method of making practical the ideas embodied in the thrift week creed decided in favor of the building and loan plan which has proved extremely popular in the state of New Jersey, that state being among the leaders in the country from the standpoint of number of building and loan organizations, number of shareholders and total assets. The committee at once consulted with an attorney, a state charter was obtained and the organization started its activities on July 1, 1919, with 50 members who subscribed for a total of 500 shares. On its first anniversary the association had 400 members with a total of 2,040 shares; on its second anniversary, 518 members with a total of 3,406 shares. The third year shows the organization as having over 1,000 members who have subscribed for over 5,000 shares.

The adoption of the building and loan plan of thrift was agreed upon because of the greater profit accruing to the members with the same degree of safety as prevails in a savings bank. An additional incentive is contained in the plan because each subscriber is required to pay in each month $1 for each share. The share matures in about 11 years, depending upon the conditions, and is then worth $200. Loans to prospective purchasers or builders of homes are made on a first mortgage and on a much higher percentage of the house's value than is usual with ordinary first mortgages. The borrower takes out shares in proportion to the amount of his loan, and then proceeds to pay off his loan in monthly installments by paying on his shares. Thus if he is loaned, say, $2,000, he is required to have 10 shares. He then pays $10 a month on his shares and $10 interest, and his loan, if held to maturity, will be paid off at the end of approximately 11 years as mentioned above.

The officers and directors of an association are elected annually by the shareholders, these men being responsible for the loans made to prospective home purchasers and for other investment of the funds. The officers and directors besides being close to the rank-and-file of the members, must be deeply interested in the welfare of the association and also shareholders to enable them to hold such office in accordance with state laws. The association is further protected by having the accounts of these officers inspected and audited at least once a year, as in the case of banks. In New Jersey also all building and loan associations are under the direct supervision of the state banking and insurance commission. The associations pay 7 per cent, or better, to the shareholders as compared with 4 per cent paid by the savings banks. In New Jersey the degree of success of the plan is indicated by the fact that there are at present in the state over 1,100 associations with over 1,000,000 subscribers and with assets approaching $500,000,000.

Traffic Direction By Signal Indication on D. L. & W.

Current of Traffic on the Meadows Line Is Authorized Only by Interlocking Block Signals

THE DELAWARE, LACKAWANNA & WESTERN delivers over 60,000 people every week day to its Hoboken terminal. These are, to a large extent, commuters who take the Lackawanna ferries or the Hudson & Manhattan tubes from Hoboken to various terminals in New York City. In the evening, the commuters are returned to their homes throughout a considerable section of northern New Jersey. Two hundred and fifty scheduled trains are run on week days and 108 on Sundays. To handle traffic of this nature safely and without delays forms one of the greatest problems in modern railway operation.

Track Facilities and Interlockers

The Hoboken terminal has 16 platform tracks. Two large electro-pneumatic interlocking plants, control train movements on the six through tracks, converging to four tracks through the Bergen tunnel. Three of the last mentioned tracks are signaled for traffic in both directions, thus allowing four tracks to be utilized for traffic in a single direction during portions of the day when this is advantageous.

Interlocking Machine and Track Model at Newark, N. J.

An electro-pneumatic interlocking at West End controls train movements to and from Bergen tunnel and the junction of the two main lines—one four-track westward towards Boonton, and one three-track leading southwest to Morristown, Montclair and Gladstone. Practically 80 per cent of the passenger traffic is handled over the latter line, while most of the freight trains are sent over the former, largely because of extensive yards and other facilities which are located at Secaucus.

The signaling which has been installed recently extends from West End interlocking to Newark interlocking—a distance of 5.9 mi. The accompanying track and signal plan indicates, to some extent, the nature of this work. Electro-pneumatic interlockings were installed in place of the older mechanical plants at Hackensack drawbridge, Kearny Junction, Harrison and Newark. A mechanical interlocking plant which was in service at Passaic drawbridge was reduced in size so that it now handles only a freight lead occupying the lower deck of the bridge, while the units governing train movement over the double track on the upper deck are controlled and operated from the Newark interlocking machine.

The four tracks from the tunnel through West End interlocking converge to three and then to two, which pass over Hackensack drawbridge. Three tracks are provided from this drawbridge through Kearny Junction and Harrison interlockings to within about 1,600 ft. of the Passaic drawbridge. The double track over this bridge joins to three tracks at the west end, this junction being handled by the Newark interlocking. Tracks 1 and 3 are signaled for traffic in both directions; track 2 has signals for eastward trains only. The changes in the number of tracks and reversals of normal direction of traffic necessitate the interlocking of switches and signals throughout this section.

Through passenger and suburban express trains pass through the newly signaled zone without stopping, and usually at speeds of from 30 to 50 miles an hour. Some of the local suburban trains stop at Harrison station, between Harrison tower and the Passaic river. No other regular stops are made. Freight trains are moved into and out of Harrison yard, and freight cars are delivered to industries west of Hackensack draw, near Harrison, and in Newark. Movements are also made from the main tracks at Harrison to the lower deck of Passaic drawbridge. Interchange tracks connect with the Pennsylvania at Kearny Junction.

A record taken on an ordinary week day showed 228 trains in 24 hr., or one train for each 6⅓ min. in one or the other direction on one of the three tracks. As a matter of fact, these trains are bunched so as to require that they run on the same track with the headways from two to six minutes during the rush hours at morning and evening. For an average length block (1,930 ft.. from which the variation is not great), trains operated on a two-minute headway must run at:

36 miles an hour on "clear" signal indications;
25 miles an hour on "approach restricting" signal indications; and
14.3 miles an hour on "approach" signal indications.

Opening Drawbridges Interrupt Schedules

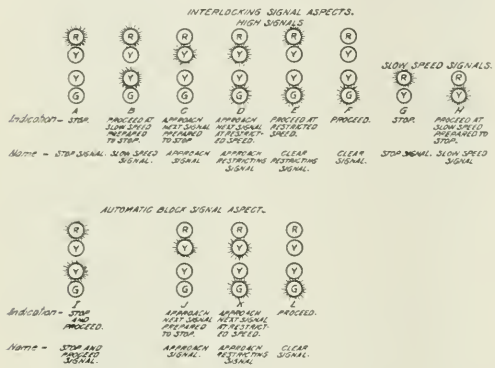
Freedom from traffic congestion cannot be secured on this section of track by even the most careful adherence to the schedules for trains or the most perfect train dispatching, as the drawbridges at the Hackensack and Passaic rivers must allow uninterrupted boat traffic in accordance with the government marine regulations. Occasionally this interferes seriously with train operation, especially when a bridge is opened during rush hours. The trains on from two to six minutes headway will close in and occupy from a half mile to a mile of track, waiting for a bridge to be closed. To witness the rapidity with which the road is freed of congestion of this nature will convince one of the necessity of providing the most complete signal facilities.

Trains can be operated eastward on three tracks or westward on two tracks simultaneously. It is not so essential that westward trains, which are just starting on their runs, be kept exactly on time, as it is that eastward trains be not delayed, as the latter are approaching the terminal and have boat and subway connections to make. With signals 1,930 ft. apart a train can follow a train safely at a headway as low as two minutes. As a result of the signal facilities provided, 95.3 per cent of the eastbound trains have been

normally reaching the terminal on time, in spite of unavoidable drawbridge delays.

Changes Required to Handle Traffic

Ten years ago there were only two tracks across the Meadows and traffic on these was protected by two-position, two-arm semaphore signals, spaced approximately 3,500 ft. apart. The number of trains increased until there was a serious traffic delay in normal operation, so that it became necessary to cut the blocks in half, making these about 1,750 ft. long. To be safe, it was necessary to have two caution signal indications for each stop indication. As traffic increased, a third track became necessary and a system of signals was installed with this which provided for the first time on the Lackawanna a differentiation between "approach" and "approach restricting" signals. A comparison



Interlocking and Automatic Block Signal Aspects

of the interlocking units and automatic signals before and after the addition of the third track and subsequent changes is indicated in the tabulated form below:

Old Layouts

	Intlg. Levers	Oper Units	Sigs.	Sw. and Derails	F. P. L.	Other Locks
Hackensack draw	12	12	5	3	2	2
Kearny Junction	41	35	18	8	9	..
Harrison	25	25	15	4	5	1
Newark draw	17	17	6	4	4	3
Newark	20	13	8	2	3	..
Automatics	..	31	..	..	..	..
Total	115	133	83	21	23	6

New Layouts

	Interlocking Levers	Working Levers	Operating Units	Ground Signals	Bridge Signals	Dwarfs	Switch and Draws	Switch and Bridge Lock.	Traffic Levers
West End (added)	..	..	5	..	1	2	..	..	2
Hackensack draw	19	15	23	..	4	1	7	2	5
Kearny Junction	19	15	33	2	3	5	14	..	4
Harrison	23	22	47	..	9	9	15	1	4
Newark draw	8	8	8	2	..	..	2	4	..
Newark	17	20	28	..	8	1	7	1	3
Roseville Avenue	..	..	1	..	..	..	..	..	1
Automatics	..	..	43	7	36	..	..	..	..
Total	96	80	188	11	61	18	45	8	19

Color-Light Signal Aspects and Indications

The adoption of color-light signals for the Meadows installation is a departure from past practice on the Lackawanna. Interlocking and automatic signal aspects and indications are shown in the accompanying sketch. This general scheme of aspects not only provides for closing in of traffic safely by qualifying the "caution" indication, but has also reduced the number of indications formerly used from

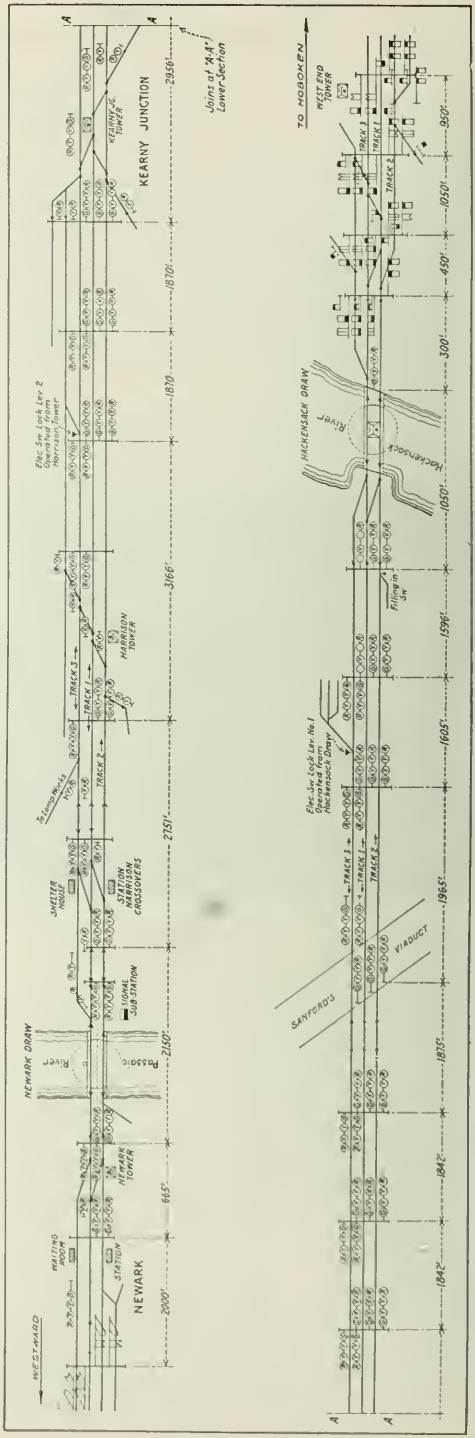
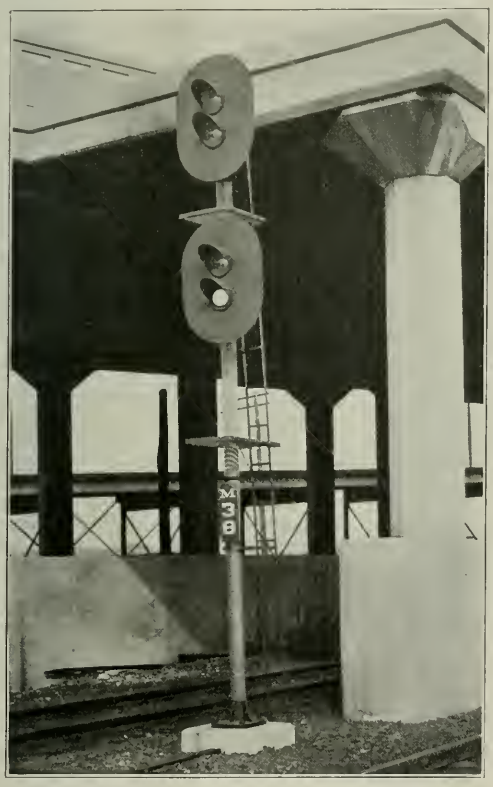


Diagram Showing Color Light Signals Between West End and Newark—Upper Section Joins Lower at Left

36 to 12. A number of dwarf signals, required by the older scheme, at the base of high signals, have been eliminated.

The greatest variation from past practice in signal indications exists in the introduction of the aspect *D* and *K* which indicates "approach next signal at restricted speed." Thus a "stop" signal, *A*, or a "stop-and-proceed" signal, *I*, will be preceded by an "approach" signal, *C* and *J*, before which will be an "approach-restricting-signal" *D* and *K*. This arrangement provides for signals to be spaced less than braking distance apart and yet allows trains to be run at maximum speed. Trains at lower speeds may close in, one train following another under the indication shown in *C* and *J*. This system furthermore provides, where desired, a "tonnage" signal which is unnecessary on this section as no train is operated which cannot regain headway after having come to a stop at any of the signals.



Two-arm Style-L Ground Signal at Sanford Crossing

Control of Train Movements by Signal Indication

Train dispatchers at Hoboken direct all train movements over this stretch of track. Three levermen, but no directors, are employed at each of the following towers: Newark, Newark drawbridge, Harrison, Kearny Junction and lower Hackensack drawbridge. Telephones and train describers are used between towers to facilitate train operation.

The bulletin placing the Meadows signaling in service contains the following provisions: *"Current of traffic will be authorized only by interlocking block signals. Enginemen will receive signal indications as per track assignment."* In other words, traffic direction is provided by signal indication. The direction of traffic may be changed as required by operating conditions.

Under such conditions the levermen obtain a release from the adjoining tower on the proper traffic lever and reverse the desired signal levers.

Regular and Emergency Power Supply Provided

The regular source of power supply is the railroad company's 6,600-volt, 3-phase, 60-cycle transmission line, which extends across the Meadows and from which taps are taken at two places, Hackensack drawbridge and Harrison substation, just east of the Passaic river. Normal connection is made at the Harrison sub-station. An emergency supply is provided by the public service, 2,400-volt, 2-phase, 60-cycle line, which is converted to 3-phase and the proper voltage by the use of scott-connected transformers.

The emergency supply of power is cut in automatically at any time when there is a failure of the normal supply, through the agency of a General Electric automatic substation. The time required for a complete change-over is approximately one-half second. Circuit controllers are interlocked in such a way as to prohibit single phasing. The change-over is effective not only upon the failure of normal supply, but also whenever the secondary voltage falls as low as 95. Restoration of the connection to the normal supply is made manually.

The three 6,600-volt transmission wires are carried on the same poles as the power department line of the same voltage. It will be noted that it was necessary to use aerial cable at Sanford's Crossing, and submarine cable under the Passaic river. With the exception of these two locations, transmission wires are carried on porcelain insulators. Nineteen 5-kva. transformers provide for the entire signal load. Those transformers are located on the line poles and are protected by means of General Electric compression chamber lightning arresters and choke coils.

The signal transmission line is sectionalized at Sanford's Crossing, Kearny Junction and Harrison towers, at which points air-break sectionalizing switches are used. In sectionalizing, any of the locations mentioned can be fed from either direction. This allows for opening a section of transmission line for repairs without suspending service at any interlocking. Arrangement is provided for the Newark interlocking to be fed from either the signal transmission line or from the railroad power department line.

Energy for Interlocking Plants

The arrangement for the supply of energy to the interlockings is remarkably simple. In the first place, no battery is required as all parts except track circuits are arranged for alternating current supply. There being no battery, no charging equipment is required. The air compressors are Westinghouse (National) type H-1 with a rated piston displacement of 12.2 cu. ft. of free air a minute. The motors are 110-volt, 3-phase, 60-cycle, developing a maximum of 2 h. p. A simple centrifugal motor clutch enables the motors to start easily without a load. An automatic controller provides for a cut-in cut-out at 45 lb. and 60 lb. respectively. Two compressors were installed at each of the Newark, Harrison and Kearny Junction plants, while there is but one at Hackensack drawbridge. The average consumption of air at each plant is less than 2½ cu. ft. of free air a minute. The compressors run approximately 20 per cent of the time. This low requirement of compressed air is brought about by the use of modern electro-pneumatic apparatus.

The supply of energy is so simply arranged that it was not considered necessary to install switch boards. The knife switches for controlling supply to the air compressor motors, the interlocking machine, and plant are suitably mounted in safety panel-boxes attached to the tower wall.

The Union Switch & Signal Company's Model 14 power

interlocking machines at all four plants are similar. Taking the Harrison machine as an example, there are:

8 levers for 15 switches
9 levers for 27 signals
4 traffic levers
1 lever for outlying switch lock

22 working levers, total
1 spare lever

23 lever machine.

It will be seen that 22 levers handle 47 units. This interlocking machine is less than 6 ft. long and its levers can be easily manipulated by one man, an economical factor where traffic is so heavy.

The indication and lock magnets are energized at 110 volts, 60 cycles. All switch levers are equipped for electric detector locking. Traffic levers have a signal lock magnet. All signal levers are three-position. A 3-light lever indicator cabinet extends the entire length of the machine. Green roundels are used except for the bottom row of lamps under signal levers, which are equipped with red prism glass for a special signal indication. The lever lamps are 12-volt. Push buttons of the mechanical stick type are provided for all signals. Mercury time releases operate in conjunction with dwarf signal levers. One push buttom is provided for controlling air whistles located on the signal bridges, with which trains can be stopped in emergency. Also with the whistle a maintainer can be called to a nearby 'phone from any location.

The interlocking machine is self-contained and is completely enclosed in an enameled sheet steel case which has removable panels. The panels are equipped with cabinet locks which prevent access to the machine by other than authorized persons.

Track Models Show Location of Trains

Track models are provided for all of the power interlockings. These are of sheet steel mounted on angle iron frames and supported from the floor on 2-in. pipe posts. Tracks, letters and figures are in white on a flat background. This combination in non-reflective finish is the clearest and best when spotlights are used to indicate track occupancy. Twelve volt telephone type lamps, behind frosted bull's-eyes, indicate by their illumination that trains are not on the various track sections. Because of the short length blocks and consequent brief interval of time for indicating a train approaching a signal, a four-block indication is provided approaching home signals.

The track models are located directly over the interlocking machines, and so provide a location where recording air gages, ground and phase indicating lamps are most readily discernible, and where train describers and clockwork time releases are easily accessible.

Switch Movements

Type A-1 electro-pneumatic switch movements are used exclusively. This movement is equipped with a cylinder having a 12-in. stroke and of sufficient capacity to handle any switch, slip, derail or frog points at 40 lb. air pressure. The switch movements are controlled by means of Style "C" cutoff type valves. The combination of reduced air pressure and normal cutoff of the air supply to the switch cylinder at the valve, results in a very considerable saving of compressed air, as is indicated by the small size compressors

Color-Light Signals Prove Advantageous

Union Style "L" color light signals are used throughout. The aspects and indications have been described and the construction as well as the mounting of these signals is clearly indicated in the accompanying views. The long range of this signal is secured by the use of an accurately based concentrated filament lamp. Provision is made for this lamp burning out and the short range indication improved by a pilot lamp which has an ordinary filament. Individual lamp transformers make possible relay control at 110 volts and the use of a rugged filament 6-volt lamp which provides long life.

The colors used in the lenses are darker than the Signal section A. R. A. standards, thereby providing satisfactory range without any filtering out of the colors, which might otherwise accompany the use of concentrated filament lamps. As a result of a number of tests, a minimum spacing of 4 ft. was established between signal units which might be illuminated simultaneously. This spacing gives ample protection from blurring.

Why D. C. Track Circuits Are Used

Anyone not familiar with all of the factors which were considered in laying out this installation might wonder why with all other units dependent upon alternating current, the track circuits were allowed to remain battery fed. The possibility of this portion of the Lackawanna being electrified at some future time, and the uncertainty at this time as to whether the propulsion current will be alternating or direct, prevents a final determination as to what track circuit apparatus will ultimately be required. Direct current track circuits were in use prior to the present installation and so were allowed to remain. All of the new apparatus will apply without change after the road is electrified, no matter what type of electrification is used.

All switches leading to the three-track line, excepting two, are power operated. These two are controlled by means of electric switch locks for which levers are provided in the Harrison and Hackensack interlocking machines. At Harrison interlocking, lever 2 is moved to the right to allow a train to pass from the siding to the main track, and lever 2 to the left allows the reverse of this movement. The electric switch lock levers are interlocked in such a way with the traffic levers as to prohibit conflicting train movements. Train describers are provided between the Newark and Roseville avenue towers, the latter being located west of Newark. Communication between Hackensack, Kearny Junction, Harrison and Newark towers is by means of telephones. As previously stated, telephones are also located at convenient points throughout the installation so that a maintainer can get in touch with a leverman within a few minutes after hearing the call whistle.

Check Locking Provides Protection Against Conflicting Train Movements

It is obvious that some means of protection against conflicting train movements on tracks signaled for traffic in both directions must be provided. Check locking is in service between adjacent towers throughout for both tracks 1 and 3. The interlocking signal levers governing train movements on tracks 1 and 3 are interlocked with the check locking levers, the latter being controlled through track repeaters in such a way that once traffic direction is established, and a train accepts a clear signal, this cannot be changed until the train has reached the next interlocking plant and it is safe for traffic to be reversed. The automatic signals between towers are wired as they would be for one-way traffic, that is, no preliminaries are provided, as would be necessary in single track operation without check locking.

The automatic signal and interlocking materials were supplied by the Union Switch & Signal Co., and Kerite insulated wire was used. The entire installation was made by the signal department forces in the employ of the railroad company.

Revision of Transportation Act Suggested*

Less Labor Standardization, Changes in Labor Board and Less Restrictive Regulation Needed

By W. G. Besler
President, Central Railroad of New Jersey

THERE ARE TWO schools of thought today, each with its very fixed opinions: one, that the Transportation Act should be revised; the other, that it should not be revised, but should be given a further trial.

Most of the criticism and dissension has to do with that part of the act dealing with disputes between the carriers and their employees and subordinate officers. In the opinion of many, the Labor Board made a fundamental error in including the craftsmen of all classes and descriptions, as well as laborers of no class or description, as employees coming within the category of "railroad men." They undertook to standardize for the railroads of this country, wages and working conditions for 500 classes of employment.

I am firmly of the opinion that this was beyond the thought of those responsible for the framing of the Transportation Act and I further believe that either the Labor Board should now reconsider and revoke its action in this matter, disavowing further authority or jurisdiction therein, or else that it should be accomplished by congressional direction, because the situation as it exists constitutes an unjustifiable subsidy to labor which happens to be in the service of the railroads; and for the further reason that this standardization unsettles for the country at large the wages and working conditions of craftsmen employed in industries other than railroad service, most of whom are of an apprenticeship that can be and is readily interchangeable with craftsmen of similar apprenticeship and training engaged in outside industrial service. As a matter of fact, such interchange is constantly taking place.

Years of service, capacity and training count for nothing. No one will seriously argue that the novice is immediately worth the wages paid to the former trained employee. It is this curse of holding men down to the level of the poorest and least efficient to which I object. It removes all incentive.

Enforcing Awards of Board

The suggestion has been made that "teeth" should be inserted in the labor section. Teeth are all right in their place, but there are false teeth as well as real teeth. I prefer another methods of approach.

No one is required to accept employment in the more than quasi-public service of railroad transportation. If, therefore, a person enters train or engine service or any kindred occupation having to do with the actual movement of traffic, he must voluntarily agree as a prerequisite condition of such employment to surrender his right to terminate his service under conditions which actually, or may in consequence thereof, result in a cessation of service, being in its practical aspect a strike, and that further as a prescribed penalty for violation of such voluntary agreement, he may subject himself to fine or imprisonment, upon the theory that a man who "saws off the limb upon which he is sitting" does so with the full knowledge of its possible subsequent effect upon himself. Is there anything wrong or insuperable in such a suggestion?

There seems to be an ever-increasing sentiment to the effect that the Labor Board should be abolished. Mr. Lee, president of the Brotherhood of Railroad Trainmen, is reported to have said that he longed for the good old days when railroads and organizations sat around the table and threshed out their differences and made agreements. Such a situation, of course, does not contemplate any necessity for a labor board. In those days, when the situation around the table reached a deadlock the next step was arbitration, concerning which we have ample precedent, with results which were just as satisfactory and at least in some respects more so than have been secured through the medium of the labor board.

Should Labor Board Be Reconstituted?

In my opinion the Labor Board, as at present constituted, cannot function properly. I would prefer one representative of labor, one of the carriers, and three of the public; or, if a larger committee is desirable, it might be 2, 2 and 5. In selecting the 3 or 5 representatives of the public, as well as the other members, something in the nature of a civil service examination, showing fitness or capacity, based upon previous training and experience along lines which qualify them to service in such a position, should be a prerequisite to appointment. Is there anything wrong in the thought that the law should require that those who are to serve the public in places of such importance should qualify as to their fitness, inasmuch as we require a prescribed course of study and training, followed by a final examination, before a diploma or license as a certificate of competency is given to a doctor, a lawyer, a minister, or even an undertaker, permitting them to practice their professions, and as a safeguard against "quacks" with their nostrums or unqualified persons who might otherwise practice or visit their schemes upon the public?

Changes in Section 15-A

Should the Transportation Act be amended so as to make the so-called "guaranty" provision, contained is Section 15-A, more effective? At the outset, it should be understood that the Transportation Act does not contain any guaranty provision which is now in effect. The so-called guaranty provision contained in Section 15-A of the Transportation Act cannot be made more effective by any rate-making device; it could only be made truly effective by taking money out of the public treasury. That course is obnoxious. The railroads don't need to be, and they don't wish to be subsidized by the Government. What they want is more freedom from regulation, more opportunity for private initiative and economies that flow therefrom, more opportunity to take care of themselves.

What the railroads need is a legislative holiday. If the regulatory statutes were permitted to become stable so that railroad managements of the country might have some assurance of the rules under which they might operate during the next five or ten years, they would then be in a position to give better service to the public and take better care of their stockholders, subject, of course, to reasonable regulations which would prevent excessive charges and discriminatory practices.

There is now pending in Congress what is known as the Newton Bill (H. R. 11822) which has been endorsed by the National Industrial Traffic League, representing practically all of the large shipping interests of the country. It pro-

*Abstracted from an address before the St. Louis Railway Club at St. Louis, Mo., on December 8.

poses that Section 15-A be amended by substituting for the present rate-making rule, the simple statutory declaration that the carriers are entitled to the opportunity of earning a fair return upon the property they devote to the public use and that the commission shall give consideration to this right in passing upon their charges. This right is already well established at common law by the decisions of the United States Supreme Court, but it has seemed that it had been overlooked at times in the past. It may be desirable that this right be clearly described in the act and thus formally kept before the eyes of the commission.

It is the opinion of a great number whose views are worth while, that Section 15-A as a whole, containing the so-called six per cent guaranty provision and the so-called recapture clause, should be eliminated from the law. Both of these were innovations introduced into the law in 1920. They have accomplished no good, but they have caused a great deal of confusion of thought and the sooner we get away from them and leave a greater freedom to the responsible officers charged with the management of the railroads of the country, the sooner we will get back to that efficiency of operation which made it possible for the railroads as a whole, prior to the war, without the assistance of the government, to earn a return approaching six per cent, while at the same time providing more satisfactory service to the public than it has enjoyed since 1917.

In my opinion, Section 15-A should, and I believe ultimately will, be eliminated. In place thereof, I suggest there might be substituted two rules or principles for the performance and observance of which the Interstate Commerce Commission should be charged with the duty, as well as with direct and personal responsibility in the matter of securing the desired results: (1) The rates charged by the carriers for their service must be reasonable. (2) The service given to the public must be adequate and satisfactory. Neither of these propositions contains anything insuperable. The first contemplates that the rates must be sufficient so as to enable: (a) The payment of wages which are fair; (b) Provision for those other operating costs which are incurred in honest, efficient and economical management; (c) Provision for the payment of fixed charges, taxes, etc., and (d) Permission for at least a reasonable return upon the capital invested.

The second will, as a corollary of these reasonable charges which the public must pay (for the railroads have no other source of revenue, or article for sale than service), result, as the natural consequence of the first being assured, in service both adequate and satisfactory.

Senator Brookhart Attacks Railroads

WASHINGTON, D. C.

SMITH W. BROOKHART, the new senator from Iowa, made his first speech in the Senate on December 18 in support of a motion to displace consideration of the ship subsidy bill to proceed with the immediate consideration of the agricultural marketing bill. He took occasion to criticise the railroads and the transportation act in arguing that the collective thought of the people had decided "that governmental aid to private enterprises for profit is fundamentally wrong and that present economic conditions are disastrously oppressive to agriculture and in a large measure are produced by improper laws and unwise governmental action. "One of the best illustrations in support of this conclusion," he said, "is the transportation act," which, he said, has changed the basic rule of rate-making so that "the paramount rights of the public are eliminated." Among the statements he made to the Senate, a large part of whose members voted for the act and presumably know what it contains, was that the Interstate Commerce Commission is "now commanded to levy rates high enough to yield a return of 6 per cent upon a valuation of $18,800,000,000 and for the first six months the deficit was guaranteed out of the Treasury of the United States." If the farmers could have had a like guaranty during the first six months of their deflation, he said, it would have saved them seven billions of dollars. He contrasted what he called a "guaranty of a half billion dollars to eight thousand millionaires to keep full the measure of their war profits" with a guaranty of the cost of production of seven million farmers for a crop produced at the command of their government. "For the next year and a half," he said, "the commission was commanded without discretion to levy rates that would pay all operating expenses and yield a net return of 6 per cent upon the full valuation." This it tried and failed because the operating expenses climbed up to the sky and the common people went broke and were unable to pay the bill upon any rates whatsoever. Since then the rate has been reduced to 5¾ per cent, and if the farmers and laboring people ever get money enough it will all be collected.

"The valuation of $19,000,000,000, round numbers, as the basis of rates is unjust. It was made under the rules of this law. This is the first time that watered value has been legalized. We have always had watered stocks and watered bonds, but they had to shift for themselves. This watered value is now given the sanction of the law and it will cost the American people $400,000,000 per year to pay the return upon it. This law should be repealed and the water punched out by the simple provision that the value shall not exceed the market value of the securities.

"The railroads are now getting over $10,000,000,000 of their capital at less than 4½ per cent. Under this law we must pay them 5¾ per cent, or a bonus of about $150,000,000 per year. It is unjust and the law should define the adequate or reasonable return, so it shall not exceed the interest rate on the bonded portion of the capital. Other gigantic items are excessive profits of subsidiary corporations and the waste of competition. These certainly amount to several hundred million dollars per year. Altogether, there is an excessive charge upon the American people of perhaps more than $1,200,000,000 per year without considering the wages of any man that works.

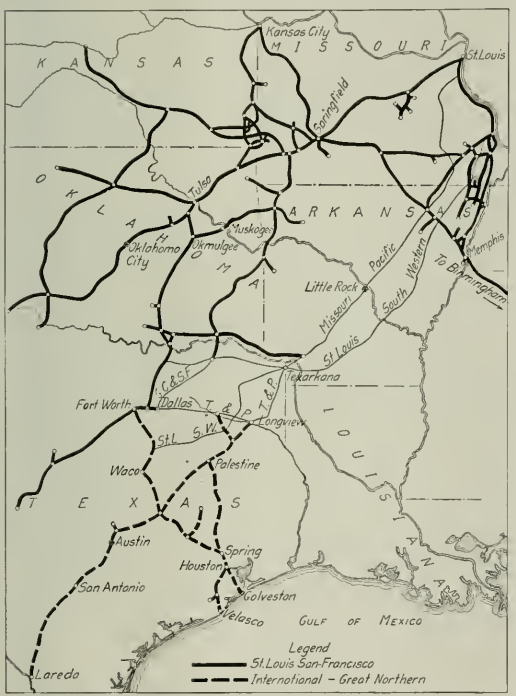
"I have not taken up the railroad law with the view of discussing it in full detail, but only for the purpose of showing that under this law the government itself has imposed these excessive burdens upon the American farmer and is, to that extent, to blame for his present plight, and I want to include this part of my statement with a review of the psychology that produced this law. The roads were being operated by the government. I do not question the integrity of the director general. But down below him, perhaps below his possible personal touch, were managing officers who were neither loyal to him nor to the government of the United States. They served the private owners of the railroads, and they wanted to discredit government operation so the roads would be turned back. They were traitors as truly as Benedict Arnold. They deliberately muddled and mixed up the service. They hired excessive numbers of inefficient employes and paid them excessive wages for the deliberate purpose of increasing the operating expenses. They advertised their own crimes as the evils of government operation.

"They created a general sentiment and demand for a return of the roads to their private owners. With it they coupled the demand for this law. In spite of the disloyalty and inefficiency in government management, in spite of the increased and unnecessary expenses, the first year after the roads were turned back, the private owners further increased the operating expenses by over $1,400,000,000. About $480,000,000 of this was wages and the other $926,000,000 must be attributed to the causes before described. Since that time wages have been reduced in a lump sum of over $400,000,000, with the further reduction that caused the machinists' strike, but rates have been reduced less than $100,000,000."

Frisco Buys International-Great Northern

As announced briefly in last week's issue, the St. Louis-San Francisco has arranged to purchase the entire capital stock of the International-Great Northern and will operate that property in conjunction with its own system, thus increasing its mileage from 4,769 miles to 5,928 miles, including trackage rights held by the purchased line. By this means, the Frisco will secure a through route to the Gulf of Mexico at Galveston and access to the Mexican border at the Laredo gateway.

The purchase was arranged through an agreement with Willard V. King, James Speyer and Frederick Strauss, voting



The Relation of the Frisco System to the International Great Northern

trustees for the majority of the stockholders of the International-Great Northern, for the acquisition of $7,500,000 capital stock, at a price of $26.75 per share, subject to approval by the Interstate Commerce Commission. Subject also to the approval of the commission, and the stockholders of the St. Louis-San Francisco, the purchaser guarantees adjustment bondholders of the International-Great Northern that the distribution on the adjustment bonds during 1924, 1925, 1926 and 1927 shall not be less than three per cent, in consideration of the granting of an option for the purchase of these bonds at 90, plus accrued interest, up to January 1, 1928, and after that date at par and accrued interest.

This plan for the consolidation of the International-Great Northern with the St. Louis-San Francisco is the most recent development in the history of the I. & G. N., which was reorganized effective December 1 with the election of J. W. Kendrick as chairman of the board of directors and T. A. Hamilton as president. It is of interest to note that Mr. Kendrick, who has had a rather intimate contact with his property for a number of years in a study of its economic possibilities, had at one time borne similar relations with the purchasing road, the St. Louis-San Francisco. The financial plan for the reorganization of the International & Great Northern and a discussion of its potentialities as an important carrier were treated at some length in an article appearing in the *Railway Age* of June 10, page 1748, and supplemented in the issue of October 28, page 811.

The International-Great Northern lies entirely in Texas. It comprises a main stem 495 miles long, extending from Longview, Texas, to Laredo, with a connection from Palestine to Houston, 150 miles, and a line from Fort Worth to Houston, 272 miles. There is also a small mileage in three or four branches. Trackage rights over the Galveston, Houston & Henderson afford a connection to Galveston. An inability to obtain adequate funds for capital expenditures and the necessity for curtailing the outlay for maintenance have resulted in a physical condition of road equipment which does not enable the railroad to handle the traffic offered to the best advantage. Five million dollars expended for heavier rails, ballasting and embankment widening and for some additions to power during the course of the receivership, beginning in 1914, has served to effect some improvement, which will be amplified by further expenditures made possible as a result of the reorganization plan, which contemplates improvements in the physical property, the development of traffic and increased efficiency of operation.

The traffic of the International-Great Northern consists primarily of wheat, cotton and forest products. The greater part of the wheat is received in interchange at its northern terminii and delivered to seaboard at Galveston. This is true in part of the cotton traffic, but a considerable portion of this originates on its own lines which traverse an important cotton-producing territory. This is true in a measure also of the traffic in lumber and other forest products. There is also a considerable movement of manufactured products and oil and a growing vegetable business, the latter originating largely in the territory immediately to the north of Laredo. The principal source of strength to which the International-Great Northern may lay claim is its service as a connection between the Gulf ports and the Mexican gateway at Laredo, and the railroads with which it connects at For Worth and Longview, this being the function which it was orginally designed to perform as a part of the Gould system in conjunction with the Missouri Pacific, the Cotton Belt and the Texas & Pacific.

It is in this capacity as a connecting link that it has developed an important through passenger service. By traffic arrangements with the Missouri Pacific and the Texas & Pacific, through passenger trains are run between the junction at Longview, and Galveston and Laredo, that afford through service between St. Louis and the Gulf and Mexico City.

It is also in this function as the connecting link that the International-Great Northern will prove of great value to the St. Louis-San Francisco, a physical connection at Fort Worth, Texas, providing the means by which the St. Louis-San Francisco will be afforded a through line to the seaboard at Galveston and a connection with the National Lines of Mexico at Laredo. This will be of particular advantage in the grain movement to the Gulf, affording the Frisco a long haul on export wheat, which undoubtedly will make it of advantage for that road to develop this routing of the wheat movement to the maximum. This also applies to the cotton business originating on the Frisco lines in Texas and Oklahoma. It will also provide the means of developing a northbound movement of lumber, vegetables and other products originating in either Texas and Mexico, as well as the traffic to be received from shipping at the port of Galveston.

Freight Car Loading

WASHINGTON, D. C.

THE NUMBER OF CARS loaded with revenue freight continued during the week of December 9 to be in excess of all previous records for the corresponding period of the year. The total was 919,828, or 178,487 more than for the corresponding week of last year and 81,875 more than for 1920. The loading was in excess of that for 1920 in all districts except the Pocahontas and in all classes of commodities except coal, coke and ore. The loading of miscellaneous freight was 50,000 cars above that for the corresponding week of 1920 and grain loading, 55,608 cars, was greater than it had been for several weeks, but coal loading, 200,505 cars, was slightly less than it has been in some earlier weeks.

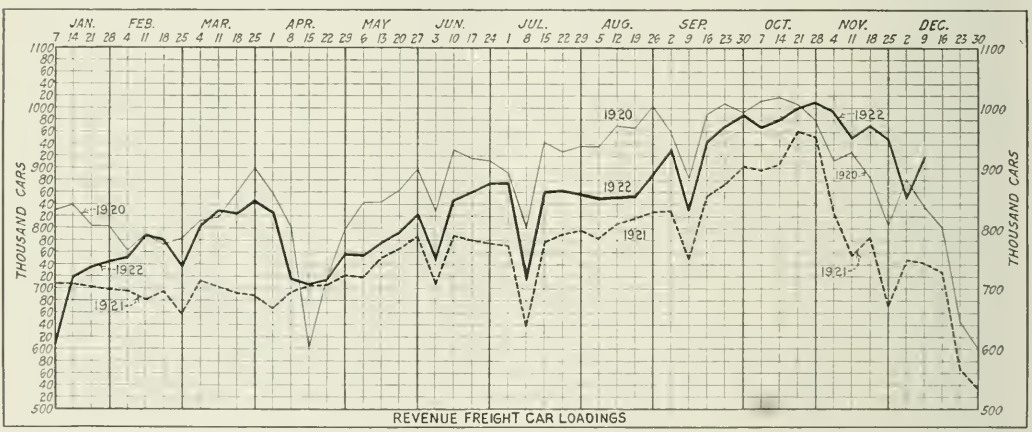
The freight car shortage for the period November 30-December 8 averaged 111,961, a decrease of 21,825 as compared with the previous week. This included 56,711 box cars and 37,613 coal cars. The surplus was 6,657.

The number of freight cars in need of repairs continues steadily to decrease. On December 1, 226,288 freight cars, or 9.9 per cent of the cars on the line, were in need of repairs. This was a decrease of 9,372 cars since November 15. Cars in need of heavy repairs totaled 176,006, compared with 187,596 on November 15, or a reduction of 11,590. Cars in need of light repairs numbered 50,282, which was an increase of 2,218. On December 1 last year 320,292 cars, or 14 per cent of the total number on line, were in need of repairs. Since July 1 last, the date on which the strike of railway shopmen began, there has been a reduction of 98,298 cars in the number in need of repairs.

From November 15 to December 1, the railroads repaired and turned out of their shops 13,484 locomotives. This was within six locomotives of the greatest number repaired during any semi-monthly period in approximately the last two years, and exceeded by 1,345 the number turned out of the shops during the first half of November this year.

Locomotives in need of repair on December 1 last totaled 18,009, or 27.9 per cent of the number on line. This was a decrease of 347, compared with the total number on November 15, at which time there were 18,356, or 28.5 per cent.

Of the total, 14,450 were in need of heavy repairs, a decrease since November 15 of 670 locomotives, while 3,559 locomotives required light repairs, an increase of 323. Serviceable locomotives on December 1 totaled 46,525. This was an increase of 424 over the number serviceable on November 15.



REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY DECEMBER 9TH, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year, 1922	Corresponding year, 1921	Corresponding year, 1920
Eastern	1922	10,953	4,358	59,951	2,496	6,491	1,469	64,752	82,720	233,090		
	1921	9,822	3,998	41,390	1,632	5,134	1,241	63,769	60,929		187,915	205,265
Allegheny	1922	3,563	3,606	56,317	6,665	3,506	3,308	46,702	74,049	197,716		
	1921	3,271	3,976	41,014	3,401	2,663	2,422	45,182	50,571		152,500	185,445
Pocahontas	1922	242	119	20,204	621	1,512	140	5,961	3,140	31,939		
	1921	264	160	15,151	171	1,249	21	5,803	3,110		25,929	33,583
Southern	1922	3,917	2,287	22,415	1,224	22,831	1,195	38,564	42,000	134,433		
	1921	3,577	2,019	15,262	478	16,560	531	37,958	35,494		111,879	126,524
Northwestern	1922	17,160	10,532	10,835	1,608	14,009	847	25,802	32,024	112,817		
	1921	13,947	8,582	7,125	730	12,083	333	26,650	24,727		94,177	99,011
Central Western	1922	14,578	13,884	25,118	291	6,934	2,426	31,436	47,514	142,171		
	1921	13,157	10,194	15,274	164	5,179	714	30,877	34,429		109,988	122,725
Southwestern	1922	5,193	3,394	5,765	146	7,922	494	15,175	29,581	67,662		
	1921	4,475	2,633	2,999	95	6,606	722	16,182	23,241		58,953	65,400
Total Western Dists.	1922	36,933	27,800	41,718	2,045	28,855	3,767	72,413	109,119	322,650		
	1921	31,579	21,409	25,398	989	23,868	1,769	73,709	84,397		263,118	287,136
Total all Roads	1922	55,608	38,170	200,505	13,051	63,195	9,879	228,392	311,028	919,828		
	1921	48,513	31,562	138,215	6,671	49,474	5,984	226,421	234,501		741,341	
	1920	35,725	32,225	229,950	13,789	49,593	18,431	197,642	260,598			837,953
Increase compared	1921	7,095	6,608	62,290	6,380	13,721	3,895	1,971	76,527	178,487		
Decrease compared	1921											
Increase compared	1920	19,883	5,945									
Decrease compared	1920			29,445	738		8,552					
December 9th	1922	55,608	38,170	200,505	13,051	63,195	9,879	228,392	311,028	919,828	741,341	837,953
December 2nd	1922	49,341	34,381	186,158	13,075	60,010	10,550	199,717	291,987	845,219	741,849	882,604
November 25th	1922	54,790	40,217	202,032	13,234	66,046	15,052	228,771	335,353	955,495	673,465	803,701
November 18th	1922	55,304	40,715	205,034	12,431	61,403	32,780	228,922	332,595	969,094	790,363	889,138
November 11th	1922	52,501	38,001	188,317	12,273	60,302	39,383	228,050	334,997	953,909	755,777	927,586

Compiled by the Car Service Division, American Railway Association.

Labor Problems From An Engineer's Point of View*

With Particular Reference to His Position as an Intermediary As Between Labor and Capital

By Elisha Lee
Vice-President, Pennsylvania Railroad

The engineer in our present industrial system generally occupies a leading position in what we commonly refer to as management. He is entrusted with the determination of policies for successfully guiding and directing the work of large numbers of men. He is in turn responsible for creating and maintaining an output satisfactory as to quantity, quality and cost per unit, and in the case of public utilities, for continuity and safety of operation.

Necessarily, these responsibilities include the building up and holding together of a working force, adequate, but not excessive, in numbers, loyal and willing in spirit, and capable of maintaining a satisfactory rate of production. This means that the engineer must not only devise labor and operating policies which are sound on paper, but must convince his working forces of their reasonableness and fairness. From this viewpoint, part of the engineer's equipment is, or should be, an adequate understanding of human nature, and a real knowledge of the causes which contribute to labor unrest or contentment.

At present, and for some time back, the engineer, confronted with the problems which I have endeavored to sketch, has been obliged to cope with practically a universal demand for lower unit costs. The people want, and in some cases are insistently demanding, lower prices for manufactured articles and commodities and lower rates for service. It is hardly necessary for me to say that this expectation cannot be realized unless we can find some means of effecting lower labor costs, either in the form of readjusted wages, increased production per man hour, or both. This arises from the fact that labor is not only the largest individual item entering into costs, but if we analyze the cost of any product sufficiently, we shall find that labor represents ultimately nearly all the cost. Anthracite coal in the ground is worth only a few cents per ton—at least that is the basis upon which anthracite-bearing land is bought and sold. Anthracite in your cellar is worth $15 or $16 per ton. Practically all of the difference represents wages or compensation for labor or effort paid to different people handling the coal between the workings of the mine and the bin of the consumer. In other words, the cost delivered is largely labor. In the case of the railroads, their own payrolls constitute about 60 per cent of the total costs of operation, and fuel and material costs, which make up nearly all the other expenses, are in themselves almost altogether wages paid to other workers.

The main problem in reducing costs, whether of products or services, lies, therefore, in obtaining the co-operation of labor. Thus far, that co-operation has not been forthcoming with sufficient readiness to make satisfactory progress. We have in this connection two general factors to deal with. One is the attitude of labor unions, and the other is the restriction of immigration. The latter is a matter of public policy and, therefore, beyond control of the engineer as an engineer.

Collective Bargaining, or Collective Coercion

Collective bargaining, in some form or another, is with us and I, for one, see little likelihood of its abandonment. It probably represents the only practicable basis by which the labor relationships of large masses of workers can be dealt with and adjusted. The thing is to distinguish between collective bargaining and collective coercion. Unfortunately, we have had a good deal of the latter; so much so that certain large and important groups of workers have been able to retain, in practical entirety, the highest inflated wage scales which prevailed during the war. We must cure that condition by a process of education, and by directing the pressure of public opinion against the attitude of those groups of workers who persist in substituting coercion for bargaining in their collective relations with society.

How unbalanced the present situation has become may be gathered to some extent from the fact that, while labor in the great organized crafts is receiving about two and one-half times pre-war wages, the farmer is receiving only 64 per cent of what he received for his products in pre-war times. These and other inequalities have set up strains in our social structure which will be very dangerous unless relieved in time. Capital is bearing a very large part of our tremendous tax burden, and, consequently the real return obtainable for its use is less than in pre-war times.

Capital is the savings of those who produce more than they consume; therefore, we are penalizing thrift on the one hand, and, by maintaining excessive wage scales and tolerating inefficiency in output, we are on the other hand placing a premium upon selfishness and waste.

The engineer is responsible not only to the owner of the enterprise in which he is engaged, but to society as a whole, for the cost of the output which society needs. The great task, therefore, is to devise ways and means for bringing the labor costs of products and service into a reasonable relationship with the capacity of the general public to pay. The problem is sometimes referred to as that of bringing down the cost of living. It might be more accurate to describe it as bringing living costs again into conformity with economic law. The present living costs are out of harmony with economic law and are filled with inequalities and injustices largely because many labor costs are being held artificially high.

The Divided Allegiance of Labor

The fundamental problem, which I do not believe is hopeless of solution, is to bring the leaders of labor into acceptances of the truth that labor must conform to the same economic principles as all the rest of society; that otherwise society is on an insecure basis, and disaster to all is certain sooner or later to come about.

If we can achieve acceptance of this truth, we shall then have ended the divided allegiance of labor, between the union on the one hand and the employing industries on the other, which is the basis of most of the present inefficiency and excessive costs. We shall have both forces working to the same end, which is to increase the output and distribution of the product, because it will then be understood that wages can only be paid out of production.

While, according to historians, strikes and other concerted labor movements to obtain more satisfactory working arrangements were not unusual, from about 2000 years B. C. up to modern times in the old country, in our own country the condition of labor unrest did not assume definite form

*Abstract of an address delivered at the meeting of the Technology Clubs, Associated, New York City, Friday Evening, December 15, 1922.

until the early part of the nineteenth century, and was of no particular importance in our economic life until about the outbreak of the Civil War. Since that time the matter of unrest among laboring men has grown in a manner corresponding rather closely to the growth of the so-called factory system of industry, where capital, management and labor are rather distinct individual groups.

It will be recalled that, up to about the beginning of the nineteenth century, industrial plants were small and the owner was not only the capitalist, but also manager and one of the workmen. Therefore, these conditions of employment, constituting an intimate relationship between management and men, deserve serious consideration in determining the policy for the handling of men under our present industrial system.

Desire for Increased Wages Not Greatest Cause of Strikes

I feel that we are often very much misled by the expressed demands involved in concerted labor movements, rather than the underlying cause for these demands. It is, for instance, a rather popular idea that the predominating cause of strikes is a desire for increased wages. As a matter of fact, the element of wages is, certainly in a very large percentage of strikes, only injected after the organization has been completed and functioning for some time. Many strikes are called without any mention of wages at all. There is a deeper cause than either wages or hours of labor, or even many of the demands calculated to improve working conditions. *I believe the chief underlying cause of labor unrest making itself felt in the form of labor unions, or other concerted labor movements, is the human desire to have an unoppressed voice in all deliberations where labor policies are involved.*

The same spirit, it seems to me, which has prompted men in overthrowing kingdoms in the old country from time to time, and particularly since the war, and in fighting to a successful conclusion the Revolutionary war in our own country, is quite as pronounced in the hearts of men with regard to their industrial life. They want to feel that they are a part of industry, have a perfect right to be consulted and to have their views and desires given the same thoughtful and sympathetic consideration that they received during those 300 years when this country industrially was in the state where the capitalist was also manager and co-worker.

There have been some experiments along this line in the form of working arrangements, commonly known as Employee Representation plans, where employees have been given unhampered right to select representatives to help mould the labor policy, and, as far as I have been able to learn, wherever management "threw the cards on the table" and placed these men on their honor, they have proved themselves honest, thoughtful and practical.

There are many other labor problems which the engineer has to cope with, particularly the selection and training of foremen, and their superiors, but, to my mind, no great progress will be made toward the elimination of the present state of unrest unless we establish an effective substitute for that condition where the employee was in position to present his point of view directly to management and have it given careful and sympathetic consideration.

THE ANTHRACITE TONNAGE of the Lehigh Valley Railroad since the resumption of mining—September 15 to December 16—has been greater than in either 1921 or 1920. The total was 3,568,494 tons; 643,196 tons over 1921 and 302,074 tons over 1920. A statement issued by the road says that "at no time since the resumption of mining has there been any suspension because of a shortage of empty coal cars at the mines, and all coal produced has been moved promptly."

Standardization From the Consumer's Point of View*

By N. F. Harriman

ONE OF THE MOST modern aids to industry is standardization, which is now recognized as being of the greatest importance to both producer and consumer. It is sometimes said that the benefits of standardization are mainly to the field of production. This is not the case. They are quite as important to both the field of buying and of selling. In industrial standardization it is the consumer who is ultimately benefited most, but the immediate benefits are largely to the producer, for it at once simplifies his work and enables him to produce what is required by the consumer cheaply and expeditiously. With lower production costs comes more extended use of the standard article, for it is a law of economics that when costs increase substitutes are used.

Objectors to standardization frequently urge that it would stifle initiative and progress and that the adoption of a standard prevents advance through improvements in the arts of manufacture. Of course this is not the case. A standard should remain standard only until something better is developed, but it should not be changed until justified from all points of view. Any given standard, to achieve its object, must be suitable for the intended use in the majority of cases. The exceptional case requires special consideration, and actual perfection will never be attained. The economies and benefits of standardization as applied to qualities of products and processes of manufacture have been so thoroughly demonstrated within the past few years that they are entirely outside the argumentative field. Standardization, like efficiency, is not an easy term to define; it is not always understood in its true sense and by many is looked upon with doubt and suspicion. The general idea of standards is not new, but its application to science, engineering and industry has been developed within comparatively recent years.

Standardization may be defined as the unification of the methods and practices involved in manufacture, construction and industry, and all lines of endeavor which present the necessity of repetition work. It may be considered under several aspects.

Standardization of nomenclature enables buyer, seller and manufacturer to use and understand the same language. It is very important that there be acceptable definitions of terms used in specifications and contracts. Purchasing is often done by persons who are quite familiar with the legal side of drawing up contracts, but who are not familiar with the technical details involved. The efficiency of many purchasing officers is lessened by their lack of knowledge of the nature and names of the articles they are intrusted to buy.

Standardization of variety, or simplification, involves the elimination of unnecessary types, shapes, grades and sizes of manufactured articles. Waste in industry is largely due to an over-multiplicity in the number of products, as well as to inefficiency of process. Waste due to idle stocks of material and products through deterioration, obsolescence and capital charges carried is large, especially with large stocks.

Dimensional standardization insures ready interchangeability of supplies and the proper inter-working of parts which may be manufactured or assembled by different manufacturers.

Standardization of specifications and methods of test puts bids on an easily comparable basis, promotes fairness in trade competition, and insures the proper grade of material for a given use.

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*From a paper presented at the National Exposition of Chemical Industries, New York, September 15. The author is engineer-physicist, U. S. Bureau of Standards and Technical Secretary, Federal Specifications Board.

The definitely standardized product is manufactured to meet particular wide needs, according to definite specifications, and is constantly tested to ensure its being up to standard grade. The ordinary purchaser is not an expert on quality of supplies, and in many cases the quality can be lowered and he would be none the wiser until the material is put into service.

One type, shape, grade or size of an article will not meet all the requirements of the consumer, neither is it desirable to have such an extensive variety that the differences are small and meaningless. The ideal condition is to have just enough variety to meet all the real needs with no overlapping. Sound industrial economy demands the elimination of the special or little used product and its substitution by the standard or most widely used and most efficiently produced goods.

Standardization of specifications is the most important phase of the subject, from the purchaser's viewpoint. It is the first and most essential step in the economy that arises from the purchase of materials or supplies in large quantities, and is a necessary factor in the improvement of the quality of materials purchased and the adaptation of quality to definite uses. The specification is the common meeting ground for the manufacturer, dealer and user, and it is at once a statement of the users' needs and what the maker is required to supply. Purchase by competitive bids on specifications is preferable to purchase on sample. The latter method implies that each bidder's product must be considered independently and it is often a very difficult matter to decide between different combinations of quality and price. The specification should include limiting values for the properties necessary to meet the required service, with proper tolerances. A proper specification is one which enables bidders to know exactly what is desired or required and what procedure the purchaser will follow to satisfy himself that the specification has been complied with. Defective and incomplete specifications, whether due to compromise of quality for temporary economy, or through lack of data, should be replaced by those in which the best magnitude of each property involved is so specified as to predetermine the definite quality best meeting the need. There is a growing appreciation of waste in industry due to the use of defective and improper materials.

To determine the value of any material for a given purpose, its properties must be measured, assuming that the properties upon which its use depends are known and are measurable. The testing of materials may prove a needless waste of time, energy and money unless due consideration is given to the nature of the tests applied, the conditions under which they are made and the interpretation of results. It includes both qualitative and quantitative measurements. These may vary from a simple visual inspection to an investigation involving laboratory and technical work of the most difficult and precise nature. Standardized methods of test consider all of these conditions and are a necessary part of an ideal specification for a material or a manufactured article. Friction and controversy between buyer and seller often arise as to the question of facts concerning the results of tests, especially when different methods or different equipment are used. Quality may be determined directly by a service test, indirectly by a test under simulated service conditions, or still less directly by a laboratory test of individual properties upon which the quality is known or assumed to depend.

The selection and adoption of specifications or standards without due regard to the manufacturing problems involved would be equally as serious as for manufacturers to establish standards without a careful consideration of the needs of the purchaser.

With many large corporations, the standardization of purchases and the resulting simplification of store stock varieties of materials offer a fertile field for economy.

Ben W. Hooper Addresses Western Railway Club

Efforts of Radical Labor Leaders and Politicians to Destroy American Institutions Denounced

Nine-tenths of the people of the United States agree with President Harding that the functions of the United States Railroad Labor Board must be exercised by some tribunal, in the opinion of Ben W. Hooper, chairman of the board, who addressed the Western Railway Club at Chicago on December 18. But, he said, the general public is probably not greatly concerned as to what the tribunal shall be. The results in wages and working conditions because of the intervention of such a tribunal will not be much different than those likely to be worked out as a natural effect of unrestricted economic action and reaction, in Mr. Hooper's opinion. Such a tribunal will, however, justify itself by the tremendous saving in the cost of the process to the railroads, the employees and the public.

Mr. Hooper began his address with a brief summary of the nature of and the conditions surrounding the work of the Labor Board, in which he characterized the institution itself as a "unique experiment in legislation in this country," conducted under conditions as far from those normal to the industry as they possibly could be. The board, he said, began its work following the fitful period of government control and was charged with the responsibility of deflating wages and working conditions of the biggest industry in the country, which had just been subjected to extremely artificial handling. Mr. Hooper compared the situation of the board with that of a man thrown into a den of Nubian lions and Bengal tigers, with instructions to bring them into peaceful harmony, with no other agency than that of his bare hands.

But whatever may be said of the quality of its work, Mr. Hooper said, the record leaves nothing to be desired as to the quantity. Up to date the board has handled 11,114 cases, 10,453 of which were formally docketed, and has disposed of 9,244 of the total number, 8,534 of these being docketed cases. But the service of the board, he said, cannot be measured alone by the results of its formal decisions. In his opinion, the mere fact that the board existed has in itself been of tremendous service, because it has constituted a forum before which both parties to the contests have had the opportunity of discussing their contentions publicly and in a measure getting the burden off their own shoulders on to that of the labor board. This, he believes, has been of inestimable value in clearing the air.

Radical Labor Leaders

Mr. Hooper then paid his respects to radical labor leaders obsessed with the idea that they must back a political movement to destroy private ownership and hasten government ownership with either government or private operation. It is a serious question, he said, whether the type of morale

can be maintained among railway employees who follow such leadership, that is necessary to give the public the character of service it demands. The labor literature of today does not deal with questions pertaining to the work of the em-employees or those directly affecting wages and working conditions, but is largely devoted to the political aspects of the railway question and seeks to prejudice the employees against the managements and in favor of government ownership.

In making these statements, Mr. Hooper disclaimed any desire to criticize labor leaders for believing in government ownership. His criticism, he said, is aimed at some of the methods used to get it.

Mr. Hooper then referred to the so-called progressive convention held at Cleveland, Ohio, during the second week in December, the membership of which was made up of radical labor leaders and socialists. Continuing, Mr. Hooper said:

"There are not many thinking men who would like to have it said that they are not progressive and not many would want to admit that they are not conservative. A combination of these two characteristics meets the approval of the average American. A progressive who is not conservative is radical. A conservative who is not progressive is reactionary.

"A radical is a man whose normal gait is running away. He reminds one of the story of the man who had bought a new automobile, and overtaking an old colored friend on a country road, invited him to get in and ride with him. Thinking that he would give Uncle Eph a real thrill, he threw his machine wide open and was clipping off about 60 miles an hour. He lost control of the machine for the fraction of a second and the auto left the road and dashed into a tree, turned turtle and threw the occupants high and clear into a sand bank. They were jolted but not hurt. Uncle Eph arose and as he brushed off the sand, said, 'Boss, what pesters me is, how do you stop dat machine wha dey ain't no trees?' The radical element never got control of any government and run it very far without jumping the track and running into a tree.

"A reactionary is best described by the language of the old colored woman, who was asked where she was going. She replied: 'I ain't gwine nowha; I'se done been wha I'se gwine to.' A reactionary has done been wha he's gwine to and his eyes are fixed in satisfied retrospection on that place. Comparatively speaking, there is not a handful of reactionaries in the United States and the real conservatives are extremely scattering.

The "Conservative-Progressive"

"A conservative-progressive is a man who moves steadily forward, but keeps his eyes on the road ahead. This man is the typical American citizen. He is the man who founded this government, the man who preserved the Union and freed the slaves, the man who has developed our vast resources, and the man who today stands for the perpetuation of our form of government, and its adaptation to the changing conditions of men and things. Men of this type realize that society, industry and government cannot stand still. They must go either forward or backward. Such men are not enamored of stagnation nor affrighted by the rolling tide of human progress. The conservative-progressive cannot command the approval of either the radical or the reactionary. The fact that he moves at all disturbs the reactionary. The fact that he studies the chart of human experience and sweeps the sea with the searchlight of prudent investigation peeves the impatient radical.

"These so-called progressive policies, which involve vital changes in our form of government, are not progressive, but are, in every sense, retrogressive. The effort to deprive the courts of the power of injunction for the protection of life, property and the right of free men to work is simply a retrogressive movement to an age when there was no law but might. The meaning of it is that the courts of this country shall stand shackled and gagged in the presence of insolent and triumphant brute force.

"The proposition to confer judicial powers on Congress is, so far as constitutional questions are concerned, retrogressive. It tends to destroy the balance wheel which our forefathers fixed in the constitution, and would ultimately make both the judiciary and the executive subservient to congress. The most radical changes in our government could be speedily wrought and our nation would be headed toward an irresponsible mobocracy and its final sequent, an autocracy. The statesmen who drafted our constitution full realized the danger of self-destruction inherent in popular government, and they made the judicial department a sea-wall against destructive tidal waves of popular sentiment, which recedes as quickly as they rise.

"The so-called progressive convention at Cleveland last week was dominated by certain leaders of labor organizations, associated with prominent representatives of the Socialist party. It seems to me that the rank-and-file of railroad labor in this country would indulge in much serious thought before they permitted themselves to be delivered. It is worthy of note that certain of the railroad labor organizations were conspicuously absent from the Cleveland meeting."

Mr. Hooper then drew attention to the fact that in all history but two ways had ever been found to get men to work. The first is hope of reward. The second is fear of suffering. The first inspires initiative, which brings out freely the full powers of the individual. The extreme example of the second is human slavery. Slavery, Mr. Hooper said, is the ultimate results of socialism or communism, based on the destruction of initiative through the denial to the individual of the hope of reward. In Russia, he said, this reversion to slavery has already taken place in the form of conscript labor.

The Cleveland Socialistic Convention

Continuing, he said: "Not the least remarkable things about this Cleveland socialistic convention, which called itself progressive, was its proposed method of political procedure. It was given out that this organization, which is nothing more nor less than a political party, would not do business under its own name, but its adherents will participate in the nominating primaries of either or both the republican and democratic parties. Then if the nominations are not satisfactory, independent candidates may be put out. Such a proposition is fraught with the gravest political danger. It might easily result in the election of a large number of public officials by a minority of voters. If a majority of the voters of a district were opposed to radicalism but were divided between the two old parties, such an organized radical block might elect candidates by adding this minority vote to the anti-radicals who would slavishly adhere to the party label. Of course, it is obvious that the success of this minority radical movement is entirely dependent on the assumption that those opposed to it will not pursue the same tactics.

"With a situation of this sort in mind, it was recently suggested by Frank Munsey that a new party movement under the name of the democratic-republican party should be launched. This would hardly seem to be impracticable, but it would be perfectly feasible, wherever necessary, to set up an organization of conservative-progressive citizens, which would offset the radical organization, operate effectively in primaries and elections, and stiffen the backbone of weak-kneed candidates who might be intimidated by the organized radical minority.

"By such a course, can men who cherish the traditions of our country, protect our institutions from the assaults of radical malcontents."

Consolidation Locomotive Weighing 301,500 lb. and Having a Tractive Force of 68,200 lb.

Powerful Consolidation Locomotive for the L. & N. E.

Unusually Heavy Weight and High Tractive Force with Well-Proportioned Boiler Are Special Features of This Design

Comparatively few locomotives of the 2-8-0 type have been built during recent years for use on American railways. While this was a popular type of freight locomotive for a long period, it has largely been superseded by the Mikado type because of the increased depth of firebox and length of boiler banel, with correspondingly increased boiler capacity, which can be obtained when a trailing truck is added. However, the Consolidation locomotive is still a highly desirable type where high tractive force combined with low total weight is the important factor as it is where heavy trains, moved at slow speeds, comprise the bulk of the traffic. By careful designing, a boiler of sufficient capacity can be obtained for such service if road clearance does not impose too many restrictions.

Conditions on the Lehigh & New England are especially suited to the operation of Consolidation type locomotives. Most of the traffic is drag freight. Since the road is close to the coal mining section fuel is relatively cheap. The vertical clearance of 15 ft. 8½ in. gives room above the driving wheels for a boiler of large diameter with a deep throat sheet. The bulk of the power is of the Consolidation type and in adding to the number of its locomotives it was decided to adhere to the same type, but to increase the capacity over that of the older locomotives, which had 208,000 lb. on the drivers.

The four Consolidation type locomotives built by the American Locomotive Company which this road has placed in service recently are excellent examples of well-designed engines to meet special conditions. Weighing 301,500 lb. with 279,000 lb. on the drivers, they are the heaviest Consolidation locomotives ever constructed. The previous record for size with this type was made by the locomotives built by the Baldwin Locomotive Works for the Western Maryland and described in the *Railway Age*, May 13, 1921. In several particulars the weights and dimensions are the same for the two designs. Both have 27-in. by 32-in. cylinders, 61-in. drivers, 17-ft. 6-in. driving wheel base, and a rated tractive force of 68,200 lb. The Lehigh & New England locomotives have boilers with a larger grate area and more heating surface, which is reflected in the increase of 6,600 lb. in weight.

The height from the rail to the center of the boiler is 10 ft. 4 in. and to the top of the stack is 15 ft. 8½ in. The firebox is 126⅛ in. long by 96¼ in. wide, while the height from the bottom of the foundation ring to the crown sheet is 83½ in. at the front and 57¼ in. at the back, which gives a fair firebox volume and sufficient space for the application of a brick arch. There are 301 2-in. tubes and 50 5⅜-in. flues.

Dimensions, Weights and Proportions

Type	2-8-0
Service	Drag freight
Cylinders, diameter and stroke	27 in. by 32 in.
Valves, kind and size	Piston — 14 in.
Weights in working order:	
On drivers	279,000 lb.
On front truck	22,500 lb.
Total engine	301,500 lb.
Tender	184,100 lb.
Wheel bases:	
Driving	17 ft. 6 in.
Total engine	26 ft. 11 in.
Total engine and tender	65 ft. 2 in.
Driving wheels, diameter outside tires	61 in.
Boiler:	
Type	Straight top
Steam pressure	210 lb.
Fuel, kind	Soft coal
Diameter, first ring, inside	88 in.
Firebox, length and width	126⅛ in. by 96¼ in.
Tubes, number and diameter	301 — 2 in.
Flues, number and diameter	50 — 5⅜ in.
Tubes and flues, length	15 ft.
Grate area	84.3 sq. ft.
Heating surfaces:	
Firebox, including arch tubes	271 sq. ft.
Tubes and flues	3,395 sq. ft.
Total evaporative	3,666 sq. ft.
Superheating	901 sq. ft.
Comb. evaporative and superheating	4,567 sq. ft.
Tender:	
Water capacity	10,000 gal.
Coal capacity	16 tons
General data, estimated:	
Rated tractive force, 85 per cent	68,200 lb.
Cylinder horsepower	2,755 hp.
Boiler horsepower	2,420 hp.
Speed at 1,000 ft. piston speed	34 m.p.h.
Coal, rate per sq. ft. grate per hour	106 lb.
Weight proportions:	
Weight on drivers ÷ total weight engine	92.6 per cent
Weight on drivers ÷ tractive force	4.08 lb.
Total weight engine ÷ tractive force	4.42
Total weight engine ÷ cylinder horsepower	109.4 lb.
Boiler proportions:	
Boiler horsepower ÷ cylinder horsepower	87.9 per cent
Comb. heating surface ÷ cylinder horsepower	1.66
Tractive force ÷ comb. heating surface	14.93
Tractive force × dia. drivers ÷ comb. heating surface	911
Cylinder horsepower ÷ grate area	32.7

The total evaporative heating surface is 3,666 sq. ft., of which 271 sq. ft. is in the firebox. The superheater has 901 sq. ft. heating surface. The rated boiler capacity is 2,420 hp., or 88 per cent of the cylinder power, which is 2,755 hp.,

a proportion which has been found to be ample for the conditions under which these locomotives are operated.

Of the total weight of the locomotive 92.6 per cent is on the drivers and available for adhesion, whereas with the typical Mikado locomotive the weight on the drivers is nearer 75 per cent. The factor of adhesion is 4.08. The possibilities of excellent use of the weight by a Consolidation type is shown by the fact that the total weight is only 109.4 lb. per cylinder horsepower and 4.42 lb. per pound of rated tractive force, figures that can scarcely be equalled by a locomotive of the 2-8-2 type.

Two of these locomotives are hauling coal trains of 3,500 gross tons from Lansford to Pen Argyl, a distance of 54 miles, part of which is up a 0.5 per cent grade, at a speed of approximately 20 m. p. h. Two others are running out of Pen Argyl and handling 690 gross tons up a 2.75 per cent grade without difficulty. While no test runs have been made, it has been observed that these locomotives are free steamers, of ample boiler capacity and consume a conservative amount of fuel.

The leading dimensions, weight distributions and proportions of these locomotives are given in the accompanying table.

Another Perfect Package Campaign

THE USE OF STEEL strapping or wire binding on boxes of shoes, clothing, confectionery, groceries and other things is looked upon by many shippers, not as an added expense (as compared with boxes not reinforced) but as an improvement in service which more than pays for itself. This fact, demonstrated by extensive inquiry, is the salient point in a circular which has been issued by Lewis Pilcher, secretary of the American Railway Association's Committee on Freight Claim Prevention, and sent to boards of trade, chambers of commerce and other shippers' organizations all over the country. Whether or not Mr. Pilcher would call it a "campaign" we do not know; but his circular contains a picture showing a pile of a dozen boxes, properly strapped and wired, which might well enlist the careful attention of any shipper interested in getting his goods into the buyers' hands in the best possible condition. Perhaps this effort might be called a movement for super-perfect packages.

With merchants or manufacturers who have not carefully investigated the cost and the results of using adequate reinforcements on boxes, the first impression may be that such an addition to ordinary boxing is merely an extra expense to head off thieves, and, therefore, is of interest only to the carrier. The carrier must bear the loss if boxes are tampered with or stolen, therefore let him provide the protection. But the carrier cannot with any reasonable economy go into the shipper's packing-room; and even if he could, the objection of the shipper to his presence there would, usually, be strong. That is one reason for not asking the carrier to take action. Another is that the shipper will find that strapping and wiring are profitable, therefore he will not wish for anybody's assistance in the matter.

A business may be so small that this argument would not be susceptible of complete demonstration mathematically; and a saving, where it is accomplished, may sometimes show itself in so many different elements, or may be spread over such a considerable period of time, that only a careful study will give full assurance of success; but the essential fact remains, nevertheless. Mr. Pilcher gives parts of numerous letters received from shippers who are using wires and straps, from which we quote:

"We would not under any circumstances permit a case to leave our establishment unless fully strapped in accordance with our system. The result of this is shown by the few claims we have had in the past 20 years with railroads although we are one of the largest shippers in the industry."—Clothing manufacturer.

"We find that our claims for damages and losses of goods due to pilfering have been reduced to such an extent that we have almost forgotten how to make out claims for loss in transit. In considering the amount of goods lost and the number of claims that we made before using the straps, we think this in itself is worthy of consideration, also combining it with satisfactory service to our customers."—Manufacturing confectioner.

"We have been using steel band strapping on boxes of groceries for seven years and under no circumstances would we discontinue the use of it."—Large wholesale grocery house.

"Never had to file a claim for damage by bursted container—considered cheap insurance."—Phonograph manufacturer.

The Union News Company uses band strapping and finds "That had order complaints have been reduced 75 per cent."

"Our experience has been that this wire binding, even though it is only one strand to each case, strengthens it very considerably

Examples of Well-Protected Boxes

and transports it in a very satisfactory manner."—Drug house.

"Since using steel strapping, we have had very few claims for loss by pilferage and no complaints from customers owing to poor packing condition. Bands when placed on center of case give strength where most needed."—Manufacturer of underwear.

"Since using strapping our loss claims have been reduced 75 per cent."—Shipper of underwear.

The Freight Container Bureau, A. R. A., has made experimental studies of the strength of boxes, and Mr. Pilcher calls attention to the fact that a box of a given strength can often be made of thinner boards if reinforced by wire or strap, and the addition of these makes the package safer against theft. Pilferers show a marked preference for unprotected packages. The average buyer will give preference to the wholesaler whose shipments arrive uniformly in good condition. Wholesalers testify to the value of this element in holding custom. Its cost is small. With modern methods and apparatus, large cases of dry goods are strapped in less than a minute each.

Railroad men, of whatever branch of the service, who are interested in a smooth-working freight department, will do well to spread this information among all classes of shippers whose goods would be benefited by the improvement.

Labor Board Announces New Rules for M. of W. Men

Previous Orders Regarding Overtime Approved—Labor Member Dissents—Chairman Files Answer

NEW RULES governing the working conditions of maintenance of way employees and dealing specifically with the subjects of seniority, promotion and, in part, hours of service, overtime and call, were announced by the Railroad Labor Board during the past week. At the same time the Board approved its previous rulings on the subjects of punitive overtime, discipline and grievances and other miscellaneous conditions, bringing another dissenting opinion from A. O. Wharton, member of the labor group on the Board. In December, 1921, the Labor Board, in its Decision No. 501, promulgated a set of new rules to take the place of the old maintenance of way national agreement. The outstanding rules announced at that time included provisions for the payment of punitive overtime after the tenth hour, instead of after the eighth hour on continuous service as had been the case under the old national agreement, and for the revision of other rules of the national agreement so that the subjects involved might be left open for adjustment to fit peculiar local conditions. This decision was described in the *Railway Age* of December 17, 1921, page 1215.

The present ruling of the Board continues in effect the following articles and sections of this previous Decision No. 501:

All of Article I, involving the scope of the rule.

All of Article IV, involving questions of discipline and grievances.

Sections a1, a2, a3, a5, a6, a8, d1, d2, e, f, i, j, k2, l, m, n, o, p, q, of Article V, involving hours of service, overtime and calls.

Sections a to h, inclusive, and Section m of Article VI, involving general rules.

The new rules promulgated by the Board at this time include the following:

ARTICLE II—SENIORITY

Sec. (a) Seniority begins at the time the employee's pay starts.

Sec. (b) Rights accruing to employees under their seniority entitle them to consideration for positions in accordance with their relative length of service with the railroad, as hereinafter provided.

Sec. (c-1) Seniority rights of employees are confined to the subdepartment in which employed.

Sec. (d-1) Seniority rights of laborers, as such, will be restricted to their respective gangs, except when force is reduced laborers affected my displace laborers junior in service on their seniority district.

Sec. (d-2) Seniority rights of laborers to promotion will be restricted to the territory under the jurisdiction of only one supervisor or other corresponding officer, except that for laborers in the mechanical department such rights will be confined to the place where employed.

Sec. (e) Seniority rights of supervisory forces in the bridge and building department will extend over the territory under the jurisdiction of one division superintendent.

Seniority rights of supervisory forces in the track and roadway departments will extend over the territory under the jurisdiction of one roadmaster.

Seniority rights of supervisory forces over laborers in the maintenance of equipment department will extend over the territory under the jurisdiction of one master mechanic.

Sec. (f) Employees assigned to temporary service may, when released, return to the position from which taken without loss of seniority.

Sec. (g) Seniority rosters of employees of each subdepartment by seniority districts will be separately compiled. Copies will be furnished foremen and employees' representatives and be kept at convenient places available for inspection by employees interested.

Sec. (h) Seniority rosters will show the name and date of entry of the employees into the service of the railroad, except that names of laborers will not be included and their seniority rights will not apply until they have been in continuous service of the railroad in excess of six (6) months.

Sec. (i) Rosters will be revised in January of each year and will be open to correction for a period of sixty (60) days thereafter.

Sec. (j) Employees given leave of absence in writing by proper authority of the railroad, for six (6) months or less, will retain their seniority. Employees failing to return before the expiration of their leave of absence will lose their seniority rights, unless an extension has been obtained.

Sec. (k) When employees laid off by reason of force reduction desire to retain their seniority rights, they must file with the officer of the subdepartment notifying them of the reduction, their address, and renew same each sixty (60) days. Failure to renew the address each sixty (60) days or to return to the service within seven (7) days after being so notified, will forfeit all seniority rights.

Sec. (l) Employees temporarily transferred by direction of the management, from one seniority district to another will retain their seniority rights on the district from which transferred.

Sec. (m) In case of change in seniority districts, a relative proportion of the total employees affected will be transferred to, and their seniority rights adjusted in, the revised district, by the management, with a properly constituted committee representing the employees.

Sec. (n) Employees accepting positions in the exercise of their seniority rights will do so without causing extra expense to the railroad, except as provided in these rules.

ARTICLE III—PROMOTIONS

Sec (a) Promotions shall be based on ability, merit and seniority. Ability and merit being sufficient, seniority shall prevail; the management to be the judge.

Sec. (b) In transferring employees to fill vacancies or new positions, the provisions of section (a) of this article will apply.

Sec. (c) Employees are entitled to promotion only on the district and in the subdepartment over which their seniority rights prevail.

Sec. (d) Employees declining promotion shall not lose their seniority, except to the employee promoted and only in the next higher rank of service.

Sec. (e) Employees accepting promotion and failing to qualify within thirty (30) days may return to their former positions.

Sec. (f) New positions and vacancies will be bulletined within thirty (30) days previous to or following the dates such vacancies occur, except that temporary vacancies need not be bulletined until

the expiration of thirty (30) days from the date such vacancies occur.

Sec. (g) Promotions to new positions or to fill vacancies will be made after bulletin notice has been posted for a period of ten (10) days at the headquarters of the gangs in the subdepartment of employees entitled to consideration in filling the position, during which time employees may file their applications with the official whose name appears on the bulletin. The appointment will be made before the expiration of thirty (30) days from the date the bulletin is posted and the name of the employee selected will then be announced. New positions or vacancies may be filled temporarily, pending permanent appointment.

Sec. (h) The general rule of promotion and seniority will not apply to positions of track, bridge and highway crossing watchmen and flagmen at railway (non-interlocked) crossings, but, when practicable, such positions will be filled by incapacitated employees from any department, and reference in filling and retaining these positions will be determined by the degree to which incapacitated for other work, seniority in the service of the railroad and ability to perform the work.

ARTICLE V—HOURS OF SERVICE, OVERTIME AND CALLS

Sec. (c-1) The starting time of the work period shall be arranged by mutual understanding between the local officers and the employees' committee based on actual service requirements.

Employees' time will start and end at designated assembling points for each class of employees.

Sec. (h) Employees whose responsibilities and/or supervisory duties require service in excess of the working hours or days assigned for the general force will be compensated on a monthly rate to cover all services rendered, except that when such employees are required to perform work which is not a part of their responsibilities or supervisory duties, on Sundays or in excess of the established working hours, such work will be paid for on the basis provided in these rules in addition to the monthly rate. Section foremen required to walk or patrol track on Sundays shall be paid therefor on the basis provided in these rules in addition to the monthly rate.

Supervisory forces shall be compensated on the same overtime basis as the men supervised when the general force is required to work in excess of eight (8) hours per day.

Sec. (k-1) Where special work, not within the scope of this agreement, is done outside of regular work period and extra compensation agreed upon, overtime will not apply.

Sec. (r) Except as provided in these rules no compensation will be allowed for work not performed.

The request of the employees that a rule be incorporated in their agreements prohibiting the contracting of work to outside employees was denied by the board on the ground that its position with respect to this question "has been clearly and definitely set out in numerous decisions recently issued and that a further reiteration of such position is unnecessary."

A. O. Wharton Files Another Dissenting Opinion

Mr. Wharton, in his dissenting opinion, strenuously objected to the Board's reiteration of its ruling on overtime payments for service rendered on Sunday and seven designated holidays and establishing pro rate payments for the ninth and tenth hours when worked continuous with the regular work period.

After quoting under the caption "Lest We Forget" the recommendations of the Railroad Wage Commission, Mr. Wharton said:

The majority, in denying these employees punitive overtime rates for Sundays and the seven designated holidays and for service rendered in excess of eight hours, are at variance with the trend of modern thought. Wise employers have quite generally recognized the justice of the workers' plea. The federal, state, and municipal governments have almost uniformly recognized the principle of punitive payment for this overtime. Tribunals and boards of arbitration created and selected to pass upon this question are to be included in the long list, and society generally endorses this principle.

There is one notable exception, however, and that is the tribunal created by an act of Congress, obligated under oath to establish "just and reasonable" rates of pay and rules governing working conditions for railroad employees.

Railroad labor, notwithstanding the misstatements emanating from the paid propagandists in the employ of the so-called "hard boiled" group of carriers, does not seek preferential treatment, but does demand and has the right to expect fair and impartial consideration. That much and more they are entitled to.

Of course there is discontent and unrest among railroad employees when an examination of the decisions of this Board will disclose that there has been but one decision issued during its existence that represented any betterment of their conditions of employment, and that decision (Decision No. 2, increasing wage rates, effective May 1, 1920), did not give consideration to the increase in the cost of living by 16 per cent, primarily due to the fact that the information was not available until a date subsequent to the findings of the Board; but the employees never benefited from that fact in any subsequent decision of the Board. This statement must not be construed to mean that the Board has not rendered decisions sustaining employees in many of the disputes filed for decision; it does mean that all other decisions rendered represented no improvement over conditions which had been previously established by and through the various organizations representing employees, or were less favorable than the rules of existing contracts provided.

B. W. Hooper Defends Majority's Ruling

An answer to Mr. Wharton's dissenting opinion in the form of a statement by B. W. Hooper, chairman of the Board, was also attached to the decision. After pointing out that he had not voted for the rule providing for pro rata rates of pay for Sunday and holiday work because of his belief that time and one-half should be paid for Sunday work, *except* such work as is unavoidably and regularly performed on Sundays, and which is absolutely essential to the continuous operation of the railroad (the principle embraced in the Sunday and holiday rule of the shopmen), Mr. Hooper said:

The statement in his dissenting opinion to the effect that there is discontent among railroad employees, because they have not retained under the decisions of the Labor Board everything of rules and wages that they obtained during government control is not impressive. Practically nobody else in this country has succeeded in maintaining the prices and conditions of work and business built up during the stress of that abnormal period. Railroad labor and its representatives could well afford to mingle with their regrets over the comparatively little they lost a large degree of self congratulation over the great advances they have retained. In view of the sufferings and losses of the farmers and producers of the country, from which railroad labor has been largely exempt, the railway employees could consistently subdue their unrest and devote their enthusiastic exertions to the efficient service of the people who are paying for it.

It must also be remembered that many of the carriers have not been pleased with decisions of the Labor Board. Some of the most important decisions that have ever been rendered by the Board were favorable to the employees. For example, the Pennsylvania case and the contract cases, in both of which the Department of Justice at Washington is defending the rights of the employees on up to the Supreme Court.

When the constituted authorities are being criticized, for denying some of the contentions of a given class of citizens, it would be refreshing to make occasional mention of the fact that the same authorities have been equally as zealous in upholding the rights of that class. A degree of fairness along this line would obviate class hatreds, allay unrest, and strengthen loyal patriotism.

News Letter No. 9 has been issued by the Railway Fire Protection Association, E. A. Ryder, president, containing news items and other matters which have come to the attention of the officers since the annual meeting last October. Fires in freight cars constitute the subject of a short article in which operating officers are urged to see that empty cars, when left unattended, have their doors shut. One prominent road, in nine months, has recorded 28 fires in freight cars, with considerable losses; and of this number, 12 were discovered in cars with open doors. In view of experiences had on a number of roads during the past summer in the construction or management of temporary barracks for shopmen, there has been appointed a committee on emergency housing, of which P. A. Bissell, 65 Kilby street, Boston, Mass., is chairman. One of the suggestions in this pamphlet is that the sessions of the association, on the occasion of the annual conventions, should be limited to two hours in the morning and two hours in the afternoon "so that there would be less strain and tiresomeness."

A List of Salaries of Railroad Officers

Senate Committee Publishes Compilation Giving Compensation Before and After Federal Control

A LIST OF THE SALARIES of railroad officers, attorneys, publicity agents, and other employees receiving compensation amounting to $5,000 or more during the calendar years 1914 and 1917, and proportionate compensation for the ten months, March 1 to December 31, 1920, and for the first six months of 1921, together with the amounts and dates of any increase or decrease between March 1, 1920 (the date of the return of the roads from federal control), and June 30, 1921, is published in Volume 5 of the report of the hearings before the Senate committee on interstate commerce in its general railroad investigation under Senate resolution No. 23. The hearings were concluded on June 19 but the report has just been printed. The information as to salaries, etc., published as an appendix to the report, was furnished in sworn statements by the railroad companies, the entire list occupying 241 pages. Following is a list of the presidents or chairmen and also of other officers receiving at the rate of $20,000 or more per annum as shown in the report. There are some duplications in the printed list where men held various positions at different times and in some cases the total compensation can be found only by combining salaries received on various roads comprising a single system. Apparently also one or two roads reported the full year's compensation for the ten months of 1920 and the first six months of 1921 as the amounts shown are the same in both cases, and there are some other apparent errors in the compilation.

Some large roads are missing from the report. In some cases footnotes to the tables state that reductions in salaries were made later in 1921. Of all the officers named in this list about 50 received increases and about ten received decreases for the same position following the return of the roads.

Salaries of Railroad Officers

WASHINGTON, D. C.

ALABAMA & VICKSBURG

	Year ended Dec. 31, 1914	Year ended Dec. 31, 1917	Ten months Mar. 1 to Dec. 31, 1920	Six months Jan. 1 to June 30, 1921
D. D. Curan, pres. and g. m..	$17,500			
L. A. Jones, pres. and g. m....		$15,000	$16,666	$10,000

ANN ARBOR

Newman Erb, pres.....	5,000	7,500	7,750	6,000

ATCHISON, TOPEKA & SANTA FE

E. P. Ripley, pres.....	75,000	75,000		
W. B. Storey, pres.....			41,666	25,000
E. J. Engel, v. p.			20,833	12,500
S. T. Bledsoe, genl. coun'l....			25,000	15,000
Asst. general solicitor.....		20,000		
D. L. Gallup, compt.....	15,000	16,250	16,666	10,000
Gardiner Lathrop, genl. sol...	25,000	25,000	20,833	12,500
A. G. Wells, v. p.			25,000	15,000
F. C. Fox, g. m.	15,000	16,250	16,666	10,000
E. Chambers, v. p.	22,500	23,750	20,833	12,500
F. G. Pettibone, v. p. and g. m.	15,000	16,250	16,666	10,000

ATLANTA, BIRMINGHAM & ATLANTIC

E. T. Lamb, pres.		24,999		
B. L. Bugg, pres. and recr.....			15,000	2,785 4,000

ATLANTIC COAST LINE

H. Walters, chm. of the bd...	7,735	7,800	6,500	3,900
J. R. Kenly, pres.	17,850	18,000	16,333	10,000

BALTIMORE, CHESAPEAKE & ATLANTIC

T. Murdock, pres. and g. m...			2,970	1,980

BANGOR AND AROOSTOOK

	Year ended Dec. 31, 1914	Year ended Dec. 31, 1917	Ten months Mar. 1 to Dec. 31, 1920	Six months Jan. 1 to June 30, 1921
Percy R. Todd, pres.....	27,500	30,000	25,000	15,000

BELT RY. OF CHICAGO

H. G. Hetzler, pres.....	7,500	7,500	6,250	3,750

BESSEMER & LAKE ERIE

J. H. Reed, pres.....	10,000	25,606	26,840	7,590

BOSTON & MAINE

Morris MacDonald, pres.....	21,733			
J. H. Hustis, pres.....	13,266	35,000	37,500	22,500

BUFFALO, ROCHESTER & PITTSBURGH

W. T. Noonan, pres.....	40,833	50,000	41,666	30,000
J. F. Dinkey, aud. and treas...	15,000	15,000	13,333	10,000
T. F. Brennan, v. p.		10,333	13,333	10,000

BUFFALO & SUSQUEHANNA

H. I. Miller, chm. of bd.....	17,784			
E. R. Darlow, pres.....	10,714	34,700	12,250	7,350

CAROLINA, CLINCHFIELD & OHIO

Mark W. Potter, pres.....	15,000	20,000	6,277	
Norman S. Meldrum, pres....			5,388	4,999

CENTRAL OF GEORGIA

W. A. Winburn, pres.....	14,611	20,000	25,000	15,000
A. R. Lawton, v. p.....	10,000	10,000	16,666	10,000

CENTRAL VERMONT

E. C. Smith, pres.....	12,000	12,000	10,000	6,000

CHARLESTON & WESTERN CAROLINA

F. B. Grier, pres. and g. sol...	4,200	6,000	7,333	5,000

CHICAGO & ALTON

W. G. Bierd, pres.....	25,833	36,000	30,000	18,000

CHICAGO & EASTERN ILLINOIS

W. J. Jackson, recr.....	24,000	24,000	30,000	18,000
W. H. Lyford, genl. coun'l...	24,000	24,000	20,000	12,000

CHICAGO & NORTH WESTERN

M. Hughitt, Sr., chairman....	50,000	50,000	25,000	25,000
W. H. Finley, pres.....	60,000	50,000	40,000	40,000
M. Hughitt, Jr., v. p.	28,000	25,000	25,000	25,000
A. C. Johnson, v. p.	30,000	30,000	25,000	25,000
General traffic manager.....	15,000	20,000	20,000	
			Abolished Dec. 31, 1920	
J. B. Sheehan, genl. coun'l...	10,000	15,000	22,600	22,600
F. W. Sargent, genl. sol.....	12,500	15,000	20,000	20,000
H. L. Adams, Iowa attorney..	25,000	15,000	9,000	9,000

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA

Marvin Hughitt, chm. of bd..	10,000	10,000	4,166	2,500
W. A. Gardner, pres.....	15,000			
J. T. Clark, v. p., St. Paul...	21,000			
President		25,000	20,833	12,500
A. W. Trenholm, v. p. and g. m.		17,000		
Vice-president, St. Paul.....			16,666	10,000

CHICAGO GREAT WESTERN

S. M. Felton, pres.....	40,000	34,534	36,666	25,000

CHICAGO, INDIANAPOLIS & LOUISVILLE

Frederic A. Delano, pres.....	15,792 Resigned Aug. 18, 1914			
H. R. Kurrie, president.....	4,916	17,231	20,833	12,500
	Elected president Sept. 3, 1914			

CHICAGO, BURLINGTON & QUINCY

Geo. B. Harris, chm. of bd....	15,000	15,000		
D. Miller, pres.....	60,000			

	Year ended Dec. 31, 1914	Year ended Dec. 31, 1917	Ten months Mar. 1 to Dec. 31, 1920	Six months Jan. 1 to June 30, 1921
Hale Holden, v. p.	31,102			
President		50,000	41,666	25,833
C. G. Burnham, exec. v. p.	22,500	31,250	29,166	17,500
H. E. Byram, v. p.	25,000	22,500		
	Resigned Sept. 30, 1917			
E. P. Bracken, v. p.	15,000	19,750	20,833	12,500
C. E. Spens, v. p.	10,000	14,000	20,833	12,500
			Deceased	
C. M. Dawes, genl. coun'l.	25,000	7,921	April, 1917	
O. M. Spencer, genl. coun'l.	16,000	23,583	20,833	12,500
Bruce Scott, genl. sol.	10,000	14,833	16,666	10,000
Cincinnati, Indianapolis & Western				
B. A. Worthington, pres.		15,000	16,666	10,000
Cleveland, Cincinnati, Chicago & St. Louis				
A. H. Smith, pres.	7,072	8,757	11,733	7,030
Ira A. Place, v. p.			4,803	3,515
A. T. Hardin, v. p.		4,777	4,803	3,515
A. H. Harris, v. p.	3,816	4,236	4,803	3,515
G. H. Ingalls, v. p.			4,218	2,812
H. A. Worcester, v. p.			20,202	13,258
Colorado & Southern				
D. Miller, pres.	10,000			
Hale Holden, pres.	3,833	15,000	8,333	5,000
C. G. Burnham, exec. v. p.				416
Chicago, Milwaukee & St. Paul				
			(From Oct. 1 to	
A. J. Earling, chm. of bd.		18,750	Dec. 31, 1917)	
President	75,000	56,250		
H. E. Byram, president		17,000	50,000	30,000
D. L. Bush, v. p.	20,000	20,000	20,833	12,500
H. B. Earling, v. p.	20,000	20,000	16,666	10,000
E. D. Sewall, v. p.	20,000	20,000	12,500	7,500
E. S. Keeley, v. p.	20,000	20,000		
R. M. Calkins, v. p.			25,000	15,000
Burton Hanson, genl. coun'l.	25,000	25,000	20,833	12,500
Chicago, Rock Island & Pacific and Chicago, Rock Island & Gulf				
T. M. Schumacher, chm. of bd. and exec. committee	25,000	(Jan. to June 24, 1917,	$36,000)	
J. M. Dickinson, recr.		20,612		
H. U. Mudge, pres.	60,000			
J. E. Gorman, pres.		25,000	41,666	25,000
Chief executive officer		18,000		
First v. p. freight and passenger traffic	25,000			
M. L. Bell, v. p. and g. coun'l.			24,166	17,500
Frank Nay, v. p. and compt.			16,666	2,202
T. H. Beacom, v. p. and g. m.			16,666	10,000
L. C. Fritch, v. p.			16,666	10,000
Delaware & Hudson				
L. F. Loree, pres.	25,000	25,000	31,250	18,750
W. H. Williams, v. p.	7,500	10,208	14,583	8,750
C. S. Sims, v. p. and g. m.	20,000	13,750		
F. P. Gutelius, v. p.		11,666	22,500	13,700
R. M. Olyphant, chm. ex. com.	7,500	7,500		
J. T. Loree, g. m.		5,833	15,583	10,000
Chesapeake & Ohio				
Frank Trumbull, chm. of bd.	21,400	21,400		
G. W. Stevens, pres.	31,050	31,200	22,500	
W. J. Harahan, pres.			2,500	15,000
H. E. Huntington, chm. of bd.	(No compensation 1920-21)			
Denver & Rio Grande Western				
E. T. Jeffery, chm. of bd.	35,000	29,166	(Receivership)	
H. F. Bush, president	13,180		(Receivership)	
H. U. Mudge, pres.		38,037	(Receivership)	
E. L. Brown, pres.		10,766	(Receivership)	
Vice-president	25,000		(Receivership)	
J. Russell, g. m.			16,666	10,000
Denver & Salt Lake				
Newman Erb, pres.	9,000			
Chas. Boettcher, pres.		3,131		
W. R. Freeman, recr.			10,000	6,000
El Paso & Southwestern				
James Douglas, pres.	12,000	12,000	(Deceased June 25, 1918)	
T. M. Schumacher, v. p.	25,000	53,333		
President			53,333	33,333
Arthur Curtiss James, v. p.	18,000	18,000	28,333	18,666
A. E. Sweet, v. p. and g. m.			16,000	10,500
W. A. Hawkins, gen. atty.			22,916	15,000
Wm. Church Osborn, g. coun'l.	4,875	15,000	15,833	11,666
Duluth, South Shore & Atlantic				
A. B. Eldridge, pres.	7,200	7,200		
Florida East Coast				
W. H. Beardsley, pres.	15,000	18,000	15,000	7,200
Fort Worth & Denver City				
Hale Holden, pres.				2,500
Georgia, Florida & Alabama				
Mrs. C. B. Williams, pres.	5,850	6,000	5,000	2,833
Great Northern				
L. W. Hill, chm. of bd.	4,166		20,833	12,500
C. R. Gray, pres.	8,049			
R. Budd, pres.			25,000	15,000
L. W. Hill, chm. and pres.	20,833	50,000		
G. R. Martin, v. p. exec. dept., St. Paul			16,666	10,000
L. C. Gilman, v. p. exec. dept., Seattle			3,194	12,500
R. A. Jackson, v. p. and genl. counsel	30,000			
E. C. Lindley, v. p. and genl. counsel		20,000	16,666	10,000
W. P. Kenney, v. p. and director of traffic	18,000	18,000	20,833	12,500
J. M. Gruber, v. p. operating department	25,000	20,833		
Vice-president and gen. mgr.		4,166		
C. O. Jenks			20,833	12,500
Gulf Coast Lines				
J. S. Pyeatt, pres.		15,000	20,833	12,500
Gulf, Mobile & Northern				
President		15,000	10,000	6,000
Hocking Valley				
Geo. W. Stevens, pres.	4,950	4,800	5,000	
W. J. Harahan, pres.			403	3,000
Illinois Central and Yazoo & Mississippi Valley				
C. A. Peabody, chm. exec. com.	12,000	12,000	10,000	6,000
C. H. Markham, pres.	50,000	60,000	62,500	37,500
C. M. Kittle, senior v. p.			25,000	15,000
W. S. Horton, genl. coun'l.	15,000	15,000	18,333	11,000
L. W. Baldwin, v. p.	20,000	20,000	25,000	15,000
F. B. Bowes, v. p.	15,000	20,000	20,833	12,500
M. P. Blauvelt, v. p.			20,833	12,500
A. C. Mann, v. p.	12,000	4,000	1,330	11,250
A. S. Baldwin, v. p.			16,666	10,000
International & Great Northern				
T. J. Freeman, pres. Jan. 1 to Aug. 10, 1914	9,153			
Kansas City Southern				
L. F. Loree, chm.	30,000	30,000	28,750	17,500
J. A. Edson, pres.	25,000	25,000	26,083	16,000
J. F. Holden, v. p.	15,000	15,000	16,250	10,000
S. W. Moore, genl. coun'l.			14,166	10,000
Lehigh & New England				
S. D. Warriner, pres.	3,000	5,000	5,333	6,000
Long Island				
Ralph Peters, pres.	25,000	30,000	25,000	15,000
Louisville & Nashville				
H. Walters, chm. bd.	15,000	15,000	12,000	7,500
W. L. Mapother, pres.	25,000	20,000	16,666	11,666

	Year ended Dec. 31, 1914	Year ended Dec. 31, 1917	Ten months Mar. 1 to Dec. 31, 1920	Six months Jan. 1 to June 30, 1921
Maine Central				
Morris McDonald, pres.	25,295	35,000	29,045	15,000
Michigan Central				
A. H. Smith, pres.	9,680	8,303	11,600	6,945
H. B. Ledyard, chm. bd. dir.	30,000	30,000	25,000	12,500
E. D. Bronner, g. m.	15,000	3,125		
Vice president and g. m.		14,250		
Vice president			19,033	12,500
Midland Valley				
C. E. Ingersoll, pres.		10,000	12,500	9,000
Minneapolis & St. Louis				
Newman Erb, pres.	20,000			
E. L. Brown, pres.		4,166		
W. H. Bremmer, pres.		12,000	19,666	12,499
Minneapolis, St. Paul & Sault Ste. Marie				
E. Pennington, pres.	$50,000	$53,125	$62,500	$37,500
W. L. Martin, v. p.	20,000	20,000	16,666	10,000
G. R. Huntington, g. m.	17,000	20,000		
v. p. and g. m.			16,666	10,000
Missouri, Kansas & Texas Lines				
C. E. Schaff, recr.	50,000	50,000	41,666	25,000
C. N. Whitehead, ch. op. offi.			20,833	15,000
J. M. Bryson, genl. con'l.	15,000	24,000	20,000	13,500
Missouri Pacific				
Harry Bronner, ch. bd., and exec. com.			8,333	5,000
B. F. Bush, pres.	50,000			
Receiver		14,583		
President		29,166		
President			41,666	25,000
J. G. Drew, v. p.			25,000	15,000
E. J. Pearson, 1st v. p.	25,000			
E. J. White, v. p. and gen. sol.		105,000	20,833	12,500
A. Robertson, ch. op. officer		10,416		
V. p. for operations		14,583	25,000	15,000
Nashville, Chattanooga & St. Louis				
John Howe Peyton, pres.	12,000	12,000		
W. R. Cole, pres.			15,000	9,000
Chairman		6,000		
E. C. Lewis, chm.	6,000			
New Orleans, Great Northern				
H. I. Miller, pres.	9,999			
A. C. Goodyear, pres.			4,166	2,500
New York Central				
C. M. Depew, chm.	22,596	22,580	20,833	12,500
A. H. Smith, pres.	48,338	44,224	44,724	26,775
I. A. Place, v. p.	35,000	32,000	18,296	13,837
J. Carstensen, v. p.	27,085	27,473	8,032	4,819
A. T. Hardin, v. p.	25,000	19,860	18,296	13,837
A. H. Harris, genl. con'l.	24,378			
Vice president		24,106	18,296	13,837
R. J. Cary, genl. con'l.	10,838	10,987	20,833	12,500
G. H. Ingalls, v. p.			16,065	10,710
C. F. Daly, v. p.	25,765	26,218		
P. E. Crowley, v. p.		25,000	25,416	16,250
W. J. Fripp, g. m.	10,000	18,000	16,666	10,000
R. D. Starbuck, asst. v. p.			16,666	10,000
Boston & Albany				
A. H. Smith, pres.	5,841	5,488	4,533	2,715
H. M. Biscoe, v. p.	18,000	20,000	17,083	11,250
Pittsburgh & Lake Erie				
A. H. Smith, pres.	4,462	4,272	4,725	2,825
J. M. Schoonmaker, v. p.	25,000	25,000		
Chairman of board			20,833	12,500
J. B. Yohe, g. m.	12,000	13,750		
V. p. and g. m.			14,791	10,000
New York, Chicago & St. Louis				
O. P. Van Sweringen, chm. bd.		6,000	12,500	8,000
W. H. Canniff, pres.	25,000			
J. J. Bernet, pres.		26,666	29,166	17,916
H. D. Howe, v. p. & genl. con'l.			16,666	10,416
New York, New Haven & Hartford				
Howard Elliott, chm. bd.	34,541			
Chm. Com. on Intercorporate Relations		12,583	14,749	9,000
President	27,166	17,666		
J. M. Hustis, pres.	21,733			
E. J. Pearson, pres.		33,333	41,666	24,999
Asst. to pres. and v. p.		11,666		
E. G. Buckland, v. p. & genl. con'l.	25,000	27,583	29,166	17,499
B. Campbell, v. p.	22,666	28,333	29,166	17,500
A. R. Whaley, v. p.	25,000	10,416		
C. L. Bardo, g. m.	15,000	11,000	20,416	12,499
Col. E. D. Hines, sp. asst. pres.			8,000	12,000
New York, Ontario & Western				
J. B. Kerr, pres.	20,000	20,000	16,666	10,000
Norfolk & Western				
L. E. Johnson, chm. bd.		50,000	41,666	
N. D. Maher, pres.	50,000	50,000	41,666	30,000
A. C. Needles, v. p. oper. & traf.	25,000	24,000	20,833	15,000
T. W. Reath, genl. con'l.	17,500	20,000	16,666	10,000
Norfolk Southern				
M. J. Perry, chm. bd.	6,000	15,000		
J. H. Young, pres. & g. m.	25,000	25,000	20,833	12,500
Northern Pacific				
W. P. Clough, chm.	40,000			
Howard Elliott, chm.		18,000	33,333	20,000
J. M. Hannaford, vice chm.			1,666	10,000
Chas. Donnelly, pres.			3,291	17,500
Exec. vice president			22,500	
Asst. gen. counsel	20,000	20,000		
W. T. Tyler, v. p.			20,430	12,500
C. W. Bunn, v. p. & g. m.	30,000	30,000	25,000	15,000
Geo. T. Reid, asst. to pres. and western counsel	15,000	15,000	16,666	10,000
J. G. Woodworth, v. p.	18,000	22,500	20,833	12,500
Land Dept.				
J. M. Hannaford, pres.			7,499	
Chas. Donnelly, pres.			833	7,500
Northwestern Pacific				
W. S. Palmer, pres. & g. m.	8,000	10,000	8,333	5,000
Pennsylvania				
Samuel Rea, pres.	47,796	47,742	47,352	28,411
J. J. Turner, senior v. p.			26,000	13,300
W. W. Atterbury, v. p. oper.	34,920	34,880	25,106	15,063
G. D. Dixon, v. p.	22,830	26,160	18,829	11,297
Henry Tatnall, v. p. finance	30,555	30,520	22,595	13,557
W. H. Myers, v. p. purch.	17,460	21,276		
G. L. Peck, v. p. personnel			19,367	11,620
Elisha Lee, v. p. eastern region			23,350	14,010
F. I. Gowen, genl. con'l.	26,220	25,890	22,595	13,557
C. B. Heiserman, genl. con'l.			17,883	10,885
Pennsylvania Co.				
Samuel Rea, pres.	11,625	10,875		
J. J. Turner, senior v. p.	23,466	20,800		
G. L. Peck, v.p. in chge. transp.	17,600	15,600		
V. p. under J. J. Turner, transp.	1,173	13,000		
Pere Marquette				
E. N. Brown, chm. bd.		21,667	17,667	12,000
F. H. Alfred, pres. & g. m.		15,215	26,500	18,000
S. L. Merriam, genl. coun'l.	15,000	17,250	16,200	10,800
Philadelphia & Reading				
Geo. F. Baer, pres.	6,666			
Agnew T. Dice, pres.		35,540	20,833	12,499
Edw. T. Stotesbury, chm. bd.		10,000	8,333	4,999
Chas H. Ewing, v. p.			20,833	12,499
Richmond, Fredericksburg & Potomac				
Wm. H. White, pres.	15,000	15,000	6,250	
Eppa Hunton, jr., pres.			4,375	7,500

St. Louis—San Francisco

	Year ended Dec. 31, 1914	Year ended Dec. 31, 1917	Ten months Mar. 1 to Dec. 31, 1920	Six months Jan. 1 to June 30, 1921
W. C. Nixon, recr.	32,634			
J. W. Lusk, recr.	32,634			
W. R. Biddle, recr.	32,634			
T. T. Fauntleroy, spec. master	23,707			
H. Ruhlender, chm. bd.		40,000		
E. N. Brown, chm. bd.			26,500	16,500
W. B. Biddle, pres.		39,879		
J. M. Kurn, pres.			35,333	21,999
E. D. Levy, v. p. oper.		27,270	13,250	8,499
C. W. Hillard, v. p. finances		20,000	20,833	13,130
W. F. Evans, genl. sol.	18,000	25,000	21,583	13,249

Southern Pacific Lines

J. Kruttschnitt, chairman	75,000	87,500	83,333	49,999
L. J. Spence, dir. of traffic	25,000	35,625	35,416	26,666
J. P. Blair, genl. consl.	32,500	34,250	35,250	26,666
A. D. McDonald, v. p. & con.	15,000	26,250	31,250	26,666
C. W. Jungen, mgr., A.S.S. Line	19,000	21,500	20,000	12,000
Wm. Sproule, pres.	50,000	61,750	62,500	37,500
Paul Shoup, v.p. & asst. to pres.	15,000	15,000	25,000	15,000
W. F. Herrin, v.p. & ch. con'l.	36,000	36,000	30,000	18,000
E. O. McCormick, v. p.	30,000	30,000	12,500	7,500
J. H. Dyer, g. m. P. S.	18,375	23,541	16,666	10,000
Epes Randolph, pres. A. E. R. R. Co.	20,000	26,250	27,083	16,249
W. R. Scott, pres. So. Pac. Lines in Texas and Louisiana	20,000	26,250	30,000	18,000
W. A. Worthington, v. p. & asst. to chairman	12,000	13,500	18,749	12,500
G. M. Buck, asst. con'l.	13,500	15,750	16,666	10,000
F. H. Wood, gen. atty. and com. counsel	13,500	15,750	16,666	10,000
E. T. Dumble, con. geologist	10,000	12,000	16,667	10,000

St. Louis Southwestern

F. H. Britton, pres.	27,000			
J. M. Herbert, pres.		19,833	29,333	17,600

Texas & Pacific

Geo. J. Gould, pres.	15,000			
E. F. Kearney, 1st v. p.	25,000			

Toledo, Peoria & Western

E. N. Armstrong, pres. and recr.	6,000	6,000	5,000	3,000

Toledo, St. Louis & Western

W. L. Ross, pres. and recr.	25,000	25,000	20,833	12,500

The Ulster & Delaware

Ed Coykendall, pres.	6,000	6,000	5,000	3,000

Virginian

	Year ended Dec. 31, 1914	Year ended Dec. 31, 1917	Ten months Mar. 1 to Dec. 31, 1920	Six months Jan. 1 to June 30, 1921
R. Du Puy, pres.		4,000		
C. W. Huntington, pres.		16,666	20,833	12,500
C. H. Hix, v. p.			16,666	10,000

Wabash

E. B. Pryor, recr.	20,000			
W. H. Williams, chm. bd.		15,000	20,833	12,500
E. F. Kearney, pres.		50,000		
J. E. Taussig, pres.			33,333	20,000
W. C. Maxwell, v. p.		16,500	20,833	12,500
H. Miller, g. m.	20,000			
W. S. Pierce, genl. con'l.		24,000	21,000	15,000
J. L. Minnis, v. p.		21,250		
N. S. Brown, v. p.			16,665	10,000
S. E. Cotter, v. p.			16,666	10,000

Western Pacific

E. T. Jeffery, chm. bd.	16,000			
Alvin W. Krech, chm. bd.			8,333	5,000
Chas. M. Levey, pres.		30,000	25,000	15,000

Wheeling & Lake Erie

W. M. Duncan, recr.	14,700			
President		15,000	12,500	7,500
L. F. Loree, chm. bd.		10,000		
C. R. Gray, chm. bd.		5,000		

The Baltimore & Ohio report was compiled on a different basis, as follows:

	1914	1917	Mch. 1, 1920	Dec. 31, 1920	July 1, 1921
O. G. Murray, chm. bd.	$25,000				
Daniel Willard, pres.	75,000	75,000	75,000	75,000	67,500
H. L. Bond, jr. gen. consl.	25,000	25,000	30,000	30,000	30,000
M. R. Waite, gen. sol.		8,000	15,000	20,000	20,000
G. M. Shriver, sr. v. p.			36,000	36,000	36,000
Vice president		30,000			
Second vice president	20,000				
A. W. Thompson, v.p. oper. and maint.	30,000				
J. M. Davis, v. p.		24,000			
C. W. Galloway, v. p.			33,000	33,000	33,000
G. m. Western lines			20,000		
G. H. Emerson, chief of m. p. and equip.			25,000	25,000	25,000
R. B. Begien, g. m. Eastern lines		15,000			
Western lines			20,000	20,000	20,000
S. Ennes, g.m. East. lines			20,000	20,000	
E. W. Scheer, g.m. " "					20,000

Underwood & Underwood.

The Navajo Limited: 23d Street, Chicago, December 16. Eight Persons Injured

P. & A. Photo

Union Pacific Locomotive No. 7000 About to Start from Cheyenne

General News Department

The American Society of Civil Engineers will hold its seventieth annual meeting at the Engineering Societies' Building, New York, on January 17, 18 and 19, 1923.

Seven sleeping cars overturned and 40 persons injured, none seriously, is the substance of a press dispatch of December 20 reporting the derailment near Allenhurst, Ga., of southbound passenger train No. 83 of the Atlantic Coast Line.

Senator Capper's resolution calling upon the Interstate Commerce Commission to furnish detailed information concerning excess earnings of the railroads that have earned net returns of over 6 per cent, was adopted by the Senate on December 15.

One trainman was killed and two trainmen and 15 passengers were injured on December 14, when Minneapolis, St. Paul & Sault Ste. Marie passenger train No. 3, northbound, from Chicago to Minneapolis, collided with a southbound freight train near Thorpe, Wis.

A bill to abolish the Railroad Labor Board by repealing sections 300 to 316 of the Transportation Act was introduced in the Senate on December 16 by Senator King of Utah.

S. Davies Warfield, president of the National Association of Owners of Railroad Securities, has issued a statement outlining the association's program for effecting economies in railroad operation and urging that Congress act at the present session on the recommendations made by President Harding in his recent address to Congress, many of which were based on the suggestions of the association.

The Transportation Brotherhoods' National Bank opened for business at Minneapolis, Minn., on December 19. This bank is owned by members of the brotherhoods of railroad enginemen and trainmen and is the sixth bank in the United States owned and operated by members of railroad labor unions. The president of the bank is Warren S. Stone, chief of the locomotive engineers, and the executive vice-president is W. P. Kennedy, general chairman, on the Chicago, Milwaukee & St. Paul Railway of the Brotherhood of Railroad Trainmen.

A Correction

In last week's issue of the *Railway Age* it was announced that the next annual meeting of Division VI, Purchases & Stores, of the American Railway Association would be held in Chicago on May 22, 1924. This is incorrect. The meeting will be held on May 22, 1923.

Eastern Presidents' Conference to Broaden Scope of Public Relations Work

The Eastern Presidents' Conference has decided to broaden the scope of its public relations work and to this end has retained Robert S. Binkerd, who has resigned as assistant to the chairman of the Association of Railway Executives, to take charge of the work. Mr. Binkerd will enter upon his new duties on January 1, 1923, and will have his headquarters at 143 Liberty street, New York.

M. & N. A. Strikers Lose All Rights

Former employees of the Missouri & North Arkansas who went on strike about two months ago following their refusal to accept the wage offered by the road under the decision of the Labor Board, have lost all rights as employees of the road, according to a ruling of the Federal court at Harrison, Ark., in which the temporary injunction against picketing was made permanent. All relationship that the former employees may have sustained to the company has ceased, according to the decision. The temporary injunction which is now made permanent was issued in July, and covered all the road's property in Arkansas.

I. C. C. to Hold Hearing on New York Terminal Plan

The Interstate Commerce Commission has ordered an investigation "in the matter of efficient, economical and joint use of terminals of common carriers in the Port of New York District and the cost to carriers of operating the terminals in performance of common-carrier services." The railroads serving the port are made respondents and the investigation is instituted for the purpose of determining what, if any, order should be made by the commission in connection with the carrying out of the comprehensive plan of the Port of New York Authority for the development of the port of New York. No date has been announced for any public hearing. The Port Authority proposes the construction of extensive belt railroads in New Jersey to connect the different railroad yards and ocean terminals, and its members have complained that the railroads are lacking in sympathy toward the project.

Convictions for the Needles Tie-Up

In the United States District Court at Los Angeles, California, on December 20, eight railroad employees on trial for conspiracy to interfere with interstate commerce were found guilty, by a jury, and are to be arraigned for sentence on December 26. The charge was that defendants had plotted to tie up traffic on the Atchison, Topeka & Santa Fe [at Needles, Calif.] last August by causing a walkout of trainmen. More than a thousand passengers were marooned several days, in intensely hot weather, and much freight and mail were delayed. The defendants said the walkout was justified because of defective equipment and the presence of armed guards at terminals. The Government contended that the walkout was brought about to assist the shopmen then on strike.

Telegraph and Telephone Section Elects Officers

The officers chosen for the ensuing year by the Telegraph & Telephone section of the American Railway Association at its meeting in Chicago last week were as follows: Chairman, R. F. Finley, superintendent telegraph, New York Central; first vice-chairman, I. C. Forshee, telegraph and telephone engineer, Pennsylvania System; second vice-chairman, G. D. Hood, superintendent of telegraph, Chicago, Rock Island & Pacific; members of the Committee of Direction: J. H. Brennan, superintendent telegraph, St. Louis-San Francisco; G. A. Cellar, general superintendent telegraph, Pennsylvania System; C. A. Plumly, superintendent telegraph, Baltimore & Ohio; H. A. Shepard, general superintendent electric transmission and communication, New York, New Haven & Hartford; C. E. Davies, general traffic superintendent, Canadian National Telegraphs; W. Rogers, telegraph and telephone engineer, Missouri Pacific.

It was decided that the officers of the Railway Telegraph & Telephone Appliance Association, which met in conjunction with the Telegraph and Telephone section should retain office during the coming year. These officers are as follows: Chairman, J. Warren Young, Kerite Insulated Wire & Cable Co., New York; vice-chairman, F. W. Bayles, New York Telephone Company, New York; secretary and treasurer, G. A. Nelson, Waterbury Battery Company, New York; members of the executive committee, B. A. Kaiser, American Telegraph and Telephone Company, New York; W. T. Kyle, Page Wire & Steel Company, New York; J. W. Hackett, Okonite Company, New York; Wallace L. Cook, Reliable Electric Company, Chicago; E. V. Adams, Western Electric Company, New York, and D. H. Morris, Ohio Bell Telephone Company, Columbus, Ohio.

Operating Statistics of Large Steam Roads—Selected Items for the Month of October, 1922,

Region, road and year		Average miles of road operated	Train-miles	Locomotive-miles: Principal and helper	Locomotive-miles: Light	Car-miles: Loaded (thousands)	Car-miles: Per cent loaded	Ton-miles (thousands): Gross. Excluding locomotive and tender	Ton-miles (thousands): Net. Revenue and non-revenue	Average number of locomotives on line daily: Serviceable	Unserviceable	Per cent unserviceable	Stored
New England Region:													
Boston & Albany	1922	394	311,458	330,022	31,598	5,803	72.5	295,603	126,328	109	33	23.1	...
	1921	394	248,213	270,090	33,718	5,001	70.3	251,120	102,469	115	29	19.9	...
Boston & Maine	1922	2,455	648,629	727,658	69,209	14,611	73.3	733,237	309,618	316	134	29.8	12
	1921	2,469	593,320	665,637	59,011	13,871	74.0	686,186	291,106	342	117	25.4	48
N. Y., New H. & Hartf.	1922	1,973	477,356	517,941	36,405	12,904	77.1	626,803	284,891	279	88	24.1	4
	1921	1,977	451,309	493,433	31,729	12,104	71.1	603,556	261,582	300	88	22.7	41
Great Lakes Region:													
Delaware & Hudson	1922	887	368,416	503,554	40,347	9,604	67.1	629,985	328,634	250	61	19.5	62
	1921	880	362,917	483,942	37,270	9,971	66.3	633,178	323,469	277	37	11.9	115
Del., Lack. & Wn.	1922	994	487,529	609,938	122,159	13,653	65.2	830,446	394,632	254	110	30.3	3
	1921	995	583,323	723,502	133,266	17,772	68.4	979,579	454,304	301	55	15.5	33
Erie (inc. Chic. & Erie)	1922	2,309	940,719	1,066,527	53,573	35,314	73.4	2,035,631	983,870	456	295	39.3	1
	1921	2,259	1,194,502	1,332,813	56,565	40,610	66.4	2,415,566	1,076,502	561	179	24.2	16
Lehigh Valley	1922	1,317	490,537	542,202	65,522	12,470	67.6	780,592	400,235	307	236	43.4	10
	1921	1,316	654,605	721,706	71,576	18,774	64.2	1,152,523	549,185	428	115	21.2	99
Michigan Central	1922	1,827	579,701	587,854	28,645	21,309	74.1	1,023,399	459,999	278	120	30.1	26
	1921	1,829	486,045	497,301	21,976	15,995	72.0	804,750	335,101	331	81	19.7	81
New York Central	1922	6,486	2,437,580	2,744,521	216,348	91,877	70.1	5,326,063	2,551,020	1,035	41	40.8	11
	1921	6,466	2,065,715	2,292,377	166,715	74,834	67.9	4,210,865	1,914,271	1,127	617	35.4	221
N. Y., Chic., & St. L.	1922	1,225	525,229	529,973	4,209	14,265	72.3	762,589	334,759	150	76	33.4	11
	1921	1,225	459,907	462,689	1,312	13,642	72.0	683,169	285,687	184	66	26.5	59
Pere Marquette	1922	2,182	359,251	366,146	7,404	9,565	76.5	489,647	238,499	151	59	28.2	...
	1921	2,196	378,377	389,805	7,872	9,828	73.4	521,250	240,797	164	47	22.2	7
Pitts. & Lake Erie	1922	228	150,708	157,482	1,180	5,597	68.3	395,694	236,509	60	19	24.4	...
	1921	228	93,428	97,353	585	3,249	63.0	234,918	132,693	57	28	33.3	7
Wabash	1922	2,418	529,410	551,485	7,668	16,556	79.0	854,844	412,227	248	95	27.6	...
	1921	2,418	633,635	662,598	8,552	18,394	75.2	948,597	434,627	279	64	18.6	31
Ohio-Indiana-Allegheny Region:													
Baltimore & Ohio	1922	5,235	1,939,187	2,226,668	144,315	57,669	72.2	3,315,362	1,699,628	999	350	25.9	...
	1921	5,185	1,842,781	1,996,076	152,975	48,440	65.0	3,055,823	1,533,669	1,030	362	26.0	174
Central R. R. of N. J.	1922	692	329,347	361,322	44,782	7,686	64.7	487,241	243,755	213	46	17.6	4
	1921	679	295,995	334,412	44,490	6,744	60.9	444,701	219,326	209	51	19.5	11
Chicago & Eastern Ill.	1922	945	223,493	225,169	4,509	5,905	69.7	342,417	177,610	91	81	47.1	4
	1921	1,131	274,317	276,709	4,016	6,870	62.3	429,980	217,941	128	47	26.9	37
Clev., Cin. Chic. & St. L.	1922	2,378	699,583	721,563	5,918	22,571	68.7	1,351,893	675,898	267	181	40.3	...
	1921	2,387	679,165	710,354	2,905	20,474	64.9	1,220,648	577,571	331	120	26.7	42
Elgin, Joliet & En.[1]	1922	459	132,079	144,812	7,813	3,940	65.8	318,282	176,262	84	22	20.4	12
	1921	456	103,892	114,557	6,998	3,278	66.5	242,893	130,266	99	9	8.5	36
Long Island	1922	394	51,897	61,422	11,026	720	63.4	41,031	16,761	37	12	25.1	...
	1921	395	48,890	54,832	9,544	625	60.6	35,433	13,830	37	9	20.2	1
Pennsylvania System	1922	10,902	5,006,921	5,515,809	412,882	136,575	68.9	8,846,838	4,600,561	2,464	832	25.3	10
	1921	10,875	4,603,675	5,041,348	380,708	124,151	65.1	8,373,895	4,261,914	2,561	932	26.7	495
Phila. & Reading	1922	1,119	672,840	766,631	96,407	18,075	69.0	1,160,224	627,932	363	67	15.5	87
	1921	1,119	577,160	654,573	83,027	15,096	64.5	1,010,602	539,633	361	78	17.7	144
Pocahontas Region:													
Chesapeake & Ohio	1922	2,551	640,628	706,176	16,439	20,497	63.3	1,460,283	807,445	361	169	31.8	10
	1921	2,548	759,300	829,763	24,065	23,127	58.8	1,757,408	958,638	468	90	16.1	88
Norfolk & Western	1922	2,228	754,760	970,918	35,363	19,502	61.3	1,508,185	817,277	543	172	24.1	46
	1921	2,222	796,648	979,489	36,351	22,911	61.0	1,704,232	936,383	602	106	15.0	178
Southern Region:													
Atlantic Coast Line	1922	4,930	666,901	669,993	11,007	16,322	73.3	806,568	354,009	330	102	23.6	13
	1921	4,899	564,675	569,960	8,647	12,873	66.0	652,649	256,434	289	126	30.4	62
Central of Georgia	1922	1,907	272,597	276,559	5,552	5,775	77.5	290,455	137,467	117	16	12.0	...
	1921	1,899	223,985	224,804	3,859	5,146	74.5	249,495	112,463	117	23	16.3	8
I. C. (inc. Y. & M. V.)	1922	6,135	2,110,301	2,125,006	50,384	60,786	66.5	3,724,575	1,760,248	731	91	11.1	6
	1921	6,151	1,813,792	1,820,960	38,383	51,042	64.6	3,146,105	1,442,999	728	88	10.7	16
Louisville & Nashville	1922	5,021	1,504,859	1,606,073	62,373	27,852	68.3	1,671,219	827,877	528	159	23.2	...
	1921	5,020	1,662,242	1,782,965	57,983	29,659	62.5	1,896,413	916,114	581	83	12.5	12
Seaboard Air Line	1922	3,537	496,469	501,924	10,385	11,044	74.0	562,840	248,801	172	104	37.6	...
	1921	3,537	431,801	442,084	8,305	9,507	74.0	465,459	195,408	167	89	34.7	...
Southern Ry.	1922	6,942	1,524,761	1,574,525	47,686	33,941	73.5	1,739,820	783,578	798	245	23.5	...
	1921	6,942	1,372,170	1,401,764	36,125	31,083	70.4	1,585,680	672,590	884	234	20.9	36
Northwestern Region:													
Chic. & N. Wn.	1922	8,393	1,855,536	1,942,998	27,692	43,341	60.2	2,451,427	1,031,502	729	299	29.1	...
	1921	8,378	1,788,642	1,858,385	29,285	39,161	63.0	2,266,132	985,420	786	282	26.4	9
Chic., Milw. & St. P.	1922	11,027	1,955,512	2,009,658	82,504	49,458	67.3	2,806,376	1,333,204	804	276	25.5	29
	1921	10,992	1,758,207	1,812,212	69,115	44,795	65.0	2,501,508	1,127,810	864	218	20.2	111
Chic., St. P., Minn. & Om.	1922	1,726	330,852	355,179	16,223	6,519	76.3	342,339	154,594	145	71	32.9	16
	1921	1,726	356,383	374,830	16,028	7,408	72.6	380,561	167,774	152	61	28.7	14
Great Northern	1922	8,255	1,187,054	1,217,445	49,035	33,468	67.2	1,973,539	964,535	549	214	28.0	11
	1921	8,162	1,287,869	1,324,973	43,484	37,181	63.1	2,218,184	960,561	633	153	19.5	121
Minn., St. P. & S. Ste. M.	1922	4,355	707,274	719,410	12,403	14,746	76.6	849,730	425,697	341	63	15.6	2
	1921	4,359	579,037	615,536	9,018	14,251	74.9	708,614	340,026	349	56	13.9	6
Northern Pacific	1922	6,388	1,050,906	1,090,418	53,982	29,038	74.7	1,586,375	771,614	564	154	21.5	44
	1921	6,420	1,096,526	1,144,694	68,232	31,900	69.1	1,802,429	812,038	583	144	19.8	65
Ore. Wash. R. R. & Nav.	1922	2,143	266,668	298,115	39,617	6,432	76.2	361,393	187,613	134	38	22.2	4
	1921	2,150	268,684	301,929	43,200	6,405	67.5	378,356	173,962	137	30	18.0	...
Central Western Region:													
Atch., Top. & Santa Fe	1922	9,798	2,165,633	2,265,106	111,687	61,152	65.2	3,473,643	1,269,485	744	228	23.5	19
	1921	9,763	2,022,714	2,167,743	104,497	57,286	65.0	3,235,278	1,154,739	773	212	21.5	55
Chicago & Alton	1922	1,010	277,415	281,674	5,865	6,741	72.5	383,672	196,169	91	54	37.2	1
	1921	1,010	390,775	399,228	5,274	8,578	63.0	519,787	216,102	117	36	23.5	8
Chic., Burl. & Quincy	1922	9,326	1,935,157	2,018,831	93,986	55,043	65.4	3,279,153	1,568,320	774	242	23.8	1
	1921	9,326	1,855,435	1,950,899	102,450	50,623	64.1	3,019,783	1,422,780	683	255	27.2	33
Chic., Rock I. & Pac.	1922	7,635	1,309,800	1,333,527	20,824	31,476	76.1	1,598,413	740,957	526	200	27.5	19
	1921	7,661	1,482,515	1,507,431	13,930	33,705	71.2	1,791,562	819,175	591	165	21.8	14
Denver & R. G. Wn.	1922	2,593	332,451	402,025	76,695	7,065	65.9	413,754	190,652	224	109	32.6	2
	1921	2,593	353,356	447,277	92,546	7,678	62.3	450,507	195,472	235	71	23.2	2
Oreg. Short Line	1922	2,367	509,070	531,445	35,724	11,176	65.6	692,439	309,969	176	62	26.0	4
	1921	2,359	512,290	530,574	37,643	11,979	60.2	759,343	322,085	193	43	18.2	14
Southern Pacific	1922	6,982	1,361,526	1,538,656	278,886	40,645	71.9	2,222,311	962,874	635	190	23.0	6
	1921	6,975	1,319,919	1,508,111	266,580	38,153	68.2	2,172,652	913,423	616	182	22.8	13
Union Pacific	1922	3,707	1,655,648	1,693,517	133,559	46,337	69.3	2,521,671	1,026,797	458	122	21.1	20
	1921	3,615	1,733,778	1,755,160	92,124	46,098	63.0	2,700,650	1,048,623	438	108	19.7	2
Southwestern Region:													
Gulf, Colo. & S. Fe	1922	1,895	271,965	279,020	6,116	7,759	71.0	406,455	176,768	119	30	20.1	3
	1921	1,895	257,751	265,063	4,436	6,658	65.5	373,373	161,740	123	35	22.4	23
Mo., Kans. & Tex.	1922	1,658	315,839	316,433	6,223	9,303	69.5	495,279	215,262	97	92	48.6	7
	1921	1,709	290,637	290,656	6,638	7,910	63.6	441,312	181,738	131	46	26.2	37
Mo., Kans. & Tex. of Tex.	1922	1,738	244,767	249,963	3,145	5,235	73.6	265,505	113,769	75	68	47.6	4
	1921	1,740	243,393	248,234	3,634	5,183	64.0	286,568	115,438	97	38	28.2	10
Missouri Pacific	1922	7,112	1,041,157	1,049,370	35,076	25,514	73.3	1,385,042	651,747	378	217	36.5	...
	1921	7,264	1,256,553	1,268,619	38,575	31,041	68.7	1,748,084	797,150	420	173	29.2	...
St. Louis-San Francisco	1922	4,683	735,846	743,228	13,781	13,092	70.2	709,413	319,147	307	154	33.5	...
	1921	4,683	842,571	854,333	13,249	16,273	68.4	995,830	399,818	352	101	22.3	14
Southern Pacific Lines[1] (in Texas and La.)	1922	3,710	618,597	621,531	7,673	14,045	69.4	763,315	338,066	186	106	36.2	2
	1921	3,647	575,418	578,770	4,742	11,745	64.7	719,163	314,386	193	103	34.7	6
Texas & Pacific	1922	1,953	250,955	250,995	6,995	6,505	72.5	332,398	139,679	103	96	48.4	6
	1921	1,953	283,360	283,360	2,569	6,651	67.3	353,101	140,400	130	65	33.1	20

[1] No passenger train service.

Compiled by the Bureau of Statistics of the Interstate Commerce Commission. Subject to revision.

Compared with October, 1921, for Roads with Annual Operating Revenues above $25,000,000.

Region, road and year	Average number of freight cars on line daily: Home	Foreign	Total	Per cent unserviceable	Stored	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton-miles per car-day	Car-miles per car-day	Net ton-miles per mile of road	Pounds of coal per 1,000 gross ton-miles, including locomotive and tender	Passenger service: Train-miles	Passenger-train car-miles
New England Region:														
Boston & Albany	1922 1,801	7,169	8,970	4.1	....	949	406	21.8	454	28.8	10,345	227	302,243	1,931,014
	1921 3,022	4,751	7,773	7.8	364	1,012	413	20.5	425	29.5	8,391	209	301,951	1,960,439
Boston & Maine	1922 13,521	21,290	34,811	13.6	....	1,130	477	21.2	287	18.5	4,068	172	806,689	4,376,381
	1921 16,933	16,404	33,337	18.7	739	1,157	491	21.0	282	18.1	3,804	142	803,782	4,403,021
N. Y., New H. & Hartf.	1922 18,402	30,837	49,239	18.9	73	1,313	597	22.1	187	11.0	4,658	196	1,004,246	6,380,045
	1921 22,805	17,432	40,237	22.9	561	1,337	580	21.6	210	13.6	4,269	161	1,024,394	6,479,665
Great Lakes Region:														
Delaware & Hudson	1922 8,261	9,441	17,702	7.9	....	1,710	892	34.2	599	26.1	11,952	208	190,857	996,788
	1921 9,518	7,084	16,602	10.5	95	1,745	891	32.4	629	29.2	11,852	182	189,965	961,429
Del., Lack. & Wn.	1922 10,406	12,052	22,458	6.3	30	1,703	809	28.9	567	30.1	12,806	210	485,302	3,505,864
	1921 16,882	16,059	32,941	21.7	....	1,679	779	25.6	571	32.7	14,735	174	497,147	3,597,032
Erie (inc. Chic. & Erie)	1922 23,739	37,712	61,451	11.9	2,992	2,164	1,046	27.9	516	25.3	13,743	144	574,647	4,113,358
	1921 34,941	21,065	56,006	19.7	1,222	2,022	901	26.5	626	33.3	15,374	141	681,595	5,009,465
Lehigh Valley	1922 23,879	17,463	41,342	7.6	....	1,591	816	32.1	312	14.4	9,805	215	346,000	2,653,924
	1921 28,594	9,649	38,243	16.9	1,135	1,761	839	29.3	463	24.6	13,458	165	356,513	2,685,495
Michigan Central	1922 8,204	21,818	30,022	10.3	....	1,765	794	21.6	494	30.9	8,124	133	569,365	5,403,952
	1921 16,882	16,059	32,941	21.7	....	1,656	689	21.0	328	21.8	5,909	129	585,346	5,577,443
New York Central	1922 55,101	90,886	145,987	11.7	....	2,185	1,047	27.8	564	29.0	12,688	129	2,464,818	20,148,998
	1921 84,302	55,694	139,996	21.5	4,748	2,039	927	25.6	441	25.4	9,551	121	2,450,078	19,927,446
N. Y., Chic. & St. L.	1922 2,954	11,499	14,453	14.4	....	1,452	637	23.5	747	44.0	8,812	136	151,807	820,673
	1921 6,020	8,616	14,636	16.8	333	1,485	621	20.9	630	41.7	7,520	118	152,865	724,023
Pere Marquette	1922 6,642	17,361	24,003	12.7	....	1,363	664	24.9	321	16.8	3,526	151	259,162	1,300,019
	1921 10,267	12,389	22,656	17.4	....	1,378	636	24.5	343	19.1	3,537	137	290,517	1,433,670
Pitts. & Lake Erie	1922 10,788	11,180	21,968	31.6	....	2,626	1,569	42.3	347	12.0	33,474	77	115,664	558,726
	1921 18,849	8,106	26,955	41.6	1,635	2,514	1,420	40.8	159	6.2	18,780	92	107,718	563,317
Wabash	1922 6,956	15,679	22,635	8.8	....	1,615	779	24.9	587	29.9	5,500	159	409,968	2,502,792
	1921 11,505	12,526	24,031	12.0	538	1,497	686	23.6	583	32.8	5,799	157	526,307	2,807,014
Ohio-Indiana-Allegheny Region:														
Baltimore & Ohio	1922 50,370	61,491	111,861	12.6	....	1,710	876	29.5	490	23.0	10,473	195	1,237,585	8,269,478
	1921 63,559	36,752	100,311	13.1	1,390	1,658	832	31.7	493	24.0	9,542	184	1,419,843	9,165,392
Central R. R. of N. J.	1922 12,354	15,479	27,833	6.2	....	1,479	740	31.7	283	13.8	11,368	201	336,585	1,631,829
	1921 17,671	8,788	26,459	15.0	4,253	1,502	741	32.5	267	13.5	10,427	171	336,196	1,625,322
Chicago & Eastern Ill.	1922 9,075	6,045	15,120	15.3	....	1,532	795	30.1	379	18.1	6,062	186	191,488	1,220,948
	1921 12,406	4,064	16,470	15.4	78	1,567	794	31.7	427	21.6	6,216	159	223,481	1,477,383
Clev., Cin., Chic. & St. L.	1922 9,721	28,173	37,894	12.2	....	1,932	966	29.9	575	27.9	9,169	136	643,173	4,149,283
	1921 14,884	18,677	33,561	11.1	376	1,797	859	28.2	555	30.3	7,807	131	715,661	4,363,218
Elgin, Joliet & Eas.	1922 8,741	5,613	14,354	16.3	....	2,410	1,335	44.7	396	13.5	12,384	122	.....	.....
	1921 10,311	3,546	13,857	8.8	362	2,337	1,254	39.7	303	11.5	9,208	129	.....	.....
Long Island	1922 1,920	4,996	6,916	3.5	....	791	323	23.3	78	5.3	1,372	291	197,539	1,161,785
	1921 1,971	3,929	5,900	5.1	199	725	283	22.1	76	5.6	1,131	304	202,762	1,136,605
Pennsylvania System	1922 148,999	147,840	296,839	9.8	1,551	1,767	919	33.7	500	21.5	13,613	161	5,125,300	35,975,267
	1921 205,908	79,358	285,266	15.4	23,411	1,819	926	34.3	482	21.6	12,641	141	5,079,674	34,510,292
Phila. & Reading	1922 13,400	20,773	34,173	4.3	....	1,724	933	34.7	593	24.7	18,108	178	503,924	2,292,814
	1921 23,583	13,352	36,935	5.2	2,668	1,751	935	35.7	471	20.4	15,550	169	492,855	2,337,671
Pocahontas Region:														
Chesapeake & Ohio	1922 30,500	21,546	52,046	12.8	....	2,280	1,260	39.4	501	20.1	10,212	140	441,171	2,538,743
	1921 36,264	13,185	49,449	11.0	....	2,315	1,263	41.5	625	25.7	12,136	131	445,453	2,508,873
Norfolk & Western	1922 24,309	14,238	38,607	3.9	....	1,998	1,083	41.9	683	26.6	11,834	224	397,036	2,501,111
	1921 29,955	6,807	36,762	9.0	611	2,139	1,175	40.9	822	32.9	13,594	175	412,388	2,663,415
Southern Region:														
Atlantic Coast Line	1922 11,233	13,906	25,139	16.7	....	1,209	531	21.7	454	28.6	2,316	128	701,831	4,402,903
	1921 20,882	9,369	30,251	19.3	....	1,156	454	19.9	273	20.8	1,688	144	703,575	4,409,348
Central of Georgia	1922 1,640	5,819	7,459	7.7	....	1,066	504	23.8	595	32.2	2,326	182	323,009	1,603,678
	1921 3,930	3,714	7,644	14.1	....	1,114	502	21.9	475	29.1	1,910	149	308,462	1,507,993
I. C. (inc. Y. & M. V.)	1922 24,505	39,886	64,391	6.0	1,043	1,765	834	29.0	852	45.8	9,256	144	1,497,501	8,027,851
	1921 37,570	25,541	63,111	8.6	1,986	1,735	796	28.3	738	40.4	7,567	140	1,439,176	8,321,393
Louisville & Nashville	1922 21,798	24,359	46,157	12.0	41	1,111	550	29.7	579	28.5	5,319	179	1,023,588	5,995,597
	1921 37,535	16,823	54,358	24.7	87	1,141	551	30.9	544	28.2	5,887	165	935,740	5,463,105
Seaboard Air Line	1922 9,933	13,990	23,923	29.7	....	1,134	501	22.5	336	20.1	2,269	179	488,235	3,112,460
	1921 11,610	8,900	20,510	27.6	....	1,078	453	20.6	307	20.2	1,782	191	557,431	3,214,635
Southern Ry.	1922 24,356	40,117	64,473	17.6	....	1,141	514	23.1	392	23.1	3,641	214	1,274,662	7,371,772
	1921 35,848	24,128	59,976	11.6	840	1,156	490	21.6	362	23.8	3,125	204	1,285,878	7,614,812
Northwestern Region:														
Chic. & N. Wn.	1922 34,956	41,720	76,676	8.6	....	1,321	556	23.8	434	26.4	3,965	171	1,384,339	9,519,828
	1921 43,477	29,550	73,027	7.9	....	1,267	551	25.2	435	27.5	3,794	170	1,631,238	10,020,373
Chic., Milw. & St. P.	1922 39,034	36,941	75,975	14.4	....	1,435	682	27.0	566	31.2	3,900	160	1,467,923	9,162,285
	1921 46,333	29,381	75,714	17.3	....	1,423	641	25.2	481	29.4	3,310	153	1,520,943	9,475,005
Chic., St. P., Min. & Om.	1922 3,020	8,729	11,749	10.6	7	1,035	467	23.7	424	23.5	2,889	176	271,877	1,715,449
	1921 3,630	12,104	15,734	13.4	212	1,068	471	22.6	344	20.9	3,135	169	303,788	1,759,316
Great Northern	1922 37,337	11,496	48,833	7.1	....	1,663	813	28.8	637	32.9	3,769	160	933,146	5,891,293
	1921 42,066	11,185	53,251	10.0	....	1,722	746	25.8	582	35.7	3,796	154	990,069	5,924,615
Minn., St. P. & S. Ste. M.	1922 16,200	7,699	23,899	7.2	985	1,201	602	28.9	575	26.0	4,153	124	424,046	2,495,551
	1921 20,453	6,110	26,563	11.0	2,997	1,224	587	23.9	413	23.1	2,517	124	434,308	2,577,928
Northern Pacific	1922 25,846	9,681	35,527	12.3	....	1,510	734	26.6	701	35.3	3,896	135	793,697	5,356,283
	1921 33,287	9,730	43,017	14.8	323	1,644	741	25.5	609	34.6	4,080	124	841,446	5,554,885
Oreg.-W. R. R. & Nav.	1922 4,689	3,179	7,868	3.2	....	1,355	704	29.2	769	34.6	2,824	240	256,290	1,703,773
	1921 7,394	4,256	11,650	2.6	243	1,408	647	27.2	482	26.3	2,610	227	255,212	1,728,061
Central Western Region:														
Atch., Top. & Santa Fe.	1922 35,809	28,403	64,212	5.3	173	1,604	586	20.8	638	47.1	4,180	147	1,665,064	13,487,397
	1921 43,814	15,161	58,975	8.8	1,897	1,599	571	20.2	632	48.2	3,815	146	1,658,487	12,797,196
Chicago & Alton	1922 6,150	7,268	13,418	9.3	....	1,383	707	29.1	472	22.4	6,264	201	238,873	1,525,600
	1921 9,061	6,020	15,081	4.0	....	1,330	555	25.2	462	29.1	6,900	186	293,706	1,669,120
Chic., Burl. & Quincy	1922 34,419	37,294	71,713	7.5	....	1,695	810	28.5	705	37.8	5,425	159	1,467,137	9,812,047
	1921 44,523	26,795	71,318	10.0	....	1,628	767	28.1	644	35.7	4,921	161	1,524,875	10,057,395
Chic., Rock I. & Pac.	1922 21,492	22,825	44,317	14.3	101	1,220	566	23.5	539	30.1	3,131	184	1,264,737	7,351,633
	1921 26,653	21,753	48,406	11.6	531	1,208	553	24.3	546	31.5	3,449	176	1,326,529	7,643,721
Denver & R. G. Wn.	1922 10,175	5,653	15,828	11.0	14	1,246	573	27.0	389	21.8	2,372	245	229,719	1,672,263
	1921 11,707	6,010	17,717	10.6	310	1,275	553	25.5	356	22.4	2,431	223	253,056	1,658,165
Oreg. Short Line	1922 5,847	5,092	10,939	4.9	....	1,341	609	27.0	914	50.0	4,224	150	282,368	2,132,146
	1921 7,758	6,360	14,118	4.1	169	1,482	629	26.9	736	45.5	4,404	141	281,433	2,034,848
Southern Pacific	1922 19,734	19,441	39,175	6.6	....	1,632	707	23.7	793	46.0	4,448	153	1,360,508	11,306,057
	1921 23,954	16,262	40,216	6.9	275	1,646	692	23.9	733	44.7	4,224	147	1,319,204	10,753,877
Union Pacific	1922 11,693	14,614	26,309	4.7	26	1,523	620	22.2	1,239	82.6	8,934	166	870,175	7,438,227
	1921 14,178	11,752	25,930	7.8	622	1,558	603	22.7	1,305	91.0	9,358	161	899,606	7,452,422
Southwestern Region:														
Gulf, Colo. & S. Fe.	1922 5,366	6,595	11,961	3.9	26	1,495	650	22.8	427	29.5	3,010	146	197,632	1,179,615
	1921 8,305	5,128	13,433	4.2	428	1,489	628	24.3	388	24.4	2,754	137	195,054	1,180,538
Mo., Kans. & Tex.	1922 6,948	9,153	16,101	8.4	....	1,568	682	23.1	431	26.8	4,187	144	248,638	2,006,534
	1921 7,869	6,154	14,023	7.5	....	1,518	623	23.0	418	28.6	3,429	139	273,962	2,068,122
Mo., Kan. & Tex. of Tex.	1922 339	11,911	12,250	7.6	....	1,085	465	21.7	300	18.7	2,112	183	203,808	1,462,376
	1921 219	12,311	12,530	5.1	....	1,177	474	22.3	297	20.8	2,140	162	275,064	1,776,187
Missouri Pacific	1922 19,965	31,394	51,359	9.6	....	1,330	626	25.5	409	21.9	2,956	169	820,431	5,095,265
	1921 28,797	24,440	53,237	8.2	176	1,391	634	25.7	483	27.4	3,540	158	927,521	5,657,228
St. Louis-San Francisco.	1922 14,699	23,422	38,121	7.0	....	964	434	24.4	270	15.8	2,198	220	661,130	3,815,004
	1921 18,690	13,402	32,092	6.9	....	1,063	475	24.6	402	23.9	2,754	190	778,370	4,482,149
Southern Pacific Lines[1]	1922 5,441	16,343	21,784	6.2	....	1,234	547	24.1	501	30.0	2,939	134	547,810	3,614,274
(in Texas and La.)	1922 8,329	16,926	25,255	16.3	1,020	1,250	546	26.8	402	32.2	2,781	131	538,933	3,506,395
Texas & Pacific	1922 3,965	10,261	14,226	14.5	....	1,325	557	21.5	317	20.3	2,307	176	284,155	1,857,132
	1921 5,032	6,890	11,922	20.5	....	1,246	495	21.1	380	26.7	2,319	150	301,314	1,994,243

[1]Includes Galveston, Harrisburg & San Antonio, Houston & Shreveport, Houston & Texas Central, Houston East & West Texas, Iberia & Vermilion, Lake Charles & Northern, Louisiana Western, Morgan's La. & Tex. R. R. & S. S. Co., and Texas & New Orleans.

$10,000,000 D. & R. G. W. Issue Authorized

The United States District Court has authorized the Denver & Rio Grande Western to issue $5,000,000 of receiver certificates to run for two years at six per cent and $5,000,000 of equipment trust notes to run for 15 years and to bear not to exceed 6½ per cent interest. Of the $10,000,000, $6,000,000 will be spent for equipment which will include 10 Mountain type locomotives, 10 heavy Mallet locomotives, 5 narrow-gage Mallet locomotives, a 150-ton wrecking derrick, a 175-ton narrow gage wrecking derrick, a narrow gage rotary snow plow, 500 stock cars, 100 narrow gage stock cars, 350 coal cars and miscellaneous equipment. The remainder of the $10,000,000 authorized in certificates and notes will be expended in improving the various lines. These improvements include new rail, ballasting, lengthening side tracks, yard improvements, water stations and additions to shop facilities, principally at the Burnham and Salt Lake terminals.

Revenues and Expenses for October

The Interstate Commerce Commission's summary of railway revenues and expenses for October and 10 months of 1922 (193 Class I roads) is as follows:

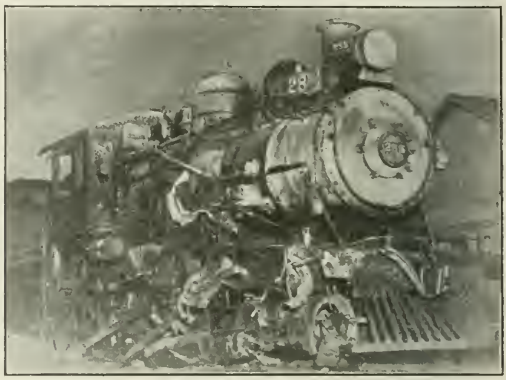
Item	October 1922	October 1921	Ten Months[1] 1922	Ten Months[1] 1921
Average number of miles operated	235,192.62	235,150.38	235,368.31	235,011.30
Revenues:				
Freight	$406,105,599	$401,951,413	$3,253,395,823	$3,296,896,869
Passenger	[2] 90,133,399	[3] 88,903,056	[4] 892,789,742	[5] 982,697,055
Mail	7,515,998	7,359,842	74,076,744	78,625,027
Express	18,755,980	12,178,757	112,784,602	82,728,318
All other transportation	16,240,598	15,917,948	146,641,440	136,856,033
Incidental	10,634,632	9,994,617	94,470,631	99,219,683
Joint facility—Cr.	886,838	595,615	8,297,277	6,357,028
Joint facility—Dr.	221,148	179,594	1,802,860	1,435,732
Railway operating revenues	550,051,896	536,722,654	4,580,653,399	4,681,944,281
Expenses:				
Maintenance of way and structures	68,957,275	72,661,765	617,111,915	653,201,561
Maintenance of equipment	130,408,463	112,191,535	1,024,418,667	1,058,558,504
Traffic	7,245,129	6,904,722	71,817,484	70,588,922
Transportation	205,891,873	189,465,425	1,767,289,149	1,924,445,014
Miscellaneous operations	4,174,925	3,936,269	39,806,196	41,509,392
General	13,044,812	13,285,351	130,299,242	140,906,559
Transportation for investment—Cr.	750,212	486,272	5,479,136	4,910,596
Railway operating expenses	428,972,265	397,958,795	3,645,263,517	3,884,269,356
Net revenue from railway operations	121,079,631	138,763,859	935,389,882	797,674,925
Railway tax accruals	27,014,299	25,825,334	254,935,753	235,416,521
Uncollectible railway revenues	42,014	175,652	1,065,847	1,059,469
Railway operating income	94,023,318	112,762,873	679,388,282	561,198,935
Equipment rents—Dr. balance	6,835,917	5,762,476	49,488,689	45,546,289
Joint facility rent—Dr. balance	1,932,435	1,479,621	15,582,324	16,238,890
Net railway operating income	85,254,966	105,520,776	614,317,269	499,413,756
Ratio of expenses to revenues (per cent)	77.99	74.15	79.58	82.96

[1] Does not include Boston & Albany, the revenues and expenses of which are included in New York Central report.
[2] Includes $2,880,164, sleeping and parlor car surcharge.
[3] Includes $2,658,395, sleeping and parlor car surcharge.
[4] Includes $27,237,711, sleeping and parlor car surcharge.
[5] Includes $27,362,471, sleeping and parlor car surcharge.

The Disaster at Humble, Tex.

The number killed or fatally scalded in the collision on the Southern Pacific at Humble, Tex., reported in our last issue, was 21; and some of the 14 injured were at last accounts in a critical condition. The killed were nearly all in the negro car, and steam from the damaged switching engine, rushing in through an open window, caused all or nearly all the deaths. All other windows of the coach were closed. It was believed that if some or all the rest had been open, the scalding would have been less severe. The collision occurred about 10 p. m. The switching locomotive, which got in the way of the passenger train (Train 28, Engine 255) had been laid up for the night, in charge of a watchman. This watchman had to supply the locomotive with water and with fuel oil; and to do this it appears that he moved it; but he is held to have moved it from one track to another when he should not have done so; and in this movement, in some way not explained, he moved it afoul of the main track.

Of the killed or fatally injured, four were white passengers and 14 were negro passengers; to which are to be added the conductor, the news agent and a porter.



International

Engine No. 255 After the Collision

The man who was in charge of the yard engine, J. H. Smith, is about 60 years old. The reports indicate that he was in such a nervous condition that his narrative was not wholly intelligible; but one account, based on statements made by Smith, says that the locomotive started unattended toward the main track, while Smith was in his shanty; and that he jumped to the engine and tried to reverse it in season to prevent fouling of the main track. The passenger train was approaching at moderate speed but there was a dense fog so that the engineman could not see far ahead.

"Railway Engineering and Maintenance"

Effective January 1, 1923, the name of the Railway Maintenance Engineer will be changed to Railway Engineering and Maintenance. At the same time, the number of editorial pages will be increased to permit the inclusion of more information relative to the design, construction and maintenance of railway bridge, building and water service facilities.

Since the establishment of the Maintenance of Way section in the *Railway Age* in 1911 and its development into the Railway Maintenance Engineer in 1916, there has developed a closer contact between engineering and maintenance, until today they are merged on many railroads. This increasingly intimate relationship has been apparent in the Roadmasters' Association, the Bridge and Building Association and the American Railway Engineering Association. It has also been reflected in the editorial contents of the Railway Maintenance Engineer and its circle of readers, until today this paper is read by nearly every railway officer of technical or practical training in charge of the construction and maintenance of roadway and structures. The new name has been adopted in order to indicate more accurately the nature of the editorial contents and the character of the readers of this publication.

The additional attention which will be given to bridge, building and water service problems is a recognition of the increasing importance of these phases of railway construction and maintenance. By increasing the number of editorial pages these developments will be treated more adequately without detracting in any way from the space now devoted to the problems of track construction and maintenance, or eliminating any other features now appearing in the publication.

Electrification—Installation and Operating Costs

Steam Road Electrification was the title of an address presented by A. H. Armstrong, chairman electrification committee, General Electric Company before the New York Electrical Society on Tuesday, December 19 at the Engineering Societies' Building in New York. Mr. Armstrong stated that the saving in coal effected by electric operation should offset the additional cost of the electrical equipment. Electrical operating facilities exclusive of locomotives, he stated, cost just about as much as the electric locomotives themselves, while steam locomotive operating facilities, not required when a road is electrified, cost about one-half as much as the locomotives. Electrification, he said, in a given case, should save about 20 per cent in operating costs as compared with steam, 12 per cent of which was effected by reduced maintenance costs.

Mr. Armstrong also elaborated upon the better known advantages of electric operation such as increased track capacity, improved terminal facilities, improved operation, etc. He also pointed out the fact that the great majority of steam road terminals were of a necessity on the outskirts of cities and he stated that electrified terminals centrally located would minimize truck competition.

Short Line Association Establishes Purchasing Agency at Chicago

The Consolidated Purchasing Agency of the American Short Line Railroad Association, which was organized in June, 1921, with James W. Caiin as manager of purchases, was removed from Washington to Chicago, on December 1, 1922, and is now located in the Railway Exchange Building. This change was necessitated by the increased volume of business being handled by this department of the association, which can best be taken care of from a more central point. There was also need of being located in an industrial and railroad center to facilitate procuring materials and equipment more promptly. Chicago was chosen in order that the agency might be able to keep in constant contact with manufacturers and secure the best class of used cars and locomotives direct from the trunk lines.

The membership of the American Short Line Railroad Association consists of slightly less than 500 different railroads, which in combination represent over 25,000 miles of main line tracks and an investment of over $1,000,000,000. These roads vary from small logging lines a few miles in length up to interstate carriers of several hundred miles, and include Class 2 and Class 3 roads.

While the consolidated purchasing agency assumes no financial responsibility, being unincorporated and without working capital, it acts as an agency for combining the purchases of these different railroad companies and for negotiating prices on a volume basis instead of the retail basis on which the individual small railroad has heretofore purchased its supplies. There has been no attempt to cover all purchases, but instead the agency has proceeded conservatively and confined its efforts during the first year to those materials which were either standard or susceptible of standardization. For example, purchases of rails have been made in 500-ton lots and distributed to member lines in less than 500-ton shipments, which gave them the same advantage as the purchaser of 500 tons and over. Likewise, spikes and bolts are purchased in carload lots, and even though a small road may need only 25 kegs it derives the benefit of the carload price. Besides purchasing, the agency aids in the sale of materials which the short lines do not need and arranges the exchange of equipment among the roads. To expedite the work of the agency a department of new equipment and materials, one of second hand equipment and one of industrial development was formed.

During its existence the agency has proved its value to the short lines, not only in purchasing and exchanging, but in the selection of equipment best suited to the most efficient operation of these lines. As a result the scope of the organization has reached such proportions that it is necessary to develop a more extensive organization. Accordingly plans are being considered wherein three regional offices will be opened during the next year, one in the East, one in the South and one on the Pacific coast, which will facilitate the distribution of materials shipped in carload lots and reconsigned.

After an investigation covering the greater part of a year, augmented by answers to questionnaires sent to all member lines throughout the United States and Canada, the consolidated purchasing agency made recommendations and placed orders for over a quarter of a million dollars' worth of gasoline railway motor car equipment, representing some 20 cars, which are showing excellent results on the different lines and which are replacing steam passenger trains.

Through the activities of the manager of purchases, a finance corporation is now being organized under direction of the association, whereby member lines and others may acquire motor car equipment under a lease purchase plan, making it possible for the equipment to pay for itself through the saving effected. This corporation will be ready to function by the first of the year, at which time formal announcement will be made.

Work is also progressing satisfactorily in the direction of arranging for standard designs of cars and locomotives, whereby substantial economies may be effected. It will also be possible by using standard designs to arrange financing on a basis that could not be done where a variety of different designs were contemplated. Through the consolidation of the requirements of these lines, the quantity will be sufficient to justify liberal prices and terms.

Just as fast as these different problems are worked out, others will be taken up, such as combining the fuel requirements in different districts, grouping the insurance, and possibly evolving policies giving more complete coverage than heretofore; conversion of coal burning equipment to oil, where the combined locomotives are sufficient to justify lower prices and enable financing of the equipment; and other such innovations which make for economy.

Central Pacific Hearing Concluded

The hearing before Commissioners Meyer and Potter of the Interstate Commerce Commission on the Southern Pacific's application for authority to retain the Central Pacific was concluded on December 14 with the testimony of Harold K. Faye, traffic manager of the Western Pacific, who asked that if the Southern Pacific is authorized to acquire the Central Pacific, care should be taken to insure that the Western Pacific will be entitled to the same treatment by the Southern Pacific so far as joint through rates on both transcontinental and local traffic are concerned, as is accorded the Central Pacific. He took no position for or against the Southern Pacific's application, but pointed out the handicaps under which the Western Pacific and its shippers now work because the Southern Pacific does not participate with it in the making of through rates. There are practically no through rates locally in California between points on the Southern Pacific and on the Western Pacific, he said, and the combination of locals restricts largely the ability of producers and manufacturers located on the Western Pacific to ship to and from points off that line in competition with those located on the Southern Pacific. Also there are similar restrictions as to the application of through transcontinental rates. Asked what would be the effect on interchange between the Union Pacific and Western Pacific at Salt Lake City if the Union Pacific should acquire the Central Pacific, Mr. Faye said he did not know; but he said it would be much against the public interest for the Union Pacific to close that gateway, and he doubted if it would do it. In reply to questions by Commissioner Potter he said that from the standpoint of competition his experience with the local California situation would indicate that the competition offered to the public if the Central Pacific were controlled by the Southern Pacific would not be materially different from that which would be offered if the Central Pacific were independent and he could not conceive of the competition between the Central Pacific and the Western Pacific being any stronger than it is now.

The last witness for the Union Pacific was H. M. Bischoff, general agent of the Chicago & North Western at Chicago, who testified that there was no co-operation between the Southern Pacific and North Western soliciting agents at Chicago in soliciting prospective business for the Ogden route. He said he did not know the Southern Pacific general agent at Chicago and the Southern Pacific was regarded as a competitor because of its interest in the southern route. He was cross-examined by F. H. Wood, commerce counsel for the Southern Pacific, to show that the Southern Pacific might work with other lines out of Chicago for business to be routed over the Union Pacific and the Ogden route.

Traffic News

The Traffic Club of New England, at its meeting in Boston on December 13, elected as president of the club, Charles B. Baldwin of the United Shoe Machinery Corporation, in place of Gerrit Fort. Mr. Baldwin is regional vice-president of the National Industrial Traffic League.

The Baltimore & Ohio now accepts shipments of milk collect using a "collect milk-cream waybill," supplanting the former rule requiring prepayment. By a new system of invoice billing for the return of empty cans a complete record is kept showing the exact time when delivered to the railroad.

A committee of 21 to study problems of the farmer, including marketing and transportation, was authorized by the Wisconsin Manufacturers' Association, at Milwaukee, Wis., on December 14. President Carl A. Johnson will appoint five representatives of agriculture, five dairymen, five bankers and five manufacturers and will himself be chairman of the committee.

The Bureau of Service, National Parks & Resorts, maintained by the Chicago & North Western-Union Pacific system, offers for sale for use as a Christmas present, a prepaid certificate covering railroad fare and all expenses, including hotel accommodations and motor trips, for a 27-day tour to Southern California. The tour may begin leaving Chicago on the Los Angeles Limited either January 6 or 27 or February 17.

Bituminous Coal Production

Production of soft coal continues at a daily rate of approximately 1,900,000 tons. The output for the week ended December 9 is estimated at 11,389,000 tons, including lignite, coal coked, mine fuel, and local sales, according to the weekly bulletin of the Geological Survey. Preliminary reports of cars loaded the first four days of last week indicated a small decline on account of lay-off in some union districts on Tuesday, miners' election day. The estimated cumulative production of bituminous coal this year to December 9, inclusive, stands at 376,826,000 tons, or 2 per cent less than in the corresponding period of 1921.

Anthracite Shipments for November

Shipments of anthracite for the month of November, as reported to the Anthracite Bureau of Information, Philadelphia, amounted to 6,420,102 gross tons, as compared with 5,314,014 tons during the corresponding month last year—an increase of 1,106,088 tons. November of this year showed a slight decrease from October, but average shipments for the days the mines were in operation exceeded those of October.

Shipments by originating carriers were as follows:

	November, 1922	November, 1921	October, 1922
P. & R.	1,224,990	1,017,409	1,266,092
L. V.	1,109,449	913,737	1,166,195
C. of N. J.	583,835	512,613	617,668
D. L. & W.	896,182	814,131	936,375
D. & H.	876,861	756,598	828,216
Penna.	546,214	429,638	579,306
Erie	706,747	503,488	701,270
N. Y., O. & W.	161,660	136,945	179,865
L. & N. E.	314,164	229,455	292,941
Total	6,420,102	5,314,014	6,567,928

Post Office Department Finds Many Late Trains

Elaborate plans made by the Postoffice Department for the use of freight cars for parcel post holiday business are being frustrated, according to a statement issued by the Postoffice Department Information Service, through "delays in the arrival of trains and the failure of the railroads to furnish readily the necessary cars at the desired points. Late trains are resulting in the loss of the utilization of hundreds of cars for many hours."

"A freeze-up at any of the larger terminal freight yards or a bad snow would make matters even worse," the statement continued. "Already many complaints of delay in daily delivery of the regular mails are being received. Many trains are arriving at destination from three to eight hours late. Important connections are failing and causing delays all along the line. The trouble is not confined to any particular road or locality but has become quite general.

"One important mail train from New York missed connection eight times within a month, delaying the delivery of mails in certain industrial centers as much as 24 hours."

Freight Commodity Statistics

The Bureau of Statistics of the Interstate Commerce Commission has issued a statement showing by districts the freight tonnage transported by Class I railways for the quarter ended September 30, 1922. Below will be found a comparison, by general classes of commodities, of the tonnage transported in 1921 with that transported in 1922:

	Number of tons originated		
Class of commodities	Quarter ended Sept. 30, 1921	Quarter ended Sept. 30, 1922	Per cent of increase, 1922 over 1921
Products of agriculture	31,920,709	28,135,979	*11.86
Animals and products	5,919,002	6,473,191	9.36
Products of mines	139,807,662	138,830,954	*.70
Products of forests	17,312,655	22,539,851	30.19
Manufactures and miscellaneous	46,208,214	61,955,035	34.08
Merchandise—All L. C. L. traffic	11,133,525	11,020,382	*1.02
Total	252,301,767	268,955,383	6.60

	Total tons carried		
Products of agriculture	59,612,632	52,584,337	*11.79
Animals and products	10,378,917	11,015,159	6.13
Products of mines	233,031,729	227,565,940	*2.35
Products of forests	33,845,769	42,429,882	25.36
Manufactures and miscellaneous	87,585,753	116,425,428	32.93
Merchandise—All L. C. L. traffic	17,425,904	17,879,418	2.60
Total	441,880,704	467,900,164	5.89

*Decrease.

For the nine months ended September 30 the number of tons carried this year was 1,293,628,322, an increase of 4.2 per cent as compared with last year.

No Congestion of Christmas Mail

Daily telegraphic reports received by the Post Office Department on December 20 from the 15 railway mail service divisions revealed no congestion of the Christmas mails at any point in the United States, according to a statement issued by the department's Information Service.

A marked improvement in the operation of trains was also a feature of the dispatches. Several of the divisions reported heavy increases in the holiday mails over last year, Atlanta showing an estimated gain of 50 per cent and San Francisco 30 per cent. At Omaha the Union Pacific was compelled to run a special mail train of 13 refrigerator cars loaded solidly with mail for Western points making a total of 19 as compared with 15 cars hauled in a single day over the same line last year. A summary of these telegrams received by the department today from its railway mail divisions follow:

ATLANTA: Heavy holiday mails. Fifty per cent increase over same period last year. Mails moving promptly.

BOSTON: Mails moving freely. Indications are early mailing campaign successful and may not have as pronounced peak as in former years.

NEW YORK: No congestion in terminals in and around New York city nor at Albany, Binghamton, Buffalo, Philadelphia and Harrisburg. Weather conditions so far favorable to prompt distribution and dispatch of mails.

WASHINGTON, D. C.: No unusual amount of unworked mail. Number of storage cars dispatched today was 71 as compared with 50 last year.

CINCINNATI: No congestion and no unworked mail. Many trains running late.

CHICAGO: Conditions favorable. No congestion or unworked mail. Empty equipment situation much improved.

ST. LOUIS: Trains running badly but no congestion nor unworked mail.

KANSAS CITY, MO.: Conditions satisfactory throughout division. No congestion. Mails heavy. Weather fine.

SAN FRANCISCO: No unworked mail. No congestion on lines nor terminals. Mails moving early to Eastern points. Estimated increase over last year over thirty per cent.

CLEVELAND: No congestion. Unworked mails normal. Terminals in good condition. Indications are for very heavy run of mail tonight and tomorrow.

ST. PAUL: Condition throughout division satisfactory. No unusual reports of unworked mail and no congestion. Storage mails continue heavy and trains experiencing difficulty in maintaining schedules on account of excessively cold weather.

FORT WORTH: No congestion of mails in district.

NEW ORLEANS: No congestion.

SEATTLE: Conditions are good. No congestion at any point in district Trans-continental trains running from two to ten hours late.

OMAHA: All terminal lines and platforms clear. Trains running much better. On account of car shortage Union Pacific running second section of Train Three as mail special with 13 refrigerator cars loaded solid with mail for Ogden and points west making total 19 storage cars as against 15 last year.

PITTSBURGH: Operation of trains better today. No congestion of mails. No unworked mail.

Commission and Court News

State Commissions

The order of the Alabama Public Service Commission requiring passenger fares in that state to be reduced on December 15 to three cents a mile was suspended on December 11 by a temporary injunction procured by the railroads from the United States District Court.

Personnel of Commissions

I. C. C. Members Reappointed

President Harding on December 20 sent to the Senate the nominations of C. C. McChord and Joseph B. Eastman for reappointment as members of the Interstate Commerce Commission. Their terms expire at the end of the year. Mr. McChord, who is now chairman, has been a member of the commission since 1910 and Mr. Eastman has been a member since 1919.

Court News

Trailer Car Not An Appurtenance Within Boiler Inspection Act

The Mississippi Supreme Court holds that a trail car constructed and equipped like an ordinary flat car, but used exclusively in pushing cars onto a transfer boat to prevent the great weight of the locomotive from being placed on the apron of the boat, is not an "appurtenance" of the locomotive and tender within the meaning of the Boiler Inspection Act. The action was for injuries sustained by being thrown from a defective footboard on the trailer.—A. W. (Miss.) 62 So. 161.

Not Liable for Explosion of Powder Left in Car by Consignee

The Utah Supreme Court holds that railroad cars used in the ordinary course of business do not come within the class of instrumentalities that may be designated as attractive nuisances. A railroad company was therefore held not liable for injuries to a boy from the explosion of powder which he found in a car where it had been left by the consignee, who unloaded the car a short time before the accident, the railroad company having no knowledge that the powder was in the car. The company had the right to assume that the consignee had removed all the powder. The car was not in a public place where children or others had a right to pass.—Bogdon v. Los Angeles & Salt Lake (Utah), 205 Pac. 571.

United States Supreme Court

Indiana Statute Requiring Settlement of Damage Claims in 90 Days Held Valid

An Indiana statute of 1911 provides for the presentation of claims for loss or damage to freight transported wholly within the state within four months and for payment or rejection by the railroad within 90 days therefrom, failing which the claim shall stand admitted as a liability. The Supreme Court of the United States holds that the statute is not unconstitutional as in violation of the due process clause of the Fourteenth Amendment. The court holds untenable the contention that by the statute, in case of suit by a claimant, he is excused from establishing his claim. "If the claim is just, there is no injustice in requiring its payment; if the claim is deemed by the company to be unjust, the statute requires a declaration of the fact by its rejection. Upon rejection, suit, of course, must be brought for it and it must be established. No penalty is imposed for its rejection nor increase of its amount in consequence of rejection."—Southern Ry. Co. v. Clift. Opinion by Mr. Justice McKenna. Decided December 4, 1922.

Foreign Railway News

Ireland Considers Consolidation of Railways

Plans are being made in the Irish Free State to consolidate all the railways into one or two systems, according to press dispatches from Dublin. A bill to that effect will, it is said, be introduced shortly in the Irish parliament.

British Railways in Conference With Unions

Conferences between representatives of the managements of the British railways and the National Union of Railwaymen and the Associated Society of Locomotive Engineers and Firemen are in progress looking toward a modification of certain phases of the national agreements with these unions. In the event that the conferees fail to reach an agreement, it is likely that the question will be submitted to the National Wages Board for adjudication.

Another Electrification Combine in Britain

An agreement is rumored, according to The Engineer (London), between Sir W. G. Armstrong-Whitworth & Company, locomotive builders, and the British Thompson-Houston Company, electrical manufacturers, whereby the former will undertake to build electric locomotives and rolling stock and the latter electrical equipment, power stations, etc. for railway electrification. Two other strong groups similarly organized already exist in England, viz. the Vickers group and the Poiver & Transport Finance Company, which is backed by the North British Locomotive Company and the English Electric Company.

Peru Ratifies Dansmuir Concession

The Peruvian chamber of deputies has ratified the Dunsmuir railway concession with certain reservations, according to dispatches to the Wall Street Journal. After approval by the Peruvian senate the company will have six months in which to place a bond issue for 1,245,000 Peruvian pounds sterling ($5,278,000 at present exchange rates). The proceeds will go to Peruvian government and the concessionaires will receive a monopoly on tobacco which is expected to yield sufficient profit to provide for railway construction.

Nine lines of railway will be built and operated by the concessionaire on his own account. At the end of a period of 45 years these lines revert to the government unless the concessionaire desires to purchase them at cost price. The tobacco monopoly reverts to the government after 33 years. It yields a profit of some $2,500,000 per annum.

The concessionaire, moreover, is to receive as an outright gift of government lands 15½ miles on each side of the railway, in lots of 12,356 acres each, the government retaining and the company receiving alternate lots. Construction must proceed at a minimum rate of 93 miles a year.

French-Built Electric Locomotive Undergoes Test

A trial run of a French built electric locomotive was recently conducted by the French Ministry of Public Works. This locomotive is the first of a series of 50 which are to be built on a standardized design for railroad service between Dax and Toulouse, a distance of 220 miles. They will be constructed by the Société des Construction Mecaniques which recently established works at Tarbes where 900 men are now employed.

It is expected that the section of the Midi Railway between Dax and Toulouse will be completely electrified during 1923. Progressively the whole of the Midi, P. L. M. and Orleans systems representing a total of about 5,750 miles of line, will be similarly transformed. This scheme for the electrification of the railways is being carried out in conjunction with the undertaking for the utilization of the rivers Rhone and Dordogne for the development of electric power, generally. The substitution of electricity for steam as a motive power on the railroads will enable France, according to official estimates, to reduce her imports of coal by about 3,000,000 tons a year.

Equipment and Supplies

Locomotives

THE DENVER & RIO GRANDE WESTERN has ordered one narrow gage rotary snow plow from the American Locomotive Company.

THE NEW YORK, CHICAGO & ST. LOUIS is inquiring for 10 switching locomotives, 10 Mikado type and 8 Pacific type locomotives.

THE SNOQUALMIE FALLS LUMBER COMPANY, Snoqualmie Falls, Wash., has ordered one Prairie type locomotive from the Baldwin Locomotive Works.

THE LEHIGH VALLEY, reported in the *Railway Age* of November 18 as inquiring for 30 locomotive tenders, has ordered this equipment from the American Locomotive Company.

THE MESABA CLIFFS IRON MINING CO., Ishpeming, Mich., has ordered three 6-wheel switching locomotives from the American Locomotive Company. These locomotives are for 19 by 26 in. cylinders.

THE CHICAGO, BURLINGTON & QUINCY, reported in the *Railway Age of* November 18 as inquiring for 50 Mikado type and 10 Santa Fe type locomotives, has ordered this equipment from the Baldwin Locomotive Works.

Freight Cars

THE TENNESSEE CENTRAL is inquiring for 1,000 composite gondola cars.

THE BALTIMORE & OHIO is asking for bids for the repair of 2,000 box cars.

THE AMERICAN TURPENTINE & TAR CO., New Orleans, La., is inquiring for one tank car.

THE TEXAS-LOUISIANA PRODUCING & CARBON CO., Monroe, La., is inquiring for three insulated tank cars of 8,000 gal. capacity.

THE DENVER & RIO GRANDE WESTERN is inquiring for 500 stock cars of 40 tons' capacity, 100 narrow gage stock cars and 350 coal cars.

THE MUSCLE SHOALS, BIRMINGHAM & PENSACOLA, reported in the *Railway Age* of December 16 as inquiring for 50 box cars and 50 flat cars, is also inquiring for 50 hopper cars and 50 gondola cars of 50 tons' capacity.

THE CHICAGO & NORTH WESTERN is inquiring for 3,000 single sheath box cars of 80,000 lb. capacity with steel underframes and upper frames and 200 steel underframe milk cars with standard refrigerator car type bodies and four wheel passenger type trucks.

THE UNION PACIFIC, reported in the *Railway Age* of December 9 as asking for bids on 5,000 refrigerator cars, has ordered 1,000 from the Pullman Company, 1,000 from the General American Car Company, 1,030 from the Pacific Car & Foundry Company, 1,500 from the Standard Steel Car Company, and 500 from the Mt. Vernon Car Company.

Passenger Cars

THE PERE MARQUETTE has ordered two dining cars from the Pullman Company.

THE CENTRAL OF NEW JERSEY is inquiring for three, 70 ft. combination mail and express cars.

THE MISSOURI PACIFIC is inquiring for 13 suburban coaches and 4 combination passenger and baggage cars, 63 feet long.

THE PHILADELPHIA & READING, reported in the *Railway Age* of December 2 as inquiring for 45 steel suburban passenger coaches and 5 steel suburban combination passenger and baggage cars, has ordered this equipment from the Bethlehem Shipbuilding Corporation, Harlan Plant.

THE NEW YORK CENTRAL, reported in the *Railway Age* of December 16 as having placed orders for 60 cars for passenger service, has purchased 125 additional cars as follows: 20 multiple unit steel passenger motor cars, 20 coaches and 10 baggage cars from the Standard Steel Car Company; 30 baggage cars and 20 coaches from the American Car & Foundry Co.; 15 combination passenger and baggage cars and 10 coaches from the Pressed Steel Car Company.

Iron and Steel

THE PENNSYLVANIA RAILROAD has ordered 500 tons of steel for bridges from the Fort Pitt Bridge Co.

THE MISSOURI PACIFIC has ordered 700 tons of structural steel from the Virginia Bridge & Iron Company.

THE FT. DODGE, DES MOINES & SOUTHERN has ordered 238 tons of structural steel from the American Bridge Company.

THE BOSTON & MAINE is inquiring for some structural steel for use on locomotive shops now building at Concord, N. H.

THE CHESAPEAKE & OHIO, reported in the *Railway Age* of November 25 as inquiring for 500 tons of steel for bridges, has ordered 400 tons from the Phoenix Bridge Company.

Machinery and Tools

THE DELAWARE, LACKAWANNA & WESTERN expects to buy shortly a total of about 27 machine tools including engine lathes and a number of miscellaneous tools for its shops at East Buffalo, N. Y. and at Gravel Place, Pa, also for its locomotive shops at Kingsland, N. J.

Miscellaneous

THE GREAT NORTHERN is inquiring for 2 all steel air operated spreaders equipped with ballast spreading and ditching attachments.

THE KANSAS CITY SOUTHERN has awarded a contract to the Truscon Steel Company, Chicago, for the sash to be used in the reconstruction of its shops at Pittsburg, Kan.

MISSOURI PACIFIC.—This company has closed bids for the installation of sprinkler systems for fire protection at its shops at St. Louis, Mo.; Nevada, Crane and Poplar Bluff.

THE NEW YORK CENTRAL has asked for bids for two inclined freight elevators for Pier D, North river, foot of Sixtieth street, New York City, also for fence wire, posts and parts for installing same.

THE CANADIAN PACIFIC has ordered a new passenger steamship for use between Canada and Australia, to be completed in 20 months. The vessel will be of 20,000 tons gross register, 600 ft. long and 72 ft. beam, four screws turned by Diesel engines.

THE MISSOURI PACIFIC has awarded a contract to the Railroad Water and Coal Handling Company, Chicago, for the underground work connected with the installation of sprinkler systems for fire protection in its shops at St. Louis, Mo., Nevada, Crane and Poplar Bluff.

THE NEW YORK CENTRAL is asking for bids until 12 o'clock noon, December 28, for its requirements until April 1, 1923, on the line Buffalo and East, of fuel oil (paraffine base), gasoline, long time burning semaphore oil, turpentine, substitute, coach candles, mineral seal oil, common black oil, West Virginia black oil and gas oil.

J. W. GREEN, a former member of the Brotherhood of Locomotive Engineers, has sued the Brotherhood for $50,000 damages in connection with his expulsion from the Brotherhood for alleged disloyal remarks; and in court at Selma, Ala., on December 13, a jury is said to have given him a verdict for $40,000.

Supply Trade News

E. F. Pride, secretary and assistant treasurer of the **Standard Coupler Company,** New York, has been elected treasurer and **C. T. Lynch** has been elected secretary.

A. P. Dennis, who has been officially connected with the Standard Coupler Company, New York, since its organization, has resigned as vice-president and treasurer.

The Railroad Supply Company, Chicago, has arranged with the Valley Electric Company to take charge of exclusive railroad sales of Valley rectifiers used in signal service.

The Ingersoll Rand Company and the **A. S. Cameron Steam Pump Works,** New York, have opened a branch office at 718 Ellicott Square building, Buffalo, N. Y. This new office is equipped to render full service to those interested in the numerous products manufactured by these companies.

Peter A. Frasse & Company, Inc., New York City, has been appointed exclusive eastern distributor for the electric carbon, alloy and tool steels in bars, billets and die blocks manufactured by the Sizer Steel Corporation with plants at Buffalo, N. Y., and Solvay, N. Y. (Syracuse), combined with the equipment of the Frasse Steel Works, Inc., Hartford, Conn., for cold finishing and heat treating. The Frasse Steel Works, has been appointed the exclusive New England distributor for the Sizer Steel Corporation.

Herbert Hall Hewitt, president of the Hewitt Rubber Company, Buffalo, N. Y.; the Magnus Company, Inc., New York.; the Reading Car Wheel Company, Reading, Pa., and the St. Thomas Brass Company, St. Thomas, Ont., died at his home in Buffalo on December 19. Mr. Hewitt had been in poor health for two years. He was born on January 19, 1855, at Detroit, Mich., and entered the employ of the Pullman Company when he was about 20 years old and later became manager of that company. He subsequently went to Buffalo where he established the Buffalo Brass Company and the Union Car Works. The latter company later became the Buffalo Car Works of the American Car & Foundry Company. Mr. Hewitt was the inventor of several railroad appliances. He had served as president of the Magnus Company since its organization in 1899 and was formerly a director of the Seaboard National Bank and the Mechanics and Metals National Bank of New York City and at the time of his death was a director of the Marine Trust Company, Buffalo.

Major Frank S. Robbins, who recently returned from the Orient after serving as a mechanical adviser for the Inter-Allied Technical Board at Harbin, Manchuria, has joined the forces of the **Pittsburgh Testing Laboratory** at Pittsburgh, Pa., having been appointed railway representative of this organization. After graduating from Purdue University, Major Robbins began his railroad work in 1900 as a machinist's apprentice for the Pennsylvania Railroad at its Meadow Shops, and continued in its service until March, 1921. At the time the company's locomotive testing laboratory was opened at Altoona, Major Robbins was assigned to work at that place. Subsequently, he occupied positions as motive power inspector, assistant road foreman of engines, assistant master mechanic and master mechanic, his last appointment being master mechanic of the Pittsburgh Terminal division. During the war, he served with the 19th Engineers and later was commanding officer of the 65th Engineers and acted as superintendent of motive power of the 16th Grand Division of the Transportation Corps.

Obituary

William J. Clark, advisory manager of the railway department of the General Electric Company, died at his home in New York City on December 12 at the age of 68. Mr. Clark had been connected with the company for 34 years; his headquarters were at the New York City office of the company.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—This company, which was reported in the *Railway Age* of December 16 as contemplating the construction of a second track on the Albuquerque division for 8.6 miles between Dalies, N. M., and Rio Puerco and for 32.6 miles between Perea, N. M., and Defiance, has awarded the contract to Sharp & Fellowes of Los Angeles, Cal., and will begin construction upon the completion of the second track work now under way at Griffith, Ariz.

CANADIAN NATIONAL.—This company will construct a connection approximately 29½ miles long, between the Canadian Northern Ontario Railway near Longlac, Ont., and the National Trancontinental Railway near Nakina. Longlac is on the Canadian Northern main line between Montreal and Winnipeg, 480.7 miles northwest of North Bay, while Nakina is 52.25 miles west of Cochrane. The distance from Winnipeg to Montreal, via the National Trancontinental to Nakina, the proposed connection to Longlac, and the Canadian Northern to Montreal, will be 1,357 miles as compared with 1,411 via the Canadian Pacific, and 1,459 via the Canadian Northern through Port Arthur. The distance from Winnipeg to Toronto will likewise be reduced to 1,207 miles, via the new line, as compared with 1,257 miles, via the National Trancontinental to Cochrane and the Temiskaming & Northern Ontario, and 1,309 miles, via the Canadian Northern line through Port Arthur. This route will also eliminate the necessity of dropping down from the height of land to Lake Superior at Port Arthur and rising again at Winnipeg.

CHESAPEAKE & OHIO.—This company is reported to have approved the construction of a 90 ft. by 242 ft. two story fruit terminal station at Cincinnati, O., to cost approximately $240,000.

CHICAGO, ROCK ISLAND & PACIFIC.—This company will construct a 24 ft. by 115 ft. passenger station at Carlisle, Ark., to cost approximately $15,000.

GULF, COLORADO & SANTA FE.—This company is constructing with company forces a 32 ft. by 80 ft. frame freight station, with platform at McGregor, Tex., to cost approximately $5,250, to replace a warehouse which was recently destroyed by fire.

ILLINOIS CENTRAL.—This company is considering plans for the construction of a new freight house and passenger station at Covington, Ky., to replace one which was recently destroyed by fire with a reported loss of $100,000.

ILLINOIS CENTRAL.—This company contemplates the construction of a new single track line from Edgewood, Ill., to the Ohio river at Metropolis and the reconstruction of its line from that point to Fulton, Ky., a total distance of approximately 175 miles. The present bridge of the Chicago, Burlington & Quincy and the Nashville, Chattanooga & St. Louis at Metropolis will be used. The new line will be about 20 miles shorter than the present route via Centralia, Ill., and Cairo, and will avoid heavy grades on the existing line.

UNION PACIFIC.—This company has completed plans for the immediate construction of shops and yards at Los Angeles, Cal., to cost approximately $1,750,000. The new terminal will include an enginehouse, locomotive shops, freight car shops, coach shops, yards and related facilities.

Boston & Albany Authorizes $4,000,000 Station at Springfield, Mass.

The Boston & Albany has authorized a new station at Springfield, Mass., estimated to cost about $4,000,000. Bids will be called for as soon as detailed plans can be completed. It is estimated that approximately three years will be required to complete the work which includes the station proper, an office building, a baggage, mail and express building and a new interlocking system, besides platforms, tracks, subways, etc. Nine tracks with 20 ft. platforms and canopies will be provided at the station.

Railway Financial News

ALABAMA GREAT NORTHERN.—*Authorized to Procure Authentication and Delivery of Bonds.*—This company has been authorized by the Interstate Commerce Commission to procure the authentication and delivery of $500,000 of first mortgage 5 per cent gold bonds to be held in the treasury.

ANN ARBOR.—*Pennsylvania Leases Terminals.*—The Pennsylvania Railroad has entered into a 100-year contract with the Ann Arbor for the use of the latter's terminals in Toledo, Ohio, and its road to the Michigan state line.

CAROLINA, CLINCHFIELD & OHIO.—*Bonds Sold.*—A syndicate composed of Blair & Co., Inc., Ladenburg, Thalmann & Co., Cassatt & Co., Spencer Trask & Co., Redmond & Co. and A. G. Becker & Co., has sold $8,000,000 first and consolidated mortgage 30-year 6 per cent bonds at 96½ and interest, to yield about 6.25 per cent.

CHESAPEAKE & OHIO.—*Van Sweringens Negotiating for Control.*—Negotiations are reported under way between O. P. Van Sweringen, of Cleveland, and H. E. Huntington, chairman of the Chesapeake & Ohio board, for the purchase of the latter's holdings in the road.

The Van Sweringen interests control the New York, Chicago & St. Louis, the Toledo, St. Louis & Western and the Lake Erie & Western.

CHICAGO & ALTON.—*Protective Committee Formed.*—A preferred and common stockholders' protective committee has been formed to safeguard these holders in the reorganization. An agreement is being prepared and stockholders are urged to deposit holdings to obtain the benefits of concerted action. Walter T. Rosen, of Ladenburg, Thalmann & Co., is chairman of the committee, and the other members are: Franklin Q. Brown, of Redmond & Co.; George Woodruff, vice-president of the National Bank of the Republic, of Chicago; Edward A. Pierce, of A. A. Housman & Co., and Hugh K. Prichitt, of Prichitt & Co. Feiner, Maass & Skutch are attorneys for the committee and S. O. Levinson is counsel. Thomas F. Thornton, of 66 Pine street, New York, is secretary of the committee.

CHICAGO, PEORIA & ST. LOUIS.—*Asks Authority to Abandon Line.*—The receivers have filed an application with the Interstate Commerce Commission for authority to abandon this company's entire line from Pekin to East St. Louis, Ill., with branches from Havana to Jacksonville and from Lock Haven to Grafton, a total of 237 miles. The application says that since federal control the company has been unable to pay its operating expenses from revenues. It was unable to pay its taxes amounting to $120,000 due on April 1, 1922. The taxing authorities of Illinois have been threatening the sale and forfeiture of the property and the receivers are unable to sell receivers' certificates.

DEATH VALLEY.—*Authorized to Issue and Sell Capital Stock.*—This company has been given permission by the Railroad Commission of California, to issue and sell from time to time at not less than par, its capital stock in an amount not exceeding $99,100 and to use the proceeds to retire at maturity at the rate of exchange then prevailing, 277 first mortgage, 5 per cent, sterling sinking fund bonds. The proceeds are to be used in conjunction with the company's sinking fund in retiring the bonds.

ERIE.—*Equipment Trust Authorized.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $2,800,000 of 5 per cent equipment trust certificates to be issued by the Commercial Trust Company of Philadelphia, and to be sold at not less than 97.

GEORGIA, ASHBURN, SYLVESTER & CAMILLA.—*Authorized to Issue Stock.*—This company has been authorized by the Interstate Commerce Commission to issue $405,000 of common stock for the purpose of acquiring and rehabilitating the railroad purchased from the Hawkinsville & Florida Southern.

GREAT NORTHERN.—*Reduces Dividend.*—The directors have declared a semi-annual dividend of $2.50 a share, payable February 1 to stock of record December 29. This compares with $3.50 a share declared in June, last.

See editorial in this issue entitled "On a 5 Per Cent Basis."

INTERNATIONAL-GREAT NORTHERN.—*Purchased by St. L.-S. F.*—See article on another page of this issue entitled "Frisco Buys International-Great Northern."

MISSISSIPPI EXPORT.—*Asks Authority to Operate Line.*—This company has applied to the Interstate Commerce Commission for a certificate authorizing it to operate a line from Pascagoula to Evanston, Miss., 42 miles, formerly operated by the Alabama & Mississippi Railroad.

MISSOURI, KANSAS & TEXAS.—*Lines Sold.*—The McKinney-Shreveport branch was sold at Greenville, Tex., on December 16 to representatives of Cook & Nathan Co., investment brokers of New York, who are said to hold an agreement to transfer the property to William Edenborn, president of the Louisiana Railroad & Navigation Company. The price was $700,000, the minimum bid fixed by the federal court, which ordered the line sold.

Representatives of J. & W. Seligman & Co., and Hallgarten & Co., the reorganization managers who purchased the Oklahoma properties of the Missouri, Kansas & Texas, have purchased the Texas lines for $6,500,000 and the Wichita Falls & Northwestern, a subsidiary road, for $2,220,300.

The reorganization of the Missouri, Kansas & Texas was approved on December 19 by the Public Service Commission of Missouri. The new name of the road is Missouri-Kansas-Texas Railroad Company.

NORFOLK SOUTHERN.—*Additional Loan Approved.*—The Interstate Commerce Commission has approved an additional loan to this company of $355,000 to aid it in the purchase of reconstructed freight cars.

PENNSYLVANIA.—*Leases Ann Arbor Terminals.*—See Ann Arbor.

READING COMPANY.—*Authorized to Assume Liability.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability as guarantor for $500,000 of 4 per cent first mortgage bonds of the Philadelphia & Frankford.

SOUTHERN PACIFIC.—*Settles With Railroad Administration.*—This company has effected a final settlement with the Railroad Administration covering the accounts arising from federal control, by which it has received from the director general $9,250,000.

ST. LOUIS-SAN FRANCISCO.—*Purchase of I.-G. N.*—See article on another page of this issue entitled "Frisco Buys International-Great Northern."

Dividends Declared

Baltimore & Ohio.—Preferred, 2 per cent, semi-annually, payable March 1 to holders of record June 13.

Canada Southern.—1½ per cent, semi-annually, payable February, to holders of record December 29.

Cleveland, Cincinnati, Chicago & St. Louis.—Common, 1 per cent; preferred, 1¼ per cent, quarterly; both payable January 20 to holders of record December 29.

Detroit River Tunnel.—3 per cent, semi-annually, payable January 15 to holders of record January 8.

El Paso & Southwestern.—1½ per cent, quarterly, payable January 2 to holders of record December 26.

Great Northern.—$2.50, semi-annually, payable February 1 to holders of record December 29.

Kansas City Southern.—Preferred, 1 per cent, quarterly, payable January 15 to holders of record December 30.

Northern Central.—4 per cent, semi-annually, payable January 15 to holders of record December 30.

Philadelphia & Western.—Preferred, 1¼ per cent, quarterly, payable January 15 to holders of record December 31.

Pittsburgh & Lake Erie.—$2.50, semi-annually, payable February 1 to holders of record January 11.

Trend of Railway Stock and Bond Prices

	Dec. 19	Last Week	Last Year
Average price of 20 representative railway stocks	63.83	64.84	57.13
Average price of 20 representative railway bonds	85.10	85.31	80.98

Railway Officers

Executive

Eugene Fox, general traffic manager of the El Paso & Southwestern, with headquarters at El Paso, Tex., has been elected vice-president in charge of traffic, with the same headquarters, effective January 1, 1923.

L. E. Martin, whose promotion to assistant to the president of the St. Louis-San Francisco was reported in the *Railway Age* of November 18, was born on December 12, 1872, at South Olive, Ohio. He entered railway service on June 1, 1892, as a clerk and stenographer in the stores department of the Kansas City, Ft. Scott & Memphis, with headquarters at Kansas City, Mo. He was promoted to maintenance clerk in the office of the general superintendent at Kansas City in January, 1899, and when the Kansas City, Ft. Scott & Memphis was taken over by the Frisco in August, 1901, he was transferred to Springfield, Mo., as chief clerk to the superintendent of bridges and buildings. He later was transferred to the office of the division engineer. He was promoted to assistant chief clerk to the general superintendent in August, 1906, and was transferred to the office of the senior vice-president at St. Louis, Mo., in December, 1908. He was promoted to chief clerk in the same office in May, 1911, and two years later was transferred to the office of the receiver and chief operating officer. During the period of Federal control he was assistant to the general manager with headquarters at St. Louis, Mo. When the roads were returned to private operation in March, 1920, he was appointed chief clerk to the president and held this position until November of this year, when he was promoted to assistant to the president.

L. E. Martin

Resignations on Central New York Southern

Roger B. Williams, Jr., has resigned as president, director and member of the executive committee of the Central New York Southern, effective December 20, 1922. R. B. Williams has resigned as vice-president and director and T. P. Clancy has resigned as director, treasurer, assistant secretary and general manager. In resigning the above mentioned officers have made the following statement in explanation:

"In 1917 the effective control of the corporation, through an agreement at that time deemed necessary, passed into the hands of Messrs. Ford, Bacon & Davis of New York, by virtue of their possession of stock. Certain differences of opinion have arisen between the resigning officers and those in control, culminating in the passage of a resolution of the board of directors committing it to an abandonment of the railroad. The resigning officers feel that such abandonment would be injurious to the property and inimical to the interests of the communities served which have become so largely dependent upon the railroad for transportation. They also feel that such action should not be taken without first exhausting all practical means of preserving the property as a going concern, and that such means had not been exhausted at the time the resolution was passed. While resisting by their arguments and votes the passage of the resolution they were powerless to prevent it. In these circumstances they found it impossible to continue official connections with the corporation and by so doing appear to aid in an attempt to carry into execution a policy to which they are utterly opposed. They have also severed all connections with the Ithaca Traction Corporation, and the Withburn Corporation, all of the stock of each of these corporations being owned by the Central New York Southern Railroad Corporation."

Financial, Legal and Accounting

J. C. Stineman, chief claim agent of the Michigan Central, with headquarters at Detroit, Mich., has been appointed chief claim agent of the New York Central lines, with headquarters at Chicago, Ill., and Indianapolis, Ind., succeeding W. H. McGarr, who has resigned to engage in other business.

Operating

G. W. Leslie has been appointed general manager of the Ohio & Kentucky, with headquarters at Cannel City, Ky.

J. W. Martz, whose promotion to superintendent of the Third division of the Denver & Rio Grande Western, with headquarters at Gunnison, Colo., was reported in the *Railway Age* of December 2, was born on September 19, 1867, at Crawfordsville, Ind. He entered railway service as a locomotive fireman on the Union Pacific at Ellis, Kan., in 1885. He entered the service of the Denver & Rio Grande as a brakeman in 1888, and served in this capacity and as a conductor until 1909 when he was promoted to trainmaster on the First division, with headquarters at Denver, Colo. He was promoted to assistant superintendent with the same headquarters in 1915 and held this position until November 23, 1922, when he was promoted to superintendent of the Third division.

J. H. Aydelott, whose promotion to general superintendent of the Illinois district of the Chicago, Burlington & Quincy, with headquarters at Galesburg, Ill., was reported in the *Railway Age* of December 2, was born in Jersey county, Ill., in 1883. He entered railway service as a stenographer and clerk in the mechanical department of the Chicago, Burlington & Quincy, at Brookfield, Mo., in September, 1902. In 1908, he was promoted to chief clerk to the division superintendent at St. Joseph, Mo., and in 1911, was transferred to the office of the general superintendent at St. Louis, Mo. A year later he entered the office of the general manager at Chicago in the same capacity, and held this position until 1916, when he was promoted to trainmaster, with headquarters at La Crosse, Wis. He was promoted to division superintendent, with headquarters at Hannibal, Mo., in 1917, and during the next three years was transferred to Omaha, Neb., and Casper, Wyo. He was promoted to assistant superintendent of transportation, with headquarters at Chicago in 1920, and a year later was promoted to superintendent of transportation, with the same headquarters, which position he held at the time of his recent promotion to general superintendent.

I. H. Luke, whose promotion to assistant chief operating officer of the Denver & Rio Grande Western, with headquarters at Denver, Colo., was reported in the *Railway Age* of December 2, was born in Tama county, Iowa. He entered railway service in 1877, in the maintenance of way department of the Missouri Pacific. He became a telegraph operator on July 1, 1881, and was promoted to chief dispatcher on December 1, 1889. From June 1, 1896, to December 1, 1902, he was division superintendent at Concordia, Kan., and Sedalia, Mo. During the next five years he was superintendent of the Second and Third divisions of the Denver & Rio Grande, with headquarters at Salida, Colo., and on October 1, 1907, he left the employ of this road to become superintendent of the Kansas City Southern, with headquarters at Texarkana, Tex. He returned to the Denver & Rio Grande as superintendent of the First division on January 6, 1910, but accepted the general managership of the Missouri, Oklahoma & Gulf, with headquarters at Muskogee, Okla., on October 10 of the same year. He returned to the Denver & Rio Grande on September 1, 1911, as superintendent of the Fourth division, with headquarters at Alamosa, Colo., and in January, 1913, was transferred to the Second division, with headquarters at Salida. His appointment as superintendent of the Salt Lake division

on November 1, 1913, was followed on February 1, 1917, by his acceptance of the position of vice-president and general manager of the Utah Railway with headquarters at Salt Lake City, Utah. On October 1, 1918, he returned to the Denver & Rio Grande as general superintendent of Utah lines, with headquarters at Salt Lake City, and held this position until his recent appointment as assistant chief operating officer, with headquarters at Denver, Colo.

Traffic

H. J. Niemann, whose promotion to general freight agent of the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific, with headquarters at New Orleans, La., was reported in the *Railway Age* of November 18 (page 965), was born in New Orleans, La., on January 25, 1885. He entered railway service as a messenger in the general freight office of the Southern Pacific at New Orleans on September 1, 1902, which position he held until January 24, 1906, when he entered the employ of the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific as assistant rate clerk in the local offices at New Orleans. He was promoted to chief clerk in the office of the freight traffic manager in 1916, and remained in that capacity until the war. During federal control he was a traffic representative in the corporate offices of the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific at New Orleans, La. With the return of the roads to their owners on March 1, 1920, he was appointed assistant general freight agent, with the same headquarters, which position he was holding at the time of his recent promotion.

H. J. Niemann

A. E. Reilly, whose promotion to general western passenger agent of the Pere Marquette with headquarters at Chicago was reported in the *Railway Age* of December 2 (page 1070), was born on July 16, 1876, at Chicago, Ill. He entered railway service in January, 1891, as a messenger in the freight office of the Grand Trunk at Elsdon, (Chicago) Ill. He became a telegraph operator at the same place in 1893, and during the next four years served as telegraph operator and agent at various points on the Grand Trunk. He entered the city ticket office at Chicago as a ticket seller and passenger agent in June, 1897, and held this position until 1900, when he was promoted to rate clerk in the passenger office. He subsequently was promoted to chief rate clerk and chief clerk in the same office. In 1918 he was transferred to Detroit as chief clerk in the passenger department of the consolidated railroads under Federal control, whose headquarters were in that city. During the period of government operation he became more closely allied with the Pere Marquette, and when the roads were returned to their owners on March 1, 1920, he remained with the Pere Marquette as chief clerk in the general passenger office at Detroit, which position he held at the time of his recent promotion to general western passenger agent.

A. E. Reilly

F. T. Alexander, ticket agent at the consolidated ticket office at Louisville, Ky., has been promoted to division passenger agent of the Louisville & Nashville, with headquarters at Atlanta, Ga., succeeding H. C. Bailey, deceased.

Mechanical

H. L. Hanna has been appointed mechanical engineer of the New York, Chicago & St. Louis with headquarters at Cleveland, Ohio, succeeding T. A. Lawes, retired.

Purchasing and Stores

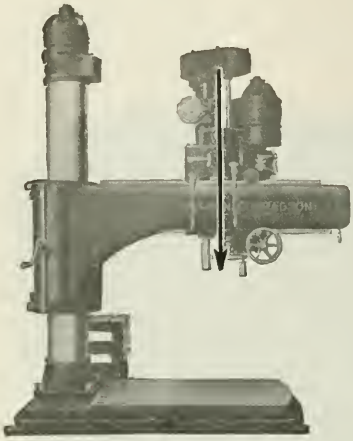
C. S. Williams has been appointed stationer of the Southern Pacific lines, with headquarters at Houston, Tex., succeeding H. O. Koch, deceased.

Obituary

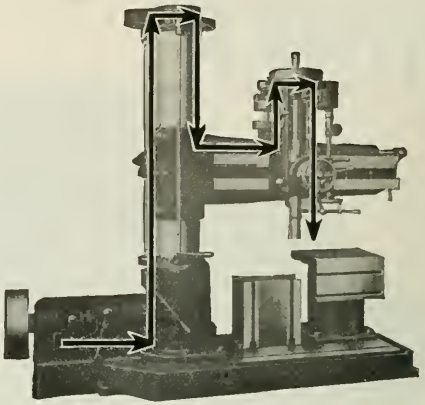
L. L. Dawson, who was superintendent of motive power of the Ft. Worth & Denver City, with headquarters at Childress, Tex., until his retirement in 1918, died on December 11 at Champaign, Ill. He was born on February 5, 1863, in London, England. He came to the United States when a boy and entered railway service in February, 1880, as a machinist's apprentice in the shops of the Illinois Central at Champaign, Ill. He received various promotions until he was made foreman of the shops at Champaign, in May, 1892. He was promoted to general foreman of shops at Louisville, Ky., in January, 1897, and a year later he was promoted to master mechanic at Memphis, Tenn. He held this position for several years until his appointment as superintendent of motive power of the Ft. Worth & Denver City, which position he held at the time of his retirement. Since 1918, he has lived on his plantation at Greenwood, Miss.

F. E. Batturs, assistant passenger traffic manager of the Southern Pacific, with headquarters at San Francisco, whose death on December 7, at Washington, D. C., was reported in the *Railway Age* of December 16, was born on August 27, 1870, at San Francisco, Cal. He entered railway service in April, 1886, as an office boy in the general passenger department of the Southern Pacific. He was promoted to clerk in the same department and held this position until August, 1892, when he was placed in charge of the division of rates in the general passenger department. He was transferred to the ticket audit office in charge of rates and divisions in June, 1894, and held this position until May, 1899, when he was promoted to chief clerk to the assistant general passenger agent. On February 1, 1904, he was appointed assistant general passenger agent of Morgan's Louisiana & Texas, and the Louisiana Western, with headquarters at New Orleans, La., and was promoted to general passenger agent of these lines in January, 1905. Four years later he returned to the Southern Pacific, Pacific System, as assistant general passenger agent with headquarters in San Francisco, Cal. He was promoted to general passenger agent of the Southern district, with headquarters at Los Angeles, Cal., in March, 1911, and was transferred to San Francisco in April, 1915. He was promoted to assistant passenger traffic manager, with headquarters at San Francisco, on September 1, 1918, and held this position until the time of his death.

The Pennsylvania Railroad finds that the annual athletic meets of its employees have been a real and useful means of cultivating the "Pennsylvania family" spirit; and, as evidence of this, cites a recent experience of the editor of the Pennsylvania News. This editor received from each one of a score of his readers the same citation from H. G. Wells' Outline of History; a passage in the history of Greece, wherein he says that the Greek people were held together, not by political organization or a constitution but by common speech, traditions, epics, religion, and, still more important, the Olympian games, that were held every four years. These games were held regularly for more than 1,000 years.



R-C STRAIGHT LINE DRIVE
power flows in one direction



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power changes direction 7 times

New Locomotives Create A Maintenance Problem

NOW that the higher capacity, more economical locomotive has arrived, railroad men are concerned with its maintenance.

In the Ryerson-Conradson twin motor radial, they have found a machine equal to the emergency. In the Round-the-Corner drive of the standard radials, power changes direction seven times between the motor and the spindle. On the R-C Straight line drive, power flows in but *one* direction. (Note the arrows.)

In the R-C Spindle Drive, four shafts and sixteen gears replace the thirteen shafts and thirty-three gears of other standard types.

This elimination of nine shafts and seventeen gears saves a large percentage of power which on other drives is lost through friction of many moving parts.

Friction means wear; wear means breakdowns, repairs and replacement; and breakdowns, repairs and replacements cost money and delay the return of much-needed power to the road.

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Contents

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WE GUARANTEE, that of this issue, 9,100 copies were printed; that of those 9,100 copies, 8,099 were mailed to regular paid subscribers; 68 were provided for counter and news company sales, 308 were mailed to advertisers; 77 were mailed to employees and correspondents, and 548 were provided for new subscriptions, samples, copies lost in the mail and office use; that the total copies printed this year to date were 471,170, an average of 9,061 copies a week.

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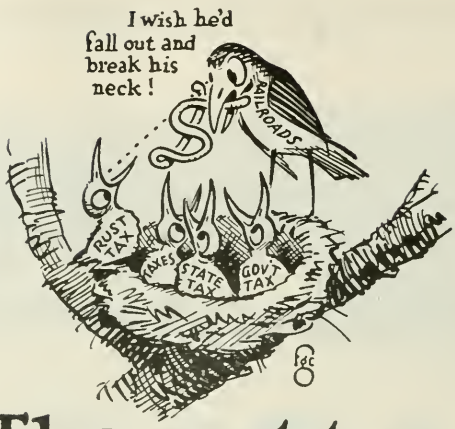

The rust tax

ALL taxes cut into gross earnings, and by no means the least of these is the rust tax.

This is the tax, amounting to millions of dollars each year, paid out by the railroads of the country to replace the enormous tonnage of iron and steel eaten away by rust.

There is, however, one essential difference between the rust tax and other taxes. Much of the rust tax can be eliminated.

Simply by using a pure, rust-resisting iron wherever possible in its equipment, a railroad can reduce its rust tax materially.

That's why for locomotive jackets, boiler tubes, cars, tanks, fences, culverts, and hundreds of other items, many railroads are using "Armco" Ingot Iron.

"Armco" Ingot Iron resists rust because it is a commercially pure iron. In fact, it is the purest iron manufactured in commercial quantities. Gauge for gauge and finish for finish, it outlasts steel under the same conditions.

If you will write us, mentioning the equipment which you contemplate ordering, we shall be glad to tell you where "Armco" Ingot Iron should be used.

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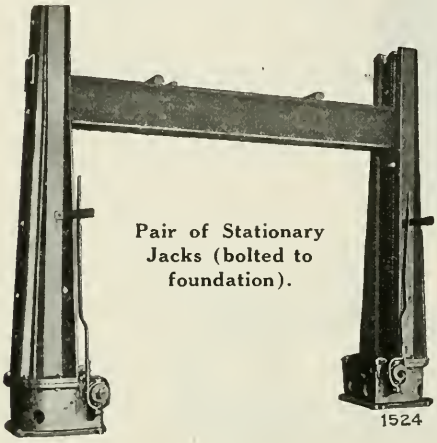

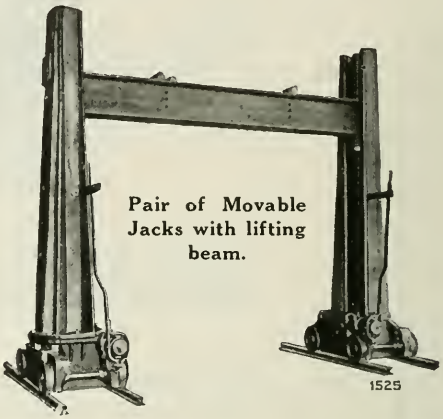

End view of Four-Jack Locomotive Hoist showing lifting beam lowered into slot in foundation; hauling winch in foreground. Lehigh Valley R. R., Lehighton, Pa. This company is using six Whiting Hoists

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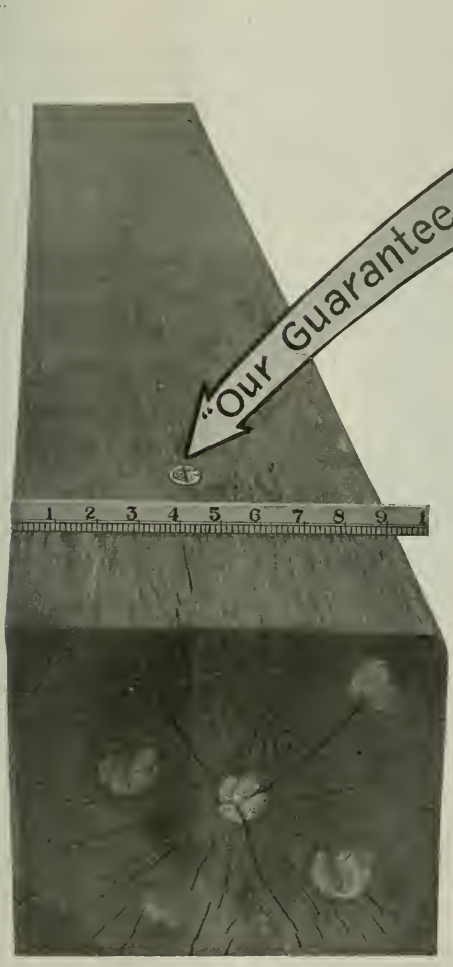

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International Creosoting & Construction Co.

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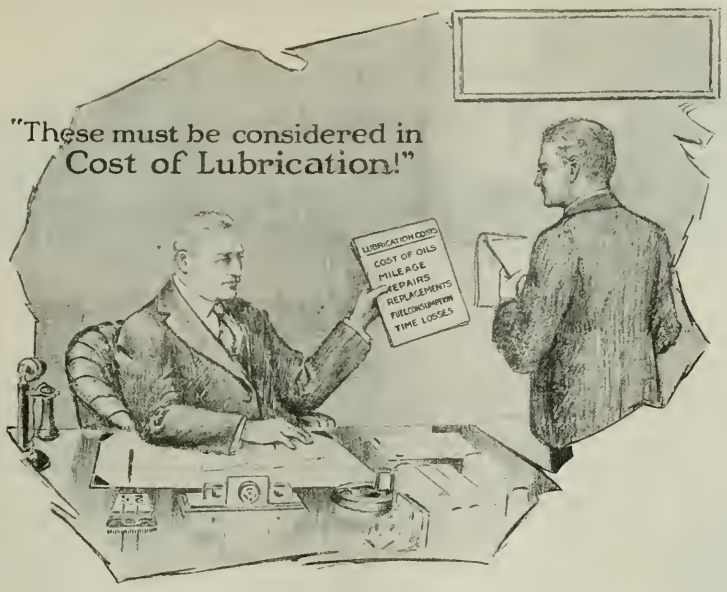
Plants: Texarkana, Texas Beaumont, Texas Galveston, Texas



Getting Facts

One of the largest and most representative railroads in the United States, wishing to get actual facts on the lubrication question, devoted a full year's service test to lubricants claiming to be "good as Galena."

A check was kept, not only on the cost of the oils, but on the class of service rendered by them——on the number of hot boxes and driving journals, on locomotive performance, fuel consumption, repairs and general condition of the bearing parts of equipment.

At the conclusion of the most thorough and impartial tests these lubricants were discontinued entirely and Galena Lubrication recommended and adopted as being much more efficient in service and considerably lower in cost, through its proven ability to maintain equipment in first class running order and practically eliminate the enormous expenses in time, labor and repairs that had grown to large proportions with the materials under test.

The assertion "good as Galena" is easy to make but hard to substantiate. Service is the unfailing test of ability.

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Goodbye 1922

1922 is just about to leave us—with its records of achievements and failures, and, looking back, there will be few who do not agree that it was a pretty good year after all.

The list of Texaco customers has grown remarkably during the year, and old customers have appreciated more than ever the lubrication service rendered by Texaco.

To the roads in whose prosperity we have shared—and to which we have contributed by furnishing better lubrication, we wish a Prosperous New Year.

To the roads who do not know Texaco Lubrication we wish a Prosperous New Year, with the suggestion that during the New Year they see for themselves what better lubrication means in railroad operation.

Texaco Extends Heartiest New Year Greetings to Every Railroad Official and Employee

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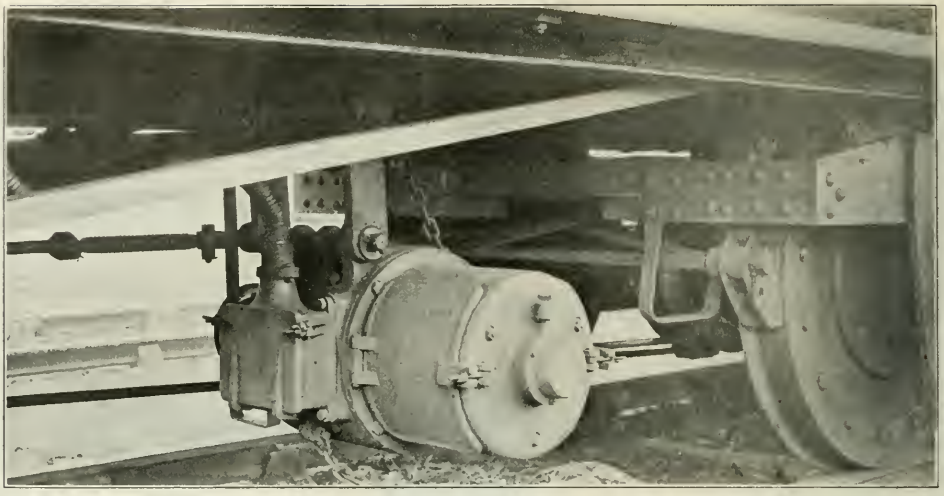

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Red-lead is especially necessary to use at contact points and on concealed and inaccessible surfaces. It should always be used for next-to-the-metal coat. It is desirable to use it for following coats.

Dutch Boy Red-Lead is widely used and is specified by the largest railroads in the country. Properly applied to a clean metal surface it holds fast and covers the metal with an even, elastic coat that time affects very slowly.

Dutch Boy Red-Lead is purest red-lead, highly oxidized and prepared in both paste and liquid form.

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Protect every inch of metal with Dutch Boy Red-Lead.

"Save the surface and you save all"—Dutch Boy Painter

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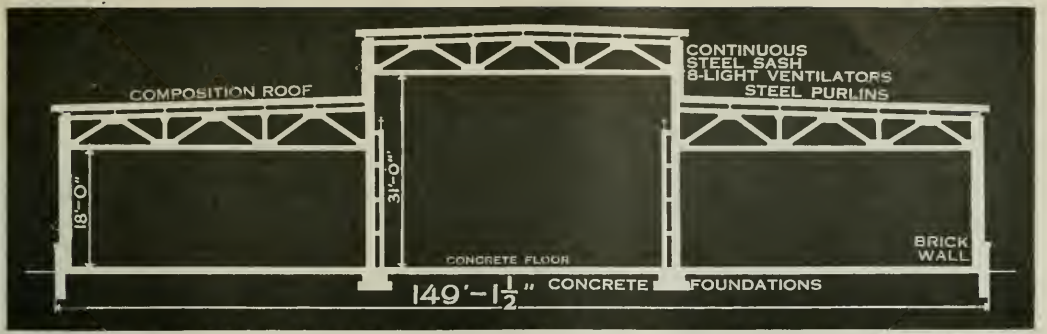
Dutch Boy Red-Lead



Cross Section of Austin No. 10 Standard Building. Normal width, 150 feet. Can be varied in multiples of 50 feet. Length, any multiple of 20 feet.

Exterior of the Standard Steel Car Company's car shop at Hammond, Ind., showing the old building and the new extension, both designed, built and equipped by The Austin Company.

Interior of Standard Steel Car Company's Shop at Hammond, Ind. (a repeat contract), designed, built and equipped by The Austin Company.

American Car & Foundry Co. Car Paint Shop, Chicago, Ill., designed, built and equipped by The Austin Company.

Standard Steel Car Co. Car Repair Shop. An Austin No. 10 Standard Building, the first of several contracts executed for this company at different points.

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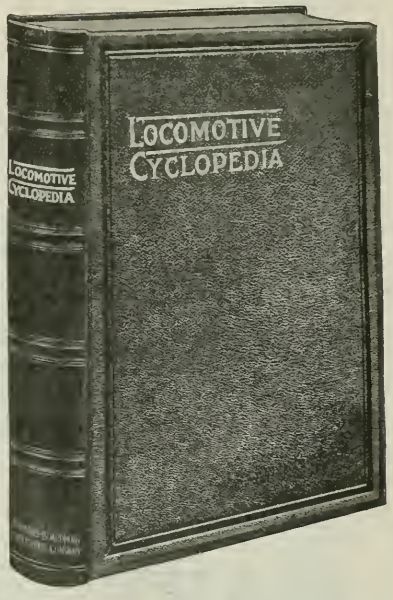

ACCURATE, up-to-the-minute information on locomotive design, construction and maintenance will be found in this Cyclopedia. The 1922-23 edition, with its new, easy-reference plan should receive a heartier welcome from Mechanical Department men than any of the previous issues. Under the new plan (which is also used in the "Car Builders' Cyclopedia") all related matter is grouped in one place—text, drawings, photos and detailed data furnished by various manufacturers. Edited by Roy V. Wright and Charles N. Winter under the supervision of a committee appointed by the American Railway Association—you can be sure that the information is practical, concise and complete.

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3 Locomotive Details—Fireboxes, Boiler Fittings, etc., with A. R. A. Specifications
4 Tender Section, including Tender Tanks, Underframes, Draft Gear, Couplers, etc.
5 Electric Locomotive Section
6 Material Section, including specifications for materials used in Locomotive Construction
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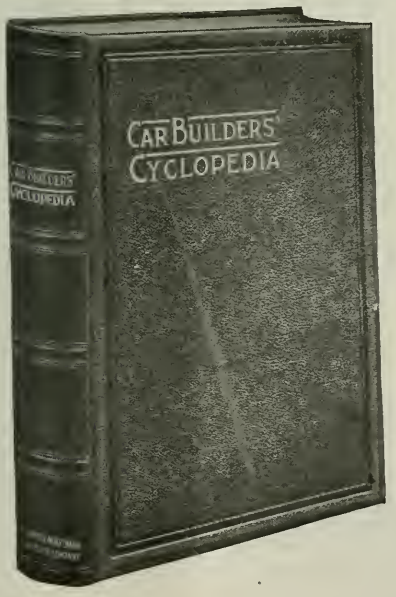

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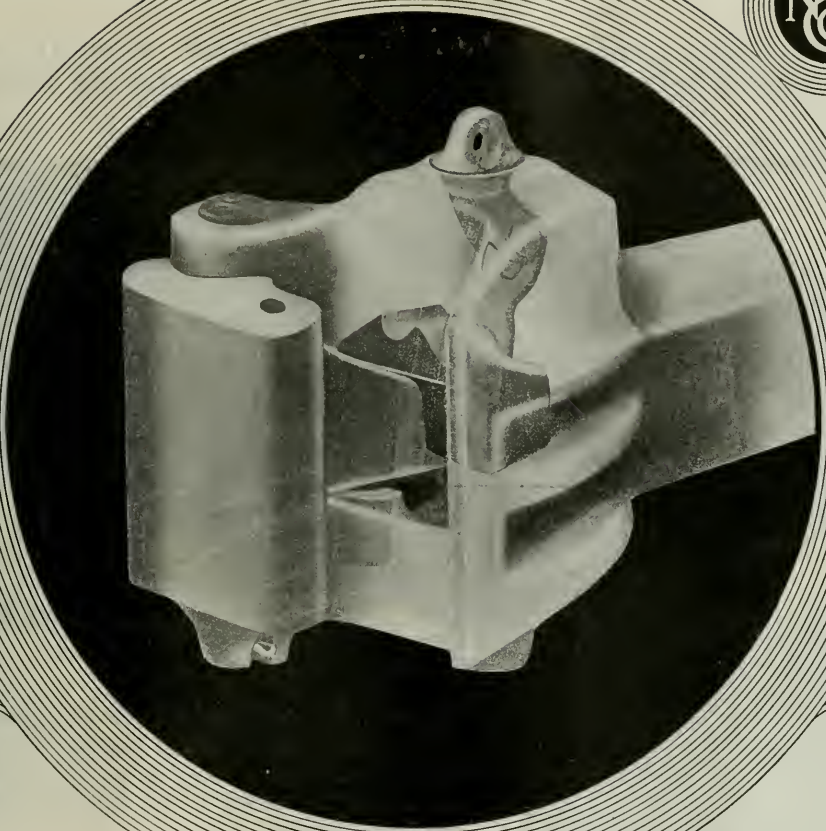

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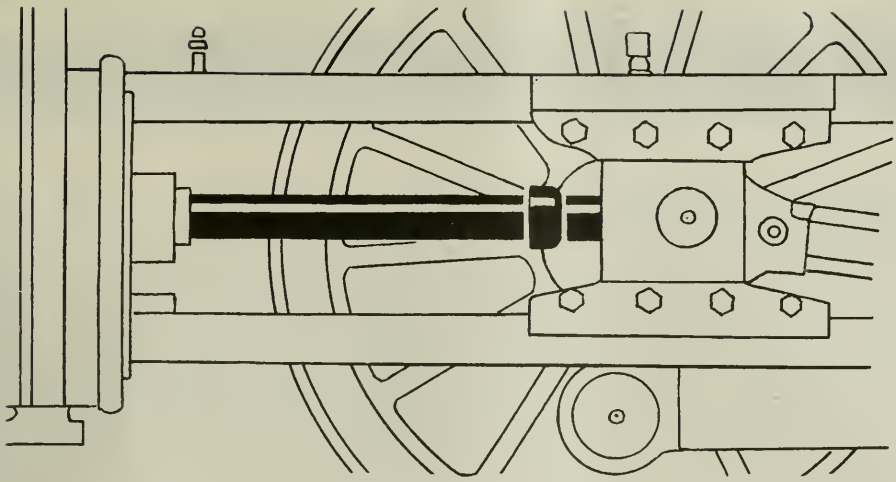

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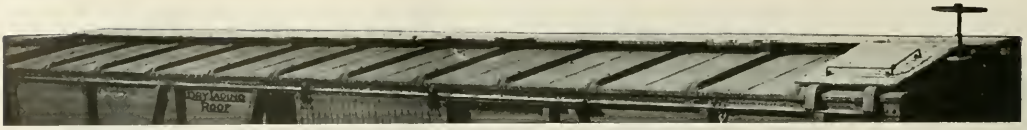

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Railway and Locomotive Engineering

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DETROIT MICHIGAN

EDITORIAL
Railway Age

1217

The Table of Contents Will Be Found on Page 5 of the Advertising Section

The Lettering of Freight Cars

The number of a freight car (with two, three or four initials indicating the name of the railroad) ought to be plainly lettered on the lower left corner of each side, with distinct horizontal lines above and below. The reader will pardon the dogmatic tone of this sentence when we remind him that it represents a reasonable rule, which was agreed upon by the car-service officers, fourteen years ago, at their convention at Niagara Falls. This simple and useful rule, costing nothing, has been widely neglected. The communication concerning it which appears on another page was accompanied by a lot of pictures showing varied arrangements of lettering, on all sorts of cars. These are new cars, not old ones; and a composite picture of old cars would make a still poorer showing. Also, many roads still show their names (by initials) tiresomely long. Since the organization of the Brotherhood of Railway and Steamship Clerks, Freight Handlers, Express and Station Employees, the introduction of long names in the railway world appears to have run wild, and the car-service men are in duty bound to keep up their movement for common sense and brevity. Our correspondent's suggestion of the use of letters to designate the kind of car is interesting, but critical readers would want to see how well he could succeed in getting a hundred or more yard clerks to make regular use of the plan with sufficient persistence and care *to make it a real time-saver.* Some very good clerical plans depend for success on courageous pushing by a determined officer, throughout a term of months or years.

President Rea on Rapid Transit

President Rea of the Pennsylvania in a letter to the mayor of New York and the chairman of the transit commission has called attention to the tremendous growth in passenger traffic within the city limits of New York which the Long Island Railroad has been called upon to carry. Most of this traffic is handled at the Pennsylvania station, the maximum capacity of which is rapidly being reached. Mr. Rea urged the mayor and the transit commission to plan additional subway and elevated rapid transit lines to relieve the burden on the Long Island Railroad. Only excessive capital expenditures, which would probably not be justified in view of the short haul, would enable the Long Island to meet the present and prospective growth of traffic in its territory within the city limits of New York and the problem is one which the public authorities should be called upon to solve. Mr. Rea also called attention to the great areas in New Jersey which are either entirely undeveloped or only slightly so because of the obstacle which the Hudson river places in the way of traffic. He suggested that the proper authorities in New York City should devote their attention to the construction of bridges across the Hudson river, just as years ago they bridged the East river and opened up Long Island to development. If Mr. Rea's letter starts the discussion which it should start, he will have done a real service to the railroads and to the public around New York City. The transit situation within the city as well as the present provisions for suburban passenger traffic are not satisfactory—primarily because little is being done to develop them to meet increasing traffic—and it will not be long before many existing lines will have reached their maximum capacity. The *Railway Age* is of the opinion that some well-thought-out plan for railway and rapid transit extension should be adopted at an early date and provisions made for carrying it out. Such a plan can only result from a full and free discussion of the problem, and it is hoped that President's Rea's letter will bring this out.

Railroad Long Distance Telephone Circuits

Long distance telephone service between division headquarters and important centers is becoming a necessity for the transaction of business on many roads. The demand for such communication is so heavy that many roads are paying large toll bills to the commercial telephone companies while others have seen fit to add through circuits to the existing pole lines. One road has a long distance conversational circuit 457 miles long in service between two large cities, that cost approximately $100,000, which has proved so useful for railroad business that it has been stated that if all the business handled on this circuit was charged for at the commercial rates the line would pay for itself in a year. It may be that if this business had to be handled by a commercial company, a considerable part of the communication would be handled by mail. However, the use of a railroad owned circuit properly supervised will be found the means of settling important questions promptly and will frequently obviate the necessity for traveling; questions relative to important details in all departments may be asked and answered and the work expedited by the use of such a circuit. Especially those roads which are handicapped by a lack of equipment and track capacity should consider the efficient application of telephones as a facility that will earn a high return on the investment in many cases.

Money Talks

The live operating officer is constantly on the alert for means of increasing the efficiency of the transportation service and, at the same time, reducing costs. One way in which this may be accomplished is through the judicious installation of signals or interlocking at strategic locations. Too often the engineering department is asked for estimates on second track work at such locations when automatic signals will postpone the need for such work indefinitely or crossings are left uninterlocked because of the first cost involved in constructing interlocking plants. As a consequence, trains continue to stop at the crossing day after day, with all the loss incident to such stops. In this connection, a signal engineer on one road carried an item of $60,000 on his budget for several years for the construction of an interlocking at one grade crossing location at which an average of 60 trains

had to stop during each 24 hours. The management refused to approve this expenditure, until the signal engineer capitalized these stops on the basis of $1.25 a stop and showed that a saving of $38,000 a year over and above interest and depreciation would result. The management, thinking $1.25 a stop excessive, referred this question to the mechanical department for check, and this department estimated that $1.40 a stop was more nearly correct. The construction of this interlocking has now been approved. The proper use of signal appliances will yield a high return on the original investment and managements should make it a point to consult the signal departments more frequently on ways to facilitate train operation and to reduce costs. Some managements have found that it pays to do this, and all will find that it pays when they come to realize the important place modern signalling holds in present day railroad operation.

Recording Instruments in Power Plants

It is impossible to run a power plant or in fact any kind of establishment economically, without detailed information regarding operation. To get this information in power plants, various kinds of indicating and recording instruments are necessary and can be installed at a cost which is insignificant compared with the possible savings. The possibilities can be appreciated from the fact that there are over 1,200 railroad power plants in the United States, consuming thousands of tons of coal annually, and many of them operated with only fair efficiency. Power plant engineers should not "save at the spigot and waste at the bunghole" by giving all their attention to the engine room. The furnace and boiler deserve first attention, and the efficiency of these important units can be checked by careful use of the flue gas analyzer, differential draft gage and high temperature thermometer or pyrometer. In certain instances these instruments should be of the recording type in order to give warning of conditions which might not be noted at instantaneous readings. In general, draft conditions, furnace efficiency, equality of boiler loading and boiler efficiency can all be improved by a judicious use of the above instruments. In the engine room, steam indicators, recording gages, graphic wattmeters, power factor and other meters perform the same relative function. They afford information enabling power leaks to be located and stopped. Power plant engineers should be assisted to get such of these instruments as they need and be encouraged—if not required—to use them.

New Figures for Old

An interesting and most disconcerting example of the manner in which railroads have a habit of substituting "new figures for old" in their various reports is that of a railroad which in its December, 1920, report showed for the year ended December 31, 1920, a net railway operating income of roughly $7,000,000. In the annual report covering the year 1920, this figure had become a deficit of roughly $1,300,000. One year later, in the December, 1921, statement to the Interstate Commerce Commission, the comparative cumulative figure covering the year 1920 was shown as a deficit of $500,000, and in the 1921 annual report the comparative figure for the year 1920 was shown in a fourth total of $6,000,000, this time a net. Thus, for this road, we have four different figures ranging from a deficit of $1,300,000 to a net of $7,000,000, all of which figures purport to represent the same thing—namely the net railway operating income for this road for the year 1920. Of course, there are good and sufficient reasons why the figures should differ; there may have been the inclusion in some and not in others of certain subsidiary mileage, of federal lapovers, of reserves for maintenance, etc. But, nevertheless, what was this road's net railway operating income in 1920? It is not easy to find out because it is difficult to determine which one of the four figures is the one desired for proper comparison with the figures of preceding or following periods. In this instance, we chose an extreme case, but although extreme, it is somewhat too typical. "New figures for old" represents a confusing and disconcerting condition which the accounting officer, in fairness to those who have to use the figures, should seek to avoid.

Make Every Dollar Count

Programs for second track construction, such as are now under consideration or actually authorized for the coming year, often give rise to the question of simultaneous grade revision, the economy of which is readily ascertained on the basis of the justified added cost to construct on a revised grade, over the expenditure necessary to provide a second track of the same gradient as the original line. A further problem is introduced in determining whether a complete new double-track line shall be built on an independent location or whether it will suffice to build a new single-track line for the uphill traffic, while retaining the old line for the downhill movement. This solution is particularly appropriate in locations where development for increased distance is required to effect the reduction in grade, since the shorter distance on the old line will be of advantage for the downhill movement in spite of the heavier descending grade. Obviously, second track provided in this manner introduces certain disadvantages such as increased cost of maintenance and the possibility of some movement against the prevailing direction of traffic to afford the necessary local passenger and freight service to an occasional station on the old line. In some cases, it also necessitates left hand operation. But in spite of these real or fancied disadvantages, many railroads have frequently found it profitable to resort to the independent second-track line. One notable example of this is the Echo Canyon line of the Union Pacific where the uphill 1.14 per cent line is used on one side of the canyon, whereas the original line on a 1.77 per cent grade on the other side is used for downhill movement. A similar example is found on the Santa Fe's line up the western slope of the San Bernardino mountains. Both of the illustrations cited involve left hand operation. In these days of inadequate railway transportation, when every effort must be made to effect the greatest increase in facilities for every dollar expended, the opportunities to be afforded by such practices as these should not be overlooked.

When There Is a Load for Every Car

The division superintendent comes into more intimate contact with the employees in those departments contributing most directly to the production of transportation than any other railway officer. Because of this fact he has a better opportunity than any other officer to stimulate these employees to greater efforts to the end that more transportation service may be rendered. There is now and probably will continue to be for some time more business awaiting movement than the railways can handle. Therefore every delay that is elim-

inated means that the capacity and the earnings of the roads are increased accordingly. With a shortage of cars of over 110,000 at the last report (December 8) it is evident that there is a load awaiting every car available. The superintendent and his staff can do much by personal contact with yardmasters, agents and yard clerks to show them the importance of their work in detecting and preventing delays to cars by anticipating their release and arranging for their movement promptly and by similar measures. They can show train crews the importance of contributing to the service the railways are rendering the country in bringing cars with minor defects into the terminals where this can be done safely, by picking up cars at outlying sidings at the first opportunity, etc. The maintenance-of-way foremen can be shown the value of their service in unloading as quickly as possible company materials intended for their use. This is a time when every measure which saves a day's delay to the cars adds to the earnings of the road. More than that it means future business for the road, for when cars are scarce every shipper who is served becomes a friend whose traffic will be highly desirable when equipment is more plentiful and freight tonnage offered for shipment scarcer.

C. & O.—Nickel Plate

Details concerning what the Van Sweringens of Cleveland may have in mind concerning their possible acquisition of a large block of Chesapeake & Ohio stock are so meagre that it is hardly possible to get any reasonable idea of what may be behind their plans. The story that has been given out is that they have recently extended an option covering the purchase of the shares at present owned by H. E. Huntington. These shares are not understood to include a majority control of Chesapeake & Ohio, which detail in itself is sufficient to add an additional measure of complication. Just how Chesapeake & Ohio would fit into the Van Sweringen system as it has thus far been assembled, it is difficult to see. The lines at present include the Nickel Plate, the Lake Erie & Western and the Clover Leaf. The Nickel Plate's traffic relationships are primarily with its connections at the Niagara frontier, so it would appear that the Chesapeake & Ohio offers to the system a rather secondary value as an outlet to the Atlantic seaboard. The C. & O. may have a value to the Nickel Plate from the standpoint of giving it a fuel supply, but it is difficult to regard this reason as important enough for so large a step as is proposed in the C. & O. acquisition. The Chesapeake & Ohio business is principally coal which moves east from the New River, Kanawha and Logan districts to tidewater at Newport News, or west and north primarily over the controlled Hocking Valley to the lakes at Toledo, where the Hocking Valley has one of the busiest of the several coal dumping piers on Lake Erie. The Van Sweringen group of railroads has thus far been made up according to the Interstate Commerce Commission's tentative consolidation plan. The three lines—Nickel Plate, Clover Leaf and Lake Erie & Western—were placed in system No. 5, which was given an outlet to New York harbor, a fuel supply through the inclusion of the Wheeling & Lake Erie, etc. The Chesapeake & Ohio was placed in a separate system, No. 8, with its controlled Hocking Valley and with the Virginian. The two systems might be joined, but it is not easy to see what favorable results might be expected to result from that course. In short, the story that the Van Sweringens may secure the C. & O. needs more amplification and explanation before the investing public is likely to be convinced that the acquisition is probable, or, if probable, that it is wise.

Freight Rates and Commodity Prices

THE CHANGES in commodity prices and freight rates which have occurred within the last year suggest some significant reflections and questions regarding the way in which freight rates should be regulated.

When the earliest proceedings for general advances in rates under the present effective system of regulation were begun by the railways about twelve years ago, the railways contended that rates should be based upon what the traffic would bear, as well as upon the cost of rendering transportation service. They showed that increases in prices and wages were increasing their operating expenses. They pointed out that the general increases in prices which were occurring made it easily possible for traffic to bear higher rates and used this as one of the principal arguments for advances in rates.

The spokesmen of the shippers and regulating authorities almost unanimously repudiated and denounced the theory that rates should be based on what the traffic would bear, and that increases in prices afforded any justification for advances in rates. They contended that schedules of rates should be based almost entirely upon the cost of rendering transportation service. They said that all a railway was entitled to earn was enough to pay its operating expenses and taxes and a fair return upon its valuation, and that as long as it did this it had no legal or moral right to complain if its rates were not advanced when prices increased.

The principle of basing rates on the cost of service was applied so rigorously that up to 1917 no substantial advances in rates had been granted, although in that year the average wholesale price of all commodities had risen until it was 76 per cent higher than in 1913. After that, both railway expenses and prices increased enormously. Strict application of the principle of basing rates on the cost of the service required the large advances in rates made under government control in 1918, and again after the railways had been returned to private operation in 1920.

The advance in rates in 1920 was followed by an unprecedented decline of prices. This was not followed for months by a decline of railway operating costs. Suddenly, however, spokesmen of the shippers reversed their attitude. They pointed out that advances in rates and declines in prices had made the rates on many commodities relatively much higher than prices. They took the position, which was exactly the opposite of that which they had taken for years, that the rates should be based on what the traffic would bear, and that rates in general should be reduced because the traffic could not bear them.

The spokesmen of the farmers had previously been foremost in contending that rates should be based on the cost of the service. Because of the unprecedented decline in the prices of agricultural products, they now became foremost in advocating application of the despised principle of charging what the traffic would bear. The Interstate Commerce Commission itself practically abandoned the cost of service principle and in the early part of 1922 ordered reductions in rates which were wholly unjustified upon any principle except that of charging what the traffic would bear.

At the very time the reductions in rates ordered by the Commission were being put into effect, the entire relationship between freight rates and commodity prices was again undergoing a great change because commodity prices were rapidly increasing. The reductions of rates required by the Commission greatly accelerated this change. The latest statistics of the Commission regarding the average railway rate, and the latest statistics of the Bureau of Labor Statistics regarding commodity prices, show that the present relationship between railway rates and commodity prices is entirely different from what it was a year ago. Then, as compared

with conditions in the pre-war year, 1913, the average railway rate was relatively higher than commodity prices. Now, many commodity prices are relatively higher than railway rates. Between September, 1921, and September ,1922, the average rate per ton per mile declined from 1.27 cents to 1.12 cents, or 12 per cent. This left the average rate per ton per mile only 54 per cent higher than in 1913. On the other hand, between November, 1921, and November, 1922, as shown by the statistics of the Bureau of Labor, the average wholesale price of all commodities increased over 10½ per cent, which made it 56 per cent higher than in 1913. The average price of cloths and clothing was 92 per cent higher than in 1913; of fuel and lighting 118 per cent higher; of metal and metal products 33 per cent higher; of building materials 85 per cent higher; of house-furnishing goods 79 per cent higher; of miscellaneous commodities 22 per cent higher; of chemicals and drugs 27 per cent higher; of farm products and foods 43 per cent. The increase in the average price of farm products within the last year has been the most notable, being 18¼ per cent. Farm products are now only 43 per cent higher than in 1913. This is less than the increase in the average rate of the railways of the entire country, but most farm products are produced in the west and shipped to market mainly over the western lines, and the average rate of the western railways is less than 39 per cent higher than in 1913.

Even in September, coal, which normally constitutes about one-third of railway freight, had not begun to move in normal volume, and probably the average rate of the railways for the last three months of this year will show a greater reduction than it did in September. On the other hand, the general trend of commodity prices is upward, and later reports undoubtedly will show further increases in them.

Now that the average railway rate is lower relatively than the average price of commodities in general, and that the increases in prices which are occurring apparently will make it relatively still lower in future months, what attitude is going to be taken by spokesmen of shippers and by regulating authorities with respect to basing rates on what the traffic will bear? Since they took the position so recently that rates should be reduced because they were relatively higher than the prices of commodities, will they in future accept the results of their own recent reasoning and take the position that rates should be advanced because commodity prices are increasing?

That the argument for reducing rates because traffic cannot bear them has been largely destroyed by the changes within the last year is tacitly recognized by the Interstate Commerce Commission in its annual report for 1922. The Commission says: "The tonnage moved by the railroads has been steadily increasing in recent months until at the end of the period covered by this report the traffic is almost equal to the largest ever handled by our railroads. Manifestly the existing rates are no longer interfering with the free flow of commerce as a whole, whatever may have been the situation prior to the reduction of July, 1922." Since this report was written the total carloads of freight handled by the railways has exceeded that handled in the same part of any previous year.

Some of the western state commissions now have pending before the Interstate Commerce Commission proceedings for further reductions of the rates on farm products in which the principal argument they have made has been that the prices of farm products are so low that the traffic cannot bear the rates. What becomes of this argument now that it can be shown that the average rate of the railways serving the very territory which these commissions represent is lower than the average price of farm products? The spokesmen of these commissions seem to be falling back upon the argument that the railways in their territory are making more money than the farmers. But the relationship between railway rates and the prices of farm products shows conclusively that if this is true the inability of the farmers to make money is mainly due to causes other than the relationship between railway rates and farm prices. Furthermore, if, as these very same men were contending a year ago, rates should be based on what the traffic will bear, what bearing upon the question of the reasonableness of the rates has the question whether the farmers or the railways are making or losing more money?

When the Interstate Commerce Commission about a year ago ordered reductions in the rates on grain, grain products and hay, the *Railway Age* called attention to the fact that in doing so it had in that particular case, at least, abandoned its own principle of basing rates mainly on the cost of the service, and had adopted the principle of charging what the traffic would bear. We showed how inconsistent this was with decisions rendered by the Commission in previous years. We anticipate with more than usual interest, in view of the recent changes in the relationship between rates and prices, what the Commission's decision will be in the case now pending for further reductions of the rates on farm products.

Tackling the Problem of Good Will

When a man uses the word "railroad" he usually means only the physical property. Railway officers at least should not think and speak of a railroad as merely a thing consisting of right-of-way, roadway, locomotives, cars, shops, terminals and stations. It is also a thing of brains, nerves, flesh and blood. The success of its development and operation depends under present conditions even more upon the development and handling of the human than of the non-human part of it.

It may be said, roughly, that a railway consists one-half of physical property and one-half of brains, manual efficiency and good will. No physical property is worth much in the long run if it has not that intangible asset, which it is impossible to appraise accurately—"good will." A concern to be long successful must have good will among its employees and good will among its patrons. The railways of this country are suffering from deficiencies and inadequacy of their physical properties, but they are suffering much more from lack of good will. In fact, the deficiencies and inadequacy of their physical plants are largely due to want of good will. If there were more good will among their patrons they would be more fairly regulated. If there were more good will among their employees they would be more efficiently operated. If the railways could create more good will among their patrons and employees it would enable them to increase their net earnings much more than would mere improvements and enlargements of the physical plants.

Perhaps the most outstanding characteristic of the management of most large modern industrial concerns, including railroads, is the large amount of study they devote to and money they spend in improving their physical properties and the relatively small amount of work they do and money they spend to increase this intangible but vitally important asset of good will. There is no amount of money that a railway will not spend, if it has it available, to increase the capacity and efficiency of its physical plant. Every railway constantly employs large organizations to study and improve its physical properties. When, however, the importance of doing work and spending money to solve the human problems of the industry is urged upon them, most railway officers are likely to begin looking out of the window. Their minds naturally drift away to the consideration of physical problems. They know that the problems of public relations and employees' relations are vast and unsolved, but their experience and training have had so largely to do with the

tangible, physical problems that they find it difficult to keep their minds for any considerable length of time upon the latter class of problems.

Consider the various associations of railway officers. The number of them that deal with the physical problems of engineering, transportation and maintenance is legion. Where is there any association which devotes itself to reports and discussions on the labor problem? Where is there an association which devotes itself to reports and discussions on the problems of public relations?

Wonderful progress has been made in the solution year by year of the physical problems of the industry. It is high time that the great problem of creating among patrons and employees the good will the industry needs should be attacked with equal courage, energy and persistency.

Need for Co-Operative Research

THE RAILROADS of America have long been recognized as the most progressive in testing new designs and new equipment. No foreign railroad has ever conducted research work on locomotives that can compare with the tests made by the Pennsylvania System at its Altoona testing plant. These have added greatly to the scientific knowledge of the locomotive; they have made it possible to build more efficient motive power, and have benefited not only the Pennsylvania, but railroads all over the world. Other American roads likewise have made important individual contributions in research that have promoted economical and efficient management.

During recent years the railroads have been so hard pressed with the operation and maintenance of their properties that they have not given much attention to testing on a large scale. Furthermore, earnings have been low and the roads have not been able to devote any considerable sum to such purposes. Because of the many innovations that have recently been put into service, or proposed, there is at present a great need for research and the railroads cannot afford to neglect this activity.

The railroads have been criticized many times because they have not adopted some new design or appliance that promised to effect large savings. Some proposals, of course, can be proved worthless without making a single installation. Others have great possibilities. In the latter case, the only effective answer that the railroads make to the critic who advocates something new is to show that they have tested it to find out what it would actually save. In the interests of economy, as well as to avoid criticism, the railroads cannot afford to hold back and wait, hoping that some other road will investigate a new design.

In the locomotive field at present there are many promising innovations. The turbine, Diesel electric and Still-Diesel locomotives, and appliances for producing draft by mechanical means have great possibilities. The railroads individually are not able to make extensive tests of such equipment, and it is hardly right that one should bear the expense when all will benefit by any improvement that may be brought out. The logical way to handle this problem is to have tests made jointly for all the roads, insuring that the work is done accurately so that there will be no question as to the acceptance of the conclusions reached and avoiding duplication which would mean a waste of effort and resources.

Co-operative research has been proposed many times in the past. Several years ago the Mechanical Division of the American Railway Association appointed a committee on this subject, but only perfunctory action has been taken at recent conventions. There has never been as great need for co-operative research as exists at the present time. It is to be hoped that the Mechanical Division will soon take some action that will bring about the utilization of the splendid equipment which is available for working out the many important basic problems that are still awaiting extensive research that they may be satisfactorily solved.

Not Insurmountable

MANY RAILROAD EXECUTIVES and employees seem to be coming to a realization of the foolishness of and the waste caused by the present wall of mistrust and misunderstanding which has grown up between them. This wall, based upon deep-seated prejudices, can only be broken down by the most patient effort and tolerant attitude on both sides. Disaster lies ahead if these misunderstandings are not wiped out. This is frankly acknowledged by many of the railroad executives and also by representatives of the men.

Representatives of the men agree that the interests of the men, the railroads, the public and the investors depend upon introducing a spirit of cordial co-operation into their relations with the managements and having each man feel as if the road he worked for was "his road." They declare, however, that they cannot trust the managements, whose representatives zealously seek every means of taking advantage of them. They will support their contentions with many specific examples. For instance, they say, a rule may be agreed upon, but with no penalties attached. The railroad, when called to account for not living up to the rule, will admit that it is at fault, but go right on disregarding the rule. If conditions are to be bettered, these men declare, the whole attitude of the railroad managements toward the men must be changed, and this must come from the very top of the organization. The chief executive must set a high standard and see that his associates live up to it. If this is not done, they say, the subordinate officers and clerks will in many cases continue to be dominated by a spirit of sharp practice in dealing with the men.

On the other hand, railroad executives will speak just as strongly about the attitude of the representatives of labor and will call attention to many specific ways in which these men have failed to observe what they consider to be the principles of square dealing. In commenting upon recent editorials which have appeared in the *Railway Age,* one chief executive expressed himself in this way: "The attitude of the labor leaders who have been, particularly in recent years, during and since the period of federal control, driving into the minds of the railway employees the propaganda that the employers and those connected with the management are their enemies, and must be dealt with only on that basis, has, to my mind, so prejudiced and embittered the mind of the average railroad man that he cannot be approached on the lines you advocate with any argument or facts that will change his mind. He has been led to believe that he cannot expect any consideration from his employers, but what is forced upon them virtually at the muzzle of the gun (the strike)."

This is a sorry state of affairs. Both sides recognize the seriousness of the situation and yet the mutual mistrust is so great that neither side wants to make a move toward improving the situation. The men, however, declare that the first move is strictly up to the managements.

Conditions can be improved. This has been demonstrated in other industries, when both sides have come to a realization that in the long run questions of relations of the employees to the management can not be settled by force and have decided to co-operate and work with each other to the mutual advantage of all concerned. One of the most striking developments in the railway world during the past year has been the getting together of the managements and the men on the British railways. There is no reason why this cannot be done on American railways. As a matter of fact,

so many of the leaders on both sides are devoting intense thought and study to the question and so many things have already been started by the managements looking toward an improvement of conditions, that undoubtedly the coming year will be notable in this country because of the getting together of the managements and the men on a better basis of understanding.

The Public Should Be Told the Facts

We have referred frequently in these columns of late to the extreme modesty of the railways in presenting their case to the public. Nowhere is this illustrated better than with reference to the agitation for hard roads which is sweeping the country. Made possible in its early days in large measure by the aid of the railways who saw in this development a system of highways radiating from the railway station, highway construction is now fostered chiefly by the automobile and motor truck interests which have converted the plan into a grand scheme of trunk lines paralleling and duplicating the railways. Not content with this, they have placed the burden of construction and maintenance on the public, with the result that the railways are required to pay a large part of the cost through taxation. The highways having been built, the country is being filled with irresponsible men and concerns that have bought trucks largely on the installment plan, that are unregulated as to rates or character of service, and that contribute little to the upkeep of the highways which they use. The unfairness of competition of this character is so evident that one is at a loss to understand why the railways have not pointed it out to the public.

There is a pressing need for specific information today regarding the true economics of highway development. What investment is a community warranted in making in hard roads from the standpoint of the farmer, the driver of a pleasure vehicle, or the truck operator? What are the relative damages to the highway which each class of service does? What are their relative values to the community? These are typical of the questions which must be answered before motor transportation can take its permanent place in the movement of the nation's traffic. It is doubtful if the highway department of a state or nation can approach the question fairly. Neither is it contended that the railways, which are suffering from the competition of the highways, will be more fair. There is, however, a way of creating an organization whose conclusions can be made accurately. As the principal sufferer, both from taxation and from the loss of traffic, the railways should take the initiative.

In one community in which an extensive investigation was made, the conclusion was reached that the farmer was not warranted in spending over $7,500 per mile for hard roads, and that this amount was sufficient to provide a good gravel road entirely adequate for his needs. Any expenditure beyond that amount should be charged those in whose interests it is made.

The hard road is here to stay. It is an agency of transportation with a definite place. The problem is to so coordinate it with other means of transportation that it may fill this place most satisfactorily and contribute most directly to the welfare of the country.

Leonard Kipp of Ossining, N. Y., who died last week at the age of 98, was said to have been a commuter on the New York Central for 63 years. He was a passenger on the first train over the road between Ossining and New York. Ossining is 31 miles from New York and it is estimated that Mr. Kipp traveled about 1,500,000 miles.

New Books

American Railroads: Government Control and Reconstruction Policies. By William J. Cunningham, James J. Hill, Professor of Transportation, Graduate School of Business Administration, Harvard University. 408 Pages. 5½ in. by 8 in. Bound in cloth. Published by A. W. Shaw Company, Chicago.

As the preface to this book says, while the volume is intended as a review of railroad events during the years 1917 to 1922, it deals primarily with the period of federal control. The book has 24 chapters, of which 17 relate to the many and varied developments in the two years and two months during which the railways were operated by the United States Railroad Administration. Preceding the 17 chapters are two which serve as introduction and one which deals with the activities of the Railroads' War Board. The four concluding chapters bring the story up to the present. They deal respectively with the Transportation Act of 1920, railroad events in 1920, conditions in 1921 and the situation in 1922. There is also an appendix of over 100 pages. Included therein are the text of the President's proclamation taking over the railroads, that of the federal control act and that of the standard contract. There is also included a paper on the U. S. R. A. operating statistics which is reprinted from the Annals of the American Academy of Political and Social Science.

The book has two assets of primary importance. One is that it is interesting and readable, qualities that appear in books of a technical character infrequently enough so that they are worthy of attention on the part of the book reviewer when they do appear. The second one of the two leading assets is the authoritative manner with which the author handles his subject. One might be tempted to say that the book is a scholarly production, but for fear that the reader might give the word "scholarly" an incorrect interpretation and secure the idea that the book is a bit too learned and heavy which, of course, is far from the case. We may be better content perhaps in pointing out that it is easy to determine that the author is absolutely at home with his facts and that the manner in which the various complicated details or interrelated events are marshalled and co-ordinated makes the story a complete whole. It is easy to follow, and in general the work is so well done as to make one feel that the time spent in reading the book has been expended to good advantage.

This is about the sort of thing, however, that we should expect from a writer of Professor Cunningham's qualifications. We should, indeed, expect a little out of the ordinary from the combination of the practical railroader and the college professor teaching transportation subjects who, in addition, was connected with the Railroad Administration in a fairly prominent capacity. Professor Cunningham was in a position to observe the activities of the U. S. R. A. at close range; he formulated the work of the operating statistics section of the division of operation, was in charge of that section for an extended period, and later served for a time as assistant director of operation.

His official connection with the Railroad Administration might have been expected to lead the author to be lenient with those who directed that organization. While it will be admitted that he is not very severe, it is also true that in no case is he overly lenient. Where criticism is merited, criticism is given, as is notably to be instanced in his chapter dealing with the ill-famed national agreements. His critical comment in that case is fairly typical. Among other things he says:

"Impaired discipline and a general lowering of the morale of the service followed in the wake of the national agreements. . . . It is pertinent to note here that all of the national agreements were entered into on dates subsequent to May 20, 1919, when the President announced that the roads would be returned to their owners at the end of that year. . . . The railroad executives,

therefore, had ground for criticizing the director-general for assuming burdens which these agreements passed on to the railroads while he was unwilling at the same time to assume the responsibility for increasing freight and passenger rates so as to meet the additional expenses."

If one were to make any criticism of the book, it would be contained in the fact that it is rather too short to cover so large a subject, which Professor Cunningham understands so intimately and about which he must have decided opinions. The book adds little or nothing to what we already know or think about either federal control or the Railroad Administration itself. It is intended only as a resumé of what happened and only enough comment is included as is necessary to explain the meaning of the various events or their importance in developments as a whole.

Most of the subjects, except as this objection may apply, seem adequately treated. It is questionable, however, whether the important subject of standardization of equipment merits no more than the meagre five pages which are devoted to it in Chapter VII. Of course, the *Railway Age* had at the time and still has now its own ideas about the U. S. R. A.'s plans for standardization of equipment. We believe that the administration introduced some good designs; that in its publicity it very much exaggerated the value of the standardization idea and that it carried the idea much further than was at all desirable or necessary. Professor Cunningham falls into the error of intimating that the administration standardized on 12 standard types of freight cars and 6 standard types of locomotives of two weights each. He might better have said that there were added 12 new types of cars and 12 (not 6) new types of locomotives to those already in service. He also falls into the error of saying—at least we believe it in error—"Obviously the process of standardization would make the problems of new construction much easier and eventually would reduce the cost of maintenance." The facts are rather that there was a tendency to delay production while the new designs were being worked out. On many roads the problem of maintenance was complicated by the addition of the new designs because of difficulty in getting repair parts for the new locomotives. Of course, the word "eventually" in the sentence helps. In five or ten years there might have been a difference. In 26 months of federal control the Railroad Administration bought 100,000 freight cars and 1,430 locomotives. We wish that Professor Cunningham had pointed out that this represented normal replacements for a period of about 12 months only, or for less than half the federal control period. The U. S. R. A. gave so much publicity to these large purchases that it is worth while to draw attention to this point.

Chapter XX of the book concludes with the following paragraph:

"It is plain, therefore, that nothing definite can be proved from the results of 1918-19. A real test of government operation is possible only if carried on over a longer period—one in which business conditions are normal and which political expediency would have normal play. The period under review would be so abnormal that the results are valueless as guides to what might be expected from a similar control or complete government ownership when normal conditions return."

There are so many of us who will disagree with this conclusion that it is hardly necessary to point out wherein we may disagree. Possibly we can be satisfied with saying that this proves our previous point, that Professor Cunningham is not very severe on federal control.

On the whole, the book is one that no railroad man or student of railway affairs can afford not to read or afford not to have handy in his bookcase. While it is unfortunate that it does not bring any new facts into the discussion or throw any new light on five or six of the most interesting years in American railroad history, it does review what took place in these years in a masterly, authoritative and interesting manner. Therein lies the book's real value.

Letters to the Editor

[*The* Railway Age *welcomes letters from its readers and especially those containing constructive suggestions for improvements in the railway field. Short letters—about* 250 *words—are particularly appreciated. The editors do not hold themselves responsible for facts or opinions expressed.*]

Do American Railways Lack the Selling Sense?

Washington, D. C.

To the Editor:

The article on page 1039 of your issue of December 2 is more especially woven around the idea of *selling tickets*, but the author is quite right, and I have no criticisms to make except to say that he has not gone far enough, for, in my opinion, it is not too much to say that all of the real problems of the railroads today are essentially problems involving *salesmanship;* and our ills and difficulties are due to an all but universal lack of a *selling sense* on the part of the railroad organizations at the top and all the way to the bottom.

The average railroad man still thinks of salesmen with unconscious superciliousness as mere "drummers"; without the realization which is so obvious nowadays to the rest of the business world, that there can be no real success without salesmanship, and that a lack of it is a form of ignorance which is almost as serious a handicap to a successful business as that of downright illiteracy.

The writer was brought to a clear realization of the depth of this characteristic deficiency of railroad men when seeking, in 1919, for one of the largest commercial concerns in the country, to recruit a corps of *salesmen* with the ability to *sell the conception* of quality and service as against price competition; and the railroad solicitors (who almost invariably credited themselves with "selling service"), with a few exceptions, had but the most rudimentary notion of that real militant, creative missionary spirit which is the essence of true *salesmanship.*

In the aggregate there are probably several thousand of these freight and passenger representatives, intelligent men, who represent their respective companies with dignity, credit and a practical altruism for which there is hardly any other business parallel; and if just half of them really understood and applied real *salesmanship* in their daily contacts, they could easily revolutionize and remold the present adverse sentiment of the nation towards the railroads.

However, even the best salesmen do not get satisfactory results without real *sales managers,* who have the confidence, backing, support and co-operation of the entire official staff of their companies up to the chief executives themselves. The highest compliment that can be paid to the chief executive of a big commercial business is to credit him with *salesmanship* talent, but the chief executive of a railroad usually visualizes himself as a statesman in whom he thinks salesmanship is undignified and out of character.

Theodore Roosevelt was of one type of *"salesman,"* Woodrow Wilson of another, and Lloyd George of still another, but the successes of each were due to their ability to *sell their ideas* to the nation; and it was the same outstanding quality which distinguished George Washington, Thomas Jefferson, Gladstone, and every other great man who has gone down in history.

It is by reason of the absence of salesmanship or "selling sense" that the railroads are in their present predicament,

and unless it be speedily developed the opposition "salesmen" of communistic ideas will inevitably succeed in selling government ownership to the nation, with disastrous results to all concerned.

MOULTRIE HITT,
Assistant to President, American Short Line Railroad Association.

The Lettering of Freight Cars

SAN ANTONIO, TEXAS.

TO THE EDITOR:

When you are considering the very numerous proposals to save money or to economize in some new way, which nowadays are sprung upon the railroad world almost every day, please remember the freight conductor and the yard clerk. They constitute an important factor in transportation economy. What a saving of time of these men, and consequent speeding up of the departure of trains from the yards, would be accomplished if all cars were numbered uniformly. Each car should show the name of the system owning the car, the car number, with a letter signifying the kind of car; and the capacity, weight and length; all in white lettering on a black background, placed in the same location on every car. This paint should be a standard paint, which would not flake or fade. The lettering should be placed where it would not be liable to obliteration by oil (as is the case frequently now on tank cars), and on the level of the eyes of the average man as he stands on the ground.

Take the Southern Pacific, where my experience has been; there are about a dozen subsidiary roads included in the Southern Pacific System, and each has its own lettering. In making record of the cars in a train, much time is consumed in writing these various initials. It is frequently necessary to scan the whole surface of the side of a car to get the required information. The record of the subsidiary to which the car is credited could be preserved by the serial number. The information whether it was a double deck, a single deck, a box car, or what not, could be designated by a single letter, to precede the number; as "D13123," indicating a double decker. The adoption of this uniform marking plan need not interfere with the carrying of any other advertising designation desired, nor need it require the repainting of the rest of the car. It could be inaugurated at a cost that would soon be absorbed in the time saved, to say nothing of the elimination of errors in car records.

Every conductor knows how a few minutes' delay is frequently stretched into hours. Take a train of sixty cars; a saving of ten minutes means a saving of six car hours; or, in the country as a whole, millions.

The difficulties beginning with the taking of the numbers are multiplied all along the line. Cars are lost because of a mistake in the number; time is lost by the switching crews through difficulty in deciphering numbers and description. There is a record of fatalities caused by car-checkers backing out onto a parallel track in the effort to decipher a number placed at the top of a car.

No railroad is more efficient than its yards. Competent and experienced checkers are put to it to keep the records straight; and experienced checkers are not numerous. When they show signs of ability they are usually promoted to higher places.

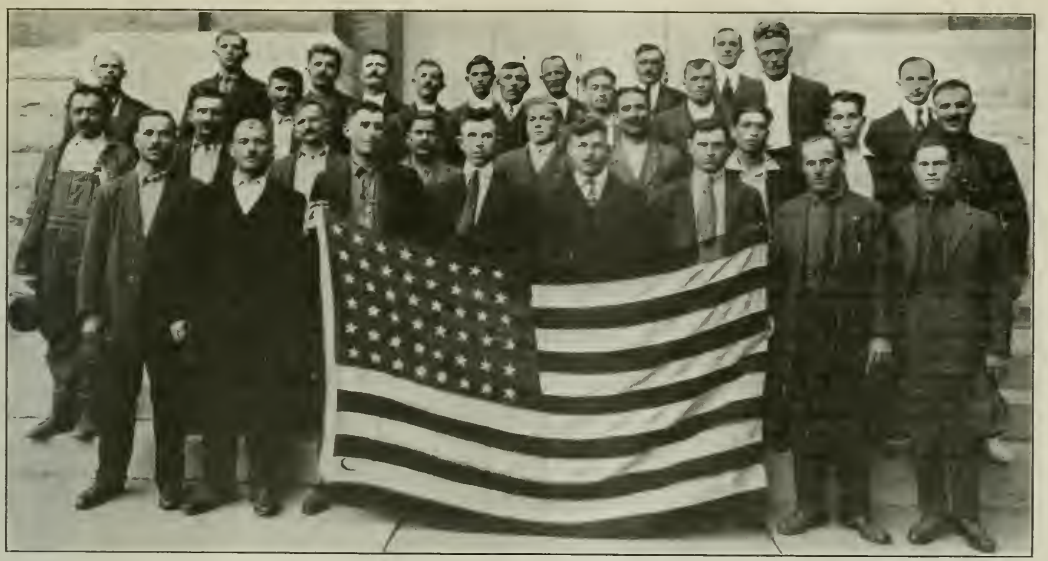
While I am saving minutes, another suggestion may not be out of place. Would it not make for greater efficiency in the disposition of cars at way stations if industries located at such stations were designated by numbers instead of names, frequently long and difficult to decipher? Thus: "S.P. B36860 to spur 6 Sabinal."

If every officer and employee were to be impressed with the fact that every time a train is delayed a minute it means, with a 60-car train, a car-hour lost, there would be fewer car-hours frittered away.

F. J. BAILEY.

Photo by Kadel & Herbert

On the Southern Pacific Between San Francisco and Portland



A Group of Employees at the Court House for Their First Citizenship Papers

Is Education of Trackmen Worth While?

Carefully Systematized Efforts in This Direction Lead One Road to Endorse Such Activities Heartily

During the last few years the Chicago, North Shore & Milwaukee has been carrying on a rather unique and decidedly interesting work in its maintenance of way department in the form of an educational movement among the track forces. Unlike many educational movements among workers, regular schools have been established where the men are gathered in classes at regular intervals and are taught how to speak, read and write in the English language as well as about American ways and about the railroad on which they work. Nor is the work limited to these schools, for, in addition, courses of instruction are given for foremen and those who care to become foremen, and social gatherings are provided in which the workmen and their families meet together in wholesome recreational activities. In the opinion of the management the experiment has proved very successful. The foreign workers have entered into the spirit of the work, and the company, originally skeptical, considers itself well repaid in various ways for the attention given this subject.

The Work Began as an Americanization Program

The work was undertaken about two years ago as an Americanization program. The need for something of this kind suggested itself during the war. There were then employed in the neighborhood of 200 trackmen. As on other roads, these men were almost all of foreign birth and all of foreign parentage. Altogether 14 nationalities were represented with Croatians and Italians predominating. As usual they were hired through labor agencies. During the war the attention given to selling liberty bonds to these men and to scrutinizing them in the interest of the government disclosed that they were living in a decidedly un-American atmosphere and were harboring un-American ideas to an alarming degree. It was apparent that little in the way of improvement was being accomplished by the customary practice of working through foremen and labor agencies and that something should be done to overcome the Old World ideas which these men entertained about their work and their relations with their employers.

As an initial step in this direction the practice of keeping labor in boarding camps maintained by contractors was replaced by a system of company camps constructed and mantained to attract the better class of men and keep them contented. An improvement was made in the commissary, baths were provided, close attention given to fumigation and finally a Y. M. C. A. secretary was employed to look after their recreation.

While this work was in the right direction it became increasingly evident, that what the men needed was Americanization and after some hesitation it was decided to encourage and by a systematic course of education to assist these foreign born employees in becoming citizens. To this end a committee was selected, composed of four officers of the maintenance of way department and four foreign track foremen to co-operate with and to advise the Y. M. C. A. secretary in carrying forward the work.

As a first step in the program a complete survey was made to ascertain the educational and citizenship needs of these men. This survey revealed some startling figures. Among other things it disclosed that while more than 88 per cent of the men have been in this country over five years, 90 per cent were not citizens and the remainder had only taken out the first papers. The survey showed further that over 30 per cent of these men, whose ages ranged from 18 to 60 years, and averaged 36 years, could not speak the English language, 75 per cent could not read it, and 80 per cent could not write

it, while 25 per cent could not even read or write in their own language. The problem therefore was one of planning a course of instruction to meet the varying requirements of the men and which at the same time would not be looked upon with suspicion by those receiving the instruction and which could be made accessible to all regardless of the place of their employment. As carried out the plans involved putting up classrooms at convenient points along the line where all gangs could meet on local trains passing their houses. In all about six classrooms were provided, the one illustrated being in an abandoned freight house.

Teaching the Men English

The first step of instructions was that of teaching the men English. For this purpose Roberts' System of English for Foreigners was selected, it being a course of study requiring no interpreter nor any reference whatever to the students' native tongues. Briefly the system consists of placing a series of words on a sheet of paper, with a sentence opposite each word to show how the word is used. On the back of this sheet each of the sentences found on the front is printed to show how it appears when written in long hand. The instructor, by means of his voice, shows how the word sounds and explains its meaning by going through the proper motions. For example, when teaching the word "drop," the instructor points out the word on the paper, pronounces it and then drops something so that the student can connect the sound of the word with the motion indicated. To promote the interest as well as enlarge upon the value of the work to the men, attention was given to tying the instruction up with track work and as a method of keeping the study from getting tiresome use was made of motion pictures at these classes. As the work progressed, English was supplemented with simple courses of study in grammar, government and arithmetic, and here, as in the case of English, the instruction was associated with the work the men were actually doing. For example, in arithmetic, a problem would be given as follows: If 350 ties are unloaded for renewals in track and 85 ties have been renewed, how many ties are left?

Beginning late in 1920, two hourly classes were held on two evenings of each week, excepting for two months during the summer, when the program was confined to pictures and recreational pastimes. Instruction was rendered voluntarily by men in clerical and supervisory positions in the service of the company, and all study was conducted on the men's own time. Early in the campaign it developed that not every foreigner was willing to take up this training, and it was thereupon decided to require all men to attend on the ground that it was advisable from a safety standpoint for all men working on track to have some understanding of English, and foremen were instructed to keep in their gangs as far as practical only such men as could read and write English and were willing to attend schools provided for them. The order had a good effect upon attendance to classes, bringing a number of men into the school who had previously shown no interest, and while it necessitated discharging a few men, it does not appear that those remaining entertained any bad feelings over this order.

Much Interest Was Displayed in the Work

Almost from the start a great deal of interest was taken in the work and creditable progress was made by the men in their studies. As indicating the interest taken in the work by some, one man over 40 years of age, who though many years in this country had not learned the language, said to an interpreter at the close of the first lesson, "I would rather learn English than to have $1,000." Even the men who could not read in their own languages began early to make progress in reading and writing English, and the progress was such that a day in May was selected as "first paper" day, upon which all foreign employees on the road who had not yet declared their intentions to become American citizens, could do so. When the day arrived (May 19), every court house from Chicago to Milwaukee was visited by groups of these men, the day being made quite an occasion. As a result of this, the number of employees not yet having declared their intentions to become citizens dropped to 27 per cent, of which six intended going back to Europe, nine did not as yet understand, and seven refused.

A Foreman School Was Instituted

So successful did the work of the English classes progress, that it was decided not only to continue these classes, but also to establish a school for foremen and all who desired to become foremen. As a matter of fact a survey showed that some of the foremen were almost as much in need of the training as the men under them, and instances were recalled where foremen had been discharged for disobeying instructions, which, as it was found out later, through ignorance, they did not understand. These schools are conducted in the form of a club at which lectures are given on methods of maintaining track. The men are not required to study lessons, but it is required that all foremen send in answers to series of questions discussed in the lectures given them. In addition to studies in track methods, foremen also discuss in these club meetings the relation of capital and labor as well as other subjects pertaining to the railroads and their relation to it.

The Work Has Been Very Successful

At the present time the Americanization program and the larger educational program into which it has grown have been conducted for two years and have proven very successful both from the standpoint of the men and the railroad. The carefully systematized instruction given the track men in the classes, supplemented as it is by family gatherings, has gone a long way not only to enlarge his interest in the work he is doing, but also to readjust his viewpoint concerning American institutions, and while much of the benefit to the railroad is not measurable it has plainly been beneficial from a safety standpoint, has materially reduced the labor turnover and minimized labor difficulties.

All of the schools are now grouped at two locations and it is the intention of the management to continue the courses and thus maintain a close contact with these men, which is possible in such a work. The work is carried on under the jurisdiction of J. S. Hyatt, engineer maintenance of way, to whom we are indebted for the above information.

International

Derailment Near Hyde Park, Boston, Mass.

Salaries of Railway Officers Compared

Only One Salary of $100,000 Shown in Data Submitted at Insistence of Senator La Follette

WASHINGTON, D. C.

A CONSIDERABLE number of prominent railway executives had their salaries reduced during the lean year 1921, while many received increases, according to the compilation of salaries made by the Senate Committee on Interstate Commerce, from which those over $20,000 were selected and published in last week's issue of the *Railway Age*. While the entire list shows many more increases than decreases, most of the increases were in the salaries of the lower paid officers.

A list of the salaries of railroad officers for 1917, compiled by McAdoo's Railroad Wage Commission, was made public in 1918 by Commissioner McChord of the Interstate Commerce Commission, who was a member of the wage commission and who furnished a copy to Congressman Sims for publication in the Congressional Record. The new list makes it possible to show comparisons and the trend of salaries in recent years, because it gives the figures for both 1914 and 1917 as well as for the ten months of 1920 following the return of the railroads and for the first six months of 1921 and also increases or decreases after March 1, 1920. It is difficult to make an analysis of the complete list, however, which takes 241 pages of the printed report, because of the numerous changes made during the course of a year, so that the compensation received for six months does not always represent half of a year's pay, and because of some differences in the method of reporting the figures by different roads. Also, a number of large roads are omitted from the compilation, such as the Delaware, Lackawanna & Western, Erie, Lehigh Valley, Seaboard Air Line, Southern and Union Pacific, Central of New Jersey, while many smaller ones are included.

La Follette Insists on Information

It is understood that this information was furnished by the railroads to the committee at its request on account of the insistence of Senator La Follette, who had threatened to call for the information in a Senate resolution. One of the chief points which the committee was attempting to investigate was the cause of the increase of some $1,400,000,000 in railroad operating expenses in 1920 as compared with 1919, and Senator La Follette was anxious to find in the salary lists something to add to the more noticeable items such as the $700,000,000 wage increase made by the Labor Board shortly after the return of the roads, the wage increases made by the Railroad Administration toward the end of 1919, the increases in cost of fuel and supplies, and the large increase in traffic. The compilation shows clearly, however, that the number of men receiving the larger salaries is very limited.

In the 1917 list the highest salary, and also the only one reaching six figures, was that of Robert S. Lovett, chairman of the Union Pacific, who was credited with $104,000. Judge Lovett's name does not appear in the new list as printed because the Union Pacific report to the committee was submitted in somewhat different form from the other roads, but it shows Judge Lovett as receiving at the rate of $75,000 for 1921 as compared with $100,000 in 1917. It also shows President C. R. Gray as receiving $75,000.

In the present list the highest salary shown is that of Julius Kruttschnitt, chairman of the Southern Pacific, $100,000. He is reported as receiving $75,000 for 1914, $87,500 for 1917, $83,333.34 for ten months of 1920 and $49,999.98 for the first six months of 1921. The next highest in the list is A. H. Smith, whose compensation from five companies of the New York Central System totaled $92,580. Of the 90 chief executives shown in the list (chairmen, presidents, receivers, etc.), as indicated by the compensation reported for six months of 1921, together with notations as to increases or decreases, eight received $75,000 or over. Hale Holden, as president and chairman of the executive committee of the Chicago, Burlington & Quincy, received $60,000, an increase of $10,000 on June 1, 1921, but his salary for the Colorado & Southern had been reduced from $15,000 in 1917 to $10,000. He also received $5,000 from the Fort Worth & Denver City, making a total of $75,000. C. H. Markham, president of the Illinois Central, also received $75,000 in 1920 and 1921 as compared with $60,000 in 1917 and $50,000 in 1914; William Sproule, president of the Southern Pacific, $75,000 in 1920 and 1921, as compared with $61,750 in 1917 and $50,000 in 1914; and E. Pennington, president of the Minneapolis, St. Paul & Sault Ste. Marie, $75,000 in 1920 and 1921, as compared with $53,125 in 1917 and $50,000 in 1914.

Six Receive from $60,000 to $75,000

Six executives were shown to be receiving at the rate of $60,000 to $75,000. L. F. Loree, as president of the Delaware & Hudson, was increased from $25,000 in 1917 to $37,500 on March 1, 1920, and as chairman of the Kansas City Southern from $30,000 in 1917 to $35,000 on March 1, 1920, making a total of $72,500. In 1917 he also received $10,000 as chairman of the Wheeling & Lake Erie. Daniel Willard, as president of the Baltimore & Ohio was reduced from $75,000 to $67,500 in 1921. W. T. Noonan, president of the Buffalo, Rochester & Pittsburgh, was increased from $50,000 in 1917 to $60,000 on January 1, 1921. H. E. Byram, president of the Chicago, Milwaukee & St. Paul, received $60,000 as compared with $75,000 formerly paid to A. J. Earling. N. D. Maher, president of the Norfolk & Western, was increased from $50,000 to $60,000 on January 1, 1921. T. M. Schumacher, president of the El Paso & Southwestern, was increased $10,000 on September 1, 1920, and reduced $10,000 on May 1, 1921, so that his compensation for the first six months of 1921 was $33,333.33.

Eleven from $50,000 to $60,000

Eleven salaries of from $50,000 to $60,000 were shown in the list: W. B. Storey, president of the Atchison, Topeka & Santa Fe, $50,000 (E. P. Ripley received $75,000); J. E. Gorman, president of the Chicago, Rock Island & Pacific, $50,000 (H. U. Mudge received $60,000 in 1914); C. E. Schaff, receiver of the Missouri, Kansas & Texas, $50,000; B. F. Bush, president of the Missouri Pacific, $50,000; Howard Elliott ($40,000 as chairman of the Northern Pacific, and $18,000 as chairman of the committee on intercorporate relations of the New York, New Haven & Hartford); E. J. Pearson, president of the New York, New Haven & Hartford, $50,000 (reduced $2,000 on July 1, 1921); Charles Donnelly, president, Northern Pacific, $50,000; Samuel Rea, president, Pennsylvania ($28,411.65 for six months. In 1917 his salary was reported as $75,000); E. N. Brown ($24,000 as chairman of the Pere Marquette, increased $4,000 on October 1, 1920, and $30,000 as chairman of the St. Louis-San Francisco, increased $6,000 on October 1, 1920, and reduced $6,000 on April 1, 1921); A. T. Dice, president, Philadelphia & Reading $50,000; S. M. Felton, president, Chicago Great Western, $50,000 (increased $10,000 on September 1, 1920).

Five railway executives received $40,000 to $50,000:

J. H. Hustis, president of the Boston & Maine, who received $22,500 for the first six months of 1921, but was reduced from $45,000 to $35,000 on July 1; W. H. Finley, president of the Chicago & North Western, $40,000 ($50,000 for 1917); J. M. Kurn, president of the St. Louis-San Francisco, $40,000; W. H. Williams, $25,000 as chairman of the Wabash, and $17,500 as vice-president of the Delaware & Hudson; J. E. Taussig, president of the Wabash, $40,000.

Fourteen from $30,000 to $40,000

Fourteen received $30,000 to $40,000: Percy R. Todd, president, Bangor & Aroostook, $30,000; W. A. Winburn, president, Central of Georgia, $30,000; W. G. Bierd, president, Chicago & Alton, $36,000; W. J. Jackson, receiver, Chicago & Eastern Illinois, $36,000; W. J. Harahan, president, Chesapeake & Ohio, $30,000 and $6,000 as president of the Hocking Valley; Ralph Budd, president of the Great Northern, $30,000; J. A. Edson, president, Kansas City Southern ($32,000, increased $7,000 on April 1, 1920); Ralph Peters, president, Long Island, $30,000; F. H. Alfred, president and general manager, Pere Marquette, $36,000; W. B. Scott, president, Southern Pacific lines in Texas and Louisiana, $36,000; J. M. Herbert, president, St. Louis Southwestern, $35,200; Charles M. Levey, president, Western Pacific, $30,000; J. J. Bernet, president, New York, Chicago & St. Louis, $35,000; Epes Randolph, president Arizona Eastern, $32,500.

Those receiving $20,00 to $30,000, 18 in all, were: L. A. Jones, president and general manager, Alabama & Vicksburg, $20,000; Henry Walters, chairman, Atlantic Coast Line, $22,800; Marvin Hughitt, chairman, Chicago & Northwestern, $25,000 ($50,000 in 1917); B. A. Worthington, president, Cincinnati, Indianapolis & Western, $20,000; H. R. Kurrie, president, Chicago, Indianapolis & Louisville; J. T. Clark, president, Chicago, St. Paul, Minneapolis & Omaha, $25,000; L. W. Hill, chairman, Great Northern, $25,000; J. S. Pyeatt, president, Gulf Coast Lines, $25,000; W. L. Mapother, president, Louisville & Nashville, $11,660.68 for six months; Morris McDonald, president, Maine Central, $25,000 (decreased $10,000 on April 1, 1921); H. B. Ledyard, chairman, Michigan Central, $25,000; W. H. Bremner, president, Minneapolis & St. Louis, $25,000; C. M. Depew, chairman, New York Central, $25,000; J. M. Schoonmaker, chairman, Pittsburg & Lake Erie, $25,000; J. H. Young, president and general manager, Norfolk Southern, $25,000; W. L. Ross, president and receiver, Toledo, St. Louis & Western, $25,000; C. W. Huntington, president, Virginian, $25,000; O. P. Van Sweringen, chairman, New York, Chicago & St. Louis, $21,000 (increased $6,000 on June 1, 1921).

There were also nine receiving $15,000 to $20,000, 14 from $10,000 to $15,000, and five receiving less than $10,000.

The Southern Pacific, in addition to paying the highest salary to its chairman, seems also to have paid the highest salaries to men other than chairman and presidents. L. J. Spence, director of traffic of the Southern Pacific System, is shown as receiving $26,660.65 for the first six months of 1921, or at the rate of $50,000 a year, as he was increased $5,000 on August 1, 1920, and $10,000 on February 1, 1921. J. P. Blair, general counsel, also received the same amount, having been increased $9,000 on June 1, 1920, and $10,000 on February 1, 1921, and A. D. McDonald, vice-president and controller, also received the same, having been increased $15,000 on August 1, 1920, and $10,000 on February 1, 1921.

The report gives the total amount of increase or decrease in the salaries included in the list (those of $5,000 or more) for each road and also totals for the various years. For example, the Atchison, Topeka & Sante Fe shows increases in the salaries amounting to $5,000 a year or over $120,480 following the return of the roads, and also decreases amounting to $9,800. The total shown in the report for the first six months of 1921 was $767,658.79 or at the rate of $1,535,317.58 a year, as compared with $1,333,968 for 1917. The salaries of the vice-presidents on an annual basis, as indicated by the report, were: E. J. Engel, $25,000; W. E. Hodges, $7,200; A. G. Wells (operating), $30,000; E. Chambers (traffic), $25,000; F. G. Pettibone (G. C. & S. F.), $20,000; S. T. Bledsoe, general counsel, is shown as receiving at the rate of $30,000.

The Pennsylvania Railroad shows increases amounting to $53,205, and decreases of $5,000, while its total for the six months of 1921 was $1,407,602, or at the rate of approximately $2,815,204, as compared with $1,184,459 in 1917. President Rea was shown in the 1917 report compiled by the Lane commission as receiving $75,460. The present report shows $47,742 as his compensation for 1917, but also reports $10,875 for the Pennsylvania Company for that year. For the first six months of 1921 he is shown as receiving $28,411.65, but as all of the subsidiaries of the Pennsylvania are not shown the report does not indicate whether or not his salary was reduced. The salaries of the vice-presidents for the six months of 1921 are shown as follows: J. J. Turner, $13,300; W. W. Atterbury, $15,063.72, as compared with $34,880 for 1917; G. D. Dixon, $11,297.69; Henry Tatnall, $13,557.42; M. C. Kennedy, $9,257.78; G. L. Peck, $11,620.65; Elisha Lee, $14,010.

The report also gives the replies of the railroads to questions calling for the amounts paid "as and for expenses in connection with or upon the account of the compensation, expenses and expenditures of any officer, attorney, publicity agent or employee of such railroad in securing or defeating legislative action or the action of any legislative committee of the Congress or of any state legislature," of the amounts spent "for advertising, pamphletizing or publicity work of any kind or nature" and amounts paid to outside companies for maintenance and repair of equipment during the years 1916 and 1920-21.

In giving the information as to expenses in connection with legislation, most of the roads made no explanations. Others gave the names of various committees or organizations to the expenses of which they had contributed, while others mentioned such items as "matters relating to taxation" or "full crew law repeal," or "attending legislative hearings." Some roads gave a division of their expenses as between "advertising" and "publicity."

International

Railway Station at Coquimbo, Chile, After Great Earthquake

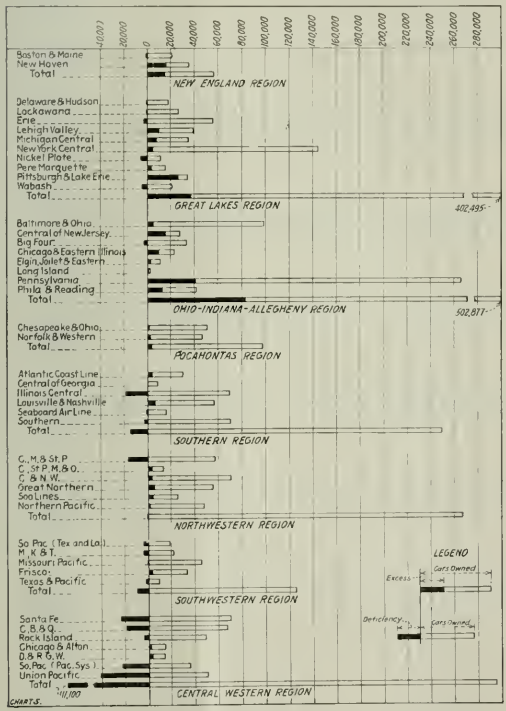
The Distribution of Railway Freight Car Ownership*

Three Bases Are Selected to Study Excess or Deficiency on 46 Leading Railroads

By J. P. Hallihan
Consulting Engineer; Formerly Secretary, Board of Economics and Engineering

THE ORIGINAL THEORY of car ownership in the United States was that each railroad should provide sufficient cars to take care of the traffic offered on its lines.

Freight destined beyond the originating line was formerly transferred at the junction point to cars furnished by the connecting line and the original car was made available for a return load offered by the connecting line or for return



Excess or Deficiency of Car Ownership on Basis of Loaded and Empty Car Mileage During 1920

Cars distributed in same proportion to total cars owned by the 46 systems (1,993,577) as loaded and empty car mileage of the individual road bears to loaded and empty car mileage of the 46 systems. Again taking the Baltimore & Ohio as an example, its ownership was 98,717 and its loaded and empty car mileage for the year was 940,471,000. This figures out at 4.72 per cent of the total empty and loaded car mileage of the 46 systems which in 1920 was 19,916,113,000. Of the total car ownership of the 46 systems—1,993,577—4.72 per cent gives a result of 94,097, or roughly, 94,100. Comparison with the actual B. & O. ownership of 98,717 gives the B. & O. on this basis an excess of approximately 4,600 cars.

empty to the loading point. The rights and responsibilities inherent in individual ownership were thus easily maintained and exercised by the owning company. This is the European system of today.

As transportation facilities were extended by the construction of new lines, difficulties arose. In addition to the delays, breakages and losses attendant upon transfer of lading at each junction point, connecting lines were frequently unable to supply cars promptly for transfer and freight embargoes followed. Large shippers became impatient of these delays and finally furnished their own cars, paying the various railroads participating in the haul on a mileage basis, after the practice of the coal companies on English roads. This opened the door to the formation of private car lines, which offered the shipper specially supervised fast service in the original car to destination, and speedily monopolized the carriage of high-class freight.

The loss in revenue suffered by the railroads forced them to enter into an arrangement for interchange of freight cars on a mileage basis of payment for use under which the roads gradually recovered control of freight traffic, displacing or absorbing all private car lines except those furnishing cars for refrigerator or other special service.

The mileage basis of payment proved defective in that it provided no penalty for undue detention of cars by roads or consignees, and in 1902 it was superseded by the present code of car service rules. Under this code the use of a freight car is paid for at a fixed rate per calendar day regardless of mileage, and the shipper or consignee is penalized by a demurrage charge for undue detention of cars.

During this period of evolution the railroads were obliged to relinquish individual control and to accept the principle of the common use of cars dictated by the commercial advantage of a rapid movement of freight from origin to destination without breaking bulk. The theory of individual ownership remained and it is now proper to inquire into the economic reasons supporting this theory.

A Moral Obligation Easily Evaded

The original requirement that each road should furnish cars sufficient for its originating business was early found to be a moral obligation easily evaded and impossible of enforcement. Roads so situated that they were able to divert empty cars returning to the owning road and load them with freight destined in the same direction were not subject to criticism, since they were complying fully with the car service rules and were, moreover, offering an economic advantage in converting a waste haul into a revenue haul. Feeder lines connecting with more than one trunk line were able to use their competitive position to secure cars.

Nevertheless the business of the country had to be taken care of, not in a restricted manner but to the full measure of the seasonal needs, and the burden has been met by the large systems able to meet it in the expectation that the per diem payments would at least carry the investment. This expectation has not been realized.

For the 15-year period from January, 1907, to January, 1922, the records of the Car Service Division of the American Railway Association show that a surplus of freight cars existed for 162 of the 180 months considered, or for 90 per cent of the time. This surplus exceeded 20 per cent at times, the average, however, on the basis of 2,500,000 cars in service being 156,000 cars or a little more than six per cent. This is not an excessive margin to be kept available for peak business but it is in addition to about the same per-

*The charts and figures used in this article are published by permission of the National Association of Owners of Railway Securities, Inc.

Selected Figures Showing Excess and Deficiency of Freight Car Ownership on Three Different Bases

Railroad	Cars owned[3] (1)	Cars loaded, year ended Feb. 19, 1921[2] (2)	Proportion of cars on basis of car loadings for year[3] (3)	Excess or deficiency on basis of car loadings for year (4) (1) — (3)	Loaded and empty freight car-miles, 1920 thousands[4] (5)	Proportion of cars on basis of loaded and empty car-mileage[5] (6)	Excess or deficiency on basis of loaded and empty car-mileage (7) (1) — (6)	Car-miles per car-day, 1920[4] (8)	Loaded and empty freight car-miles, 1920, thousands (9)	Loaded and empty freight car-days, 1920, thousands (10) (9) ÷ (8)	Proportion of cars on basis of loaded and empty car-days[6] (11)	Excess or deficiency on basis of loaded and empty car-days (12) (1) — (11)
New England Region												
Boston & Maine	20,847	740,353	40,300	—19,500	221,003	22,100	—1,200	16.6	221,003	13,310	33,300	—12,400
New York, New Haven & Hartford	35,706	834,707	45,300	—9,600	198,179	19,800	15,900	10.6	198,179	18,680	46,700	—11,000
Total for region	56,553	1,575,060	85,600	—29,100	419,182	41,900	14,700	f 13.1	419,182	31,990	80,000	—23,400
Great Lakes Region:												
Delaware & Hudson	18,038	400,509	21,800	—3,800	188,496	18,900	—800	27.9	188,496	6,750	16,600	1,400
Delaware, Lackawanna & Western	26,439	523,554	28,500	—2,100	267,108	26,700	—300	29.5	267,108	9,060	22,600	3,800
Erie	55,703	722,590	39,300	16,400	590,161	59,100	—3,400	26.3	590,161	22,450	56,200	—500
Lehigh Valley	39,569	595,308	32,400	7,200	295,626	29,600	10,000	21.9	295,626	13,500	33,800	5,800
Michigan Central	35,129	433,138	23,600	11,500	273,992	27,400	7,700	26.7	273,992	13,230	33,100	2,000
New York Central	144,455	1,961,069	106,800	37,900	1,400,707	140,200	4,500	a 23.3	1,400,707	62,750	156,800	—12,100
New York, Chicago & St. Louis	11,104	116,188	6,300	4,800	168,627	16,900	—5,800	b 22.9	168,627	7,360	18,400	—7,300
Pere Marquette	17,085	271,150	14,700	2,400	133,720	13,400	3,700	16.2	133,720	8,250	20,600	—3,500
Pittsburgh & Lake Erie	34,160	353,082	19,200	15,600	83,764	8,400	25,800	8.8	83,724	9,520	23,800	10,400
Wabash	20,613	385,295	20,900	—300	252,826	25,300	—4,700	27.0	252,826	9,360	23,400	—2,800
Total for region	402,495	5,761,783	313,400	89,000	3,655,027	365,900	36,700	f 22.7	3,655,027	162,230	405,300	—2,800
Ohio-Indiana-Allegheny Region:												
Baltimore & Ohio	98,717	1,945,500	106,000	—7,300	940,471	94,100	4,600	24.5	940,471	36,900	92,300	6,400
Central of New Jersey	27,476	454,545	24,700	2,800	123,798	12,400	15,100	13.9	123,798	8,900	22,300	5,200
Big Four	32,967	584,347	31,800	1,100	363,456	36,400	—3,400	28.3	363,456	12,850	32,200	800
Chicago & Eastern Illinois	22,709	315,194	17,100	5,600	131,773	13,200	9,500	b 21.0	131,773	6,270	15,700	7,000
Elgin, Joliet & Eastern	10,664	433,633	23,700	—12,800	85,402	8,600	2,300	e 13.0	85,402	6,560	16,400	—5,700
Long Island	2,758	98,281	5,300	—2,500	8,766	900	1,700	e 13.0	8,766	670	1,700	1,100
Pennsylvania System	265,824	4,908,092	267,200	—1,400	2,249,434	225,300	40,500	20.2	2,249,434	111,300	278,200	—12,300
Philadelphia & Reading	41,562	937,616	50,900	—9,300	294,235	29,400	12,200	20.0	294,235	14,710	36,800	4,800
Total for region	502,877	9,677,208	526,700	—23,800	4,197,335	420,300	82,500	f 21.1	4,197,335	198,160	495,600	7,300
Pocahontas Region:												
Chesapeake & Ohio	50,783	731,991	39,800	11,000	496,172	49,600	1,200	35.0	496,172	14,180	35,500	15,300
Norfolk & Western	46,398	799,056	43,400	3,000	441,138	44,100	2,300	34.5	441,138	12,870	32,200	14,200
Total for region	97,181	1,531,047	83,200	14,000	937,310	93,700	3,500	f 34.7	937,310	27,050	67,700	29,500
Southern Region:												
Atlantic Coast Line	29,769	578,236	31,400	—1,500	263,244	26,300	3,500	23.1	263,244	11,400	28,500	1,300
Central of Georgia	8,393	307,256	16,700	—8,300	80,891	8,100	300	g 23.4	80,891	3,460	8,700	—300
Illinois Central	69,141	1,260,976	68,600	500	887,753	88,900	—19,700	40.9	887,753	21,700	54,300	14,900
Louisville & Nashville	56,001	1,190,699	64,800	—8,800	502,972	50,300	5,700	30.6	502,972	16,440	41,200	14,800
Seaboard Air Line	15,838	363,286	19,700	—3,900	171,523	17,200	—1,400	22.4	171,523	7,660	19,200	—3,400
Southern	69,608	1,561,677	85,000	—15,400	732,576	73,300	—3,700	23.7	732,576	30,900	77,200	—7,600
Total for region	248,750	5,262,130	286,200	—37,400	2,638,959	264,100	—15,300	f 28.7	2,638,959	91,560	229,100	19,700
Northwestern Region:												
Chicago, Milwaukee & St. Paul	56,582	1,426,014	77,600	—21,000	738,288	73,900	—17,300	26.3	738,288	28,080	70,300	—13,700
Chicago, St. Paul, Minneapolis & Omaha	12,727	287,718	15,600	—2,900	94,811	9,500	3,200	22.2	94,811	4,270	10,700	2,000
Chicago & North Western	69,838	1,459,471	79,500	—9,700	664,516	66,500	3,300	21.5	664,516	30,880	77,200	—7,600
Great Northern	54,578	835,377	45,400	9,200	495,410	49,600	5,000	26.7	495,410	18,560	46,400	8,200
Minneapolis, St. Paul & Sault Ste. Marie	24,955	398,279	21,600	3,400	210,019	21,000	3,900	26.3	210,019	7,990	20,000	5,000
Northern Pacific	47,200	690,603	37,500	9,700	459,793	46,000	1,200	32.8	459,793	14,000	35,000	12,200
Total for region	265,880	5,097,462	277,000	—11,300	2,662,837	266,500	—700	f 25.7	2,662,837	103,780	259,600	6,300
Southwestern Region:												
Southern Pacific (Tex. & La.)	18,071	298,558	16,200	1,900	230,680	23,100	—5,000	h 23.0	230,680	10,030	25,100	—7,000
Missouri, Kansas & Texas	21,136	372,098	20,200	1,000	254,082	25,400	—4,300	a 23.0	254,082	11,040	27,600	—6,500
Missouri Pacific	44,403	876,428	47,600	—3,300	455,070	45,500	—1,100	22.8	455,070	19,970	50,000	—5,600
St. Louis-San Francisco	32,434	586,807	31,900	500	292,537	29,300	3,200	21.1	292,537	13,870	34,700	—2,300
Texas & Pacific	9,065	249,295	13,500	—4,500	122,349	12,200	—3,100	22.2	122,349	5,500	13,800	—4,700
Total for region	125,109	2,383,186	129,400	—4,300	1,354,718	135,600	—10,300	f 22.4	1,354,718	60,410	151,200	—26,100
Central Western Region:												
Atchison, Topeka & Santa Fe	69,288	1,124,876	61,200	8,100	936,682	93,800	—24,500	a 30.5	936,682	30,720	76,700	—7,400
Chicago, Burlington & Quincy	66,324	1,339,821	73,000	—6,700	858,057	86,000	—19,700	31.8	858,057	26,980	67,500	—1,300
Chicago, Rock Island & Pacific	48,020	825,049	44,900	3,100	526,263	52,700	—4,700	26.7	526,263	19,720	49,300	—1,200
Chicago & Alton	13,822	256,577	13,900	—100	131,903	13,200	600	23.4	131,903	5,630	14,100	—300
Denver & Rio Grande Western	13,405	266,154	14,500	—1,100	110,562	11,100	2,300	20.0	110,562	5,500	13,800	—400
Southern Pacific (Pacific System)	34,584	800,755	43,500	—8,900	578,082	57,900	—23,300	35.5	578,082	16,280	40,700	—6,100
Union Pacific	49,139	747,681	40,600	8,400	909,196	91,000	—41,800	a 52.9	909,196	17,170	43,000	6,200
Total for region	294,582	5,360,913	291,500	2,900	4,050,745	405,700	—111,100	f 33.3	4,050,745	122,000	305,100	—10,500
Grand Total	1,993,577	36,648,789			19,916,113			f 25.0	19,916,113	797,180		

See facing page for footnotes.

centage normally out of service for repairs, and taken alone represents an unused capital investment of approximately $150,000,000. The carrying charge at five per cent, leaving out of consideration the storage tracks required, is $7,500,000, incurred for the common good of all roads but met by the individual owners. There is in addition the loss to all roads in empty car mileage caused by return to owner when surplus, and relocation to loading territory when a shortage develops.

During the latter half of this period an attempt was made to cover the carrying charges by an increase in per diem rates but the rate was again reduced and at times suspended during federal control and the net result of individual ownership has been the inequitable distribution of the burden of equipment costs.

Studied From Several Angles

In an endeavor to ascertain the relative inequality of ownership, the traffic of the year 1920, a year of good business, when all the equipment was in use, has been studied from various angles taking as a basis the performance of the 46 principal systems as derived from the records of the Car Service Division of the American Railway Association. The result of these studies is shown graphically by a series of several charts, three of which are herewith submitted, giving the individual position of each road and the position of the regional groups, as defined (1) in the weekly reports of car loadings, (2) in the loaded and empty car mileage, and (3) on the basis of loaded and empty car days.

The calculation of excess or deficiency in ownership is made in each case on the assumption that the ownership of cars on any individual road should bear the same ratio to total cars in service as its car loadings bear to total car loadings or as its car mileage bears to total car mileage, etc.

Three of the Bases Used in Present Instance

In making an analysis of the situation on each road, it was necessary to consider three principal factors:

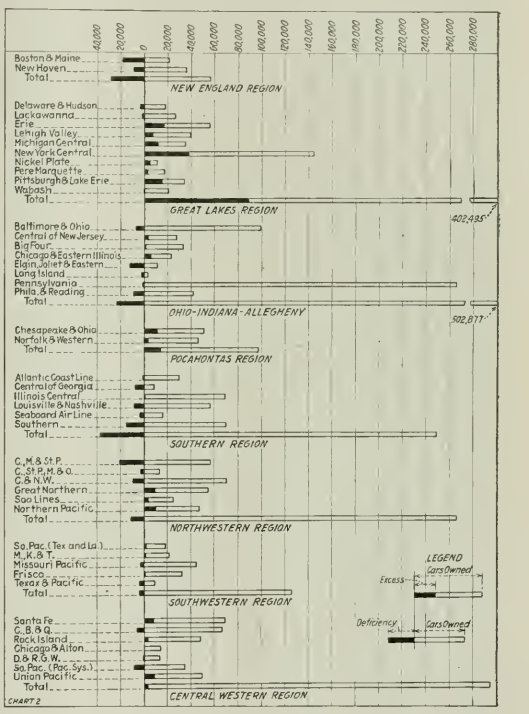
1. The requirement of each road and its contribution to the total business of the country expressed by its car loadings.

2. The participation of each road in the revenue derived from the use of the equipment expressed by its loaded and empty car mileage.

3. The character of service performed by each road expressed by the relation of loaded and empty car days to its loaded and empty car mileage.

On the basis of car loadings alone, it appears that with the exception of the Central Western Region—where the roads have enough cars for their requirements—all the other regional groups own less cars than they should be required to own with the single exception of the roads in the Great Lakes Region which, combined, have a surplus of more than 80,000 cars beyond their requirements for originating tonnage. When the comparison is made on the basis of empty and loaded car miles which in a measure is indicative of the revenue derived from the use of equipment, this situation immediately changes. The roads in the Central Western Region show a deficiency in car ownership of over 111,000 cars, indicating that their contribution to the total car supply of the country is very much less than their proportionate share of the benefits derived. The roads in the Great Lakes Region appear on this basis to be in a more normal position, having more than fulfilled their obligations by a surplus of 36,000 cars.

When the comparison is further extended to show the beneficial use of the equipment or, in other words, the comparative rapidity of movement of freight on the various lines as indicated by the figures of car miles per day and loaded and empty car days, the deficiency of ownership shown in the Central Western Region on a revenue basis disappears, the Central Western Region showing almost a perfect balance due to the long haul and low proportion of terminal delays



Excess or Deficiency of Car Ownership on Basis of Car Loadings for Year Ended February 19, 1921

Cars distributed in same proportion of total cars owned by the 46 systems (1,993,577) as number of cars loaded by the individual road bears to total cars loaded by the 46 systems. Thus the Baltimore & Ohio's ownership for the period was 98,717; its car loadings totaled 1,945,500. The total loadings of the 46 systems for the same period were 36,648,789. The former figure is 5.31 per cent of the latter. 5.31 per cent of the total ownership of the 46 systems—1,993,577—gives a result of 105,859, or roughly, 106,000. This figure compares with the Baltimore & Ohio's actual ownership of 98,717, indicating a deficiency, roughly, of 7,300 on this particular basis.

permitting a much faster movement than on other roads less fortunately situated.

Consider the Pennsylvania System which, besides being the road owning the largest number of cars—over 265,000—enjoys a traffic much more diversified than the average, has a great many feeders and connections with other lines, reaches the great terminals on the seaboard as well as the important gateways in the interior and is, in a word, a great collector as well as a transmitter of freight. The charts show that it is keeping up to its requirements on originating load-

FOOTNOTES FOR TABLE ON FACING PAGE.

[1] Railway Equipment Register.
[2] Car Service Division, American Railway Association.
[3] Cars distributed in same proportion to total cars owned by the 46 systems (1,993,577) as number of cars loaded by the individual road bears to total cars loaded by the 46 systems (Column 2).
[4] Interstate Commerce Commission figures.
[5] Cars distributed in same proportion to total cars owned by the 46 systems (1,993,577) as loaded and empty car-mileage of the individual road bears to total loaded and empty car-mileage of the 46 systems (Column 5).
[6] Cars distributed in same proportion to total cars owned by the 46 systems (1,993,577) as loaded and empty car-days of the individual road bears to total loaded and empty car-days of the 46 systems (Column 10).
a Average of component parts of system.
b Average for region.
e Estimated
f Approximate average.
g Average of Atlantic Coast Line, Seaboard Air Line and Southern.
h Assumed to be same as for Missouri, Kansas & Texas System.

ings; that on the basis of revenue derived from participation in handling the total business of the country it has, in fact, exceeded its obligation by a little more than 40,000 cars, but its movement being somewhat retarded by a large proportion of intermediate hauls, on the basis of car days, it becomes again deficient in its obligation of ownership by 12,500 cars.

The New England Roads

Perhaps the most characteristic example of the necessity of considering the three bases mentioned is shown by the New England roads on which traffic moves slowly and experiences many delays at junctions and at terminals. On the basis of car loadings the New England Region has but little more than half of the number of cars required. If its ownership is considered on the basis of its proportionate obligation due to the revenue derived, it appears with an excess of cars which is wiped out, however, by reason of its slow movement, leaving the New England Region in deficiency on any form of average calculation. From an economic point of view this is as it should be, since under normal circumstances more cars arrive in New England with raw material to be converted into manufactures or to furnish power for such conversion or with food products for the population than are required for manufactured products going out, which constitutes the burden of its outbound traffic.

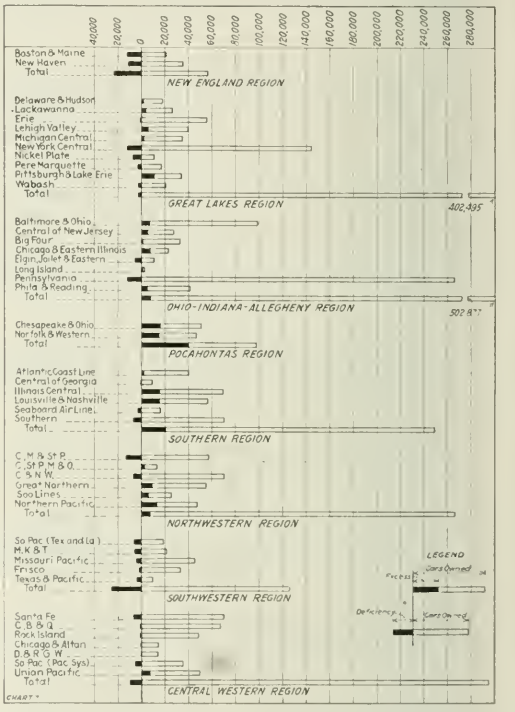
The problem of fair distribution of capital cost of ownership in equipment that is employed, whether individually owned or not, in a common service is quite evidently, from this picture of the situation, not an easy problem to solve. The inherent conditions differ on each road and in each group, differing less between roads in the various groups than between those governing a group of eastern roads and those governing a group of roads in southern or western territory. A short haul coupled with movement in and out of congested terminals has a very important bearing on the movement of freight expressed in car miles per day. Again, the position of a bridge road originating very little freight but receiving freight from its connections destined for points beyond its own lines, giving it the advantage of a long haul with very little terminal switching, permits it to profit from the general business of the country with a very small contribution to the equipment used. In such circumstances, as in New England, it would be an economic loss to compel a road so situated to purchase cars which in time of surplus would come back to its lines for storage, thus creating unnecessary empty car mileage, when the movement of empty cars in both directions over its line furnish it at all times with a supply of cars more than adequate for its needs. Circumstance of location should not, however, permit it to evade its share of the capital cost.

Burden of Ownership Not Now Equitably Distributed

The fact that is brought out very clearly from the analysis is that the burden of ownership is not now equitably distributed, and the question naturally arises whether it is best to attempt equitable distribution on the basis of individual ownership. Certainly it cannot be done without power of enforcing the purchase of rated equipment deficiency by individual roads, and as shown, many of the roads most deficient in equipment on any of the bases considered should not, from an economic standpoint, be permitted to own cars individually so long as the practice obtains of return to owner when surplus. Such equipment, under car service rules, would be located in times of surplus at points where a car supply is not required and would require relocation to loading territory before it could again come into general use.

Coming now to consideration of common ownership as well as common use, it is evident that some thought must be given to the manner of protecting individual ownership in the common supply, and to the possibility of deducing a formula under which each road could thereafter contribute its proper proportion to the capital investment. For example, the present supply of freight cars might be evaluated and equipment certificates issued to cover the whole capital investment, each road receiving certificates for the equipment contributed and subscribing in addition to such amount as would make up its proper contribution or receiving credit for its excess ownership.

Protection of present capital investment offers no difficulty. There is considerable difficulty, however, in determining the excess or deficiency of contribution to the total equipment in service on the part of each road. The base for derivation of



Excess or Deficiency of Car Ownership on Basis of Loaded and Empty Car Days During 1920

Cars distributed in same proportion to total cars owned by the 46 systems (1,993,577) as loaded and empty car days of the individual road bear to total loaded and empty car days of the 46 systems. Thus the Baltimore & Ohio is shown as having an excess of 6,400 cars on this basis. Its ownership was 98,717; its loaded and empty car days were 36,900,000. Total loaded and empty car days of the 46 systems were in 1920, 797,180,000 of which 36,900,000 constitutes 4.63 per cent. This per cent of the total ownership of the 46 systems—1,993,577—gives a result of 92,303, approximately 6,400 less than the actual ownership of 98,717. In other words, on this basis the Baltimore & Ohio has an excess of 6,400 cars.

a formula would appear to be that of benefits derived from use; that is, the revenue derived from the haul of a loaded car as expressed by the relation of the car mileage of the individual road to the total car mileage. This would have to be modified by the requirement for originating tonnage and again by the manner in which the road performed its part of the service of transportation, modified again by the circumstance of location and by the physical conditions of operation under which some roads must work and which are not in evidence on other roads. It seems clear, however, that a reasonable standard of movement could readily be determined for each group, and a premium established for acceleration of movement by individual roads of the group.

The situation is somewhat analogous to the problem confronting a customs smelter receiving various ores, some of which are free-smelting and some refractory.

Within reduction limits, the base rate per ton for treatment is the same for all. Each lot, however, is credited a definite sum per unit for each unit of fluxing elements in excess of the base percentage established and is likewise penalized for each unit of refractory elements above the permissible limit. The adjusted treatment charge expresses the net smelting value of the constituents of the ore.

A similar working formula could, no doubt, be deduced in this case, and be applied monthly or annually, as might be agreed. Standards of movement and values of modifying circumstances could readily be determined for each group by the roads interested, or by a general committee for all roads, as standards are now determined in interchange practice.

There are various maintenance and operating economies that would naturally follow if common interest and responsibility are added to common use of freight cars, but the unfair distribution of the financial burden alone, under the plan of individual ownership, warrants the conclusion that it is not adapted to present-day conditions of operation and should be supplanted by a method sufficiently flexible to ensure that no road would escape its share of the burden of ownership nor be deprived of due credit for beneficial use of equipment.

Agitation for Reduced Rates Termed Menace to Reviving Prosperity

THE Western Railways' Committee on Public Relations, on December 23, issued a statement declaring the reductions of freight rates made within the last year have averaged 12 per cent, and are costing the railways at the rate of at least $471,000,000 annually in freight earnings, and characterizing the agitation, especially in the Western States, for further reductions, as a "menace to the reviving prosperity of the country."

The committee is composed of the following railway presidents: Ralph Budd, Great Northern; H. E. Byram, Chicago, Milwaukee & St. Paul; W. H. Finley, Chicago & North-western; Hale Holden, Chicago, Burlington & Quincy; J. E. Gorman, Rock Island Lines; C. H. Markham, Illinois Central; C. E. Schaff, Missouri, Kansas & Texas, and S. M. Felton, Chicago Great Western. The statement, which was given out by the chairman, S. M. Felton, is as follows:

"The present agitation for further reductions of railway rates, which is especially active among the farmers in western territory, indicates a serious want of public understanding of the railroad situation, and is a menace to the reviving prosperity of the country. This want of public understanding will, it is to be feared, be increased by a statement made in President Harding's message to Congress on December 8. This statement is as follows: 'When some very moderate wage reductions were effected last summer there was a 5 per cent horizontal reduction in rates.' The appearance of this statement in the message must have been due to an unfortunate mistake, for, as shown by the latest statistics of the Interstate Commerce Commission, the reduction of rates has been more than twice the amount stated. While railway rates and earnings have been seriously reduced, the prices of all commodities have been increasing.

"September was the first month since the general reduction of freight rates was put into effect on July 1, the facts for which show the full effect of the reductions of rates which have been made within the last year. This is the case because September was the first month after the reduction of rates when the railways handled a normal amount of low grade freight, especially coal. The statistics of the Interstate Commerce Commission show that between September, 1921, and September, 1922, two months which are entirely comparable, the average freight rate per ton per mile in the entire country declined 12 per cent, or from 1.27 cents to 1.12 cents. Few people realize the great effect this has had on railroad earnings. The total freight earnings of the railways of the country from freight business in September alone were $47,773,000 less than they would have been except for this reduction in rates. Based on the freight traffic handled in 1921 the reduction of freight rates within the last year amounts to about $471,000,000 annually.

"The largest reduction in rates has occurred in western territory, because the reductions on grain, grain products and hay have been relatively larger than on other commodities. The reduction in the average rate of the western lines between September, 1921, and September, 1922, was 13 per cent. The western railways in September earned almost $22,000,000 less than they would have if the reductions of rates had not been made. Because of the reduction in rates the earnings of the western lines, on the basis of the traffic of 1921, have been reduced at an annual rate of almost $265,000,000.

"The argument has been made that rates should be reduced because they are too high compared with the prices of commodities, and especially of farm products. A statement just issued by the Bureau of Labor Statistics of the Department of Labor shows that between November, 1921, and November, 1922, the average wholesale price of all commodities increased over 10½ per cent. It also shows that within this year the average increase in the prices of farm products was 18¼ per cent. The result of these reductions in railway rates and increases in the wholesale prices of commodities is that the average rate per ton per mile in the entire country is now only 54 per cent higher than it was in 1913, before the war, while the average wholesale price of all commodities other than farm products and foods is 65 per cent higher.

"Since most of the complaints regarding high railway rates come from the farmers in western territory, it is pertinent to call attention to the fact that as compared with 1913 the average price of farm products is now higher than the average rate of the western railways. The average rate per ton per mile of the western railways in September was only 38.6 per cent higher than in 1913, while the average price of farm products in November was 43 per cent higher than in 1913. The price of corn in the Chicago market is 50 per cent higher than it was a year ago.

"The railways are suffering not only from these large reductions of rates, but also from the increases in prices which have occurred, which include, of course, increases in the prices of the things they have to buy. They are large purchasers of metals and metal products, and the average increase in the price of these things within the last year has been almost 20 per cent. They are the largest purchasers of coal, and they are paying almost 40 per cent more per ton for coal than they were when the coal strike began. They are large purchasers of lumber, and the increase in the price of southern pine within the last year has been 39 per cent, while the increase in the price of Douglas fir lumber has been 36 per cent.

"In the four months following the reductions of rates on July 1, for which complete statistics of earnings and expenses are available, the railways of the country earned almost $87,000,000 less net return than in the same months of 1921, although 1921 was an extremely poor year. In these months the western lines earned $38,000,000 less net return than in the same months of 1921. This reduction of net return was due partly to increases of expenses caused by the shop employees' strike, but mainly to the reduction of rates and increases in the prices of fuel and materials.

"The railways have never been able since the coal strike

ended to furnish the country with as much transportation as it has needed, and the shortage of transportation has been acute in the western states, where the farmers have suffered severely from it. Further reduction of rates, which would be absolutely without justification on economic grounds, would cripple the railways. All signs indicate that the demand for transportation will continue to increase, and the railways will become less and less able to cope with this demand if their rates continue to be the object of unwarranted attacks."

Many Gages Are Found Throughout the World

A Study of the Practices of the Roads of 59 Countries Show 76 Per Cent Use Standard Gage

NOTWITHSTANDING the general tendency throughout the world toward uniformity in railway details, and especially in the promotion of free inter-communication, there is one important detail with respect to which there is still a lack of universal agreement. That detail is the railway gage. The accompanying statistics of railway mileage by gages, compiled by the Bureau of Railway Economics for 59 of the principal countries of the world, show that no one gage or width of track has been adopted to the exclusion of others; the majority of the railways, however, use the so-called "standard" gage of 4 ft. 8½ in. This gage is practically universal in the United States, Canada, Cuba, Holland, Hungary, New South Wales, Turkey and Chosen.

Next to the standard gage comes the meter gage of 3 ft. 3⅜ in. This is the almost exclusive gage in Porto Rico, French Sudan, Malay Peninsula, Bolivia, and Dutch Guiana, applies to a large part of the mileage in Brazil, and is found on some mileage in nearly all the principal countries of Europe and Asia. The two next important gages in use seem to be the 5 ft. 6 in. gage and the 3 ft. 6 in. gage. The former is found chiefly in India, Spain and Argentina. The latter is standard in South Africa, New Zealand, South Australia, Queensland, Tasmania, Western Australia, Japan, and the Philippines.

The accompanying tabulation gives details as to gages on 565,088 miles of railway in the 59 countries. These 565,088 miles represent about 76 per cent of the total railway mileage of the world. Several important, and a number of unimpor-

	North America				Central America						West Indies			
Gage	Canada	Mexico	United States*	Gage	Costa Rica	Guatemala	Nicaragua	Panama	Salvador	Gage	Cuba	Jamaica	Porto Rico	San Domingo
4 ft. 9 in.	....	....	190	5 ft. 0 in.	....	....	....	53	....	4 ft. 8½ in.	2,287	198	13	..
4 ft. 8½ in.	35,694	10,286	241,938	3 ft. 6 in.	322	....	166	....	....	3 ft. 3⅜ in.	....	....	325	..
3 ft. 6 in.	904	....	.....	3 ft. 0 in.	....	962	....	....	100	3 ft. 0 in.	51	....	....	.
3 ft. 3⅜ in.	....	16	.....							2 ft. 6 in.	....	....	....	62
3 ft. 0 in.	....	1,848	1,285	Total	322	962	166	53	100					
2 ft. 6 in.	....	33	.....							Total	2,338	198	338	62
2 ft. 0 in.	....	21	.....											
Total	36,598	12,204	243,413											

SOURCE: Reports of the carriers to the Interstate Commerce Commission and the Universal Directory of Railway officials.

*Miles of Main track owned.

SOUTH AMERICA

Gage	Argentine Republic	Brazil	Chili	British Guiana	Bolivia	Colombia	Dutch Guiana	Ecuador	Paraguay	Peru	Uruguay	Venezuela
5 ft. 6 in.	14,356	.....	64	....	....	....	....	....	....	.....	.....	....
5 ft. 5 in.	....	.....	670	....	....	....	....	....	....	.....	.....	....
5 ft. 4¼ in.	....	.....	11	....	....	....	....	....	....	.....	.....	....
5 ft. 2½ in.	....	1,023	.....	....	....	....	....	....	....	.....	.....	....
4 ft. 8½ in.	1,793	8	431	61	....	....	....	....	158	1,016	1,557	....
4 ft. 3½ in.	....	6	.....	....	....	....	....	....	....	.....	.....	....
4 ft. 2 in.	....	....	79	....	....	....	....	....	....	.....	.....	....
3 ft. 6 in.	....	....	275	19	....	11	....	288	....	16	.....	200
3 ft. 3⅜ in.	7,337	18,987	1,497	....	358	345	105	....	....	73	.....	48
3 ft. 0 in.	....	....	.....	....	....	577	....	....	....	306	.....	23
2 ft. 6 in.	....	454	784	....	....	....	....	....	....	.....	.....	....
2 ft. 5-17/32 in.	102	.....	.....	....	....	....	....	....	....	.....	.....	....
2 ft. 0 in.	....	.....	.....	....	....	....	....	....	....	.....	.....	136
1 ft. 11⅝ in.	....	1,152	38	....	....	....	....	....	....	50	.....	....
Total	23,588	21,630	3,840	80	358	933	108	288	158	1,461	1,557	407

EUROPE

Gage	Belgium	France	Greece	Holland	Hungary	Italy	Luxemburg	Norway	Spain	Sweden	Switzerland	United Kingdom
5 ft. 3 in.	....	....	....	....	....	....	....	....	4,777	....	....	3,109
4 ft. 8½ in.	2,972	27,602	780	2,604	11,554	11,518	198	1,297	58	5,863	4,003	20,070
4 ft. 6 in.	....	....	....	....	....	....	....	....	....	....	....	4
4 ft. 0 in.	....	....	....	....	....	....	....	....	....	....	....	7
3 ft. 8 in.	....	....	....	....	....	....	....	....	14	....	....	....
3 ft. 7 in.	....	....	....	....	....	....	....	....	....	51	....	....
3 ft. 6 in.	306	....	....	....	339	....	....	652	....	329	....	26
3 ft. 3⅜ in.	2,128	4,308	639	....	30	214	312	16	3,644	....	608	....
3 ft. 1 9/16 in.	....	....	....	....	....	1,137	....	....	....	....	....	....
3 ft. 0 in.	....	....	....	....	....	....	....	....	....	....	....	395
2 ft 11 in.	....	....	....	....	....	....	....	....	....	1,540	....	....
2 ft. 8½ in.	....	....	....	....	....	....	....	....	....	....	....	2
2 ft. 7 31/32 in.	....	....	....	....	....	....	....	....	....	....	35	....
2 ft. 7½ in.	....	....	....	....	....	....	....	....	....	32	....	5
2 ft. 6 in.	....	....	....	....	....	....	....	....	....	....	....	12
2 ft. 5 17/32 in.	....	....	....	....	9	....	....	52	65	....	9	....
2 ft. 4½ in.	....	....	....	....	....	....	....	....	....	....	....	9
2 ft. 4 in.	....	....	....	....	....	....	....	....	....	....	....	3
2 ft. 1 9/16 in.	....	....	....	....	....	....	165	....	....	....	....	....
2 ft. 3 in.	....	....	....	....	....	....	....	....	....	....	....	24
1 ft. 11⅝ in.	....	....	....	....	....	....	....	....	....	83	....	....
1 ft. 11½ in.	....	140	....	....	....	....	....	....	....	....	....	51
1 ft. 3 in.	....	....	....	....	....	....	....	....	....	....	....	7
Total	5,406	32,050	1,419	2,604	12,232	12,869	675	2,017	8,558	7,898	4,655	23,724

AFRICA

Gage	British East Africa	Egypt	French Sudan	Gold Coast	Nigeria	Union of South Africa	West Africa (Angola)
4 ft. 8½ in.	...	1,849	....	....	....	....	....
3 ft. 6 in.	...	1,070	....	269	983	8,982	390
3 ft. 3⅜ in.	94	....	1,186	....	....	....	226
2 ft. 7 31/32 in.	...	....	....	....	....	560	....
2 ft. 6 in.	108	....	....	....	143	....	....
2 ft. 5 17/32 in.	...	915	....	....	....	....	....
Total	202	3,834	1,186	269	1,126	9,542	616

AUSTRALIA

Gage	New South Wales	New Zealand	South Australia	Tasmania	Victoria	Western Australia	Queensland
5 ft. 3 in.	...	....	1,124	....	4,092	....	....
4 ft. 8½ in.	5,048	....	....	....	....	....	....
3 ft. 6 in.	36	3,010	1,210	818	....	4,003	5,931
3 ft. 3⅜ in.	18	....	....	....	....	....	....
2 ft. 6 in.	...	....	....	....	122	....	....
2 ft. 0 in.	...	....	....	41	....	....	....
Total	5,102	3,010	2,334	859	4,214	4,003	5,931

ASIA

Gage	China	Chosen	India	Japan	Malay Peninsula	Mesopotamia	Philippine Islands	Siam	Turkey
5 ft. 6 in.	....	....	21,126	....	....	...	...	....	...
5 ft. 0 in.	3,746	....	....	....	....	...	...	....	...
4 ft. 9 in.	344	....	....	....	....	...	...	....	...
4 ft. 8½ in.	2,242	1,157	....	24	....	186	...	590	814
3 ft. 6 in.	...	....	...	7,248	...	...	925	...	...
3 ft. 3⅜ in.	151	....	13,914	....	1,209	624	...	836	...
2 ft. 6 in.	....	....	1,629	151	....	58	...	....	...
2 ft. 0 in.	....	....	582	26	....	...	...	....	...
Total	6,483	1,157	37,251	7,449	1,209	868	925	1,426	814

tant, countries are not included because complete or up-to-date statistics are not easily available. Among the countries so excluded are Russia (including Siberia), Germany, Poland, Turkey in Europe, Bulgaria, the Balkans, and various possessions in Africa and elsewhere.

Of the 565,088 miles operated in the 59 countries, here covered, in 1920, 396,169 miles are of the standard gage, 54,685 miles are of a gage wider than standard, and 114,234 miles of a narrower gage, the percentages being as follows:

Standard gage,	70	per cent
Wide "	10	per cent
Narrow "	20	per cent

The three gages shown for the United States are for the Class I railways, and represent 243,413 miles of main track owned. Practically all of this mileage is 4 ft. 8½ in. gage. During recent years there has been a rapid concentration on the standard gage in the United States and at the present time only three gages are in use on Class I railways. Of these the standard gage represents 99.4 per cent of the total mileage, the remaining 0.6 per cent being divided between 4 ft. 9 in. and 3 ft.

The railway mileage of Canada is divided between two gages. Ninety-eight per cent represents standard gage, while the other two per cent is 3 ft. 6 in. gage.

The United Kingdom has 3,109 miles of the broad gage of 5 ft. 3 in. (1.676 meter), and it also boasts of the narrowest, that of 1 ft. 3 in. However, 85 per cent of the railway mileage of that country is standard gage.

On the continent of Europe the English standards and details were adopted in the first lines to be constructed, and at the present time the standard gage, whose metric equivalent is 1.435 meters, represents 76 per cent of the railway mileage operated. But as in the United Kingdom this gage is not universal. For the 11 continental European countries shown in the accompanying statement no less than 23 gages are represented. Nearly all European countries (Spain excepted) have adopted the standard gage for their main lines, while secondary or local lines have been constructed on narrow gages.

In Africa the gages are mainly 3 ft. 6 in., 3 ft. 3⅜ in. (meter) and 2 ft. 5 17/32 in. (0.75 m.). The railways there also operate 1,849 miles of standard gage.

The mileage of the railways of Australia, including Tasmania, consist of six gages. The 3 ft. 6 in. gage predominates with standard gage next in importance, while there is a small amount of mileage of 2 ft. 6 in., and 2 ft. gages still in service. A commission recently appointed to consider the unification of railway gages in Australia has recommended that the 4 ft. 8½ in. gage be adopted as standard.

In Asia, the Indian railways, the largest Asiatic system, are divided chiefly between a "broad" gage of 5 ft. 6 in. and a narrow gage of 2 ft. The greater percentage of the Chinese railway mileage is 5 ft., although 35 per cent of the mileage of that country is of standard gage. Practically all the Japanese lines use the gage of 3 ft. 6 in. (1.067 m.).

In South America there is great diversity, lines being built to gages ranging from 1 ft. 11⅝ in. (0.60 m.) to 5 ft. 6 in. In Central America and the West Indies the principal gages are 4 ft. 8½ in., 3 ft. 6 in., and 3 ft., with 4 ft. 8½ in. predominating except in Panama, where the gage is 5 ft.

Interstate Commerce Commission May Require Additional Equipment

WASHINGTON, D. C.

THE Interstate Commerce Commission announced on December 27 what promises to be one of the most important general investigations it has ever undertaken, under docket 14,489, "into and concerning the adequacy of the locomotives and cars of all descriptions owned and of the locomotives and cars used by each such common carrier by railroad, and used in the transportation of freight between points in continental United States, and into and concerning the customs and practices prevailing or desirable with respect to the ownership, use and interchange of cars with a view to promoting economical and efficient service, to prescribing and establishing such just and reasonable rules, regulations and practices with respect to car service, and to require the respondents to provide themselves with such safe and adequate locomotives and cars wherewith to perform as common carriers their car service as may upon such investigation appear to be contemplated and required by law." The order was entered on December 11. As a preliminary step the commission has by questionnaires attached to the order called upon the carriers for the following information:

(a) Freight train cars owned or leased at the beginning and close of year 1922, and number ordered but not delivered December 31, 1922.

(b) Estimated number of additional cars needed by classes; estimated cost thereof; proposed program for acquiring such cars; and proposed plan of financing.

(c) Ages of cars in service by classes, December 31, 1922, 100,000 lb. capacity and over.

(d) Ages of cars in service, 80,000 lb. and less than 100,000 lb. capacity.

(e) Ages of cars in service, 60,000 lb. and less than 80,000 lb. capacity.

(f) Ages of cars in service less than 60,000 lb. capacity.

(g) Locomotives owned or leased at the beginning and close of year 1922 and number ordered but not delivered on December 31, 1922.

(h) Unserviceable locomotives on line first of each month in 1922, by classes, and tractive power.

(i) Ages of locomotives at close of year 1922, by classes —freight, passenger, switch.

(j) Estimated number of additional locomotives needed;

proposed program for acquiring such equipment; and proposed plan of financing the purchase thereof.

(k) Commodities loaded monthly, 1922, revenue freight—carloads.

(l) Carloads of non-revenue freight loaded monthly, 1922.

(m) Freight cars on line daily, serviceable and unserviceable, by months in 1922—box, coal.

(n) Freight cars on line daily, serviceable and unserviceable, by months in 1922—refrigerator, flat.

(o) Freight cars on line daily, serviceable and unserviceable, by months in 1922—stock, all freight.

(p) Freight car surplusages, daily averages by months, 1922, railroad owned cars.

(q) Freight car shortages, daily averages by months, 1922, railroad owned cars.

(r) Freight car surplusages, daily average by months, 1922, cars owned by private companies.

A questionnaire has also been directed to all private car lines requesting information concerning freight train cars owned or leased by them, and the number of such cars ordered but not received.

All carriers by railroad subject to the Interstate Commerce Act are made respondents. The governor of each state, as well as the tribunal thereof, if any, having regulatory powers over the common carriers by railroad, have been notified of this proceeding.

The times and places for hearings will be announced later.

The Transportation Act gave the commission for the first time authority to require railroads to provide an adequate supply of equipment and the numerous complaints it has received because of the unprecedented car shortage of this fall have apparently decided the commission to see whether the remedy lies in the exercise of such powers. Such an investigation will naturally involve such additional questions as whether the need is for additional cars or a better supply of motive power or more adequate terminals which will enable obtaining greater service from the existing equipment; whether shippers should provide themselves with greater storage facilities or whether the business of the country can be better distributed through the year so that there will not be so acute a demand for cars for seasonal loading, and also, if it should be determined that more railroad equipment is required, what companies should be the ones to purchase it. When the Railroad Administration ordered a considerable number of cars and locomotives it allocated them to the companies best able to finance them rather than to those that needed them the most.

Freight Car Loading

WASHINGTON, D. C.

FREIGHT CAR loading during the week ended on December 16 continued to break all records for the season of the year. The total was 888,082, an increase of 162,008 over the corresponding week of 1921, and of 85,811 over 1920. The usual seasonal decline was shown, however, by a drop of 31,000 as compared with the previous week. In all districts except the Pocahontas, where the loading was less than in 1920, the figures exceeded those of both 1921 and 1920 and the same was true of all classes of commodities except coal and ore. Coal loading was 198,510 cars as compared with 134,789 in 1921 and 225,059 in 1920. Miscellaneous loading was 45,000 cars above that for 1920 and there was an increase of 14,000 cars in grain, 8,000 in live stock, 15,000 in forest products and 31,000 in merchandise.

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, DECEMBER 16, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year 1922	Corresponding year 1921	Corresponding year 1920
Eastern	1922	10,003	4,185	60,137	2,618	5,971	2,735	62,804	79,094	227,547	.....	.....
	1921	9,566	4,030	38,928	1,777	4,925	808	60,759	59,712	.....	180,505	192,482
Allegheny	1922	3,413	3,559	56,084	6,586	3,525	2,699	45,691	70,760	192,317	.....	.....
	1921	3,018	3,400	41,290	3,606	2,573	2,378	45,731	47,177	.....	149,173	177,122
Pocahontas	1922	253	126	18,214	577	1,544	142	6,008	3,295	30,159	.....	.....
	1921	247	92	14,675	159	1,304	24	5,487	3,085	.....	25,073	31,815
Southern	1922	3,290	2,251	23,004	1,337	22,284	1,113	37,848	40,863	131,990	.....	.....
	1921	4,023	2,116	15,420	481	18,003	594	37,911	34,062	.....	112,610	124,964
Northwestern	1922	15,640	11,011	11,742	1,637	11,932	909	25,400	29,303	107,574	.....	.....
	1921	13,747	9,681	6,181	825	9,844	308	25,670	23,636	.....	89,886	91,761
Central Western	1922	13,462	14,769	23,650	375	6,615	2,568	31,105	40,798	133,342	.....	.....
	1921	12,628	11,805	14,928	193	4,874	758	30,683	34,470	.....	110,339	119,280
Southwestern	1922	4,943	3,247	5,679	96	8,231	582	15,604	26,771	65,153	.....	.....
	1921	4,365	2,794	3,367	124	5,455	635	16,222	24,526	.....	58,488	64,847
Total Western districts	1922	34,045	29,027	41,071	2,108	26,778	4,059	72,109	96,872	306,069	.....	.....
	1921	30,740	24,280	24,476	1,142	21,173	1,701	72,575	82,626	.....	258,713	275,888
Total, all roads	1922	51,004	39,148	198,510	13,226	60,102	10,748	224,460	290,884	888,082	.....	.....
	1921	47,594	33,918	134,789	7,165	47,978	5,505	222,463	226,662	.....	726,074	.....
	1920	35,231	30,472	225,059	12,340	46,748	14,489	192,721	245,211	.....	.....	802,271
Increase compared	1921	3,410	5,230	63,721	6,061	12,124	5,243	1,997	64,222	162,008	.....	.....
Decrease compared	1921	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Increase compared	1920	15,773	8,676	.....	886	13,354	.....	31,739	45,673	85,811	.....	.....
Decrease compared	1920	.....	.....	26,549	.....	.....	3,741	.....	.....	.....	.....	.....
December 16	1922	51,004	39,148	198,510	13,226	60,102	10,748	224,460	290,884	888,082	726,074	802,271
December 9	1922	55,608	38,170	200,505	13,051	63,195	9,879	228,392	311,028	919,828	741,341	837,953
December 2	1922	49,341	34,381	186,158	13,075	60,010	10,550	199,717	291,987	845,219	741,849	882,604
November 25	1922	54,790	40,217	202,032	13,234	66,046	15,052	228,771	335,353	955,495	673,465	803,701
November 18	1922	55,204	40,735	205,024	12,431	61,403	32,780	228,922	352,595	969,094	790,363	889,138

Compiled by the Car Service Division, American Railway Association.

THE KANSAS INDUSTRIAL COURT has ordered the arrest of 46 railroad strikers at Horton, Kan., charging violations of the Industrial Court Act. The warrants were issued on the three counts of disturbing the peace, picketing and conspiracy to obstruct the operation of the railroads.

The Rich Lerma Valley, Served by the New Line

New Transcontinental Line in Northern Argentina

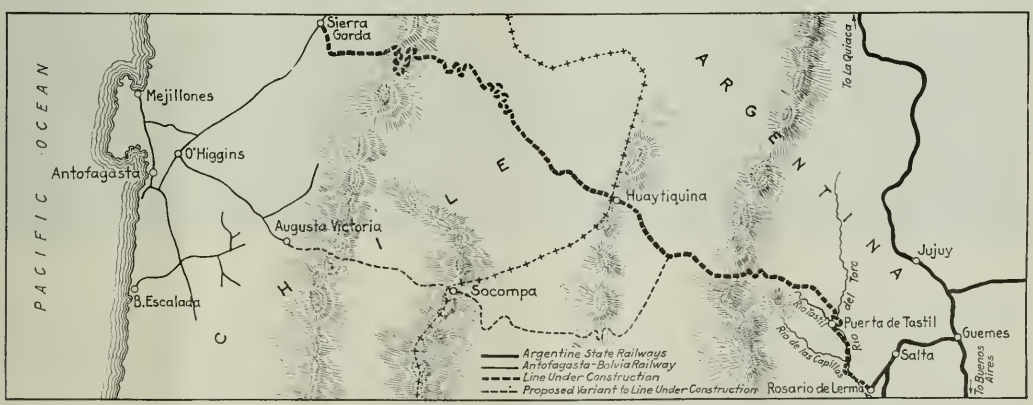
Interesting Engineering Problems Involved—Rich Agricultural and Oil Lands Made Accessible

By Richard F. Maury
Chief Engineer, Salta to Antofagasta International Railway

WITH THE OBJECT of opening up the rich northern provinces of Argentina it was recently decided by the governments interested to initiate the construction of a new trans-Andean line from the city of Salta, Argentina, to the port of Antofagasta, Chile, on the Pacific, crossing the main range of the Andes and following roughly the traditional Inca highway through the mountains. This line at its eastern terminus connects with the Argentine State Railway system, of which it will form an integral part. From many points of view it presents features of great interest, the center of the sugar district, which is in this territory, being more than a thousand miles from Buenos Aires. The fertile plains and wonderful valleys of the region make of it one of the most promising zones in the world for future development, producing as it does every class of tropical and sub-tropical products, timber, cattle and minerals.

New Line to Reduce Distance

The new line now in construction will reduce the rail haul to the sea by 435 miles, more or less, while the sea haul to



The New Transcontinental Link

prominent among which are the low rates of grade, as gradients go in the country, which have been found feasible and some rather remarkable developments which have been introduced to maintain these low gradients.

The Argentine provinces which will be served by the line are at present sparsely settled, due to the want of a port and the enormous distances that separate them from the littoral, American ports will be enormously reduced, the distance from Antofagasta to Panama being only 2,200 miles. Undoubtedly the present trade routes will be completely changed by this construction and it will be a factor of great importance in encouraging commercial relations between the United States and Argentina.

Taking as a center, Guemes, the junction point of the new

line with the State Railways, the distances to the sea and American and European ports are as follows:

From	To Antofagasta Miles	To Buenos Aires Miles
Guemes	469	931
Liverpool	6,770	6,258
New York	4,212	5,838
New Orleans	3,620	6,255
Amsterdam	7,058	6,370

Northern Argentina and eastern Bolivia will, in time, be large consumers of American products. The sugar industry, already well established, will acquire impetus with the opening up of the new route, while the existence of enormous fields of petroleum in the region has aroused the interest of American capital, boring operations on a large scale having been started. This also will be a source of traffic, while it is probable that, in time, a considerable proportion of the agricultural machinery used in the Argentina will be imported through this new channel. Trade relations will not, in any sense, be unilateral since northern Argentina can become in time one of the great corn and cattle producing areas of the world. With these facts in view, the new line is being constructed to handle a heavy traffic.

Viaduct, 950 ft. in Length and 80 ft. High, Being Built Over the Rio Toro

Maximum Grades 2.5 Per Cent

Work on the Argentine section of the line was begun with great activity in April, 1921. The original surveys included several sections of rack rail with gradients up to 7.5 per cent and normal grades of 3 per cent, but it was wisely determined to try for a 2.5 per cent line, compensated, and with relatively easy curvature (11 deg. 40 min.). New surveys now being undertaken on this basis have reached the stage where it is possible to state that these standards will not be passed at any point. The work is being done by the State Railway organization of which Domingo Fernandez Beschtedt is general manager and Arthur Acevedo chief engineer. Surveys and construction work are in charge of the writer.

The line leaving Salta crosses the rich Lerma valley for some 25 miles to intern itself in the gorge of the Rio Toro, which it follows to Puerta de Tastil, 65 miles. In the first 19 miles of the gorge of the Toro, the rise of the river bed is, in parts, in excess of the maximum grade and due to the impossibility of introducing development without recourse to rising tunnels, it was found necessary to employ two short sections of switch-back, one of 3,937 ft. and one of 2,625 ft., both placed at crossing stations to reduce operating difficulties to a minimum.

A Sharp Climb

At Puerta de Tastil the line leaves the Toro to swing west directly toward the coast and here the principal difficulty was encountered. A table land running in the direction desired on practically maximum grade was found, but between its level and the bed of the Toro there exists a vertical rise of some 2,300 ft. in an air line distance of 5 miles. Careful surveys of the region, of which a part was made by photo-stereoscopic methods employing the Zeiss photo comparator, demonstrated the possibility of attaining sufficient development within the established grade, and at one point the line makes six spirals around a group of conical hills on practically a surface line. From a scenic point of view this is without doubt one of the most remarkable stretches of rail in the world. At the top of the climb the traveler will dominate with his eye on a range of snow-covered hills, many of which exceed 20,000 ft. in altitude, while below him the line stretches away in eight distinct levels, the last being more than 2,000 ft. below.

Erecting 2-10-2 Locomotives, Built by Baldwin

The line from here follows to the west with very easy grading, with the exception of the crossing of the three dis-

tinct ranges in the Abra Blanca (13,450 ft. high), the Abra Chorillos (14,750 ft.) and the continental divide at the frontier, the point of which crossing is not yet decided.

Danger from Slides

In the period from April to December, 1921, 56 miles of very heavy grading have been finished, with a total of more than 2,000,000 cubic yards of rock and hard-pan, while 25,000 cubic yards of bridge and culvert masonry have been finished in the same time. Some heavy viaduct and tunnel work is found on the same section, as well as hillside retaining walls. The lower stretches of the line are in a zone of torrential rainfall and slides will be the worst enemy of the constructor. In places, to avoid future difficulties, the line is carried under the mud slides in cut-and-cover tunnels carried out in reinforced concrete and it is possible that in the future considerably more work of this nature will be required. Fortunately, in the higher altitudes the precipitation is very small and no difficulty will be experienced with snow, giving the new line a great advantage over the existing Transandine line in the province of Mendoza.

The work is being given out on small contracts, the railway furnishing equipment, and 5,000 men are being employed, mostly Argentine peons from the mountain districts, who are proving extremely good workers. The equipment includes 70-ton railway type, Bucyrus shovels, complete compressed air equipment for the tunnel work and a large fleet of motor trucks. Well-equipped shops are being provided for the erection and repair of locomotives and plant, while, to better the living conditions of the workers, co-operative stores have been established in which it is possible to purchase articles of good quality at cost price.

The line is of meter (39.37 in.) gage to conform to the gage of its connections and is being laid with 80 lb. rails on red quebrachi ties (2,420 per mile) and is heavily ballasted with broken stone and gravel. Santa Fe type locomotives of 146 tons are being supplied by the Baldwin Locomotive Works, the first having been erected and placed in service. The fuel used is crude oil from the Argentine fields and complete installations for storage and loading are being erected in Salta.

An Alternative Route

Work on the Chilean section has not been started, pending the decision of a variant of the original survey through Huaytiquina. The modification proposed, the possibilities of which in Argentine territory are now being studied, will pass the frontier in Socompa, considerably to the South of Huaytiquina, skirting the volcano of Socompa to connect up at Augusta Victoria (the ex-kaiser's important nitrate mine) with an existing branch of the Antofagasta & Bolivia Railway. This line of 75 centimeter (2 ft. 5½ in.) gage would be rebuilt to meter gage and put into condition to handle the heavy traffic of the transcontinental line. The proposed variant would be very advantageous to Argentina, since it would reduce considerably the total distance between Salta and the sea, while increasing the part to be constructed by the Argentina by only some 50 miles. Considerable opposition to this cut-off has been aroused in the north of Chile, since it avoids the richer mining regions and the only zone with irrigation.

Rio Toro Gorge—Railroad Embankment on One Side, Highway on the Other

Accident Investigations—July, August and September*

THE THIRTEENTH quarterly issue of the Summary of Train Accident Investigations, prepared by the Bureau of Safety of the Interstate Commerce Commission, which is for the months of July, August and September, 1922, was issued on December 20. The report covers 21 collisions and 11 derailments, besides an accident on an electric road and one on the New York & Long Branch which was not a train accident.

Below is a list of these accidents, the date in the last column being that on which a report of the accident was published in the *Railway Age*. The letter *c* indicates collision and *d*, derailment. Ten of these I. C. C. reports have already been noticed in these columns, as noted; ten others, indicated by stars in the list, are abstracted below; leaving 14, of relatively less importance, which must be omitted because of limitations of space.

Abstracts of Government Reports

Atchison, Topeka & Santa Fe, Burrton, Kan., July 8, about 4 p. m. Eastbound passenger No. 4, consisting of locomotive 1428, a buffet car, a dining car and five sleeping cars, while moving at 18 or 20 miles an hour, ran over a misplaced switch and into some cars of gasoline standing on a side track; one passenger killed and 48 passengers and employees injured. The buffet car was telescoped for half its length by the dining car. Tank cars on the siding were ignited and burned; but the cars in the passenger train were not damaged by fire. The line of road is straight, the switch target showed red and the weather was clear, but the engineman evidently did not see the target; and the fireman did not see it until he was very close to it. The switch is close to the station and close to the crossing of the St.

*Previous quarterly summaries, for 1921 and 1922, were noticed in the *Railway Age*, as below:

No. 7, 1921, July 2, 1921, page 35;
No. 8, 1921, September 3, 1921, page 459;
No. 9, 1921, December 10, 1921, page 1145;
No. 10, 1921, June 10, 1922, page 1343;
No. 11, 1922, June 17, 1922, page 1483;
No. 12, 1922, September 2, 1922, page 426.

Louis-San Francisco. The operator at the station had just returned to its normal position the gate at the St. L.-S. F. crossing, but had not noticed the switch in the wrong position. The report, quoting the fireman, says that the tank at the station is painted red and forms a background for the target, making it difficult to read the indication for any considerable distance. The inspector finds that the switch had been left in the wrong position by the conductor of a freight train of the St. Louis-San Francisco, who had been using the Santa Fe track a few minutes before for the purpose of turning his locomotive; but the conductor claimed emphatically that he went back to the switch and closed it. The speed of trains over the St. Louis-San Francisco crossing is limited by rule to 15 miles an hour; and it is held that if the engineman had obeyed this rule, the collision probably would have been avoided. It seems to have been the common practice for the Frisco people to use the main track of the Santa Fe at Burrton for turning

Accident Investigations Completed in Third Quarter of 1922

d.	Atlanta, B. & A.	Ben Hill, Ga.	March 12.	
d.	Atlantic City	Winslow J.	July 2	Sept. 23.
..	N. Y. & Long Br.	Asbury Pk.	July 4.	
c.	A., T. & Santa Fe.	*Burrton, Kan.	July 8.	
c.	Mo. Pacific	Leeds, Mo.	July 12	Sept. 9.
c.	M., K. & Texas	Alsuma, Ok.	July 19	Sept. 9.
c.	St. Louis-S. F.	Logan, Mo.	July 22	Sept. 9.
c.	Penn.	Lester, O.	Aug. 1	Sept. 9.
..	Cincinnati, I. & N.	Pleasant Ridge—same as preceding.		
c.	M., St. Paul & S. S. M.	*Gile, Wis.	Aug. 3.	
c.	Mo. Pacific	Sulphur Spgs.	Aug. 5.	{ Aug. 19. / Nov. 18.
c.	Balt. & Ohio	Ellwood Cy.	Aug. 6	Sept. 9.
d.	Boston & Alb.	Worcester	Aug. 8.	
d.	Bangor & A.	Caribou	Aug. 9.	
c.	M., St. Paul & S. S. M.	Annadale	Aug. 12	{ Aug. 19. / Aug. 26.
c.	Balt. & Ohio	Kanawha	Aug. 13.	
c.	Nor. Pacific	*Durant	Aug. 14.	
c.	St. Louis-S. F.	*Horine	Aug. 16.	
..	Internt'l	Elwood, N. Y.	Aug. 17.	
d.	Mich. Central	Gary, Ind.	Aug. 20.	
d.	Ches. & Ohio	Muncie	Aug. 21.	
c.	Ill. Central	*D. Boone	Aug. 24.	
d.	Nor. Pacific	Wymer	Aug. 25.	
c.	Colo. & South'n.	Marnel	Aug. 27.	
c.	Utah	*Martin	Aug. 28.	
d.	Chi. & N. W.	Waukesha	Aug. 30.	
d.	St. Louis-S. F.	*Starland	Sept. 1.	
c.	Nor. Pacific	*Parkwater	Sept. 7.	
d.	Macon, D. & S.	Fitzpatrick	Sept. 11.	
c.	S. P. and I.-G. N.	Houston	Sept. 13	Nov. 11.
c.	Chi. & N. W.	*Clintonville	Sept. 17.	
d.	Mobile & O.	Tamsla	Sept. 18.	
c.	Southern Pac.	*Montalvo	Sept. 22.	
c.	Denver & R. G. W.	Toltec, N. M.	Sept. 29	Oct. 28.
c.	Ill. Central	Doris	Sept. 30.	

locomotives, without any form of protection, except that inquiry would be made of the operator if the block was clear, the line of the Santa Fe being worked by a manual block system.

Minneapolis, St. Paul & Sault Ste. Marie near Gile, Wis., August 3. Eastbound extra freight 2427 collided with westbound freight No. 151. Both locomotives were badly damaged and the fireman of train 151 was killed. Nine other employees were injured. The operator at Ironwood had neglected to deliver a meeting order to train 151. It appears that he accepted the order from the dispatcher after the train had left his station; he evidently had depended upon the conductor to come into the office, as was his ordinary practice, after finishing his switching and before departing. The operator had been in service five years and had a clear record.

Northern Pacific, Durant, Mont., August 14. Westbound freight extra No. 1747, moving at about 18 miles an hour, collided with eastbound passenger No. 2, moving at about 10 miles an hour. Both of these trains were long and heavy, but the report says that neither of the locomotives was derailed. The second car in the passenger train was telescoped by the first for about 15 ft. The express messenger on the passenger train was killed and 20 passengers and 4 employees were injured. No block signal system is in use on this line. The freight had no orders and no rights against No. 2 and every man on the train admitted overlooking No. 2, although all had time-tables and all were familiar with the road and with the regular trains of the division. The conductor said that he had consulted his time-table on leaving Butte, 13 miles east of the point of collision; but, he did not make a thorough check of it for opposing trains as he had worked on this line for years and was positive that he absolutely knew which trains were due. None of the men gave any reason for their neglect.

St. Louis-San Francisco, Horine, Mo., August 16. Southbound passenger train No. 801 collided with northbound passenger No. 806, causing fatal injury of Engineman Weston of the southbound train and Fireman Jones of the northbound. Five employees and 68 passengers were injured. Train 806 was standing on the main track waiting for the southbound, which was ordered to enter the siding, but did not do so. Engineman Weston appears to have been under the impression that the northbound train, which was late, had passed on to the double track at Southeastern Junction, 28 miles north of Horine. Weston had received an order fixing Horine as the meeting point, but he had made a remark to the fireman from which it is believed that he had misunderstood the order and had taken it as a notice that No. 806 had cleared the single track line. Weston had had considerable trouble with his injector and other things on the locomotive; this could have no direct bearing on the misinterpretation of the order, but it may have prevented him from seeing No. 806 in time to avert the collision. The fireman, who had been in the service 12 years, was a son of the engineman. The meeting order had not been shown to him. Had he insisted on a compliance with the rule and thus had read the order himself instead of taking the engineman's interpretation of it, "it is probable that the error or oversight on the part of the engineman would have been discovered in season." The engineman had been a runner 20 years. He had been dismissed once and had been disciplined for serious infractions of the rules, including two occasions when he was responsible for collisions; but at the time of this collision, "his record was clear." No block signal system is in use on this line.

Illinois Central, Daniel Boone, Ky., August 24. Collision between southbound third-class freight train No. 197 and northbound second-class freight No. 176; three trainmen and one trespasser killed and five employees and one other person were injured. This is a single track line with no block signal system in use. The northbound train had been ordered to wait at St. Charles, about two miles south of Daniel Boone, until 5:15 P. M., but it did not do so; also, the southbound train left Daniel Boone and attempted to reach St. Charles without sufficient time to clear the other train five minutes, as required by the rule. The inspector reports that there was "an utter disregard for the rules, as far as time was concerned, by all the employees involved." The operator at St. Charles recorded the departure of 176 before the train started; No. 197 disregarded the rule requiring it to keep 10 minutes behind a preceding passenger train. The operator at another station mis-stated the time of this train so as to make it appear that the 10-minute interval had been observed; and from the nature and multiplicity of these violations of rules, the inspector concludes that they are of common occurrence. The circumstances attending this collision "present an extreme case of lax operating conditions." The fireman of train 176 was inexperienced and the conductor of 197 had been promoted only five days before.

Utah Railway, Martin, Utah, August 28. Westbound extra freight No. 102 collided with eastbound extra freight No. 3 in a tunnel, 240 ft. from the end, both trains moving at low speed; one employee killed and four injured. The westbound train had an order to wait at Jacobs, east of the tunnel, until 2:35 p. m. Afterward, the dispatcher issued another order allowing the eastbound extra until 3:15 to

reach Jacobs. The westbound train, being on a descending grade, was moving at more than eight miles an hour while the speed limit in the tunnel is six miles an hour; also the line in the tunnel is on a curve of eight degrees, and one of the locomotives had no headlight because the engineman had forgotten to replace a defective bulb. The eastbound train was pulled out of the tunnel, after the collision, without delay, but the other one took fire and six cars were destroyed, together with some of the timber lining of the tunnel.

The dispatcher was performing the duties of local freight agent and was hurried; and in allowing Extra No. 3 until 3:15 P. M. to reach Jacobs, he was acting on a mistaken reading of the preceding order in his book. He discovered his mistake in less than two minutes after the faulty order had been delivered, but too late to prevent the collision.

The inspector found much loose practice. An operator signed a conductor's name to an order and allowed the conductor to sign his (the operator's) name, to a clearance card. Orders were often issued for train movements without regard to the rule requiring them to be given to all concerned in the same words; that is to say, the use of the single-order system was habitual.

Orders restricting rights of trains are sometimes issued without sending copies to the superior train. Trainmaster Thompson, about a month before, had been assigned to this district, with instructions to watch the work of the dispatchers; but being very busy in distributing cars to mines, he had not made any useful investigation of dispatching practices. Personally, he considered the single order system unsafe, but had not got around to making a change.

The inspector characterizes Thompson's attitude as amazing. He had checked the train dispatcher's order book three times but had not discovered the glaring faults to be found in it. No block system was in use, yet conductors and enginemen neglected to compare watches with each other and one engineman did not know where the standard clock was located. The train dispatcher entered the service of the Utah Railway as operator in June, 1920, and was made dispatcher a year later.

St. Louis-San Francisco, Starland, Mo., September 1. Southbound passenger train No. 805, moving at about 40 miles an hour, was derailed on a trestle bridge which had been weakened by a flood, resulting in the death of three passengers and the injury of 64 passengers and four employees. This derailment occurred about 4 a. m., and the two central bents of the bridge, which extended 11 ft. 6 in. into the earth, had been entirely washed out by a flood which occurred between midnight and 3 a. m. The section foreman had gone to bed at 1:30 a. m., concluding, from what he deemed satisfactory evidence, that the rain had not been sufficiently serious to endanger the track. Trestles have been maintained at this point for 19 years and this is the first trouble that has been experienced with wash-outs.

Northern Pacific, Parkwater, Wash., September 7. Westbound passenger train No. 41, moving at about 40 miles an hour, or faster, ran into a preceding train of one locomotive and three coaches carrying shop workmen, and moving slowly, near the station; and six employees were killed and four injured. The employees killed were the engineman and the electrician of the passenger train, the engineman and the fireman of the shop train and two shop employees. The collision occurred at 7:12 p. m. Parkwater is 4½ miles east of Spokane. The shop train had brought a load of shopmen from Spokane and discharged most of them at the shops at Parkwater, and had just crossed over to the westbound track preparatory to returning to Spokane. At this point the two main tracks are 132 ft. apart and the crossover, through which the shop train passed from one to the other, is 1,280 ft. long. The road is equipped with automatic block signals and there is a switch indicator at each of the two switches of the crossover; but except at the ends, the crossover track is not bonded; and a short train, moving from one track to the other, does not hold the main line signals against approaching trains throughout the whole of its journey through the crossover.

Between Parkwater and Spokane, the speed of all passenger trains is restricted to 20 miles an hour, the whole territory being included within yard limits. The block signal which should indicate stop for westbound trains as soon as the crossover switch is opened, is 6,228 ft. east of the point of collision; and the next signal, which at the same time should indicate caution, is more than two miles farther east.

The route of the shop train being wholly within yard limits, the train is regularly moved without written orders. By rule, the shop train must protect against regular passenger trains, but the only precaution taken when passenger trains are late is for the conductor to examine a blackboard on which is kept a memorandum of telegraphic advices received indicating when trains are expected to arrive. Approaching Parkwater from the east, the line of road is straight, and parallel to it is a highway on which many automobiles travel; and employees said that often it was impossible to tell, when seeing an approaching headlight, whether it was on a train or on an automobile. In the present case, the men of the shop train saw a headlight approaching and concluded it was a freight train. No flag was out, and all efforts to move the shop train out of danger or to stop the passenger train, were too late. There is a rule requiring that when making a crossover movement at least one of the switches must be kept open; but the trainmen did not know of or did not realize its importance. Train 41 had been reported late and was not expected at Spokane until 7:35.

The engine of the passenger train was overturned, as was one of its cars and the engine of the shop train, which was at the east end, pushing the cars, was wrecked, together with the car next ahead of it.

The report gives the primary cause as the occupying of the main track within yard limits without authority or proper flag protection; and the secondary cause, the failure to keep one of the crossover switches open all the time the crossover was being occupied. The inspector thinks that train 41 received a clear home signal because the shop train at that moment was on the unbonded section of the crossover, No. 41 having passed the distant signal at clear before the shop train entered the crossover. Hand signals were given to stop the shop train after the impending danger was discovered, and it is impossible to explain why these were not heeded by the engineman.

The inspector says that proper vigilance on the part of the officers of the road would have disclosed that the information posted on the blackboard was being improperly used to dispense with flag protection and that the switches at the crossover were not being operated according to the rules. The cars of the shop train were being pushed ahead of the engine, yet the conductor, on the front of the leading car, had no means of applying the air brakes, except by going inside of the car.

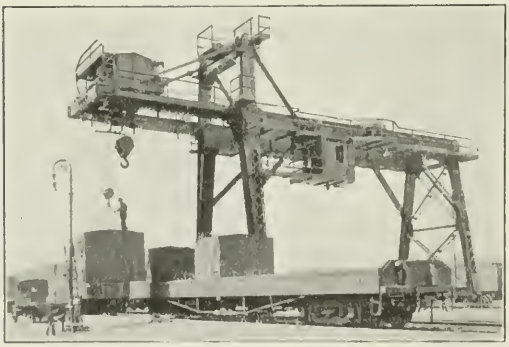
Chicago & Northwestern, Clintonville, Wis., September 17. Westbound passenger train No. 141 collided with eastbound freight extra 1875 which, while most of its cars were on a side track, was switching on the main track, on the time of the passenger train. Its locomotive fouled the main track at the east switch of the passing track at the time of the collision. The fireman of the passenger train was killed and 26 passengers and two employees were injured. The inspector found much loose practice in the management of the freight, the principal excuse for encroaching on the time of the passenger train being that the station operator had said to one of the brakemen that 141 was about 30 minutes

late. The east switch was set for the side track and the distant signal was set against the passenger train, but the engineman disregarded it. He said that he had often found these signals set against him when the switch was straight. There are 111 signals of this kind on this division and surprise tests are made; but no record of these tests is kept. The superintendent said that no case had come to his attention where an engineman had disregarded a caution indication at a distant switch signal.

Southern Pacific, Montalvo, Cal., September 22. Side collision about 8:35 p. m.; one engineman and one fireman killed; 29 passengers and seven employees injured. Eastbound passenger train No. 38, moving from a wye to the main line, fouled the main line just as eastbound passenger No. 78, a heavy train, came along at 40 or 50 miles an hour; and both locomotives were overturned. There was a dense fog at the time. The engineman of No. 38 said that after stopping at the approach to the main line to give time for a brakeman to run forward and look at the switch indicator, he started along, having been told by the fireman to come ahead; the supposition being that the fireman had received a hand-motion signal from the brakeman; but the fireman was killed in the wreck, and the brakeman says that he had not given any signal. He said that he had not yet reached the switch indicator when the collision occurred. The brakeman thinks that the locomotive had drifted over the fouling point of the main line before coming to a stop. The only way to give credence to the engineman's statement is to assume that the fireman had seen a motion of some light which he took for a proceed signal; the brakeman says that he was carrying his lantern in such a position that it could not have been seen by the fireman.

Gantry Crane for Handling Heavy Freight

An electric gantry crane has been erected by the Niles-Bement-Pond Company in a busy freight yard near New York, as shown in the illustrations. This crane, embodying modern features of construction through-

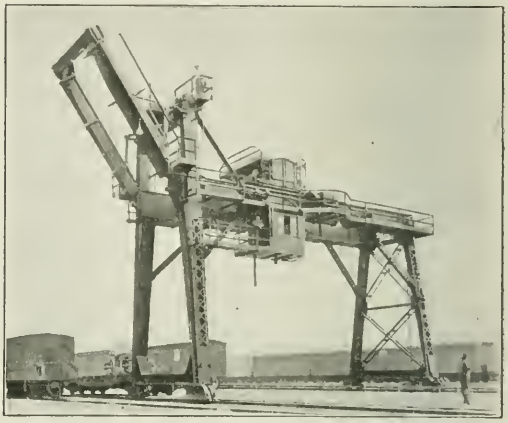


New 40-Ton Niles Gantry Crane Unloading Container Car Section

out, covers three tracks with two driveways, approachable from either direction, with trackage space for 15 cars at the crane. With a lifting capacity of 40 tons, the crane furnishes ample facilities for handling heavy freight, such as structural iron, building materials, machinery, boilers, steel freight containers, transformers, etc. An auxiliary hoist is provided, having 10 tons capacity.

The span, center to center of the runway rails, is 49 ft. 3 in. With the cantilever extension at one end, the effective reach of the main hoist is increased 19 ft. 6 in., and the effective reach of the auxiliary hoist 21 ft. 11 in. The lift of the hook above the runway rails is 23 ft. The main and auxiliary hoist motors are each 50 hp. The trolley and bridge motors are 10 and 80 hp. respectively. The speeds with maximum full load are: main hoist, 10 ft. per min.; auxiliary hoist, 40 ft. per min.; trolley, 100 ft. per min., and bridge, 80 ft. per min.

The cantilever extension is of the elevating type, being



Gantry Crane with Cantilever Extension Placed in Raised Position

motor-operated from the cage, and is readily elevated to clear any obstruction. Platforms are furnished on both girders running the entire length, including the cantilever extension. A platform is also placed at the top of the shear legs for access to the cantilever elevating mechanism and one on each side of the trolley, which is enclosed for outside service, as is also the cage. The top of the trolley housing is arranged so that any part can be opened on hinged joints, allowing easy access to the trolley mechanism for oiling, etc., or the entire house can be easily removed. The cross platforms are easily lowered on hinged joints, allowing unobstructed access to main and auxiliary hoist drums and gears.

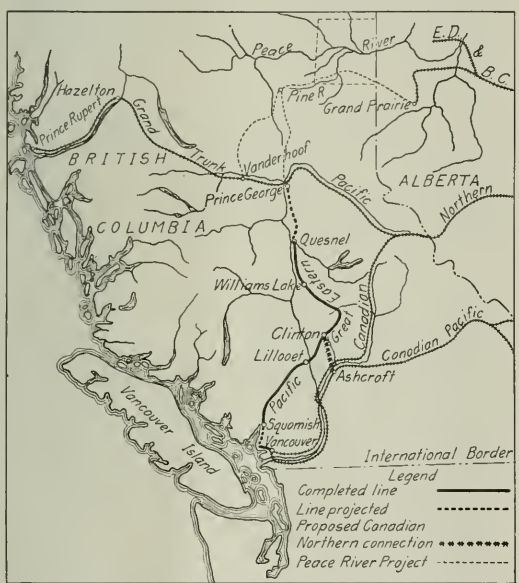
The trolley frame is a self-contained built-up steel structure, with all the mechanism and motors mounted. The trolley is designed to incorporate such improved features of construction as complete lubrication, large wearing surfaces, ample strength and rigidity, self-contained units, easy accessibility and easy handling. The cage is of plate steel construction, special provision being made for mounting the controlling apparatus with concealed wiring. The back of the switchboard is reached through large doors, which, when opened, expose the entire board, allowing ready access to all wiring connections. The crane travels on eight wheels, four at each end. Two of the wheels at each end are driven and the others trail.

The installation of cranes of this type insures the prompt unloading and placing on trucks of all classes of heavy freight from any one of 15 cars available in the shortest possible space of time, thereby solving in a large measure freight congestion at terminal warehouses. There is an important saving of time and cost in handling heavy freight, and in addition it is moved more promptly to the consignee's premises.

Abandonment of Pacific Great Eastern Is Urged

J. G. Sullivan Advises Giving Up Line Unless People Are Willing to Pay Large Annual Deficit

CONTRARY to the advice of the counsel it employed, the province of British Columbia has decided to continue the operation of the Pacific Great Eastern, a province owned line, extending from Squamish, B. C., a small village on Howe Sound, to Quesnel, in the heart of the Cariboo placer mining district, a total distance of 362 miles, and to proceed with a program of extensions and betterments. John Oliver, minister of railways of that province, recently announced this decision before a Liberal convention, stating: "We come of good old British stock and if we can't go through with the maximum of efficiency, we'll muddle it through in the good old British way." He declared that



The Pacific Great Eastern and Adjacent Lines

the Pacific Great Eastern would not be abandoned and that work would be carried on for another year to the end, in order that the taxpayers' investment of $40,000,000 should not be wholly lost. "I'll take my chances. I'll not abandon the road until I have taken stock and have satisfied myself that we cannot redeem the situation," said the premier.

This step taken by the "Oliver" government is considered one of the most important in the history of that province, noteworthy because the decision reached by the administration was in the face of adverse reports submitted by the three experts who were engaged last spring to investigate the P. G. E. and to determine both its present economic and its potential value. According to one of the investigators, J. G. Sullivan, consulting engineer, Winnipeg, Man., and formerly chief engineer of the Canadian Pacific, western lines: "If the people of British Columbia are not prepared to continue paying from $2,500,000 to $3,000,000 per year on the investment already made, an amount that will be necessary for the next ten years, it is recommended that the line be abandoned at once and what salvage possible be recovered." W. P. Hinton, another investigator, a former general manager of the Grank Trunk Pacific, had very little to say in favor of continued operation, and J. S. Dennis, director of colonization of the Canadian Pacific, stated that the railroad in question could not be expected to pay operating and maintenance costs for many years to come. Inasmuch as all three of the reports presented are somewhat similar in nature and language, this article has been limited to that of Mr. Sullivan, who discusses in detail both the economic and the engineering features of the P. G. E., the substance of which is abstracted below.

Physical Features Adverse to Construction

The physical features of the territory which the Pacific Great Eastern traverses are unfavorable to the construction of a railroad, due largely to the prevalence of much clay, sand, gravel and like materials. Sheer cut banks and the unstable condition of the above materials when wet forced the location out of the valley of the Fraser river (the natural location where low grades might be obtained) to high levels. In climbing out of the valley of the Fraser river and dropping into the valleys of other water-sheds sheer rock bluffs, with rugged contours, were encountered, necessitating comparatively heavy tunneling and a large number of rock cuts, or a loose foundation of clay, sand and gravel, which increased the cost of construction and made maintenance expenses very high. This, combined with the adverse financial conditions at the time of construction, made it impossible to build a line cheaply.

The line is constructed and in operation from North Vancouver to White Cliff, a distance of 12.7 miles, and from Squamish to Quesnel, a distance of 350 miles. From White Cliff to Squamish, a distance of about 29 miles, no construction has been undertaken. This portion of the line follows a very rugged shore of rock bluffs, the cost of construction of which is estimated at $3,500,000 to $4,000,000. From Quesnel north to Prince George the grading is completed with the exception of cleaning out slides that have occurred since the line was first graded some six year ago. The track is laid from Quesnel to Cottonwood river, a distance of 17.5 miles, and also from the junction with the Grand Trunk Pacific (about one mile east of Prince George), to Red Rock Creek, 18 miles south, leaving a gap of 45 miles without track. The track fastenings and ties required for this work are on the ground. The Cottonwood river is to be crossed by a steel viaduct, requiring about 1,225 tons of steel, of which amount 1,130 tons have been fabricated and are now stored at Walkerville, Ont. The cost of this steel and fabrication has been paid for, but before the work can be undertaken, an additional 95 tons must be purchased and reinforced concrete foundations built. In addition, some 8,000,000 ft. b. m. of timber remains to be built in trestles, nearly all of the timber for which is on the ground and paid for excepting about 840,000 ft. b. m. of stringers. The cost of the work necessary to complete the gap and put the line in good operating condition is estimated at $500,000 to $600,000, without taking into consideration about $1,500,000 for new equipment that would also have to be bought, the entire expenditure totaling over $2,000,000. To complete both gaps between North Vancouver and Prince George will require about $6,000,000 of new capital.

The line as built is in accordance with good branch line

standards, having 70-lb. rail on grades of 2 and 2.2 per cent and 60-lb. rail on the lighter grades, all liberally supplied with a good type of tie plates on curves. The bridges and culverts are of wood. On this road 27 wooden spans have also been constructed, varying in length from 60 ft. to 150 ft. with a total length of 3,180 ft. In addition, 27,000,000 ft. b. m. of timber is already in place in wooden trestles and culverts with about 8,000,000 ft. additional b. m. to be placed before the completion of the Quesnel-Prince George gap. To renew the wooden structures with permanent work, such as steel viaducts and trusses, concrete culverts and fills, will cost in excess of $8,000,000. The only alternative is to renew in wood at an enormous maintenance cost and the extra cost of maintenance will about balance the interest charges for more permanent construction.

Financial Condition

The total par value of the outstanding debt is $44,226,403, of which amount $5,925,135 is held by the company. The interest charges for the year ending December 31, 1921, amounted to $1,911,913. The total investment in road and equipment on December 31, 1921, was $38,438,590. This is the net sum on the company's books after $5,618,248 has been credited, this amount being waived in claims against the province. The Government took over the railway and subsidiary companies on the receipt of $750,000 in cash. The assets of the subsidiary companies, the Pacific Coast Eastern Development Company and those of the Pacific Great Eastern Equipment Company, consisting of lands, townsites, docks and wharves, locomotives, cars and stores of various kinds were turned over to the P. G. E. In addition the contractors waived claims to $245,000 in unpaid estimates and $1,647,583 of retained percentages on progress estimates, the whole totaling $5,618,249, which has been credited to the various accounts. Of the $38,438,590 investment, $10,543,530.79 was expended in paying interest charges and the deficit in operating revenues during construction.

The rolling stock of the P. G. E. consists of 12 locomotives adequately assorted for this class of road, although the heaviest engines are about up to the limit that the standard of construction will sustain. Two gas-electric cars and two gas motor cars operate out of North Vancouver. There are 12 passenger, 1 combination and 2 baggage cars in passenger service, and 258 miscellaneous cars in freight service, in addition to 68 cars in company service, the majority of these cars being used for construction purposes. The management claims that the present equipment is sufficient for operation as far as Quesnel, but that if the line is put into operation between Quesnel and Prince George, extra equipment will be necessary.

Revenues and Expenses

During 1921, the Pacific Great Eastern handled 53,351 tons of freight for a total of 4,634,231 ton miles and at a rate of 5.7 cents per ton mile, the revenue per mile of road operated being $844.70. During the same year the company carried 15,290 passengers 1,462,871 passenger miles with total receipts from this business of $63,890, equal to a rate of 4.3 cents per passenger mile. The passenger earnings per mile of road operated were $323.86.

Average number of tons of freight per loaded car mile	16.98
Average number of tons of freight per train mile	89.26
Total gross income from all sources	$484,327.00
Total gross corporate expenses	2,689,205.00
Net corporate loss	$2,204,878.00

Of this amount $1,911,913 was charged to interest during construction and $292,965 to operating loss. As $88,632 was earned from rent of equipment in construction during the year the actual loss or deficit in operation for the year should be increased by that amount.

If the road is to be completed between North Vancouver and Prince George it will require $6,000,000 of new capital, and an additional $8,000,000 within the next ten years to replace wooden structures. Adding this to the present investment of $38,438,950 will give a total final investment of $52,538,950 for 470 miles of line, or nearly $112,000 per mile, the interest charges on which will be over $5,500 per mile of road. If the Quesnel-Prince George gap only is completed, the new capital investment will only be $10,000,000, making a total of $48,438,950 for approximately 440 miles of road, or $110,000 per mile of road, and the interest charges will be nearly $5,500 per mile of road. If no more construction is done and the line from Quesnel to Prince George is abandoned, there should be at least $250,000 salvage, and to replace the wooden structures south of Quesnel should not require over $6,500,000. In this case the total investment would be $44,688,950 for 360 miles of road or an investment of $124,000 per mile, and the interest charges would be over $6,100 per mile of road. Therefore, regardless of what action the company may decide upon, it is faced with an ultimate interest charge of about $5,500 per mile of road, which some one, either the taxpayers of British Columbia or the patrons of the road, must pay in addition to the cost of operating the road.

Inasmuch as the Canadian National has a much shorter and much cheaper line to operate to Vancouver than via the P. G. E. connection, no business of any moment can be expected from that source, and the P. G. E. must depend almost entirely on business developed along its own lines. During 1921 the outbound freight from the line amounted to 36,505 tons. As a local line between Vancouver or Squamish and Prince George, the country will not produce enough traffic at any reasonable rate to pay operating expenses, plus a fixed charge.

Questions of Abandonment—Construction—Leasing

Owing to the nonproductive nature of the country for a distance of over 100 miles south of Clinton, a plan is being considered by the province whereby that portion of the line would be abandoned and an extension constructed from Clinton to Ashcroft to connect with either the Canadian National or the Canadian Pacific. The total receipts from freight, both forwarded and received, on this section during 1921 (after the line has been in operation for a number of years) did not exceed $400 per mile. There are over 8,000,000 ft. b. m. of timber in trestles and about 1,000,000 ft. b. m. in truss spans on this section that will have to be renewed within a few years, besides the timber foundations at the crossing of the Fraser River at Lillcost. The cost of the proposed line will not be less than $3,500,000, which will increase fixed charges by at least $175,000 per year. Nevertheless, it is advisable that the entire line south of Clinton should be abandoned, providing the timber interests at the south end cannot raise enough money to purchase any portion of the south end cut of Squamish at a cost of from $15,000 to $20,000 per mile. If this portion of the line will not pay interest on that sum it should be abandoned. The salvage should amount to about half the cost of the Clinton cutoff. The savings in operating expenses and in renewals on the abandoned line would show a substantial reduction over the interest on half the cost of the Clinton-Ashcroft line.

It is also advisable that the line between Quesnel and Prince George be abandoned because an expenditure of $2,000,000 would be required to complete this line and to acquire sufficient rolling stock to meet the operating expenses and the traffic to be derived from the completion of this route will not justify the necessary construction. This same argument holds true in reference to the proposed extension from Prince George to the Peace river country.

It has been suggested that one of the larger connecting lines might be induced to take over the Pacific Great East-

ern and operate it as a feeder line. The road, however, with its limited traffic collected from the local inland points, is of no value to a trunk line. In 1921, the total inward and forwarded freight handled through Vancouver for the P. G. E. was only approximately 36,000 tons. If it is assumed that the 36,000 tons would be hauled an average distance by a trunk line of, say 450 miles, and that the rate received would be 25 per cent greater than the average rate per ton mile, say 1.5 cents, then the 16,200,000 ton miles this traffic would make on the above assumptions, would bring in a revenue of $243,000, a sum less than two-thirds the deficit in the cost of operating the P. G. E. in 1921. The P. G. E. has no strategic advantages, excepting the possibility that if there should ever arise a demand for an Alaskan rail connection, the line would become a link.

Mr. Sullivan's Conclusions

In the concluding words of his report, Mr. Sullivan states that it is impossible for the Pacific Great Eastern to meet expenses in the near future. It certainly cannot be done if the present method of financing is followed, that is, charging to capital the accrued interest and deficit in operating expreses, for the interest charges will increase faster than the business. The results of the investigation show that the total indebtedness at the end of ten years will be nearly doubled without taking into account the extra expenditure that would be necessary to purchase sufficient new equipment to handle a greatly increased business.

Among the suggestions by Mr. Sullivan in addition to those referred to above are the following:

"Abandon the operation of steam trains for passenger and express business and replace them by gas driven motor cars. To raise money for the necessary expenditures, sell some of the locomotives now owned by the company, cancel mail contracts for the winter months and close down that portion of the line where snow trouble occurs during the winter months. Operate a freight train as often as there is business to warrant during the summer months, be that one a fortnight or one a month. Do not send out an engine unless there is a full load at least in one direction. Raise rates, both passenger and freight, to all that the traffic will bear, that is, meet competition. Stop hauling freight at less than cost, to say nothing of paying interest charges. Encourage development as much as possible by giving commodity rates to low grade freight as long as it can bear a rate slightly above cost."

Victorian Railways Consolidate Departments

Signal and Telegraph Branches Combined In One Organization to Prevent Overlapping of Duties

A SEPARATE SIGNAL and telegraph branch has been formed by the commissioners of the Victorian Government Railways, Australia, which was made effective July 1, 1922. The branch comes under the control of the chief engineer of signals and telegraphs, F. M. Calcutt, who reports direct to the commissioners. Prior to the formation of the branch, the signal department was a division of the way and works branch, and came under the engineer of signals reporting to the chief engineer of way and works; and the telegraph department from 1919 has been a section of the electrical engineering branch under the chief electrical engineer, but before that date it was a separate branch under a telegraph superintendent. Owing to the overlapping of duties between the two branches and to provide more efficient and economical working, it was decided to form a separate branch to be responsible for all matters pertaining to traffic protection on the railways.

Organization of the Branch

The accompanying chart shows the organization of the new branch. The clerical staff is in charge of a chief clerk. The engineering staff comes under four headings. The technical and drawing office staff engaged on mechanical signaling and interlocking, power signaling and all kindred electrical circuit work, and mechanical and electrical design is under the supervision of the office engineer. Immediately under the office engineer are a circuit checker and a locking checker, who are responsible for the correctness of the circuit and locking plans issued, and an officer in charge of each division of the drawing office work. The installation of power and automatic signaling is in charge of the power signal construction engineer, who has under him the signal supervisors and the staff required for this purpose.

The maintenance of all apparatus connected with the branch is in charge of the signal and telegraph maintenance engineer. The telephone and telegraph engineer and the power and lighting engineer report to the maintenance engineer on all technical details connected with their portion of the work. The state is divided into eight districts for maintenance purposes, and each district is in charge of a signal and telegraph supervisor. The arrangement of the maintenance staff is shown in the chart.

A bonding supervisor is located in the metropolitan area and is responsible to the maintenance engineer for installing and maintaining the traction bonding and the overhead structure, ground connections, etc., the staff required for this purpose coming under his charge. A testing officer is under the maintenance engineer for conducting all electrical tests connected with signaling and kindred matters. All large construction work, as well as some of the larger maintenance renewal work, is carried out by construction supervisors, who have their headquarters at Melbourne.

Facilities Handled

The signal and telegraph branch is responsible for the installation and maintenance of:

Signaling and interlocking appliances, telegraphs, telephones, and the pole lines and wires required for these purposes.

Traction bonding, cable trunking and overhead structure and ground connections required for the Melbourne electrified railways. Electric bells (with the exception of those used in the railway power-houses and the different substations), electric clocks and clock controls, train describers, train departure clocks and indicators, fire alarms and time recorders.

Gas, lux and kerosene lighting at stations, road crossings, depots, etc., including stationary Pintsch gas holders and gas pipe lines.

Outside the electrified area, all electric lighting and (with a few exceptions) all electric power required for railway purposes.

The erection and maintenance of signal boxes and all buildings required by the signal and telegraph branch, as

well as the painting of signal masts and fittings, will continue to be carried out by the way and works branch.

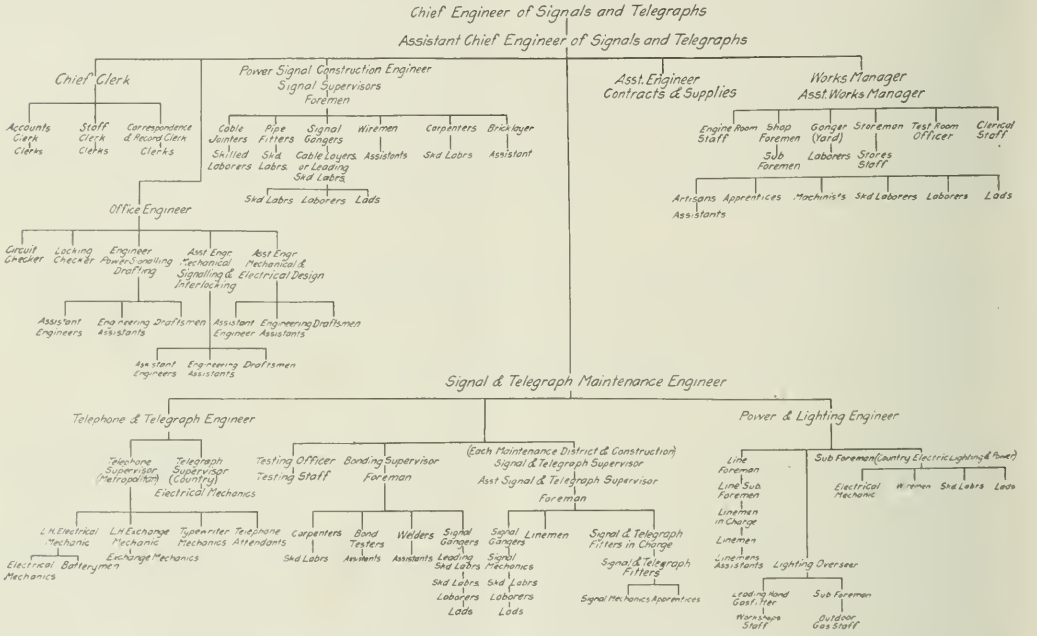
Apparatus in Service

On June 30, 1921, there were on the 5 ft. 3 in. track gage lines 8,102 interlocked levers over a route mileage of 4,274 miles, 3,944 miles of which were single track, with 5,801 signals, 5,012 switches, and 1,087 lock bars. Train protection appliances were installed on 3,520 miles, there being 582 electric staff and tablet instruments, 317 Winter's block instruments, etc., and 1,092 track circuits. Within the Melbourne suburban area there were in service on June 30, 1922, 359 left-hand, upper-quadrant, three-position signal mechanisms and 75 color-light signals, with 296 train stop mechanisms, on 38 miles of double track.

A 2,200-volt a.c. signal transmission and 110-volt a.c. signal operation circuits are used on the 1,500-volt d.c. operated traction system. One electro-mechanical interlocking frame, containing 32 levers, has been in service for the past six years; and an electric interlocking frame, containing 55 levers, is being installed in the central area, where the traffic is exceptionally heavy. At present one electric switch mechanism—operating with 110-volt a.c. energy—is in service, which has been installed for experimental and observation purposes prior to equipping a large plant with such mechanisms. The test has proved satisfactory. A section of single-line automatic signaling is in service for 3.5 miles between Upper Fern Tree Gully and Belgrave on the 2 ft. 6 in. narrow gage railway.

Telegraph and Telephone Equipment

On June 30, 1922, there were 7,719 miles of telegraph and telephone wire, with 2,738 miles of wire used for electric staff and block working, electric bells and signal repeaters. In addition to the railway wires, there were 7,678 miles of postal wire carried on the railway poles and maintained by the railway. There were 876 miles of railway telegraph and telephone wire carried on postal poles and maintained by the Commonwealth Government postal department. There are 3,686 miles of pole line on railway property. There are nearly 400 telegraph stations in operation, and, excluding automatic telephone exchange connections, there are 3,700 telephones. An automatic telephone exchange, with a capacity of 500 lines, is located in the head offices of the railway administration at Melbourne, and this has been in service for the last 10 years, being one of the heaviest worked switchboard installations in Australia and having a switching capacity of 40 per cent. Another automatic telephone exchange, having a capacity of 50 lines, has been installed in the principal railway sub-station for the exclusive use of the services required by the electrified railway system.



Organization Chart Showing Definitely the Division of Duties

Shops and Stores

It is the policy of the railways commissioners to manufacture such material as can be economically done, with the exception of all appliances which are highly specialized. At the signal shops located at Newport, seven miles from Melbourne, all interlocking frames, signal fittings, a large portion of the apparatus required for power signaling, etc., are manufactured. The telegraph workshops now located at Melbourne are to be transferred to Newport and combined with the present signal shops to form the signal and telegraph workshops. The workshops are under the control of the works manager, who reports to the assistant chief engineer of signals and telegraphs. The works manager, who has an assistant, is responsible for the manufacture and repair of materials, and supervises the requisition and issue of all stores connected with the branch. About 510 men are employed at present in the combined shops. An assistant engineer, reporting to the assistant chief engineer, is in charge of all contracts between the branch and outside firms. He is responsible for the preparation of all specifications for public tender, and co-operates between the different engineers and the workshops for the prompt supply of material.

The Fundamentals of Good Organization*

These Must Be Kept Clearly and Constantly in Mind to Insure Efficient and Economic Operation

By R. N. Begien
General Manager, Western Lines Baltimore & Ohio, Cincinnati, O.

MAXIMUM EARNINGS and minimum expenses are impossible unless a railroad is carefully organized, and officers and men thoroughly understand that deviation from the rules of proper procedure will not be tolerated. Every officer should understand clearly for what duties and results he is held responsible. He should not be excused from such responsibility on any pretext whatsoever. His superior should deal with him only, and he should never run around or ignore any officer, subordinate or superior. If responsibility is definitely fixed from top to bottom and a definite plan of action is made, an organization of ordinary men will accomplish far better results than the same number of brilliant men, each working hard to carry out his own ideas.

It is not possible to realize a high standard unless it is known what constitutes it. In a railroad organization some one has to fix the standard. Only one person can do it and he is the chief executive. It is important, therefore, that he should be a man who knows what a high standard is. If he selects a staff of men who are able to measure up to his ideals and who know what they are, he has made good progress.

Each man of the staff has his own special department, but he must conduct his department in such a way as to meet the standards of his chief. If an executive has selected his aids with a view to having them carry out his plans and ideas it may be necessary to go only into the question of standards, without consideration of methods of attainment. Instruction in method is generally necessary, however. Promotion generally comes to a man as soon as he has learned the importance of correct standards and organization, so that new men have to be educated constantly. Above all, a subordinate should never see that the standard of his chief has been lowered.

An Accurate Sense of Justice

An accurate sense of justice is a valuable asset for any man. Without it a man is disqualified for an executive position. Some men have an excellent idea of justice when they are calm, but become unjust when they are disturbed in mind. A superior should never frighten a subordinate. If the chief makes no impression on his subordinate, then it is evident that the latter has but little regard for what he says. If his remarks do make an impression they will probably be passed on to subordinates.

If the chief is cross or excitable he usually says things he does not mean and leaves his subordinate with an uncertain feeling of what is required. He does not fill his man with a desire to accomplish much good, but he does often make make him realize that his job hangs by a thread. He thus has a confused man who is frightened. Such a man will usually pass it on to his subordinates and it will go on down the line. The length of time that it takes to disorganize a job will be in direct proportion to the number of times the "boss" explodes.

An organization of more than 10,000 men needs only about six steps from the top to the bottom. It will be conceded that one man is capable of supervising the actions of ten men. In addition he can educate them in the standards of his chief.

Look at this—

1	Chief officer
10	Vice chiefs
100	Heads of departments
1,000	Sub-heads
10,000	Bosses
100,000	Men
111,111	Total

Some railroads have more steps than shown; some have less. Thus the laborer on a section has only five steps to the presidency of a railroad. As there are only six grades from top to bottom, only four men have to interpret the words of the president before the man on the track is working according to the standards laid down by the president.

The selection of the subordinates in sequence is a most important matter. If a 100 per cent officer selects 100 per cent assistants the result is 100 per cent performance. If a 90 per cent general superintendent selects a 90 per cent superintendent, and he selects a 90 per cent division engineer, who employs a 90 per cent supervisor, who hires a 90 per cent foreman and 90 per cent men, the result is a 53 per cent result.

It should be remembered that the highest officer is the standard bearer and his men are rarely ever any bigger than he is.

In other words, it is hardly possible for a 90 per cent officer to have a 100 per cent assistant for any length of time. They would probably change places if the relation was true, unless the chief raised his own standard to 100 per cent.

Men are largely what we expect them to be. It is perfectly evident to anyone who gives the matter thought, that if a subordinate feels that a mediocre performance is satisfactory to his chief, he has no incentive to produce more than a mediocre performance. Much can be gained by expecting a great deal of subordinates, as they will then make an effort to realize what is expected.

The Principal Function of a Railroad

A railroad is a highly organized body. Unless care is taken in placing competent supervision in every part of the organization, the effect will be felt in other parts of the organization. An expensive and expert staff may evolve fine plans for economy, but they can not be carried out by a disorganized force. Proper organization will make expenses lower and earnings better at once, for it will then be possible to carry out a plan. It is important to remember that if a feasible plan cannot be carried out it is nearly always due to defective organization. For example, a bridge gang repairing a bridge may delay operations to the extent that the effects are felt over the entire railroad.

It is not unusual for a bridge gang or in fact for those who supervise bridge gangs, to feel that the railroad is operated very largely for the purpose of supporting the bridge gang, while we all know that the work of these gangs is entirely subordinate to the principal function of running a railroad—the handling of cars. From an economical standpoint it is always cheaper and better to delay the work of a

*From a paper read before the convention of the American Railway Bridge and Building Association at Cincinnati, O., on October 18.

bridge gang than to allow the bridge gang to delay the work of the railroad in serving the public.

It is not enough that an officer or a sub-officer is competent in the discharge of his own immediate duties. It is his chief duty to see to it that his force is competent, able and willing to do the things that are assigned to them to do in the best possible manner, and if he does not have such men he is negligent in the most important part of his duties.

Men should not be replaced indiscriminately, as it is often a fact that little good is accomplished by making a change. It should first be determined that a more suitable man than the one at present occupying the position is available, and the one who is now occupying the position cannot be made available by proper instruction. If men are made to feel that nothing but a high standard of performance will be satisfactory, they are bound to improve.

Therefore it is important to do the following things: (1) Study the staff with a view to knowing that they are performing their duties properly; (2) If they are not performing their duties properly ascertain if they can be instructed in such a way as to improve them; (3) If they are not suitable men for the positions which they are now occupying, and cannot be made to be suitable men, find out if there is any one who is suitable, or can be made suitable; (4) Impress subordinates with the fact that they should expect the same things of their subordinates as is expected of them; (5) Make subordinates feel responsible for the results in their departments. Encourage them in every possible way to take responsibility onto themselves. Do not spare praise in cases of successful administration, and in cases of failure try to find out what is the matter and help them work out a solution of the problem.

Every officer should understand it is not sufficient merely to state that the cause of some failure to perform a duty properly was that some of his subordinates did not carry out instruction. If the organization is a proper one excuses of this kind will gradually disappear.

In a divisional organization, the superintendent should assign each member of his staff to definite duties and definite territories wherever possible. The object of such assignments is for the better delegation of work and for the fixing of specific responsibility.

Strictly Up to the Chief

The chief of each branch must feel that the results to be secured are strictly up to him. On the other hand, he should not be hampered in his work, and excepting that he should conform to certain standards which are laid down by his superior officers, he should be allowed to use his judgment, which is equivalent to asking him to exercise his ingenuity.

No officer should fall into the habit of dodging an issue. In his dealings with subordinates or others he should never speak of having referred a question at issue to anyone for a decision. To others his own judgment is the only one that should be asked for or should be given. If it should become necessary for him to ask for a ruling or advice, that should be a matter strictly between him and his superior officer.

It is important that new officers and employees be instructed in their duties before being allowed to fill a position. One naturally thinks that all new officers and employees are instructed in their duties prior to appointment, but it is too often the case that this is not a fact. It is true that some classes of employees are handed books of rules, and are examined upon them, but that does not constitute instructions in their duties. Good men often fail to fill positions on account of the fact that they are not instructed. Failure may occur on account of being over-zealous, or of being backward to the point of laziness.

If a man is fit to be advanced at the start he generally is able to advance further and it is a serious reflection on his superiors if he fails. He must not be allowed to fail; it is the duty of his superior to train him and it should be impossible for men to be good men for a time and all of a sudden be discharged or demoted as unfit.

Notwithstanding the importance of organization, the personnel is, generally speaking, the last thing which should be disturbed. Where improvement is demanded it is better to mold the existing personnel into a proper organization and then see if the men can be brought up to the standard as individuals. Where there is disorganization it should be remembered that men of ability are often not able to work to any degree of efficiency on account of this. When the form of organization is improved the efficiency of the individual has a chance to assert itself.

It is necessary for every executive to form habits of thoroughness and concentration that will make it possible to compare values carefully. It is far easier to let things go along as they are than to organize and put into effect new ideas, but new ideas must be carried out. When an officer thoroughly realizes that betterments are possible in almost all operations he has reached a satisfactory starting point. It is certain that if his mind is made up that present conditions cannot be improved, he will waste a lot of time trying to prove that he is right. The first thing that an officer needs is the desire to accomplish things. A great personal desire to accomplish something is the strongest moving impulse that is known. It is greater than fear of punishment or hope of reward.

Some men are skilful in carrying out their own ideas but have difficulty in getting into the proper frame of mind to carry out the ideas suggested by another. It is less difficult to get an idea carried out if by the power of suggestion a man may be led to believe that he himself originated it.

Dealing With Employees

Discipline should be firm but not harsh. Adhere rigidly to the contract if there is one. In dealing with organized labor do not adopt an air of antagonism. Organized labor is here to stay, and there are features in its favor that may be and can be turned to the advantage of a railroad company, or any other company employing it. The wide influence of these organizations holds down complaints from individual employees and has standardized practice in the discipline of men that is not without benefit to the employer.

Rates of pay and working conditions may be subject of controversy, but the local officer is chiefly concerned with the administration of the rules as laid down in the contract. In dealing with committees, courteous treatment and a disposition to hear their side of the case fairly will help the relation of officers and employees materially. It is not strange that the interpretation of the contract should be the subject of dissension. The contracts and their interpretations have grown in size and complexity. It should be remembered that thousands of lawyers make a living by telling citizens what their rights are under the Constitution of the United States and its various branches and interpretations. It could hardly be supposed that a few railroad men could draw up anything as complicated as a wage schedule without serious complications and differences of opinion.

The foregoing is largely fundamental; but it must be realized that until the fundamental conditions have been made correct it will not be possible to plan economies and carry them out successfully. Even then it should be remembered that large organizations absorb changes slowly. To get best results take up one thing at a time and correct the trouble in that. With each difficulty overcome other things will be benefited. Work slowly enough to observe fully the effect of innovations. Do not expect results too quickly.

It is possible that officers think a great deal of their own attitude toward men of the rank and file and pay too little attention to what employees think of the officers and the company in general. It is certain that if a man likes his officers

and is proud of the company for which he works, he will do much better work and form a better part of the whole organization than if he is dissatisfied and displeased with his "boss."

The rank and file know but little of the officers at the head of a large organization. They deal entirely with their foremen and it is generally the foreman, or his boss, who gives a man his idea of the company or concern he is working for. Since the man under discussion, in many instances, is the one who performs the manual work, for the purpose of getting results it is most important that he should be handled well and be in a proper frame of mind.

The laboring man prizes most good working conditions, a steady job, a boss who knows how to handle men properly, and delivery of his pay envelope with regularity. In times of stress I have seen labor troubles of considerable size generated by failure of the paymaster to deliver the pay envelope on time, and it is worth the earnest thought of men in charge of organization to make a plan that will result in the men being paid with regularity.

Motor Truck Competition

The Houston, Tex., chapter of the American Association of Engineers has arranged for a series of addresses on the motor truck as a competitor of the railways. The first of this series was presented on October 11, by J. D. Fauntleroy, state highway engineer of Texas, who spoke from the standpoint of the highway builder. Other speakers scheduled include Julius Kruttschnitt, chairman of the executive committee of the Southern Pacific, who will present the views of the railway executive; F. J. Feight, president of the Teche Transfer Co., Jeanerette, La., who will present the truck users' view, and J. B. Culbertson, president of the Wichita Motors Co., Wichita Falls, Tex., who will speak from the standpoint of the truck builder. An abstract of Mr. Fauntleroy's paper follows.

We have no exact figures as to the total number of trucks which are operated in the state for the purpose of carrying freight, but the following figures are interesting. Smith county reports that truck traffic has increased 100 per cent since its highways were improved two years ago. Four large grocery houses are now handling 60 per cent of their outgoing freight in trucks. One large concern with 14 branch houses uses trucks extensively in handling its goods between branch houses in trucks operated by the firm. Only 40 per cent of its goods are handled by railroads or by wagons. Another large wholesale firm handles 65 per cent of its outgoing freight in trucks and also delivers to customers in trucks, because it is claimed that in this manner it can make much faster deliveries than can be secured by railroads.

El Paso county reports that for the past two years a truck line of four trucks has operated regularly between El Paso and Las Cruces, N. M., 48 miles, and has given good service, picking up inbound and delivering outbound freight of any class, such as milk, calves, potatoes or manufactured products. The delivery is from farm to store or vice versa. Deliveries are prompt. On account of this truck line we are informed that the Santa Fe now handles freight between these two points only in carload lots.

The operation of trucks has had an appreciable effect on the freight traffic of the railroads. All material used in building the Alamo Gordo road was hauled in trucks, as that method was cheaper than the railroad haul. All cement used in the construction of the Anthony-Las Cruces highways was hauled in trucks direct from the plant at a considerable saving. All lumber dealers in El Paso make delivery of materials by trucks to any place in the county. Oil companies in like manner use trucks to deliver gasoline and oil to any point desired in the county. Coca Cola is delivered in the same way. All local hay is brought in trucks or by wagons and no hay is shipped by rail to El Paso except for rebilling to other points. This applies to practically all other farm products. On a rough estimate it appears that the local freight business done by the railroads today is 10 per cent of the total local freight handled within a radius of 100 miles of El Paso.

Motor Trucks Perform Valuable Service for Short Hauls

There are approximately 26,000,000 food producers in the United States who are trying to feed themselves and also the other 79,000,000 American citizens. We should therefore welcome any new means of transportation that will simplify the transportation of food products to consumer and thereby tend to lower the cost of living, for at present the original producer gets only 35 cents out of every dollar which the consumer pays for his goods. It appears that, especially in the case of fruits, vegetables and other perishable products, the motor truck has a special and very necessary function to perform and if it can cheapen the price of food to the consumer and at the same time cut out the middleman so as to give the producer a better price for his products, it will be entitled to fair treatment by our lawmakers.

It is interesting in this connection to consider that the Public Service Commission of Nevada, in the case of the Virginia & Truckee Railway Company vs. Ginocchio Brothers to restrain the latter from operating a truck line along a road parallel to the railroad and competing with it, ruled that railroad freight service for short distances in less than carload lots has become wasteful and obsolete and it welcomed the addition of the truck service for agriculture, live stock and mining sections of the state and recommended that the railroads install similar facilities.

While the use of motor trucks for carrying freight undoubtedly has proved beneficial to many merchants and their customers, it also has its corresponding disadvantages. For example, many gravel and iron ore roads, which were built with the expectation of carrying ordinary farm traffic and a reasonable amount of auto traffic, have been damaged and some of them almost destroyed in a short time by the use of heavy trucks. The result is that we have roads now in a bad condition of repair which will require large expenditures to put them in proper shape and for which no funds are in sight. Nevertheless, the bonds which were voted and sold to pay for these roads will not be retired for perhaps 25 or 30 years. The condition is a very serious one.

The state legislature has prescribed laws regulating traffic upon highways, but the enforcing of these rules rests with the commissioners' courts of the different counties and in many instances it seems that little or no effort is being made to carry out the intention of the legislature. It appears that if the roads are to be adequately protected from destruction by heavy trucks and by overloaded trucks some means must be found to enforce the traffic regulations, probably by giving some central body the necessary authority to see that the laws are enforced.

The State of Maryland finds itself in a peculiar condition in that it has the most complete system of improved highways of any State in the Union, but it is surrounded by states whose highways are in more or less completed conditions. Also located around Maryland and near its borders are many large manufacturing cities. As a result a tremendous truck traffic has grown up on the Maryland roads and these trucks are frequently licensed in adjoining states. The general tendency of these trucks is to be overloaded. As a result Maryland authorities found their roads in imminent danger of destruction by these foreign owned trucks. It was decided to try the experiment of weighing each heavily loaded truck to see if it was overloaded and if it was overloaded to fine the owners and to compel the overloaded trucks

then and there to remove part of their loads so as to come within the limits prescribed by the law. Of course the truck drivers cursed and swore, but the highway policeman, after testing the load by means of small portable scales, compelled the drivers to unload a portion of their load alongside the road, where it would lay unprotected until the driver could arrange to haul it to some nearby store or farm house for storage. In a little while there were no more complaints, as one experience of unloading was enough for any driver.

The State Highway Commission of Maryland informs me that in 1918 heavy trucks were permitted to operate over the main highway running north and south through Baltimore and that many of these trucks were overloaded. As a result the road was practically destroyed and had to be reconstructed at a cost of $600,000. If all of the loads carried over the road during this period by these trucks had been within the legal limit the road would not have been destroyed but could have been maintained at a reasonable cost. He estimated that by overloading these trucks instead of using more trucks with lighter loads the truck owners had saved about $16,000, whereas the cost to the state of reconstructing the road was $600,000.

Another matter which is worthy of serious consideration is the fact that many of our main highways parallel railroads and the construction of such highways is largely paid for by the proceeds of district highway bond issues. The railroads, being in the district, necessarily will pay their proportional part of the cost of building these highways. The fees which the trucks pay are in many instances totally inadequate to repair the damage done to the roads by the use of the trucks, so we have the peculiar condition existing that the railroads are helping to pay for the improvement of highways which parallel their lines and which are being destroyed by trucks whose business it is to take traffic away from the railroads.

Motor Trucks Must Pay Their Share of Highway Costs

It seems to be the opinion of many thinking men that not until the truck operator shall contribute his due proportion to the cost of highway construction and maintenance, can his right to use the highway be considered equal to that of the ordinary taxpayer. This is the conclusion of the Public Utilities Commission of Colorado in a decision rendered on March 8, 1922. The Colorado Commission held that through abuse of the highways by inadequately taxed buses and trucks, "the 137,336 passenger car owners of the State are grievously wronged" and "the farmer and city home owner pays the bills."

In a similar decision, June 14, 1921, the Public Service Commission of Pennsylvania declared, "public interest would immeasurably suffer" if auto lines were permitted to engage in destructive competition with the railroads that were providing reasonably adequate service to their territories. The Pennsylvania Commission, in a decision on March 16, 1921, refusing to permit an auto line to parallel an electric railway, pointed out that the proposed competition would mean either increased rates or impaired service for the patrons of the electric line.

These decisions are important because they enunciate first principles relating to the regulation and taxation of highway carriers and have a vital bearing on conditions in every western state today.

It may not be amiss to state in this connection that the use of highways by jitneys and bus lines is also having a very serious effect upon the revenues of the railroads. We are informed that due to the general use of jitneys and buses over an improved highway which parallels the Katy railroad, the passenger receipts were $1,500 less at one station in June of this year than in June, 1921.

Our whole system of transportation is in more or less of a transition stage, but the railroads have been of greater value in developing the agricultural, manufacturing and mining resources of our country than any other one factor and their continued operation on a paying basis is essential to the very life and prosperity of our people. The auto has also come to stay and the proper use of the motor truck is going to aid very greatly in the future development of our State.

Both railroads and motor trucks have certain special functions to perform and there appears to be no reason why these functions cannot be performed without conflict and, moreover, to their mutual benefit. The railroads themselves should use motor trucks to a large extent.

New Laws Enacted in 1922

J. E. Fairbanks, general secretary of the American Railway Association, acting in behalf of the committee on the relation of railway operation to legislation, has issued a circular giving abstracts of laws of interest to railroads enacted during the year 1922 in the 11 states where the legislatures were in session; and also abstracts of bills introduced but not passed. An abstract in tabular form of the information gathered shows, under 32 heads, 228 laws introduced and 49 enacted. The largest number of laws passed on any one subject was nine, on taxes; there were six under the head of claims, personal injury, etc. From the abstracts of laws passed we condense the following notes of those which are of more general interest:

Georgia changed the name of its railroad commission to the Georgia Public Service Commission, and provided for a tax on public service corporations to support the commission.

Kentucky adopted two laws providing for the elimination of grade crossings and apportionment of the cost of such work; increased the penalty for train wrecking to not less than five nor more than 20 years; gave the state commission increased powers with respect to the regulation of common carriers.

Louisiana adopted a law regulating the jurisdiction of courts over claims for loss or damage to freight.

Maryland repealed the full crew law.

Massachusetts modified the regulation relative to the abandonment of passenger stations, allowing the Department of Public Utilities to authorize exceptions.

New Jersey repealed its full crew law, revised the law concerning passes for officers of the state, empowered the Public Utilities Commission to fix prices of securities to be sold, removed the necessity for municipal approval of railroad police officers and changed to December 10 the date for fixing valuations of railroad property.

New York amended the law relating to cabooses and coal jimmies, amended the law relative to the inspection of locomotives and added a requirement that small concerns operating locomotives shall have them inspected the same as is required of railroads.

Rhode Island adopted a law regulating the operation of jitneys.

South Carolina consolidated the Railroad Commission with the Public Service Commission.

Virginia made changes in its tax laws, and adopted a bill requiring vehicles approaching certain railway grade crossings to be stopped before passing over them.

"Stop That Leak" is the slogan of a campaign which has been started in the Baltimore & Ohio Employees' Magazine to reduce expenses. Officers in all departments are pointing out opportunities for economies in their various fields, and employees are being urged to contribute suggestions.

General News Department

The Pennsylvania reports encouraging progress in repairing freight cars, the output of the shops having increased in six months so that the number of cars requiring repairs was reduced to about nine per cent of the total number owned. In November the daily average number of cars awaiting repairs was 25,056 or 11,614 less than in June.

The Signal Section of the American Railway Association, which holds its next meeting at the Drake Hotel, Chicago, in March, announces that the sessions will occupy three days: Tuesday, Wednesday and Thursday, the 13th, 14th and 15th. Secretary H. S. Balliet expects to mail the committee reports to members on February 12.

The Illinois Central extended Christmas and New Year's greetings to its patrons through the distribution of holiday cards, which were handed to all passengers at the ticket gates. Officers of the road also sent out cards with their letters. They expressed appreciation for patronage and asked continued patronage, confidence and friendship.

Payment of dividends by railroad companies, except after a certificate has been obtained from the Interstate Commerce Commission to the effect that an inspection has been made and the equipment found adequate for the requirements of traffic, would be prohibited by a bill which has been introduced in the Senate by Senator Johnson of California.

Passenger train No. 16 of the Chicago, Burlington & Quincy was derailed three miles east of Saxton, Mo., on December 12, by malicious misplacement of a rail. The rail had been taken out, at one end, and spiked down six inches out of line. A section house had been broken into and a claw-bar and wrench taken out. Although seven of the eight cars of the train left the track, only three passengers were injured and these but slightly.

The Atchison, Topeka & Santa Fe has prepared plans for the construction of a large office building to accommodate its general offices in Chicago on land owned by the company on the east side of State street, south of Roosevelt road. The company's present lease of three floors in the Railway Exchange building will expire in 1923 and it is now considering whether to remain at its present location, to become tenants in the new west side Union Station office building, or to construct its own building.

The Interstate Commerce Commission has announced that the hearing set for January 17 on its consolidation plan as applying to several western systems will be interrupted for two days on account of the argument before the full commission on January 19 and 20 on the application of the Southern Pacific to acquire control of the Central Pacific. On January 17 and 18 evidence will be received with respect to Systems No. 14 and 15 and commencing on January 22 evidence will be received with respect to Systems Nos. 13, 16 and 17 of its tentative plan.

"Company unions" have been formed on the Chicago & Eastern Illinois by shopmen, signalmen and telegraphers; and, in conjunction with officers of the road, have agreed on wages and working conditions. These organizations are the Chicago & Eastern Illinois Association of Mechanical Department Employees and the Chicago & Eastern Illinois Association of Signal and Telegraph Department Employees. The wages agreed upon are in accord with the rulings of the United States Railroad Labor Board, but with provision for graduating the rates of pay according to the skill and experience of various classes of mechanics.

Railway officers and railway supply men of Chicago are participating actively in the campaign of the Chicago Safety Council to secure financial support for that organization, which proposes to spend $100,000 during 1923. F. A. Poor, president of the P. & M. Company is general chairman of the drive. W. E. Sharp, president of the Grip Nut Company, is chairman of the railway supply division conducting the campaign among the railway supply companies. J. G. Rodgers, vice-president of the Pennsylvania, is supervising the work of the steam transportation division, which includes safety officers of nearly all the railroads entering Chicago. The Chicago Safety Council has co-operated with the railroads at every opportunity to minimize accidents. It directed the recent Careful Crossing Campaign of the American Railway Association in Chicago, and plans to conduct three safety instruction classes for railway foremen in 1923.

Hall Three-Color Signals

The Hall Switch & Signal Company has received orders for its color-light signals—a single lens serving for all three colors—from the New York Central (lines west) eight signals; the Michigan Central, three signals; the Toledo & Ohio Central, one signal, and the Baltimore & Ohio, two signals.

Society of Terminal Engineers

The Society of Terminal Engineers will discuss the illumination of piers, warehouses and railroad terminals and yards at its meeting on January 9, at 8:00 p. m., at the Engineering Societies Building, New York. G. T. Johnson, electrical supervisor of the New York, New Haven & Hartford, will speak on the illumination of terminals and yards, giving special attention to the installation at Cedar Hill. H. E. Mahan, illuminating engineering laboratory, General Electric Company, will discuss the illumination of piers and warehouses.

Nine Thousand Foreign-Born Citizens

Of the 12,907 foreign-born employees on the Eastern Region of the Pennsylvania Railroad a total of 9,249 or 70 per cent have either become naturalized American citizens or have obtained their first papers. Forty-eight nationalities are represented; Italians. 5,707; English, 1,610; Irish, 1,444; German, 696; Austrian, 586; Polish, 528; Russian, 511; Hungarian, 338; Norwegian, 177; Spanish, 172; Swedish, 148; Scotch, 139; and Czecho Slovak, 102. The following show less than 100 each: Armenian, Mexican, Portuguese, Canadian, Danish, West Indian, French, Swiss, Jugo Slav, Greek, Syrian, South American, Dutch, Welsh, Roumanian, Belgian, Turkish, Cuban, Lithuanian, Finnish, Bohemian, Australian, Ukranian, Bulgarian, Serbian, East Indian, Macedonian, Galician, Arabian, Porto Rican, Egyptian, Costa Rican, African, Central American and Japanese.

It is the policy of the Pennsylvania to assist all foreign-born employees who wish to take advantage of instruction in English and the fundamental principles of American government.

Unequal Taxes in Nebraska

The Chicago, Burlington & Quincy, the Chicago & North Western and the Chicago, St. Paul, Minneapolis & Omaha, have been denied a Federal court order enjoining the collection of their taxes for 1921 in Nebraska, based on appraisals and valuations which they claim were discriminatory. The roads claim that their taxes have been assessed on valuations as high as 40 per cent greater than the actual value of their property, while other property in the state was assessed at only 65 per cent of its actual value. The opinion denying the order held that the roads should have exhausted all means provided by state law for correcting the assessment before coming into Federal court for relief. Reference was made to the provision in the Nebraska law for appeal to the State Supreme Court in tax cases after the state board of equalization has acted, which action the roads had not taken.

Readjustment of Wages on U. P.

An agreement has been reached between the Union Pacific and representatives of the Miscellaneous Employees' Association of that system whereby it will pay wages ranging from two to ten cents an hour over those established by the United States Railroad Labor Board to employees performing work of a high degree of skill. For work semi-skilled in nature and other grades requiring but little skill, the rates of pay are less in some instances than rates established by the Labor Board. A complete set of rules governing working conditions was also agreed upon, which are similar to those contained in agreements recently entered into between the Union Pacific and the Shop Employees' Association of that road.

Butler, McChord and Eastman

The Senate on December 21 confirmed the appointment of Pierce Butler as an associate justice of the Supreme Court by a vote of 63 to 7. Those voting against the confirmation were Senators Harris, Heflin, LaFollette, McKellar, Norris, Sheppard and Trammell. In opposing the confirmation, Senator LaFollette is said to have used a letter from John H. Gray, former valuation analyst of the Interstate Commerce Commission, saying that Mr. Butler had caused his dismissal from the faculty of the University of Minnesota because of the attitude he had taken on railroad valuation questions while with the commission. The Senate also confirmed the re-appointment of C. C. McChord and Joseph B. Eastman as members of the Interstate Commerce Commission.

Coal Production

The rate of production of soft coal has declined since the second week of December, according to the Geological Survey Bulletin. Revised estimates for that week show 11,495,000 tons including lignite, coal coked, mine fuel and local sales, whereas the preliminary estimate for the week ended December 16 stands at 10,518,000 tons, and for the week of December 18-23 at 10,000,000 to 10,300,000 tons. The decline began on Tuesday, December 12, when the output was limited by observance of Miners' Election Day in some union districts, and has continued since that day for causes which are not yet apparent.

Production of anthracite in the week ended December 16, including mine fuel, local sales and washery and dredge output is estimated at 2,197,000 net tons, the highest week's output for the year 1922.

The total mine output of bituminous coal in November is estimated at 45,300,000 net tons. This is 8,495,000 tons, or 23 per cent more than the November, 1921, production.

The Lake season is now virtually closed. Cumulative dumpings of cargo coal (bituminous) over Lake Erie piers in the 1922 season to December 17 total 18,500,055 tons which is 17.5 per cent less than in 1921 and 1920, and 15 per cent less than in 1919. It is noteworthy, however, that of the total cargo coal reported for 1922 1,179,417 tons, or 6.4 per cent, has gone to Lake Erie destinations not ordinarily taking "Lake" coal. Therefore, on the basis of regular movements the present season is 22.5 per cent behind 1921 and 1920 and 20 per cent behind 1919.

Constitutionality of Recapture Law Contested

The first suit to test the constitutionality of the so-called recapture provisions of the transportation act has been instituted in the United States district court at Beaumont, Texas, by the Dayton-Goose Creek Railway, which has filed a petition for an injunction to restrain the Interstate Commerce Commission from instituting proceedings to collect from the company $10,833.12 for 1920 and $16,833.49 for 1921, representing one-half of this company's net in excess of 6 per cent upon its value. The petition states that this law is in violation of the fifth amendment to the constitution and declares that its rates were fixed both by the Interstate Commerce Commission and by the Texas Railroad Commission as reasonable rates and that the commissions could not have declared lower rates to be reasonable. It also makes the point that part of its net operating income was not derived from freight or passenger service, but from profits accruing to it from rentals, leases, trackage rights and interest; also that it does not know how much of its net income it may be able to retain as it may eventually be reduced as a result of litigation over rates, damage suits, etc.

Dearborn Station Damaged by Fire

Dearborn Station, Chicago, operated by the Chicago & Western Indiana and used by the Atchison, Topeka & Santa Fe, the Chesapeake & Ohio, the Chicago & Eastern Illinois, the Erie, the Chicago, Indianapolis & Louisville, the Grand Trunk and the Wabash, was damaged by fire to the extent of $300,000 on December 21. The fire was caused by crossed wires and started in the ceiling over the second floor at 3:30 p. m., spreading rapidly to the third floor and loft. The fire was confined to the upper floors of the building which were used for offices and the storage of records. It spread so rapidly that within half an hour the entire upper portion of the building was in flames. The train shed was not damaged and no mail or baggage was lost. As soon as the fire was under control, arrangements were made to handle the heavy holiday traffic with a minimum of inconvenience and delay. By 7 p. m. trains were being handled on schedule and an annex ordinarily used for the accommodation of suburban passengers was used for regular passenger traffic. On December 23 the debris had been cleared so that passengers were able to enter the train shed through the main floor of the building. The baggage and waiting rooms were restored to service on December 24. The station was built in 1885 at a cost of from $400,000 to $500,000, and was considered one of the largest and best appointed stations in the country at that time.

Illinois Central Urges More Intensive Use of Railway Facilities

In an article appearing in the Illinois Central Magazine for December this company points out that relief from the present transportation shortage can be secured only through the more efficient use of present limited facilities. Quoting from this article, relief may be brought about by the loading or unloading of cars the same day they are delivered instead of holding them over into the following day. This company is endeavoring to load cars as heavily as possible. It has been found that only three-fourths of the full capacity of freight cars, except coal cars, is being utilized, which means that one-fourth of the capacity of such cars is being wasted. The co-operation of patrons in assisting in the correction of this condition is solicited. In October, lumber loadings on the Illinois Central were only 58.6 per cent of the capacity of the cars, mixed seed 54.9 per cent, cement 76 per cent, cotton seed products 56.2 per cent, flour and meal 59 per cent, sugar 52.2 per cent and stucco and plaster 75.3 per cent. Coal car loading exceeded 95 per cent of the maximum capacity, wheat and corn 90 per cent and stone, sand and gravel nearly 96 per cent. That the railway is attempting to do its part is indicated by the fact that a record of 45.75 miles per car per day was made in October of 1922, as compared with the previous high record of 44.59 miles per car per day established in October, 1920.

A Bill to Protect I. C. C. Against Influence

A bill to make it unlawful "to attempt to influence the determination of any proceeding before the Interstate Commerce Commission or any examiner thereof, excepting under the rules and regulations of the commission governing its proceedings in the orderly administration of the interstate commerce law" has been introduced in the Senate by Senator La Follette. The bill provides that:

"Every person who attempts to influence the action of the Interstate Commerce Commission or any member thereof, in making or refraining from making any ruling, conclusion, finding, recommendation, report or order in the determination of any proceeding before the commission or any examiner thereof, by writing or sending to the commission or any member thereof or to any examiner thereof any letter or any written or printed communication, circular, paper, or by writing or printing or circulating or causing to be printed and circulated any communication, matter or thing addressed to the commission or any member thereof or any examiner thereof, or by communicating with the commission or any member thereof or any examiner thereof in any

other manner with like purpose and intent in relation to such ruling, conclusion, finding, recommendation, report, order or proceeding pending before the commission or examiner thereof, excepting under the rules and regulations of the commission governing its proceedings in the orderly administration of the Interstate Commerce law and acts amendatory thereof, shall be deemed guilty of a misdemeanor and upon conviction shall be punished by a fine of not more than $2,000 or imprisonment for a term not exceeding one year, or by both fine and imprisonment, in the discretion of the court."

W. H. Johnston Asks Investigation of Strike Expenditures

William H. Johnston, president of the International Association of Machinists, on December 23 filed with the Interstate Commerce Commission a petition requesting the commission to investigate the expenditures by railroad companies for the maintenance of their equipment since July 1, 1922.

"The present freight and passenger rates were originally determined by you on the assumption that adequate standards of economical and efficient operation would be fulfilled by the carriers," he said. "Consequently, if at any time they are not fulfilled, it becomes the duty of your honorable body to act in a way which will record the facts of the situation and effect the necessary remedies. Especially is such action on your part appropriate and necessary at this time, in view of the persistent demand by the agricultural and other shipping interests of the nation for reduced freight rates. I charge that progress toward such reduction has been effectively and consistently blocked by the carriers in recent months as a result of their costly and utterly unwarranted labor policy."

Mr. Johnston said that there exists today not only a depletion of usable cars, coupled with a serious decline in railroad earnings, but also a condition of deferred equipment maintenance which is likewise very serious in view of the coal shortage and the increasingly severe winter weather. He charged that this situation is "the direct result of those very faults of management which the Interstate Commerce Act has made a primary factor in the determination of railroad rates and which the commission, in accordance with this act is authorized to remedy." He calls the present state of affairs "tantamount to a lockout."

"Green Caps" at Pennsylvania Station

The "Message Exchange" introduced at the Grand Central Terminal, New York city, last July, is now in operation also at the Pennsylvania Station, New York, with "Green Cap" messengers circulating among passengers in the waiting rooms and concourse. The announcement issued by the railroad company lists the things that the Exchange and its messengers will do, among which are:

If a patron has failed to telephone an important message to his home or elsewhere, his message can be taken by a messenger. If a reply to the message is required, the Message Exchange will get the answer.

Messages may be left to be called for.

Travelers may have letters and telegrams addressed to themselves in care of the Message Exchange. * * * On request, the Message Exchange will require positive identification of persons to whom valuables are delivered.

Messengers will deliver messages, bags and parcels of all kinds between any two points in Greater New York.

A "Green Cap" will page anyone throughout the Pennsylvania Station. This service can be obtained by telephoning Pennsylvania 0114.

Railroad patrons can have railroad and Pullman tickets purchased and held for them.

The booth is open from 7 a. m. until midnight. For the present its working force consists of a day and a night telephone operator and four messengers. The Exchange during its first two days accommodated approximately one hundred railroad patrons.

The Grand Central announcement said that for all ordinary service the charge would be uniformly ten cents each. The present announcement simply says that a nominal charge will be made.

Traffic News

The navigation season on the upper Great Lakes ended on December 22, when the locks at Sault Ste. Marie, Mich., were closed for the winter.

The Interstate Commerce Commission on December 20 issued a service order directing the Pennsylvania Railroad to place three cars a day for 15 consecutive days at the mine of the Commercial Coal Mining Company, Twin Rock, Pa., for coal consigned to the government fuel yards at Washington. These yards supply all public buildings in Washington.

The Chicago, Burlington & Quincy, the Great Northern and the Northern Pacific, are planning a $1,000,000 campaign to advertise the institutions, the economic resources, the development, the history and the future of the northwest. Officers are now traveling through this territory collecting information which will be used in the campaign. The campaign will be handled through the Burlington offices. A motion picture scenario laid in Colorado, Yellowstone Park and Glacier Park has been completed and will be displayed in cities throughout the United States.

Christmas holiday traffic on the railroads centering in New York City was this year heavier than ever before. The different roads reported estimates of from 20 to 30 per cent above the normal average number of passengers passing through the station on ordinary winter days. The New York Central sent out many extra trains, including 75 extra sleeping cars. An officer of the Pennsylvania said that 50 more Pullman parlor cars could have been used if they could have been found. Similar increases in the aggregate number of passengers were reported also at Philadelphia.

Advice how to fight the boll-weevil is the subject of the latest advertisement published by the Central of Georgia Railway in the daily and weekly newspapers published along its lines. The agricultural department of the road will supply any farmer with all available facts and figures as to how the weevil has been fought, and the results. The only advice given in the advertisement is the naming of the best weapons, which are "hard work and common sense." These must be supplied by the farmer himself, but the railroad, without attempting to say what method is best, and without recommending one plan above another is ready to do what it can. Pamphlets may be obtained on application and personal interviews may be had with the department's agricultural agents at Cuthbert, Griffin, Milledgeville and Columbus. This railway organized its agricultural department in 1911 and has established test farms, has assisted boys' clubs for crop growing and stock raising and has distributed pure-bred sires, cattle and swine, throughout its territory; it has shown how tobacco and other money crops may be grown to bridge over the lean years while the farmer is learning to live with the weevil; it has conducted farm tours through the west; aided in the construction of correctly designed storage houses for sweet potatoes, and is now promoting test pastures to show that permanent pasturage is possible.

Car Service Division Appoints Agricultural Representative

To enable the Car Service Division of the American Railway Association to keep more intimately advised regarding the transportation requirements of the farming communities of the country, it has appointed Elmer Knutson, of St. Cloud, Minn., as agricultural representative, whose function will be to keep in touch with farm needs so far as freight transportation requirements are concerned. He will analyze the movement of agricultural products and will co-operate with farm organizations throughout the country in anticipating car requirements. He will spend most of his time in the agricultural sections of the country. Creation of this office is part of the general plan of the Car Service Division to bring about closer co-operation between shippers and carriers.

Commission and Court News

State Commissions

The Railroad Commission of California will apply to the California Supreme Court for a rehearsing in the Los Angeles terminal case in which the court denied the commission authority to order the construction of a union passenger station. The Supreme Court annulled the order of the commission directing the Southern Pacific, the Atchison, Topeka & Santa Fe and the Los Angeles & Salt Lake to join in the construction of a station as part of a plan for eliminating grade crossings. The Supreme Court, while conceding the power of the Commission to order the elimination of grade crossings, held that the Interstate Commerce Commission possessed exclusive power over all extensions to railroad facilities, including terminals. In the event that the order of the Supreme Court becomes final, the California commission will initiate proceedings before the Interstate Commerce Commission to accomplish the result sought.

Court News

Railroad Company Not Liable for Work Contracted While Under Federal Control

Where a railroad was under federal control when an agreement for construction formerly made was modified and performed, partly by the contractor and partly by the railroad after the contractor's abandonment of the work, the Tennessee Supreme Court holds that the railroad company was not liable for the amount due the contractor under the modified agreement nor for the rental of the contractor's equipment taken and used after the abandonment.—Johnston v. Cincinnati, N. O. & T. P. (Tenn), 240 S. W. 429

Alabama Cattle Guard Statute

The Alabama Court of Appeals holds that under the 1907 statute requiring the erection of cattle guards for plantation roads when demanded and shown to be necessary, two things are essential to recover damages (1) the cattle guards and crossings must be on plantation roads, either present or prospective; (2) there must be a demand by the owner or person in possession, accompanied by a showing that such guards are necessary to prevent depredation of stock upon his land, and that the crossings are necessary for the proper use of the land.—A. T. & N. v Norwood, etc. Stock Co. (Ala. App.) 92 So. 199.

Consignee, Agent of Shipper, Liable for Deficiency in Freight Though B. L. said P. P.

Goods were shipped to the shipper's agent, on a straight bill of lading reciting that the freight had been prepaid. On arrival it was found that the full lawful freight had not been prepaid, and a small additional amount demanded was paid by the consignee "to avoid delay and confusion." Some months later it was discovered that $93 additional was lawfully due, and on the consignee's refusal to pay this, the railroad sued him. The consignee contended that the rule that the consignee accepting the goods is to be treated as assuming the charges cannot apply if the contract of shipment is that the freight is to be prepaid, especially when the railroad knows that the consignee is the shipper's agent. None of the cases in the higher federal courts involves a prepaid shipment, but the federal district court for the Northern District of Georgia in the present case arrives at the conclusion that the consignee cannot accept delivery without incurring liability for the carrier's charges, known or unknown, supposed to be prepaid or otherwise, and no matter what the consignee's actual relation to the shipper is. If by the shipper's omission the consignee is thus made liable for a charge which as between him and the shipper should not be borne by him, his recourse is on the shipper. —Western & Atlantic v. Underwood, 281 Fed. 891.

Ownership of Condemned Land Not Used for Railway Purposes

Certain lands of plaintiff's predecessor in title were condemned in 1879 for railway purposes. Hitherto the defendant company has not used or needed all the land condemned, and a portion of it has been continually occupied and used by the plaintiff and his predecessors. The Kansas Supreme Court holds that, as plaintiff and predecessors were strictly within their rights there has been no adverse, hostile, inconsistent use to the prejudice of the company so as to give rise to a right founded on 15 years' adverse possession, and an action by the fee title holder to quiet the title against the railroad company cannot be maintained.—Harvey v. Missouri Pacific (Kan.), 207 Pac. 761.

Sufficient Excuse for Failure to Furnish Cars

In an action for failure to furnish cars, it was shown the cause of the failure was an unusual demand for cars after a switchmen's strike, which had practically stopped shipments during the preceding months. The Wisconsin Supreme Court holds that a finding that the railroad could, in the exercise of reasonable diligence have furnished the cars without jeopardizing its other business was not warranted. It is undoubtedly the duty of the railroad to notify the shipper within a reasonable time if it cannot furnish the cars at the time and place requested; but where there is no causal relation between failure to give such notice and the damages sustained, it is immaterial that the notice was not given. —Richland Equity Shipping Assn. v. Rock Island (Wis.) 188 N. W. 625.

Underwood & Underwood

When a Train Is Approaching the Four Lights Below the "Railroad" Sign Show "Stop" in Red Letters in the Crossing Signal Developed by A. B. Ramsdell, Assistant Vice-President of the Rock Island

Equipment and Supplies

Locomotives

THE LEHIGH & NEW ENGLAND is inquiring for three Consolidation type locomotives.

THE LOUISVILLE, HENDERSON & ST. LOUIS is inquiring for five Pacific type locomotives.

THE HOLTON INTER-URBAN has ordered one Prairie type locomotive from the American Locomotive Company.

THE NARRAGANSETT PIER RAILROAD has ordered one 8-wheel locomotive from the American Locomotive Company.

Freight Cars

THE UNITED GAS IMPROVEMENT COMPANY, Philadelphia, Pa., reported in the *Railway Age* of December 16 as inquiring for 150 coal cars of 50 tons' capacity, has ordered this equipment from the American Car & Foundry Co.

THE GREAT NORTHERN, reported in the *Railway Age* of December 9 as inquiring for 500, 75-ton steel ore cars, has divided equally an order for 1,500 ore cars between the Pressed Steel Car Company and the Cambria Steel Company. This company is now inquiring for 1,000 U. S. R. A. standard, double-sheathed box cars.

THE SOUTHERN PACIFIC, reported in the *Railway Age* of December 2 as inquiring for 5,000 cars, has ordered 3,700 box from the Standard Steel Car Company, 350 flat from the Ralston Steel Car Company, 550 stock from the Pullman Company. The railroad company will build 300 flat cars and 100 caboose cars in its own shops.

Passenger Cars

THE UNION PACIFIC contemplates coming in the market soon for about 50 cars for passenger service.

Iron and Steel

THE LOUISVILLE & NASHVILLE has ordered 1,599 tons of structural steel for its Rigolets bridge in Louisiana.

THE MISSOURI PACIFIC has ordered two through riveted spans, 700 tons, from the Virginia Bridge & Iron Company.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS will receive bids until January 3 for plates, shapes, nails, wire, cable, axles and tubes.

Track Specialties

THE LONG ISLAND received bids until 12 o'clock noon, December 29, at Jamaica, N. Y., for 420 kegs of track bolts 1,350 kegs iron track spikes, 36 open hearth frogs, 2 hard frogs, 24 switches and 2 pair alloy tipped switch points.

Miscellaneous

THE NORFOLK & WESTERN received separate bids until 12 o'clock noon, December 27, at Roanoke, Va., for its requirements from January 1 to June 30, 1923, of locomotive steel tires, wire fencing, steel springs, and from January 1 to March 31, of couplers and repair parts. Bids were also received on the same date for 101 cast steel truck bolsters. The company is also asking for separate bids until 12 o'clock noon, January 3, for 550 sheets finished steel, 12 cast steel truck bolsters, 8,000 switch plates, 300 bars bevel reinforcing steel, 100 cast steel side frames, requirements of brake shoes from January 1, 1923, to March 31, 1923.

Supply Trade News

The **W. S. Murrian Company,** Knoxville, Tenn., has been appointed field representative for the southern part of the United States of the **Mahr Manufacturing Company,** Minneapolis, Minn.

H. A. Hutchins district manager of the Chicago territory for the Thew Shovel Company has become associated with the main office of the **Northwest Engineering Company,** 1220 Steger building, Chicago.

The **George Oldham & Son Company,** Baltimore, Md., has opened a branch office in the National building, 1404 E. Ninth street, Cleveland, Ohio. This office is in charge of **W. W. Davidson** and **C. M. Hartzell.**

The **Lehigh Portland Cement Company** has awarded a contract to Dwight P. Robinson & Company, New York, for the design and construction of a Portland cement plant at Birmingham, Ala., having an annual capacity of 1,000,000 barrels of cement.

The **Globe Steel Tube Company,** Milwaukee, Wis., has opened a southeastern district sales office at 716 Continental building, Baltimore, Md., and **R. R. Lally,** formerly of the National Tube Company, has been appointed district sales agent.

Edwin L. King has been appointed district sales manager for the Reading Steel Casting Company, Inc., Reading, Pa.; Pratt and Cady Company, division Reading Valve and Fittings Company, division, Bridgeport, Conn., with headquarters at 208 South La Salle street, Chicago, to succeed M. L. Chase, resigned.

L. R. Phillips has been appointed district sales manager of the **Detroit Seamless Steel Tubes Company,** Detroit, Mich., and will establish an office in Chicago on January 1. For the past 20 years Mr. Phillips has been associated with the National Tube Company, 17 of which were with the Chicago office, and the latter three with its St. Louis office.

O. D. Street, general manager of distribution of the Western Electric Company, Schenectady, N. Y., has resigned to organize a company of consulting specialists to deal with questions affecting management and distribution. Mr. Street was connected with the Western Electric Company for 22 years, most of the time in an executive capacity.

The **Gibb Instrument Company,** Bay City, Mich., has taken over, under exclusive license, the manufacture and sale of the automatic and semi-automatic electric arc welding machines developed and heretofore manufactured by the Fred Pabst Company of Milwaukee, under various letters patent, and have contracted to act as selling agent for the Pabst line of patented covered electrodes.

John J. Gault has joined the sales force of the **Bucyrus Company,** South Milwaukee, Wis. Mr. Gault's headquarters will be at 622 McCormick building, Chicago. He formerly served as assistant engineer of the Chicago & North Western, engineer maintenance of way of the Chicago & Alton, construction engineer for the United Fruit Company and assistant engineer of the Chicago, Milwaukee & St. Paul and later with the International Harvester Company as locating engineer on a railroad project.

Walter C. Doering has resigned as vice-president of the Southern Wheel Company, St. Louis, Mo., effective January 1, to engage in the railway supply business in St. Louis. Mr. Doering has been connected with the above company and its predecessor the St. Louis Car Wheel Company since January, 1900. Among the concerns that Mr. Doering will represent, are the American Brake Shoe & Foundry Company, New York, the Bradford Draft Gear Company, New York

and Chicago, and the Republic Railway Equipment Company, Chicago. His offices will be located in the Railway Exchange building, St. Louis.

Obituary

William R. Walker, assistant to the president of the United States Steel Corporation, died on December 22 in St. Luke's Hospital, New York City. Mr. Walker was born in La Porte, Ind., on November 26, 1857. He had been identified with the Steel Corporation since its formation.

Fred A. Marsh, general purchasing agent of the Link-Belt company, died on December 11 at his home in Chicago at the age of 52 years. Mr. Marsh was a member of the Link-Belt organization for over 33 years. He was one of the organizers of the Purchasing Agents Association of Chicago, and served as its first president; he has been for some years a director in the National Association of Purchasing Agents.

Railway Construction

Baltimore & Ohio.—This company has awarded a contract recently to the American Bridge Company covering the fabrication and delivery of approximately 750 tons of steelwork for bridge superstructures. The order in question consists principally of deck plate girder spans, but includes a number of short "I" beam spans and one through plate girder span. The majority of these new bridges are to be placed on the line paralleling the Ohio river between Benwood and Brooklyn Junction, W. Va. The material is to be delivered early in the coming spring, and the erection is to proceed as soon as the steelwork reaches the respective bridge sites and the weather conditions become suitable for field operations.

Belt Railway of Chicago.—This company, which was reported in the *Railway Age* of December 16 as receiving bids for the construction of a brick freight house at Chicago to cost $75,000, has awarded the contract for the work to Rowley Brothers Company, Chicago.

Chicago & Western Indiana.—This company has awarded a contract to the E. W. Sproule Company, Chicago, for the reconstruction of Dearborn Station, Chicago, which was recently damaged by fire.

Chicago, Burlington & Quincy.—This company is considering plans for the construction of a union station at Clinton, Iowa, to serve the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific and the Chicago, Milwaukee & St. Paul. The structure is expected to cost approximately $40,000.

Chicago, Milwaukee and St. Paul.—This company contemplates terminal improvements at Sioux Falls, South Dakota, including increased trackage and alterations to freight and passenger stations.

Chicago, Rock Island and Pacific.—This company is surveying a new line from Waurika, Oklahoma, to Healdton, a distance of approximately 15 miles.

Eastern Maine.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a new line from Houlton to Bancroft, Maine, 31 miles, with a branch of 3 miles to the Canadian border, and also for authority to issue $2,000,000 of capital stock.

Illinois Central.—This company is receiving bids for the laying of 38 miles of second track from Central City, Ky., to Dawson Springs, which will follow a new route for a short distance. The construction of yards and terminal buildings at Central City is included in the project, which is estimated to cost approximately $3,000,000. This company closed bids December 28 for the construction of wash room facilities at Memphis, Tenn., consisting of a two-story brick building to cost approximately $60,000. The company will close bids on January 3 for the construction of a gravel washing plant at Freeport, Ill., to have a capacity of 2,000 cu. yd. per day.

Illinois Central.—This company, which was reported in the *Railway Age* of December 23 as contemplating the construction of a single track line from Edgewood, Ill., to Fulton, Ky., approximately 175 miles, has completed plans for this work. The maximum grade will be 0.3 per cent. There will be no large bridges but there will be one tunnel, one mile long, in the Ozark Mountains of Southern Illinois. The line from Edgewood, Ill., to Akin and from Fulton, Ky., to Metropolis, Ill., will be constructed first. The total cost of the work will be approximately $13,000,000.

Kansas City Terminal.—This company plans the construction, jointly with the city of Kansas City, of a viaduct near Chestnut and Guinotte avenues, Kansas City, Mo., approximately 1,500 feet long, crossing the tracks of the Chicago & Alton, the Missouri Pacific, the Kansas City Terminal and part of Guinotte avenue.

Louisville & Nashville.—This company has awarded a contract to the Missouri Valley Bridge & Iron Company, Leavenworth, Kan., for the construction of piers for a bridge at Rigolets, La. This company has begun with company forces the construction of 15 miles of second track on its Cumberland Valley division between Bailey, Ky., and Walls End.

New York Central.—This company contemplates the construction, jointly with the city of Cleveland, of a new bridge in that city; estimated cost approximately $100,000.

Pennsylvania.—This company has awarded a contract to the H. E. Culbertson Company, Cleveland, O., for the construction of trestle work in connection with the elevation of its tracks through the city of Cleveland.

Southern Pacific.—This company plans the construction of a bridge across the Colorado river at Yuma, Ariz., in a new location to cost approximately $2,000,000.

St. Louis-San Francisco.—This company, which was reported in the *Railway Age* of December 16 as having closed bids for the construction of a round house at Muskogee, Okla., has awarded the contract for this structure to C. E. Hamilton of St. Louis, Mo.

St. Louis-San Francisco.—This company is contemplating the construction of a new line from Sipsey, Ala., to Arkadelphia.

St. Louis-San Francisco.—This company contemplates the construction of a new freight house at Fayetteville, Ark. It is also considering remodeling the present passenger station.

Wabash.—This company contemplates the construction of a locomotive repair and machine shop at Decatur, Ill.

Kadel & Herbert

Christmas Trees Being Taken from Railway Piers at New York

Railway Financial News

CAROLINA, CLINCHFIELD & OHIO.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized an issue of $9,500,000 of first and consolidated mortgage 6 per cent bonds to be sold at not less than 91½, the proceeds to be used in paying off loans aggregating $8,000,000 from the government and in reimbursement for expenditures amounting to $1,500,000.

CHESAPEAKE & OHIO.—*Guaranty Certified.*—The Interstate Commerce Commission has issued a certificate placing the amount of this company's guaranty for the six months' period of 1920 at $4,378,841, of which $1,078,841 is still to be paid.

CHESAPEAKE & OHIO.—*Option on Stock Extended.*—The Wall Street Journal says:

The Van Sweringen interests will acquire the Huntingdon holdings of Chesapeake & Ohio common stock at $80 a share, if their recently acquired option is exercised according to bankers close to the Cleveland railroad operators. As the option is understood to cover about 30 per cent of the outstanding stock of the road, the total amount involved will be about $16,000,000. The road has outstanding common stock of a par value of $62,792,600.

Apparently the Van Sweringens are having some difficulty in finding the cash to finance this transaction. It was learned that their option, which originally expired on January 1, 1923, has been extended for two weeks to give the intending purchasers time to complete their arrangements.

CHICAGO, ROCK ISLAND & GULF.—*Guaranty Certified.*—The Interstate Commerce Commission has issued a final certificate placing the amount of this company's guaranty for the six months period of 1920 at $273,076.

CHICAGO WAREHOUSE & TERMINAL COMPANY.—*Asks Authority to Issue Notes.*—This company has applied to the Interstate Commerce Commission for authority to issue $150,000 of 5 per cent notes to be sold to the Chicago, Burlington & Quincy, the proceeds to be used in the construction of new tunnel and elevator shafts necessitated by the removal of the Burlington freight station facilities in Chicago to a point immediately south of the present location.

DETROIT & MACKINAC.—*Authorized to Sell Bonds.*—The Interstate Commerce Commission has authorized this company to sell $450,000 of first lien bonds at not less than 80.

INTERNATIONAL-GREAT NORTHERN.—*To Offer Bonds.*—This company will offer $13,462,000 6 per cent bonds on January 3 through a syndicate composed of Speyer & Co. and J. & W. Seligman & Co. They mature in 30 years and are secured by a direct first lien on the 1,159 miles of track, of which 1,106 miles are owned in fee. The total issue is of $20,000,000, of which $3,788,000 were exchanged for first mortgage bonds of the old company taken over in the reorganization and $2,750,000 were pledged with the director general of railroads as collateral for a 6 per cent. loan of $2,400,000 due March 1, 1930.

KENTWOOD & EASTERN.—*Authorized to Abandon Line.*—The Interstate Commerce Commission has issued a certificate authorizing the abandonment as to interstate commerce of this company's line from Kentwood to Scanlon, La., 16.53 miles.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—*Equipment Trusts Sold.*—Dillon, Read & Co. and the National City Company have purchased $2,360,000 5 per cent equipment trust certificates, series K. issued under the Philadelphia plan. All the certificates have been sold privately at prices to yield from 5 to 5.20 per cent.

NIAGARA JUNCTION.—*Authorized to Issue Stock.*—The Interstate Commerce Commission has authorized this company to issue 10,000 shares of capital stock without par value in place of 1,345 shares of preferred stock and 1,600 shares of common.

PENNSYLVANIA COMPANY.—*Extra Dividend.*—This company, the capital stock of which is owned by the Pennsylvania Railroad Company, has declared its usual semi-annual dividend of 3 per cent and an extra dividend of 20 per cent, payable out of its accumulated surplus on December 30, to stockholders of record December 27.

The extra dividend is a further step in liquidating the Pennsylvania Company, which has been in progress since 1917 when it relinquished the operation as lessee of the various lines in the Pennsylvania System West of Pittsburgh, which obligations were assumed by the Pennsylvania Railroad Company.

VIRGINIAN.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $2,074,000 of first mortgage 5 per cent, 50-year gold bonds to be sold at not less than 95 to reimburse the treasury for expenditures for additions and betterments.

Dividends Declared

Louisville & Nashville.—3½ per cent, semi-annually, payable February 10 to holders of record January 15.

Northern Pacific.—1¼ per cent, quarterly, payable February 1 to holders of record December 29.

Reading Company.—Common, 2 per cent, payable February 8 to holders of record January 16; 2nd preferred, 1 per cent, quarterly, payable January 11 to holders of record December 29.

Trend of Railway Stock and Bond Prices

	Dec. 26	Last Week	Last Year
Average price of 20 representative railway stocks	64.88	63.83	56.30
Average price of 20 representative railway bonds	85.02	85.10	80.31

Maroggia Bridge, St. Gotthard Railway, Switzerland

Railway Officers

Executive

W. S. Andrews has been appointed assistant vice-president of the Southern.

E. Fox, general traffic manager of the El Paso & Southwestern, with headquarters at El Paso, Tex., has been promoted to vice-president in charge of traffic, with the same headquarters.

C. E. Spens will conclude his work as federal fuel distributor on December 31 and return to his duties as vice-president in charge of traffic of the Chicago, Burlington & Quincy, with headquarters at Chicago, from which he has been on leave of absence.

Traffic

E. H. Potter has been appointed general agent, freight department, of the New York Central, with headquarters at South Bend, Ind.

G. Byrne has been appointed general agent of the Cleveland, Cincinnati, Chicago & St. Louis and the Evansville, Indianapolis & Terre Haute, with headquarters at Terre Haute, Ind., succeeding A. T. Kingsley, who has resigned to take up other work.

F. N. Westerman, assistant general passenger agent of the Southern, with headquarters at Cincinnati, Ohio, has been transferred to Washington, D. C., in the same capacity. **E. G. Irwin**, chief clerk in the passenger department at Cincinnati, has been promoted to assistant general passenger agent, with the same headquarters, succeeding Mr. Westerman.

C. S. Morse, district freight agent for the Canadian Pacific, with headquarters at Toronto, Ont., has been transferred to Ottawa, Ont., in the same capacity, succeeding **F. P. Tucker**, who has been transferred to Detroit, Mich. **G. C. Cochlan**, district freight agent, with headquarters at Detroit, Mich., has been transferred to Toronto, Ont., succeeding Mr. Morse.

W. J. Tremaine, assistant general freight agent of the Alabama & Vicksburg and the Vicksburg, Shreveport & Pacific, with headquarters at Vicksburg, Miss., has been transferred to New Orleans, La., succeeding H. J. Niemann whose promotion to general freight agent was reported in the *Railway Age* November 18. **J. F. Hardin** has been promoted to assistant general freight agent with headquarters at Vicksburg, Miss., succeeding Mr. Tremaine.

W. C. Barnes, freight traffic manager of the El Paso & Southwestern, with headquarters at El Paso, Tex., has been promoted to traffic manager, with the same headquarters. **G. King**, general passenger agent, with headquarters at El Paso, Tex., has been promoted to assistant traffic manager, with headquarters at San Francisco, Cal. **W. S. Dawson**, assistant general freight agent, with headquarters at El Paso, Tex., has been promoted to general freight agent, with the same headquarters. **J. D. Mason** has been promoted to general passenger agent, with headquarters at El Paso, Tex., succeeding Mr. King. **H. D. McGregor** has been promoted to assistant general passenger agent, with headquarters at El Paso, Tex. **C. F. Arnold** has been appointed general agent, with headquarters at San Francisco, Cal.

A. Cotsworth, Jr., assistant general passenger agent of the Chicago, Burlington & Quincy, with headquarters at Chicago, Ill., has been promoted to general passenger agent, with headquarters at Omaha, Neb., succeeding **L. W. Wakeley**, who has been transferred to Chicago as assistant to the passenger traffic manager. Mr. Cotsworth was born on March 18, 1882, at Burlington, Iowa. He entered railway service in February, 1900, as an office boy in the general passenger department of the Chicago, Burlington & Quincy at Chicago, Ill. During the next six years he served in various clerical positions in the same department, and on February 1, 1906, was promoted to chief clerk in the department. He was promoted to assistant general passenger agent on March 1, 1920, and held this position until the time of his recent promotion to general passenger agent, as noted above.

Harvey Allen, whose promotion to assistant general freight agent of the Missouri, Kansas & Texas, with headquarters at St. Louis, Mo., was reported in the *Railway Age* of December 9, was born on February 28, 1889, at Evansville, Ind. He attended Staunton Military Academy at Staunton, Va., and Washington and Lee University at Lexington, Va., until November 12, 1907, when he entered the service of the Missouri, Kansas & Texas as a clerk in the local freight office at St. Louis, Mo. He was transferred to the claim department in February, 1909, and was promoted to rate and tariff clerk in June, 1910. He served in various capacities in this department until he was promoted to clerk to the assistant general freight agent at St. Louis, Mo., in October, 1916, and held this position until October, 1919, except for a period of 15 months when he was in the engineering corps of the army. In October, 1919, he re-entered railway service as chief clerk in the general freight office of the Missouri, Kansas & Texas at Dallas, Tex., and held this position until he was promoted to division freight agent at Oklahoma City, Okla., in July, 1920. He was serving in this capacity when he was promoted to assistant general freight agent in December, 1922.

Mechanical

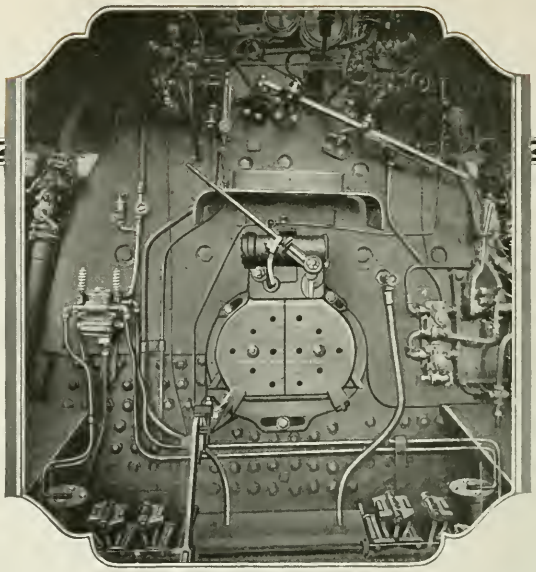
C. E. McCloskey has been appointed master mechanic of the Gulf Coast Lines, with headquarters at Kingsville, Tex.

Obituary

W. W. McCauley, assistant general superintendent of transportation on the Northern Pacific, died at St. Paul, Minn., on December 25.

Alexander Hilton, vice-president in charge of traffic of the St. Louis-San Francisco, died at St. Louis, Mo., on December 25, following a nervous breakdown.

A Dining Car in Norway



Franklin Automatic Firedoor
Butterfly Type

SHUT THE DOOR

NO ONE would build a locomotive and leave off the fire door.

Everyone knows that enough cold air will kill any engine.

To keep out steam-killing cold air is the purpose of the Franklin Automatic Fire Door.

With a good fireman, there's just enough time to get the scoop out and the firedoor is closed.

Franklin Firedoors make freer steaming engines and at the same time save coal.

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Franklin Railway Supply Company of Canada, Limited, Montreal
Export Department—International Railway Supply Co.—30 Church St., New York

"On the Lehigh and New England Railroad"

Total Weight of Engine, 301,500 pounds; Weight on Driving Wheels, 279,000 pounds; Diameter of Driving Wheels, 61 inches; Boiler Pressure, 210 pounds; Cylinders, 27x32 inches; Maximum Tractive Power, 68,200 pounds.

Consolidated locomotive No. 301, one of several of this type recently delivered to the Lehigh & New England Railroad is the heaviest and most powerful consolidated locomotive ever built.

> "Two of these locomotives are assigned to a region where they are handling heavy coal trains a distance of fifty-four miles, encountering .5% grade, hauling 3500 tons at a speed of approximately twenty miles per hour.
>
> Their performance is highly satisfactory, negotiating all grades and curves with ease, steaming freely without excessive coal consumption. Two others, working out of Pen Argyl on a 2.75% grade, haul 690 gross tons with similar results."

The remarkable results obtained by these locomotives point with particular clearness to the efficiency of Alco engineering methods.

To retain consolidation arrangement but increase its power to the capacity usually only found in a widely different type was the objective.

Working in close co-ordination with the Mechanical Department of the railroad, Alco Engineers succeeded in enlarging the capacity of this type without departing from established methods of weight distribution or altering arrangement of consolidation design.

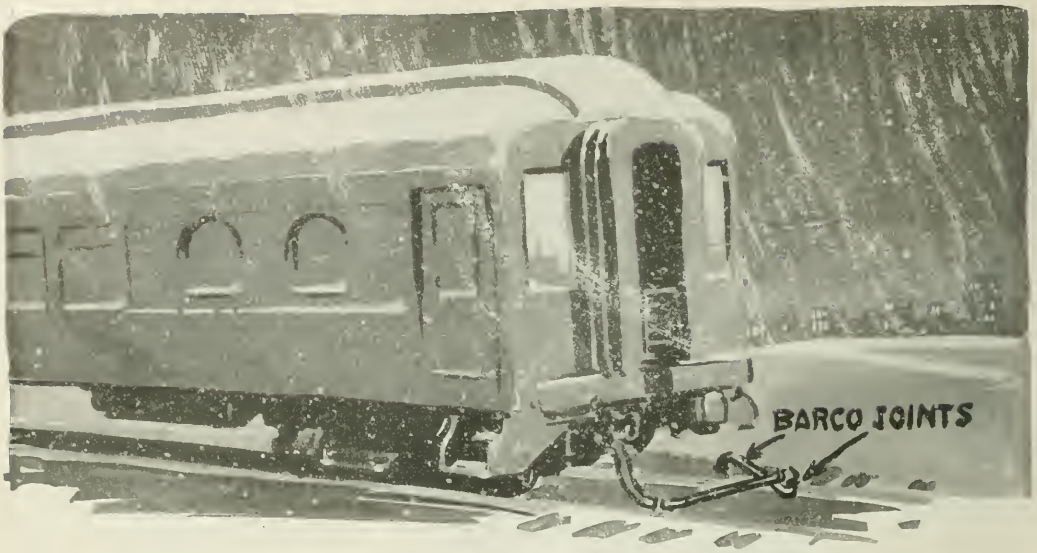
In this instance as in many others, a need was supplied—without supplying more than was needed.

Alco service has often demonstrated that there is a vast difference between—

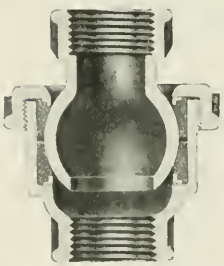
getting all you need
and
needing all you get.

AMERICAN LOCOMOTIVE COMPANY

30 Church Street **New York City**



When Winter Comes



THEN is the time that the proper heating of coaches and Pullmans in station sidings, coach yards and terminals counts—counts big in securing the good will of the traveling public and in obtaining increased patronage for your road.

The rigor of the coldest winter weather will find your passenger cars warm and comfortable, if you use

BARCO
Station and Coach Yard Connections

Zero weather, snow, ice, or high pressure cannot hurt Barco All Metal Connections nor cause them to burst, leak or fail—while the Barco Universal Ball Joints always furnish a free and unobstructed passage for steam, regardless of the exact position of the car and without requiring accurate spotting of trains.

And think of the savings in hose renewals made possible by the use of Barco metallic connections. This item alone quickly pays for their installation.

Why not let us solve your terminal car heating problems? Complete information gladly furnished—write for it.

Barco Manufacturing Company
CHICAGO, ILL.

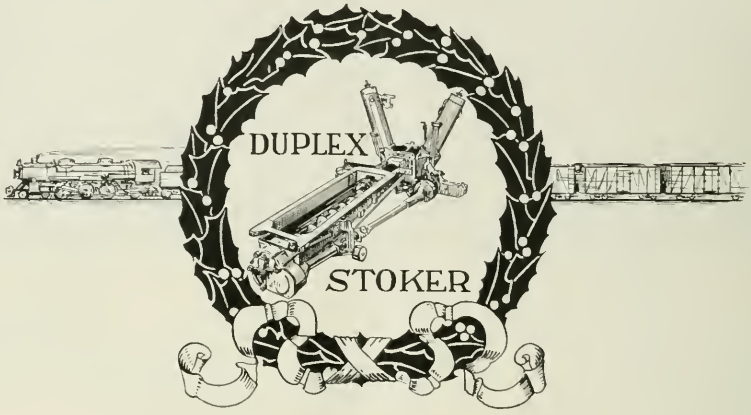
IN CANADA
MONTREAL-TORONTO

THE HOLDEN CO., LTD.

IN CANADA
WINNIPEG-VANCOUVER

making good on

A Resolution!



TEN years ago we resolved to build a locomotive stoker that would embody every quality shown by study and experience to be required in performing the tremendous task of firing *any* locomotive to full capacity—

Under all conditions which might arise in the course of a normal road trip;

Crushing its own coal as it went;

Distributing fuel in a manner to obtain the most efficient and scientific combustion;

Rugged enough to stand up under *years* of gruelling service;

Practical, economical, dependable, *satisfying;*

A stoker for which no job would be too big!

Our resolution culminated in the DUPLEX STOKER, and proof that we have successfully met every requirement laid down for perfect stoker performance is found in the fact that

5,000 of our Stokers are now in Service on 78 Railroads

—"because the Promise has been performed"

LOCOMOTIVE STOKER COMPANY

Main Office and Works: Pittsburgh, Pa.

50 Church Street
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Munsey Bldg.
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Railway Exchange Bldg.
CHICAGO

New Year Greetings

¶ To our friends the railroads, and our contemporaries in the railway supply field, we extend best wishes for the New Year.

¶ On the threshold of another twelve-month business cycle, we take pleasure in thus publicly renewing our pledge of 53 years' standing to give our customers and our friends in the future the same degree of loyal co-operation and unselfish service which it has been our constant endeavor to render in the past.

¶ May Nineteen Hundred and Twenty-Three hold a full measure of happiness and prosperity for us all.

A. L. Humphrey

PRESIDENT

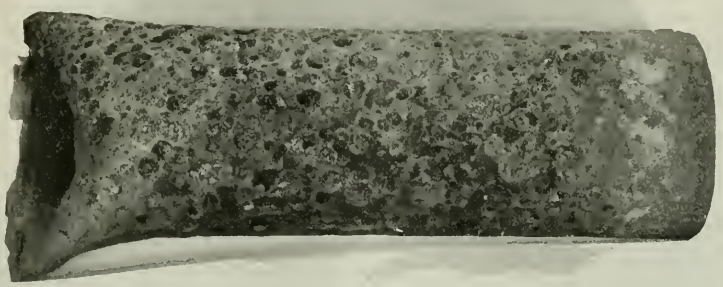
WESTINGHOUSE AIR BRAKE CO.

General Office and Works, Wilmerding, Pa.

New York Washington Pittsburgh Chicago St. Louis San Francisco

PARKESBURG TUBES

are REAL Charcoal Iron Boiler Tubes



A lower priced tube—not a cheaper one. A genuine charcoal iron tube, at a slightly higher price per foot, would have given longer and lower cost service.

Buying *for* Service

AN important railroad recently ordered forty locomotives at a total expenditure that would have purchased sixty locomotives of the same class, but less efficient.

Forty of these better locomotives will do more than sixty weaker ones. Forty locomotives require less maintenance than sixty.

A number of large roads buy boiler tubes on the same basis. They pay a little more per foot for genuine charcoal iron tubes because they know that charcoal iron tubes give longer service life with few replacements and less maintenance cost.

Locomotives or boiler tubes—it pays to pay a little more for a better article.

For corrosion-resisting charcoal iron tubes that last beyond the life of ordinary tubes, specify Parkesburg Charcoal Iron Boiler Tubes.

"For Every Locomotive," a little folder with an interesting story of the Charcoal Iron Boiler Tube, will be sent you on request. Write for a copy.

The Parkesburg Iron Company

Parkesburg, Pa.

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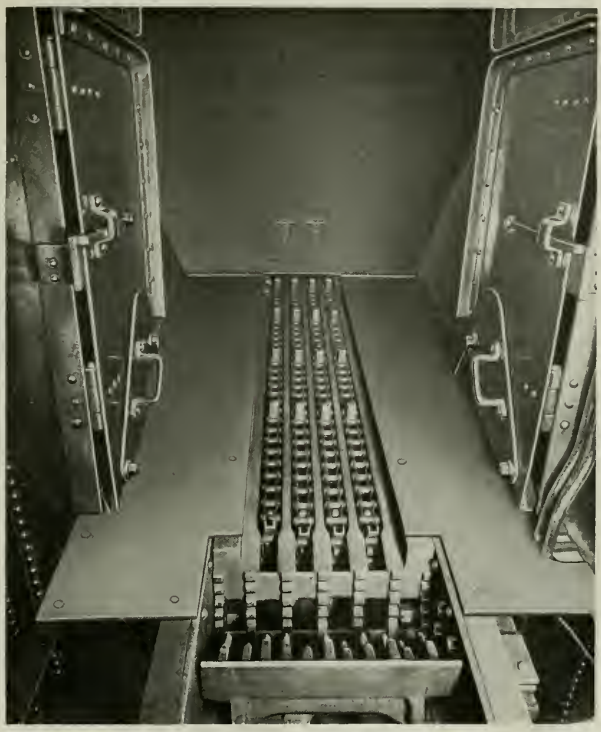
Philadelphia, Commercial Trust Building — St. Louis, Security Building
San Francisco, Rialto Building — Montreal, New Birks Building

EXPORT AGENTS

Wonham, Bates & Goode Trading Corporation, New York



View looking into the tank of a locomotive equipped with an Elvin Mechanical Stoker, the front deck plate and cover over the coal breaker being removed to more clearly illustrate the operation.

Coal Crushing

Elvin Mechanical Stokers do not crush coal already small enough for stoker use. Such coal passes through slots direct to the conveyor. The Elvin breaker *breaks lumps* only and does it in plain view ahead of the coal gates, where foreign matter can be easily removed if necessary.

Approximately three Horse Power only is required to run the stoker and appurtenances under full load.

Elvin Mechanical Stokers fire less coal in a manner that secures more work from your locomotive—and *keep doing it!*

ELVIN MECHANICAL STOKER COMPANY
50 Church Street **New York City**

PROFESSIONAL DIRECTORY

THE ARNOLD COMPANY
ENGINEERS—CONSTRUCTORS
Electrical — Civil — Mechanical

Specialists in the planning of railroad properties and their construction. Offering complete service from conception to operation, eliminating hazardous division of responsibility and insuring maximum economy.

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An organization experienced in laying-out, designing, building and equipping railroad shops and terminals.
Specialists in designing steel and reinforced concrete structures.

Exclusive Representatives for
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Our complete and experienced organization is at your service for the design and construction of railway structures of every character.

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M. C. B. Design
25% longer wear. Do not heat, burn or wear wheels. A trial order sent on request. Write us for quotations.
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Let the Get Together Department act as your silent salesman in helping you turn your idle second-hand equipment into cash.

Use the Professional Directory in order to keep your name before every important railway official.

Classified Advertisements—Help and Situation Wanted advertisements appearing in the "Get Together Department," 5c. a word an insertion, including ten words for address. Minimum charge $1.00 for each insertion. For Sale advertisements, $3.00 a column inch (1" deep x 1⅝" wide.) Any number of inches may be used. Copy must be in this office by Saturday noon to insure insertion in the following week's issue.

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SALARIED positions $2,500 to $25,000 upward; executive, technical, administrative, engineering, manufacturing, professional, managing, financial, etc., all lines. If you are qualified, and receptive to tentative offers for a new connection, you are invited to communicate in strict confidence with the undersigned, who will conduct preliminary negotiations for such positions. A method is provided through which you may receive overtures in confidence, without jeopardizing present connections, and in a manner conforming strictly to professional ethics. Send name and address only; preliminary particulars will be sent without obligating or compromising you in any way. R. W. Bixby, Inc., 402 Lockwood Building, Buffalo, N. Y.

WANTED in New York City by private company, clerk for checking A. R. A. repairs. State age, education, experience, salary expected. Address Box 443, Railway Age, Woolworth Building, New York City.

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Sales Manager and Executive desires to change his position. Has had many years' experience directing sales organization in steam railway and industrial sales. Has also had considerable experience in merchandising. Correspondence invited and will be kept confidential. Address Box 440, care Railway Age, Woolworth Building, New York, N. Y.

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An Executive with thorough training seeks real activity and responsibilities. Long service with two large manufacturing companies earned consistent advancement to position of General Manager and in such capacity he successfully directed a 1400-man organization including operations of a large factory. The automobile accessories and railway supplies manufactured were nationally distributed. Highest references business and personal—a record of achievement and ability to grasp and solve problems. Address Box 442, Railway Age, Woolworth Building, New York City.

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POSITION WANTED—Electrical engineer with broad experience in telegraph, telephone and signal construction and maintenance. Position with central, western or foreign railway. Address Box 441 Railway Age, Woolworth Building, New York City.

AMBITIOUS young man 34 years of age wants supervisory position in Passenger Car Department, with some up-to-date railroad. Has long experience in both mechanical and engineering department. Reference furnished. J. L. Williams, Passenger Car Dept., N. & W. Ry., Roanoke, Va.

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SEND for Free Special Bulletin and learn how to increase your knowledge of practical railroad work and fit yourself for promotion. The Railway Educational Bureau, Omaha, Nebr.

If you have second-hand equipment to sell, your advertisement should appear in the—

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Take advantage of it.

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125 65,000 lb. Capacity BOX CARS; ALL REBUILT, in strictly first class condition; ready for immediate shipment.

GONDOLA CARS

25 100,000 lb. Capacity ALL STEEL, Double Hopper cars.
25 100,000 lb. Capacity, ALL STEEL, Flat Bottom cars.
80,000 lb. and 100,000 lb. NEW STEEL FLAT CARS.

LOCOMOTIVES

5 to 100 tons in weight, ALL TYPES, for all classes of service. Have over 50 rebuilt and ready for IMMEDIATE SHIPMENT.

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Use the Classified Section, when in need of a man or looking for a position.

36" Gauge Equipment for Sale
1 50-Ton Shay Locomotive.
1 35-Ton Brooks Mogul Locomotive.
5 35-Ton Cooke Consolidation Locomotives
1 18-Ton Davenport Saddle Tank Locomotive.
3 28' Box Cars, 30 m. cap.
3 30' Flat Cars, 40 m. cap.
MORSE BROS. MACH. & SUPPLY CO., Denver, Colo. 3

FOR SALE

70 ton (140,000) 41 ft. Flat Car.
3—Western 16 yd. Air Dump Cars.
35—Side Dump Ballast Cars.

Walter A. Zelnicker Supply Co.
St. Louis

FOR SALE ALL STEEL GONDOLA CARS

110,000 lb. capacity.

Twin hopper bottom
or
Flat Steel Floors.

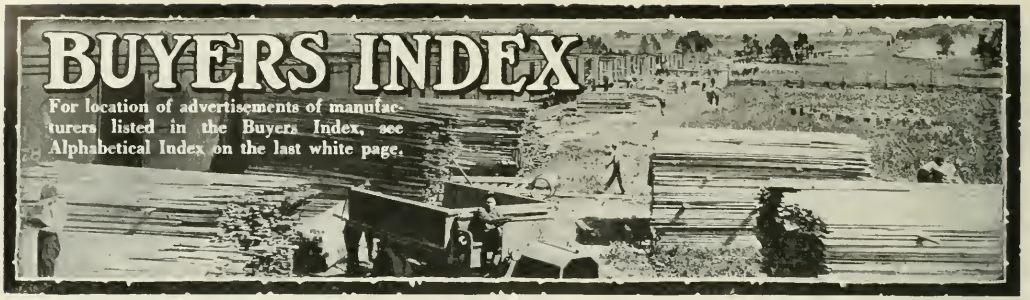
Air Brakes.

Standard Safety Appliances.

Completely Rebuilt and Meeting all I. C. C. requirements.

For further information and photos of cars write or wire.

The Youngstown Equipment Company
Niles Ohio



Acetylene, Dissolved.
Air Reduction Sales Co.

Air Lifts.
Ingersoll-Rand Co.

Air Reservoir Joints — (See Joints, Air Reservoir).

Angle Bars — (See Joints, Rail).

Angles, Channels and Tees—(See Shapes, Structural).

Arch, Locomotive Brick.
American Arch. Co.

Arresters, Lightning.
General Electric Co.
P. & M. Co., The.

Ash Conveyors.
Conveyors' Corporation of America.

Automatic Train Control.
Miller Train Control Corp.
National Safety Appliance Co.

Axles, Car and Locomotive.
American Locomotive Co.
Baldwin Locomotive Works, Tire.
Cambria Steel Co.
Standard Steel Works.

Barges, Steel.
American Bridge Co.
Pittsburgh-Des Moines Steel Co.

Barrels, Tumbling.
Whiting Corp.

Bars, Concrete Reinforcing.
American Steel & Wire Co.
Cambria Steel Co.
Carnegie Steel Co.
Illinois Steel Co.
Interstate Iron & Steel Co.
Midvale Steel Co.

Bars, Iron and Steel.
Cambria Steel Co.
Carnegie Steel Co.
Falls Hollow Staybolt Co.
Illinois Steel Co.
Ryerson & Son, Joseph T.
United Alloy Steel Corp.

Batteries, Electric Storage.
Safety Car Heating & Lighting Co.
Stone Franklin Co.

Batteries, Wet Cell.
Electric Storage Battery Co.

Bearings, Center.
Chicago Ry. Equipment Co.
Miner, W. H.
Symington Co., T. H.
Woods & Co., Edwin S.

Bearings, Journal.
Magnus Co., Inc.
More-Jones Brass & Metal Co.

Bearings, Side.
American Steel Foundries.
Chicago Ry. Equipment Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
Standard Car Truck Co.
Wine Ry. Appliance Co.
Woods & Co., Edwin S.

Benders, Rail.
American Chain Co.

Bending and Straightening Machines.
Ryerson & Son, Joseph T.

Billets, Steel.
Cambria Steel Co.
Illinois Steel Co.
Midvale Steel & Ordnance Co.

Blanks, Rolled Gear.
Cambria Steel Co.
Midvale Steel & Ordnance Co.

Blocks, Creosoted.
American Creosoting Co.
Central Coal & Coke Co.
International Creosoting & Construction Co.
Jennison Wright Co.

Blower Fittings, Automatic Smokebox.
Barco Mfg. Co.

Blow Off Line Joints, Roundhouse—(See Joints, Etc.).

Boilers, Locomotive.
American Locomotive Co.
Baldwin Locomotive Works.

Boilers, Water Tube.
Babcock & Wilcox.

Bolsters, Steel.
American Steel Foundries.
Illinois Steel Co.
Republic Railway Equip. Co.
Scullin Steel Co.

Bolts and Nuts.
Ross Nut Co.
Cambria Steel Co.
National Malleable Castings Co.
Russell, Burdsall & Ward Bolt and Nut Co.
Ryerson & Son, Joseph T.

Bolts, Patch.
Falls Hollow Staybolt Co.

Bolts, Track.
Illinois Steel Co.

Books.
Simmons-Boardman Pub. Co.

Booster.
Franklin Ry. Supply Co.

Booths, Telephone.
Dickinson, Inc., Paul.

Boring and Turning Mills, Vertical.
Niles-Bement-Pond Co.

Braces, Rail.
American Chain Co.
Cambria Steel Co.
Fort Pitt Malleable Iron Co.
Midvale Steel & Ordnance Co.
National Malleable Castings Co.
Ramapo Ajax Corp.
Q & C Co., The.

Brake Beams.
American Steel Foundries.
Chicago Ry. Equipment Co.
Parlin & Bingham Co.
Republic Railway Equip. Co.

Brake Beams—Supports.
American Steel Foundries.
Chicago Ry. Equipment Co.

Brake Forging, Pins, Levers, Etc.
American Steel Foundries.
National Railway Appliance Co.
Schaefer Equipment Co.
Steel Car Forge Co.

Brake Heads.
American Steel Foundries.
Chicago Ry. Equipment Co.
National Malleable Castings Co.

Brake Jaws.
National Malleable Castings Co.
National Railway Appliance Co.
Schaefer Equipment Co.
Steel Car Forge Co.

Brake Shoes.
American Brake Shoe & Fdy. Co.
Fort Pitt Malleable Iron Co.
Railway Materials Co.
Weirbach Brake Shoe Co.

Brakes, Air.
Westinghouse Air Brake Co.

Brakes, Clasp.
American Steel Foundries.

Brakes, Electric.
Westinghouse Air Brake Co.

Brakes, Hand.
Miner, W. H.
Minich Ry. Appliance Co.
National Malleable Castings Co.
Wine Ry. Appliance Co.

Brick Locomotive Arch.
American Arch Co.

Bridge Builders.
Arnold Co.
Austin Co., The
Fowler, Chas. Evan.
Pittsburgh-Des Moines Steel Co.

Buckets, Clam Shell.
Blaw Knox Co.
Brown Hoisting Machy. Co.
Browning Co.
Industrial Works.
Orton & Steinbrenner Co.

Buckets, Grab.
American Bridge Co.
Blaw Knox Co.
Brown Hoisting Machy. Co.
Browning Co.
Hayward Co.
Industrial Works.
McMyler Interstate Co.
Orton & Steinbrenner Co.

Buffers, Friction.
Miner, W. H.
Westinghouse Air Brake Co

Buffers, Radial.
Franklin Ry. Supply Co.

Buildings, Iron, Steel and Steel Concrete.
Arnold Co.
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Ferguson Co., H. K.
McLellan & Junkersfeld, Inc.
Pittsburgh-Des Moines Steel Co.
Robertson Co., H. H.
Robinson Co., Dwight P.
Stone & Webster.
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Builders, Portable Steel.
Blaw-Knox Co.

Bulldozers.
Niles-Bement Pond Co.
Ryerson & Son, Joseph T.

Burners, Bunsen, Oxygen, Gas.
Air Reduction Sales Co.

Cables, Electric.
American Steel & Wire Co.
Kerite Insulated Wire & Cable Co.

Cableways—(See Tramways).

Calcium Carbide.
Air Reduction Sales Co.

Car Ends, Pressed Steel
Parlin & Bingham Corp.

Car Ends, Steel.
Chicago Cleveland Car Roofing Co.

Car Lighting Equipment — (See Lighting, Car Equipment).

Carlines.
Chicago Cleveland Car Roofing Co.
Standard Ry. Equipment Co.

Car Material, Wood.
Exchange Sawmills Sales Co.
Kirby-Bonner Lumber Co.

Car Steps, Safety.
American Abrasive Metals Co.

Carriers, Monorail.
Conveyors Corp. of America.

Cars, Ballast.
Cambria Steel Co.
Western Wheeled Scraper Co.

Cars, Convertible.
Cambria Steel Co.

Cars, Dump.
Cambria Steel Co.
Clark Car Co.
Western Wheeled Scraper Co.

Cars, Freight.
American Car & Fdry. Co.
Cambria Steel Co.
Greenville Steel Car Co.
Ralston Steel Car Co.
Ryan Car Co.
Youngstown Steel Car Co.

Cars, Hand and Push.
Fairbanks, Morse & Co.
Mudge & Co.

Cars, Industrial.
Whiting Corp.
Youngstown Steel Car Co.

Cars, Motor (Section).
Clark Car Co.
Fairbanks, Morse & Co.
Mudge & Co.

Cars, Ore.
Clark Car Co.

Cars, Passenger.
American Car & Fdry. Co.
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American Locomotive Co.
Baldwin Locomotive Works.
Midvale Steel & Ordnance Co.
National Malleable Castings Co.
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Fort Pitt Malleable Iron Co.
McConway & Torley Co.
National Malleable Castings Co.
P. & M. Co., The.

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American Steel Foundries.
Edgewater Steel Co.
McConway & Torley Co.
Midvale Steel & Ordnance Co.
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Union Spring & Mfg. Co.

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Dearborn Chemical Co.
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Dickinson, Inc., Paul.

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American Chain Co.
Q & C Co., The.

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National Malleable Castings Co.
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National Malleable Castings Co.

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Orton & Steinbrenner Co.
Roberts & Schaefer Co.

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Fairbanks, Morse & Co.
Pittsburgh-Des Moines Steel Co.
Roberts & Schaefer Co.

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Westinghouse Air Brake Co.

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U. S. Cast Iron Pipe & Fdry. Co.

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Pittsburgh-Des Moines Steel Co.

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Bird-Archer Co., The
Dearborn Chemical Co.

Compressors, Air.
General Electric Co.
Ingersoll-Rand Co
Norwalk Iron Works
Worthington Pump & Mchy. Corp.

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Ingersoll-Rand Co

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Barco Mfg. Co.
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Industrial Works
Orton & Steinbrenner Co.

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Industrial Works.

Cranes, Wrecking.
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Browning Co.
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Orton & Steinbrenner Co.

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Morton Mfg. Co.

Curtains & Fixtures, Car Vestibule.
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Cutting and Welding Apparatus (Oxy-Acetylene).
Air Reduction Sales Co.

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Air Reduction Sales Co.

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Industrial Works.

Diaphragms, Buffing, Mechanism.
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Jordan Co., O. H.

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Fort Pitt Malleable Iron Co.
Hall Draft Gear Corp.
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Standard Coupler Co.
Symington Co., T. N.
Union Draft Gear Co.
Westinghouse Air Brake Co.

Draft Yokes.
American Steel Foundries.
Miner, W. H.
National Malleable Castings Co.
Steel Car Forge Co.

Drawbar Centering Device.
Miner, W. H.

Dredging Machinery.
Industrial Works.
Pittsburgh-Des Moines Steel Co.

Drill Steel, Rock and Steel Sharpeners.
Ingersoll-Rand Co.

Drilling Machines, Pneumatic.
Ingersoll-Rand Co.

Drilling Machines, Rock.
Ingersoll-Rand Co.
Oldham & Son Co., Geo.

Drilling Machines, Upright and Radial.
Niles-Bement-Pond Co.
Ryerson & Son, Joseph T

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Independent Pneumatic Tool Co.
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Independent Pneumatic Tool Co.
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Bird-Archer Co., The
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Greenfield Tap & Die Corp.

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Glessel Co., Henry.

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Dryers, Rotary.
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Economizers, Fuel.
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Electrification, Railroad.
General Electric Co.
McLellan & Junkersfeld, Inc.
Robinson Co., Dwight P.
Smith & Co., C. E.

Enamels, Air Drying and Baking.
Murphy Varnish Co.

Engineers and Contractors.
Roberts & Schaefer Co.
Robinson Co., Dwight P.
Stone & Webster
Watson Engineering Co.
White Eng. Corp., J. G.

Engineers, Construction.
Arnold Co.
Austin Co., The
Bush, Roberts & Schaefer.
Ferguson Co., H. K.
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Engineers, Consulting, Civil, Elec., Hydraulic, Mech. Val.
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Battey, Paul L.
Bush, Roberts & Schaefer.
Ferguson Co., H. K.
Fowler, Chas. Evans
Fowler, Geo. L.
Gifford-Wood Co.
Gilmore, Thomas N.
Hunt & Co., Robert W.
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Stone & Webster
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Engineers, Inspecting.
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Austin Co., The
Bush, Roberts & Schaefer Co.
Ferguson Co., H. K.
Fowler, Geo. L.
Gulick, Henderson Co.
Hunt & Co., Robert W.
Muhlfeld, John E.
Smith & Co., C. E.

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Fairbanks, Morse & Co.
Ingersoll-Rand Co.
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Engines, Gas and Gasoline.
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Worthington Pump & Mchy. Corp.

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Industrial Works
Orton & Steinbrenner Co.

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Mudge & Co.
Sturtevant Co., B. F.

Fasteners, Car Door.
Arnold Co.
Camel Co.
Fort Pitt Malleable Iron Co.
Miner, W. H.
National Malleable Castings Co.

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Ferro Molybdenum.
Vanadium Corp. of America.

Ferro Tungsten.
Vanadium Corp. of America.

Ferro Vanadium.
Vanadium Corp. of America.

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Graver Corp.

Filtration Plants (Water).
Graver Corp.

Fireboxes.
American Locomotive Co.
Baldwin Locomotive Works

Fittings, Air Brake.
National Malleable Castings Co.
Westinghouse Air Brake Co.

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U. S. Cast Iron Pipe & Fdry. Co.

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Camel Co.
Miner, W. H.
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Flangers, Snow.
Q & C Co., The

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Central Coal & Coke Co.
Exchange Sawmills Sales Co.
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Forges, Rivet Heating.
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Forgings.
American Steel Foundries
Edgewater Steel Co.
Illinois Steel Co.
Midvale Steel & Ordnance Co.
Parish & Bingham Co.
Steel Car Forge Co.
United Alloy Steel Corp.

Forgings, Drop.
Steel Car Forge Co.

Forms, Steel, for Concrete Construction.
Blaw-Knox Co.

Foundations.
Fowler, Chas. Evans
Smith & Co., C. E.

Foundry Equipment.
Whiting Corp.

Foundry Supplies.
Bird-Archer Co., The
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Frames, Locomotives.
American Locomotive Co.
American Steel Foundries
Baldwin Locomotive Works

Frames, Truck.
American Locomotive Co.
American Steel Foundries
Baldwin Locomotive Works
Franklin Railway Supply Co.
Scullin Steel Co.

Frames, Vanadium.
American Locomotive Co.
Baldwin Locomotive Works

Frogs and Crossings.
Cambria Steel Co.
Ramapo Ajax Corp.

Fulcrums, Brake Beam.
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Furnaces, Melting.
Whiting Corp.

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Gage Testers—(See Testers, Gage).

Gages, Machinists.
Greenfield Tap & Die Corp.

Gages, Steam.
Ashton Valve Co.

Gages Wheel Press, Recording.
Ashton Valve Co.

Gates, Tail.
Morton Mfg. Co.

Gear Blanks, Rolled Steel.
Standard Steel Works.

Gears and Pinions.
American Steel Foundries

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Safety Car Lighting & Heating Co.
Stone Franklin Co.

Generators, Acetylene.
Air Reduction Sales Co.

Generators, Electric.
Fairbanks, Morse & Co.

Glass, Wire.
Mississippi Wire Glass Co.

Goggles.
Air Reduction Sales Co.

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Galena Signal Oil Co.

Grapples, Wood.
Industrial Works.

Grate Shakers.
Franklin Railway Supply Co.

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Franklin Railway Supply Co.

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Hammers, Riveting.
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Graver Corp.
Superheater Co., The.
Worthington Pump & Mchy. Co.

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Gold Car Htg. & Ltg. Co.
Safety Car Heating & Lighting Co.
Stone Franklin Co.
Vapor Car Heating Co., Inc.
Wine Ry. Appliance Co.

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Sturtevant Co., B. F.

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Hoists, Coach.
Whiting Corp.

Hoists, Electric.
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Hoists, Locomotive.
Whiting Corp.

Hoists, Pneumatic.
Ingersoll-Rand Co.
Whiting Corp.

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Duner Co.

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Ingersoll Rand Co.
Oldham & Son Co., Geo.
Westinghouse Air Brake Co.

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Air Reduction Sales Co.

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Edgewater Steel Co.
Illinois Steel Co.
McConway & Torley Co.
Midvale Steel & Ordnance Co.
National Malleable Castings Co.

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Ewald Iron Co
Falls Hollow Staybolt Co

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Cambria Steel Co.
Falls Hollow Staybolt Co.
Midvale Steel & Ordnance Co.
Parkesburg Iron Co

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Falls Hollow Staybolt Co.
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Falls Hollow Staybolt Co.
Rome Iron Mills, Inc.
Ryerson & Son, Joseph T.
United Alloy Steel Corp.

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Dickinson, Inc., Paul.

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Barco Mfg. Co.
Franklin Ry. Supply Co.

Joints, Blow Off Line (Roundhouse).
Barco Mfg. Co.
Franklin Ry. Supply Co.

Joints, Coach and Coach Yard.
Barco Mfg. Co.
Franklin Ry. Supply Co.

Joints, Flexible.
Barco Mfg. Co.
Franklin Ry. Supply Co.

Joints, Rail.
American Chain Co.
American Steel Foundries.
Cambria Steel Co.
Illinois Steel Co.
Q & C Co., The
Rail Joint Co., The

Joints, Steam, Air and Liquid.
Barco Mfg. Co.
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